

CHAPTER

28

FUEL



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28-EFFECTIVE PAGES			28-00-00 (cont)			28-00-00 (cont)		
1 thru 15	Feb 15/2025		207	Oct 15/2015		910	Oct 15/2024	
16	BLANK		208	Oct 15/2015		911	Oct 15/2024	
28-CONTENTS			209	Feb 15/2015		912	Feb 15/2024	
1	Feb 15/2024		210	Oct 15/2014		913	Feb 15/2024	
2	Feb 15/2024		211	Feb 15/2015		914	Feb 15/2024	
3	Feb 15/2024		212	Feb 15/2015		915	Feb 15/2024	
4	Jun 15/2024		213	Oct 15/2014		916	Feb 15/2024	
5	Apr 15/2022		214	Oct 15/2014		917	Feb 15/2024	
6	Feb 15/2022		215	Feb 15/2015		918	Feb 15/2024	
7	Jun 15/2024		216	Jun 15/2016		919	Feb 15/2024	
8	Jun 15/2024		217	Oct 15/2022		920	Feb 15/2024	
9	Jun 15/2024		218	Jun 15/2023		921	Feb 15/2024	
O 10	Feb 15/2025		219	Oct 15/2022		922	Feb 15/2024	
O 11	Feb 15/2025		220	Feb 15/2020		923	Feb 15/2024	
O 12	Feb 15/2025		221	Oct 15/2015		924	Feb 15/2024	
O 13	Feb 15/2025		222	Oct 15/2015		925	Feb 15/2024	
O 14	Feb 15/2025		223	Oct 15/2015	R	926	Feb 15/2025	
15	Oct 15/2024		224	Oct 15/2015		927	Feb 15/2024	
16	Oct 15/2024		225	Oct 15/2015		928	Feb 15/2024	
17	Oct 15/2024		226	Oct 15/2015		929	Feb 15/2024	
18	Oct 15/2024		227	Oct 15/2015		930	Feb 15/2024	
19	Oct 15/2024		228	Oct 15/2015		931	Feb 15/2024	
20	Oct 15/2024		229	Oct 15/2015		932	Feb 15/2024	
21	Oct 15/2024		230	Jun 15/2023		933	Feb 15/2024	
O 22	Feb 15/2025		231	Jun 15/2023		934	Feb 15/2024	
23	Oct 15/2024		232	Jun 15/2023		935	Feb 15/2024	
24	Oct 15/2024	28-00-00			R	936	Feb 15/2025	
25	Oct 15/2024		901	Oct 15/2014		937	Feb 15/2024	
26	BLANK		902	Feb 15/2024	R	938	Feb 15/2025	
28-00-00			903	Oct 15/2024	O	939	Feb 15/2025	
201	Oct 15/2015		904	Oct 15/2024		940	Feb 15/2024	
202	Jun 15/2019		905	Oct 15/2024		941	Feb 15/2024	
203	Oct 15/2015		906	Oct 15/2024	R	942	Feb 15/2025	
204	Jun 15/2023		907	Oct 15/2024		943	Feb 15/2024	
205	Jun 15/2023		908	Feb 15/2024	R	944	Feb 15/2025	
206	Oct 15/2017		909	Feb 15/2024	O	945	Feb 15/2025	

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R 946	Feb 15/2025		223	Oct 15/2022		R 232	Feb 15/2025	
O 947	Feb 15/2025		224	Oct 15/2022		R 233	Feb 15/2025	
948	Feb 15/2024		225	Oct 15/2022		234	Jun 15/2024	
949	Feb 15/2024		226	BLANK		235	Jun 15/2024	
950	Feb 15/2024		28-11-00			236	Jun 15/2024	
951	Feb 15/2024		201	Jun 15/2024		237	Jun 15/2024	
952	Feb 15/2024		202	Jun 15/2024		238	Jun 15/2024	
953	Feb 15/2024		203	Jun 15/2024		239	Jun 15/2024	
954	Feb 15/2024		204	Oct 15/2024		240	Jun 15/2024	
955	Feb 15/2024		205	Jun 15/2024		241	Jun 15/2024	
956	Feb 15/2024		206	Jun 15/2024		242	Jun 15/2024	
957	Feb 15/2024		207	Jun 15/2024		R 243	Feb 15/2025	
958	BLANK		208	Jun 15/2024		244	Jun 15/2024	
28-10-00			209	Jun 15/2024		R 245	Feb 15/2025	
201	Jun 15/2024		R 210	Feb 15/2025		246	Jun 15/2024	
R 202	Feb 15/2025		R 211	Feb 15/2025		247	Jun 15/2024	
203	Jun 15/2024		212	Jun 15/2024		248	Jun 15/2024	
204	Jun 15/2024		213	Jun 15/2024		249	Jun 15/2024	
205	Jun 15/2024		214	Jun 15/2024		250	Jun 15/2024	
206	Oct 15/2023		215	Jun 15/2024		251	Jun 15/2024	
207	Oct 15/2021		216	Jun 15/2024		R 252	Feb 15/2025	
208	Oct 15/2021		217	Jun 15/2024		R 253	Feb 15/2025	
209	Oct 15/2021		218	Jun 15/2024		254	Oct 15/2024	
210	Oct 15/2021		219	Jun 15/2024		255	Jun 15/2024	
211	Oct 15/2022		220	Jun 15/2024		256	BLANK	
R 212	Feb 15/2025		221	Jun 15/2024		28-11-00		
213	Oct 15/2022		222	Jun 15/2024		601	Jun 15/2020	
214	Feb 15/2023		223	Jun 15/2024		602	Oct 15/2014	
215	Feb 15/2023		224	Jun 15/2024		603	Oct 15/2015	
216	Oct 15/2022		R 225	Feb 15/2025		604	Jun 15/2020	
217	Oct 15/2022		R 226	Feb 15/2025		605	Jun 15/2021	
218	Oct 15/2022		227	Jun 15/2024		606	Oct 15/2014	
219	Oct 15/2022		R 228	Feb 15/2025		607	Oct 15/2014	
220	Oct 15/2022		229	Oct 15/2024		608	Oct 15/2015	
221	Oct 15/2022		R 230	Feb 15/2025		609	Oct 15/2015	
222	Oct 15/2022		231	Oct 15/2024		610	Feb 15/2023	

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28-11-00 (cont)			28-11-00 (cont)			28-11-00 (cont)		
R 611	Feb 15/2025		710	Feb 15/2020		827	Oct 15/2022	
612	Feb 15/2023		711	Feb 15/2020		828	Oct 15/2017	
613	Feb 15/2023		712	Feb 15/2020		829	Oct 15/2017	
614	Feb 15/2023		713	Feb 15/2020		830	Oct 15/2017	
615	Feb 15/2023		714	Feb 15/2020		831	Oct 15/2017	
616	Feb 15/2023		715	Oct 15/2021		832	Oct 15/2017	
617	Jun 15/2024		716	Oct 15/2021		833	Oct 15/2017	
618	Jun 15/2024		717	Oct 15/2021		834	Oct 15/2017	
619	Feb 15/2023		718	BLANK		835	Oct 15/2017	
620	Feb 15/2023		28-11-00			836	Oct 15/2017	
621	Oct 15/2015		801	Jun 15/2019		837	Oct 15/2017	
622	Oct 15/2015		802	Oct 15/2022		838	Oct 15/2017	
623	Oct 15/2015		803	Oct 15/2018		839	Oct 15/2017	
624	Oct 15/2015		804	Feb 15/2018		840	Oct 15/2017	
625	Oct 15/2015		805	Oct 15/2015		841	Oct 15/2024	
626	Oct 15/2020		806	Feb 15/2023		R 842	Feb 15/2025	
627	Feb 15/2021		807	Feb 15/2023		843	Jun 15/2021	
R 628	Feb 15/2025		808	Feb 15/2023		844	Jun 15/2021	
629	Feb 15/2021		809	Feb 15/2023		845	Jun 15/2021	
630	Feb 15/2021		810	Feb 15/2023		846	Jun 15/2021	
631	Feb 15/2021		811	Feb 15/2023		847	Jun 15/2021	
632	Feb 15/2021		812	Feb 15/2023		848	Jun 15/2021	
633	Jun 15/2021		813	Feb 15/2023		849	Jun 15/2021	
634	Jun 15/2024		814	Feb 15/2023		850	Jun 15/2021	
635	Feb 15/2021		815	Feb 15/2023		851	Jun 15/2021	
636	Feb 15/2021		816	Feb 15/2023		852	Jun 15/2021	
28-11-00			817	Feb 15/2023		853	Jun 15/2021	
701	Feb 15/2020		818	Feb 15/2023		854	Jun 15/2023	
702	Oct 15/2022		819	Feb 15/2023		855	Jun 15/2021	
703	Oct 15/2022		820	Feb 15/2023		856	Jun 15/2021	
704	Oct 15/2022		821	Feb 15/2023		857	Jun 15/2021	
705	Feb 15/2020		822	Feb 15/2023		858	Jun 15/2021	
706	Feb 15/2020		823	Oct 15/2017		28-11-11		
707	Feb 15/2020		824	Oct 15/2017		401	Feb 15/2023	
708	Feb 15/2020		825	Oct 15/2017		402	Oct 15/2022	
709	Feb 15/2020		826	Oct 15/2017		403	Jun 15/2021	

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R 404	Feb 15/2025		440	Jun 15/2024		412	Jun 15/2024	
O 405	Feb 15/2025		441	Jun 15/2024		413	Jun 15/2024	
406	Oct 15/2015		442	BLANK		414	Jun 15/2024	
407	Oct 15/2015		28-11-11			415	Jun 15/2024	
408	Oct 15/2015		801	Feb 15/2022		416	Jun 15/2024	
409	Feb 15/2022		R 802	Feb 15/2025		417	Jun 15/2024	
410	Oct 15/2015		O 803	Feb 15/2025		R 418	Feb 15/2025	
411	Feb 15/2023		O 804	Feb 15/2025		28-11-41		
412	Jun 15/2023		O 805	Feb 15/2025		401	Oct 15/2017	
413	Jun 15/2023		806	Feb 15/2022		402	Oct 15/2014	
414	Jun 15/2023		807	Feb 15/2022		403	Oct 15/2015	
415	Jun 15/2023		808	Oct 15/2020		404	Oct 15/2015	
416	Jun 15/2023		809	Feb 15/2017		405	Oct 15/2017	
417	Jun 15/2023		810	BLANK		406	Oct 15/2017	
R 418	Feb 15/2025		28-11-21			28-11-61		
O 419	Feb 15/2025		401	Feb 15/2022		201	Jun 15/2019	
R 420	Feb 15/2025		402	Oct 15/2015		202	Oct 15/2024	
421	Jun 15/2024		403	Oct 15/2015		203	Oct 15/2022	
422	Jun 15/2024		404	Oct 15/2024		204	Oct 15/2015	
423	Jun 15/2024		405	Feb 15/2022		205	Oct 15/2015	
424	Jun 15/2024		406	Feb 15/2022		206	Oct 15/2024	
425	Jun 15/2024		407	Feb 15/2022		207	Oct 15/2015	
426	Apr 15/2022		408	Feb 15/2022		208	Oct 15/2015	
427	Apr 15/2022		409	Feb 15/2022		28-13-11		
428	Apr 15/2022		410	BLANK		401	Jun 15/2019	
429	Apr 15/2022		28-11-31			402	Oct 15/2017	
430	Apr 15/2022		401	Oct 15/2022		403	Oct 15/2017	
430	Feb 15/2023		R 402	Feb 15/2025		404	Oct 15/2017	
431	Feb 15/2023		R 403	Feb 15/2025		405	Jun 15/2023	
432	Feb 15/2023		404	Oct 15/2015		406	Oct 15/2019	
433	Feb 15/2023		405	Oct 15/2015		28-13-31		
434	Feb 15/2023		406	Oct 15/2015		401	Feb 15/2015	
435	Feb 15/2023		407	Oct 15/2015		402	Oct 15/2014	
R 436	Feb 15/2025		408	Oct 15/2015		403	Oct 15/2015	
R 437	Feb 15/2025		409	Oct 15/2015		404	Oct 15/2015	
O 438	Feb 15/2025		410	Feb 15/2024		405	Jun 15/2023	
O 439	Feb 15/2025		411	Jun 15/2024		406	Jun 15/2022	

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407	Feb 15/2022	O	612	Feb 15/2025		401	Oct 15/2020	
408	Feb 15/2022		613	Jun 15/2021		402	Jun 15/2023	
28-13-31			614	Jun 15/2018		403	Oct 15/2015	
601	Jun 15/2024	28-21-00				404	Oct 15/2015	
602	Jun 15/2024		401	Jun 15/2023		405	Jun 15/2023	
603	Oct 15/2015		402	Jun 15/2023		406	Jun 15/2023	
604	Jun 15/2024		403	Jun 15/2023	28-21-11			
605	Jun 15/2024		404	Jun 15/2023		601	Jun 15/2023	
606	Jun 15/2024		405	Jun 15/2023		602	Oct 15/2020	
28-13-31			406	Jun 15/2023		603	Oct 15/2015	
701	Jun 15/2024		407	Jun 15/2023		604	Oct 15/2015	
702	Jun 15/2024		408	Jun 15/2023	28-21-21			
703	Feb 15/2022	28-21-00				R 401	Feb 15/2025	
704	Feb 15/2022		501	Oct 15/2019		402	Jun 15/2024	
705	Feb 15/2022		502	Oct 15/2019		403	Feb 15/2015	
706	BLANK		503	Oct 15/2017		404	Oct 15/2015	
28-13-41			504	Jun 15/2018		405	Jun 15/2024	
401	Oct 15/2024		505	Jun 15/2018		406	Jun 15/2024	
402	Oct 15/2022		506	Oct 15/2019	R 407	Feb 15/2025		
403	Feb 15/2016		507	Oct 15/2019		408	Jun 15/2024	
404	Oct 15/2015		508	Oct 15/2024		409	Jun 15/2024	
405	Oct 15/2024		509	Oct 15/2019		410	Jun 15/2024	
406	Oct 15/2024		510	BLANK		411	Jun 15/2024	
407	Oct 15/2022	28-21-00				412	Oct 15/2015	
408	BLANK		601	Jun 15/2015		413	Oct 15/2015	
28-13-41			602	Jun 15/2015		414	BLANK	
601	Oct 15/2014		603	Oct 15/2017	28-21-32			
602	Oct 15/2014		604	Oct 15/2015		401	Oct 15/2020	
603	Jun 15/2018		605	Oct 15/2015		402	Oct 15/2014	
604	Jun 15/2018		606	Oct 15/2015		403	Oct 15/2015	
605	Jun 15/2018		607	Oct 15/2015		404	Oct 15/2015	
606	Jun 15/2018		608	Oct 15/2015		405	Feb 15/2024	
607	Jun 15/2018		609	Oct 15/2019	28-21-41			
R 608	Feb 15/2025		610	Feb 15/2018		401	Jun 15/2019	
R 609	Feb 15/2025		611	Feb 15/2018		402	Oct 15/2017	
R 610	Feb 15/2025		612	Feb 15/2018		403	Oct 15/2015	

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28-21-41 (cont)			28-21-71 (cont)			28-21-81 (cont)		
404	Oct 15/2015		415	Feb 15/2017		208	Oct 15/2024	
405	Jun 15/2022		416	Jun 15/2021		28-22-00		
406	Feb 15/2022		417	Jun 15/2023		501	Oct 15/2024	
28-21-51			418	Feb 15/2017		502	Feb 15/2024	
201	Jun 15/2022		419	Jun 15/2023		503	Oct 15/2024	
202	Feb 15/2022		420	Feb 15/2017		504	Feb 15/2024	
203	Jun 15/2016		421	Feb 15/2017		505	Feb 15/2024	
204	BLANK		422	Jun 15/2023		506	Feb 15/2020	
28-21-51			423	Oct 15/2020		507	Oct 15/2024	
401	Oct 15/2022		424	Jun 15/2023		508	Feb 15/2020	
402	Jun 15/2024		425	Jun 15/2023		509	Feb 15/2020	
403	Oct 15/2015	R	426	Feb 15/2025		510	Feb 15/2020	
404	Oct 15/2015	O	427	Feb 15/2025		511	Feb 15/2020	
405	Jun 15/2024	O	428	Feb 15/2025		512	Feb 15/2020	
406	Jun 15/2024	O	429	Feb 15/2025		R	513	Feb 15/2025
407	Oct 15/2022	O	430	Feb 15/2025		514	Oct 15/2024	
408	BLANK	O	431	Feb 15/2025		515	Oct 15/2024	
28-21-51		O	432	Feb 15/2025		516	Feb 15/2024	
601	Oct 15/2024	O	433	Feb 15/2025		R	517	Feb 15/2025
602	Oct 15/2024	O	434	Feb 15/2025		R	518	Feb 15/2025
603	Oct 15/2024	O	435	Feb 15/2025		519	Feb 15/2024	
604	Jun 15/2023	O	436	Feb 15/2025		520	Feb 15/2024	
28-21-71		O	437	Feb 15/2025		521	Feb 15/2024	
401	Jun 15/2022		438	BLANK		522	Feb 15/2024	
402	Jun 15/2022		28-21-71					
403	Jun 15/2023		601	Oct 15/2014		R	523	Feb 15/2025
404	Oct 15/2023		602	Oct 15/2014		R	524	Feb 15/2025
405	Oct 15/2023		603	Oct 15/2015		O	525	Feb 15/2025
406	Jun 15/2022		604	Oct 15/2015		O	526	Feb 15/2025
407	Feb 15/2017		28-21-81			O	527	Feb 15/2025
408	Jun 15/2018		201	Oct 15/2024		O	528	Feb 15/2025
409	Feb 15/2017		202	Oct 15/2024		O	529	Feb 15/2025
410	Feb 15/2017		203	Oct 15/2024		O	530	Feb 15/2025
411	Jun 15/2023		204	Oct 15/2024		O	531	Feb 15/2025
412	Jun 15/2023		205	Oct 15/2024		O	532	Feb 15/2025
413	Jun 15/2023		206	Oct 15/2024		O	533	Feb 15/2025
414	Feb 15/2017		207	Oct 15/2024		O	534	Feb 15/2025

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O 535	Feb 15/2025		R 571	Feb 15/2025		610	Feb 15/2020	
O 536	Feb 15/2025		R 572	Feb 15/2025		611	Feb 15/2020	
O 537	Feb 15/2025		R 573	Feb 15/2025		612	Feb 15/2020	
O 538	Feb 15/2025		R 574	Feb 15/2025		613	Feb 15/2024	
O 539	Feb 15/2025		R 575	Feb 15/2025		614	Feb 15/2024	
O 540	Feb 15/2025		O 576	Feb 15/2025		615	Feb 15/2024	
O 541	Feb 15/2025		R 577	Feb 15/2025		616	Feb 15/2024	
O 542	Feb 15/2025		R 578	Feb 15/2025		617	Feb 15/2024	
O 543	Feb 15/2025		R 579	Feb 15/2025		618	Feb 15/2024	
O 544	Feb 15/2025		R 580	Feb 15/2025		619	Feb 15/2024	
O 545	Feb 15/2025		R 581	Feb 15/2025		620	Feb 15/2024	
O 546	Feb 15/2025		O 582	Feb 15/2025		621	Feb 15/2024	
O 547	Feb 15/2025		O 583	Feb 15/2025		622	Feb 15/2024	
O 548	Feb 15/2025		O 584	Feb 15/2025		623	Feb 15/2024	
O 549	Feb 15/2025		O 585	Feb 15/2025		624	Feb 15/2024	
O 550	Feb 15/2025		O 586	Feb 15/2025		625	Feb 15/2024	
O 551	Feb 15/2025		O 587	Feb 15/2025		626	Oct 15/2024	
O 552	Feb 15/2025		O 588	Feb 15/2025		627	Oct 15/2024	
O 553	Feb 15/2025		O 589	Feb 15/2025		628	Oct 15/2024	
O 554	Feb 15/2025		O 590	Feb 15/2025		629	Oct 15/2024	
O 555	Feb 15/2025		O 591	Feb 15/2025		630	Oct 15/2024	
O 556	Feb 15/2025		O 592	Feb 15/2025		631	Oct 15/2024	
O 557	Feb 15/2025		O 593	Feb 15/2025		632	Oct 15/2024	
O 558	Feb 15/2025		O 594	Feb 15/2025		633	Oct 15/2024	
O 559	Feb 15/2025		A 595	Feb 15/2025		634	Jun 15/2024	
O 560	Feb 15/2025		A 596	BLANK		635	Jun 15/2024	
O 561	Feb 15/2025		28-22-00			636	Jun 15/2024	
O 562	Feb 15/2025		601	Feb 15/2024		637	Jun 15/2024	
O 563	Feb 15/2025		602	Feb 15/2024		638	Jun 15/2024	
O 564	Feb 15/2025		603	Feb 15/2024		639	Jun 15/2024	
O 565	Feb 15/2025		604	Feb 15/2024		640	Oct 15/2024	
O 566	Feb 15/2025		605	Feb 15/2024		641	Oct 15/2024	
O 567	Feb 15/2025		606	Feb 15/2024		642	Oct 15/2024	
O 568	Feb 15/2025		607	Feb 15/2020		643	Oct 15/2024	
O 569	Feb 15/2025		608	Feb 15/2020		644	Oct 15/2024	
O 570	Feb 15/2025		609	Feb 15/2020		645	Oct 15/2024	

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646	Feb 15/2024	O 423	Feb 15/2025	O 459	Feb 15/2025			
647	Oct 15/2024	O 424	Feb 15/2025	R 460	Feb 15/2025			
648	Oct 15/2024	O 425	Feb 15/2025	R 461	Feb 15/2025			
649	Feb 15/2024	O 426	Feb 15/2025	O 462	Feb 15/2025			
650	Oct 15/2024	R 427	Feb 15/2025	O 463	Feb 15/2025			
28-22-11			R 428	Feb 15/2025	O 464	Feb 15/2025		
201	Jun 15/2023	R 429	Feb 15/2025	O 465	Feb 15/2025			
R 202	Feb 15/2025	O 430	Feb 15/2025	O 466	Feb 15/2025			
R 203	Feb 15/2025	O 431	Feb 15/2025	O 467	Feb 15/2025			
O 204	Feb 15/2025	O 432	Feb 15/2025	O 468	Feb 15/2025			
O 205	Feb 15/2025	O 433	Feb 15/2025	O 469	Feb 15/2025			
R 206	Feb 15/2025	O 434	Feb 15/2025	O 470	Feb 15/2025			
207	Feb 15/2020	O 435	Feb 15/2025	O 471	Feb 15/2025			
208	BLANK	O 436	Feb 15/2025	O 472	Feb 15/2025			
28-22-11			R 437	Feb 15/2025	O 473	Feb 15/2025		
R 401	Feb 15/2025	R 438	Feb 15/2025	O 474	Feb 15/2025			
R 402	Feb 15/2025	O 439	Feb 15/2025	O 475	Feb 15/2025			
O 403	Feb 15/2025	O 440	Feb 15/2025	O 476	Feb 15/2025			
O 404	Feb 15/2025	O 441	Feb 15/2025	O 477	Feb 15/2025			
O 405	Feb 15/2025	R 442	Feb 15/2025	O 478	Feb 15/2025			
O 406	Feb 15/2025	R 443	Feb 15/2025	O 479	Feb 15/2025			
R 407	Feb 15/2025	R 444	Feb 15/2025	O 480	Feb 15/2025			
O 408	Feb 15/2025	O 445	Feb 15/2025	O 481	Feb 15/2025			
R 409	Feb 15/2025	O 446	Feb 15/2025	O 482	Feb 15/2025			
R 410	Feb 15/2025	O 447	Feb 15/2025	28-22-11				
R 411	Feb 15/2025	O 448	Feb 15/2025	R 601	Feb 15/2025			
O 412	Feb 15/2025	O 449	Feb 15/2025	R 602	Feb 15/2025			
O 413	Feb 15/2025	O 450	Feb 15/2025	O 603	Feb 15/2025			
O 414	Feb 15/2025	O 451	Feb 15/2025	604	Oct 15/2024			
O 415	Feb 15/2025	R 452	Feb 15/2025	605	Oct 15/2024			
O 416	Feb 15/2025	O 453	Feb 15/2025	606	BLANK			
O 417	Feb 15/2025	R 454	Feb 15/2025	28-22-13				
R 418	Feb 15/2025	O 455	Feb 15/2025	401	Oct 15/2024			
R 419	Feb 15/2025	O 456	Feb 15/2025	402	Oct 15/2024			
O 420	Feb 15/2025	O 457	Feb 15/2025	403	Feb 15/2024			
O 421	Feb 15/2025	O 458	Feb 15/2025	404	Feb 15/2024			
O 422	Feb 15/2025			405	Feb 15/2024			

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406	Oct 15/2024		609	Oct 15/2024		601	Jun 15/2019	
407	Oct 15/2024		610	Oct 15/2024	R	602	Feb 15/2025	
408	Feb 15/2024		611	Oct 15/2024		603	Jun 15/2022	
409	Oct 15/2024		612	Oct 15/2023	R	604	Feb 15/2025	
410	Feb 15/2024		613	Oct 15/2023	R	605	Feb 15/2025	
411	Feb 15/2024		614	Oct 15/2023	R	606	Feb 15/2025	
412	Oct 15/2024	28-22-14				R 607	Feb 15/2025	
413	Oct 15/2024		401	Oct 15/2024		R 608	Feb 15/2025	
414	Feb 15/2024		402	Oct 15/2024		R 609	Feb 15/2025	
415	Oct 15/2024		403	Oct 15/2022	O	610	Feb 15/2025	
416	Feb 15/2024		404	Oct 15/2024	O	611	Feb 15/2025	
417	Feb 15/2024		405	Oct 15/2024	O	612	Feb 15/2025	
418	Feb 15/2024		406	Oct 15/2024	O	613	Feb 15/2025	
419	Oct 15/2024	28-22-15				R 614	Feb 15/2025	
420	Oct 15/2024		401	Jun 15/2019	O	615	Feb 15/2025	
421	Oct 15/2024		402	Jun 15/2019	O	616	Feb 15/2025	
422	Feb 15/2024		403	Oct 15/2022	O	617	Feb 15/2025	
423	Oct 15/2024		404	Oct 15/2015	O	618	Feb 15/2025	
424	Feb 15/2024		405	Oct 15/2015	O	619	Feb 15/2025	
425	Feb 15/2024		406	Oct 15/2015	O	620	Feb 15/2025	
426	Oct 15/2024		407	Jun 15/2016	D	621	Feb 15/2025	
427	Oct 15/2024		408	Jun 15/2016	D	622	BLANK	
					28-22-16			
428	Oct 15/2024		409	Oct 15/2015		401	Jun 15/2019	
429	Oct 15/2024		410	Oct 15/2015		402	Jun 15/2015	
430	Oct 15/2024		411	Oct 15/2015		403	Oct 15/2015	
431	Feb 15/2024		412	Jun 15/2017		404	Oct 15/2015	
432	BLANK		R 413	Feb 15/2025		405	Jun 15/2023	
28-22-13			R 414	Feb 15/2025		406	Oct 15/2024	
601	Oct 15/2024		R 415	Feb 15/2025	28-22-17			
602	Oct 15/2024		R 416	Feb 15/2025		401	Jun 15/2018	
603	Oct 15/2024		R 417	Feb 15/2025		402	Oct 15/2014	
604	Oct 15/2024		R 418	Feb 15/2025		403	Oct 15/2015	
605	Oct 15/2023		R 419	Feb 15/2025		404	Oct 15/2015	
606	Feb 15/2023		R 420	Feb 15/2025		405	Oct 15/2015	
607	Feb 15/2023		R 421	Feb 15/2025		406	Jun 15/2019	
608	Oct 15/2024		422	BLANK		407	Jun 15/2019	

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28-22-17 (cont)			28-22-21 (cont)			28-22-21 (cont)		
408	Oct 15/2021		423	Oct 15/2024		459	Oct 15/2024	
409	Oct 15/2021	R	424	Feb 15/2025		460	Oct 15/2024	
410	BLANK		425	Oct 15/2021		461	Oct 15/2024	
28-22-18			426	Feb 15/2020		462	Oct 15/2024	
401	Oct 15/2024		427	Feb 15/2020		463	Oct 15/2024	
402	Oct 15/2024		428	Feb 15/2020		464	Oct 15/2024	
403	Oct 15/2024		429	Feb 15/2020		465	Oct 15/2024	
404	Oct 15/2024		430	Jun 15/2023		466	Oct 15/2024	
405	Oct 15/2024	R	431	Feb 15/2025		467	Oct 15/2024	
406	Oct 15/2024		432	Oct 15/2022		468	Oct 15/2024	
407	Oct 15/2024		433	Oct 15/2020		469	Oct 15/2024	
408	Oct 15/2024		434	Oct 15/2020		470	Oct 15/2024	
409	Oct 15/2024		435	Oct 15/2020		471	Oct 15/2024	
410	BLANK		436	Feb 15/2025		472	Oct 15/2024	
28-22-21			R 437	Feb 15/2025		473	Oct 15/2024	
401	Oct 15/2024		438	Oct 15/2024		474	Oct 15/2024	
402	Feb 15/2020		439	Oct 15/2024		475	Oct 15/2024	
403	Feb 15/2020		440	Oct 15/2024		476	Oct 15/2024	
404	Feb 15/2020		441	Oct 15/2024		477	Oct 15/2024	
405	Jun 15/2023		442	Oct 15/2024		478	Oct 15/2024	
406	Oct 15/2022		443	Oct 15/2024		479	Oct 15/2024	
407	Feb 15/2022		444	Oct 15/2024		480	Oct 15/2024	
408	Feb 15/2022					28-22-21		
R 409	Feb 15/2025	R	445	Feb 15/2025		601	Jun 15/2023	
410	Oct 15/2024		446	Oct 15/2024		602	Feb 15/2021	
411	Oct 15/2024		447	Oct 15/2024		603	Jun 15/2018	
412	Oct 15/2024		448	Oct 15/2024		604	Oct 15/2024	
413	Oct 15/2024		449	Oct 15/2024		605	Feb 15/2020	
414	Oct 15/2024		450	Oct 15/2024		606	BLANK	
415	Oct 15/2024		451	Oct 15/2024		28-22-41		
R 416	Feb 15/2025		452	Oct 15/2024		401	Feb 15/2023	
417	Oct 15/2024	R	453	Feb 15/2025		402	Oct 15/2024	
418	Oct 15/2024		454	Feb 15/2022		403	Oct 15/2024	
419	Oct 15/2024		455	Oct 15/2024		404	Oct 15/2024	
420	Jun 15/2019		456	Oct 15/2024		405	Oct 15/2024	
421	Jun 15/2017		457	Oct 15/2024		406	Oct 15/2024	
422	Oct 15/2024		458	Oct 15/2024		407	Jun 15/2017	

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28-22-41 (cont)			28-22-41 (cont)			28-22-43 (cont)		
408	Jun 15/2017		444	Jun 15/2023		415	Feb 15/2024	
409	Feb 15/2019		445	Jun 15/2023		416	BLANK	
410	Jun 15/2019		446	Jun 15/2023		28-22-51		
411	Jun 15/2019		447	Jun 15/2023		401	Jun 15/2023	
412	Jun 15/2019		448	Oct 15/2023		402	Jun 15/2023	
413	Jun 15/2019		449	Oct 15/2024		403	Jun 15/2023	
414	Jun 15/2019		450	Oct 15/2024		404	Oct 15/2015	
415	Jun 15/2019		451	Oct 15/2023		405	Oct 15/2015	
416	Jun 15/2019		452	Oct 15/2023		406	Jun 15/2023	
417	Jun 15/2019		28-22-41			407	Jun 15/2023	
418	Jun 15/2019		501	Oct 15/2024		408	Jun 15/2023	
419	Jun 15/2019		502	Oct 15/2024		409	Jun 15/2023	
420	Jun 15/2024		503	Oct 15/2024		410	BLANK	
421	Jun 15/2024		504	Oct 15/2024		28-22-61		
422	Jun 15/2024		505	Oct 15/2024		401	Feb 15/2023	
423	Oct 15/2024		506	Oct 15/2024		402	Feb 15/2023	
424	Oct 15/2024		507	Oct 15/2024		403	Feb 15/2023	
425	Jun 15/2024		508	Oct 15/2024		404	Feb 15/2023	
426	Jun 15/2024		509	Oct 15/2024		405	Oct 15/2024	
427	Feb 15/2024		510	Oct 15/2024		406	Jun 15/2023	
428	Feb 15/2024		511	Oct 15/2024		407	Jun 15/2023	
429	Feb 15/2024		512	Oct 15/2024		408	BLANK	
430	Jun 15/2024		28-22-43			28-22-71		
431	Feb 15/2024		401	Feb 15/2024		401	Jun 15/2022	
432	Feb 15/2024		402	Oct 15/2024		402	Jun 15/2022	
433	Feb 15/2024		403	Oct 15/2024		403	Jun 15/2022	
434	Feb 15/2024		404	Oct 15/2015		404	Oct 15/2015	
435	Feb 15/2024		405	Oct 15/2024		405	Oct 15/2015	
436	Feb 15/2024		406	Oct 15/2015		406	Oct 15/2024	
437	Jun 15/2019		407	Feb 15/2024		407	Oct 15/2024	
438	Feb 15/2023		408	Oct 15/2024		408	Oct 15/2022	
439	Feb 15/2023		409	Oct 15/2024		28-25-00		
440	Jun 15/2019		410	Feb 15/2024		501	Oct 15/2023	
441	Jun 15/2023		411	Feb 15/2024		502	Oct 15/2023	
442	Oct 15/2024		412	Feb 15/2024		503	Oct 15/2023	
443	Feb 15/2023		413	Feb 15/2024		504	Oct 15/2023	
			414	Oct 15/2024		505	Oct 15/2023	

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28-25-00 (cont)			28-25-02 (cont)			28-25-05 (cont)		
506	Feb 15/2020		409	Jun 15/2024		403	Oct 15/2022	
507	Feb 15/2020		410	Jun 15/2024		404	Oct 15/2015	
508	Feb 15/2020		411	Oct 15/2023		405	Oct 15/2015	
509	Oct 15/2023		412	Oct 15/2023		406	Feb 15/2018	
510	Oct 15/2023		413	Oct 15/2023		407	Oct 15/2024	
511	Oct 15/2023		414	Oct 15/2023		408	Jun 15/2023	
512	Oct 15/2023		415	Oct 15/2023		409	Oct 15/2022	
513	Oct 15/2023		416	BLANK		410	Jun 15/2023	
514	Oct 15/2023		28-25-02			411	Jun 15/2023	
515	Oct 15/2023		601	Jun 15/2023		412	Oct 15/2022	
516	BLANK		602	Oct 15/2017		413	Oct 15/2022	
28-25-01			603	Oct 15/2015		414	Oct 15/2022	
401	Nov 15/2022		604	Oct 15/2015		415	Feb 15/2018	
402	Nov 15/2022		28-25-04			416	Feb 15/2018	
403	Nov 15/2022		401	Jun 15/2019		417	Oct 15/2024	
404	Nov 15/2022		402	Jun 15/2019		418	Oct 15/2022	
405	Nov 15/2022		403	Oct 15/2017		419	Oct 15/2022	
406	Nov 15/2022		404	Oct 15/2017		420	Feb 15/2024	
407	Jun 15/2023		405	Oct 15/2017		421	Feb 15/2024	
408	Nov 15/2022		406	Oct 15/2024		422	Oct 15/2024	
409	Nov 15/2022		407	Nov 15/2022		28-25-06		
410	Nov 15/2022		408	Oct 15/2017		401	Feb 15/2020	
R 411	Feb 15/2025		409	Oct 15/2017		402	Jun 15/2019	
412	Nov 15/2022		410	Oct 15/2017		403	Jun 15/2016	
413	Jun 15/2023		411	Oct 15/2017		404	Oct 15/2015	
414	Nov 15/2022		412	Jun 15/2023		405	Feb 15/2024	
415	Nov 15/2022		413	Jun 15/2023		406	BLANK	
28-25-02			414	Feb 15/2019		28-25-07		
401	Oct 15/2023		415	Oct 15/2017		401	Jun 15/2017	
402	Oct 15/2023		416	Oct 15/2018		402	Jun 15/2021	
403	Oct 15/2015		417	Jun 15/2023		403	Oct 15/2015	
404	Jun 15/2017		418	Jun 15/2023		404	Oct 15/2015	
405	Oct 15/2023		419	Jun 15/2023		405	Oct 15/2024	
406	Oct 15/2023		420	Jun 15/2023		406	Oct 15/2024	
407	Oct 15/2023		28-25-05			407	Oct 15/2024	
408	Jun 15/2024		401	Oct 15/2022		408	BLANK	
			402	Feb 15/2018				

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28-26-00			28-26-11 (cont)			28-41-00 (cont)		
201	Jun 15/2019		408	Oct 15/2021		515	Jun 15/2019	
202	Oct 15/2022		409	Oct 15/2021		516	Jun 15/2019	
203	Oct 15/2022		410	Oct 15/2021		517	Jun 15/2019	
204	Nov 15/2022		411	Oct 15/2021		518	BLANK	
205	Oct 15/2022		412	Oct 15/2021		28-41-21		
206	Oct 15/2022		413	Oct 15/2021		401	Oct 15/2023	
207	Oct 15/2022		414	Jun 15/2023		402	Oct 15/2023	
208	Oct 15/2022	R	415	Feb 15/2025		403	Feb 15/2018	
209	Oct 15/2022		416	Oct 15/2024		404	Oct 15/2015	
210	Oct 15/2022		417	Oct 15/2022		405	Jun 15/2017	
211	Oct 15/2022		418	Oct 15/2022		406	Jun 15/2017	
212	Oct 15/2022		419	Apr 15/2022		407	Jun 15/2017	
213	Oct 15/2022	R	420	Feb 15/2025		408	Jun 15/2018	
214	Oct 15/2022		421	Apr 15/2022		409	Oct 15/2024	
215	Oct 15/2022		422	Apr 15/2022		410	Oct 15/2024	
216	Oct 15/2022		423	Apr 15/2022		411	Oct 15/2024	
217	Jun 15/2018		424	Apr 15/2022		412	Oct 15/2024	
218	Jun 15/2018		425	Jun 15/2022		413	Oct 15/2024	
219	Jun 15/2018		426	Oct 15/2024		414	Oct 15/2024	
220	Feb 15/2020		427	Oct 15/2024		415	Oct 15/2024	
221	Oct 15/2022		428	Jun 15/2022		416	Oct 15/2024	
222	Oct 15/2024	28-41-00				28-41-21		
223	Oct 15/2024	R	501	Feb 15/2025		R 501	Feb 15/2025	
224	Oct 15/2024		502	Feb 15/2023		R 502	Feb 15/2025	
225	Oct 15/2024	R	503	Feb 15/2025		R 503	Feb 15/2025	
226	Oct 15/2024	R	504	Feb 15/2025		R 504	Feb 15/2025	
227	Oct 15/2024	R	505	Feb 15/2025		R 505	Feb 15/2025	
228	BLANK	R	506	Feb 15/2025		R 506	Feb 15/2025	
28-26-11		R	507	Feb 15/2025		O 507	Feb 15/2025	
401	Jun 15/2022		508	Oct 15/2018		R 508	Feb 15/2025	
402	Jun 15/2022		509	Oct 15/2018		R 509	Feb 15/2025	
403	Oct 15/2015		510	Oct 15/2018		O 510	Feb 15/2025	
404	Oct 15/2015		511	Oct 15/2018		O 511	Feb 15/2025	
405	Oct 15/2024		512	Oct 15/2018		R 512	Feb 15/2025	
406	Oct 15/2021		513	Oct 15/2018		R 513	Feb 15/2025	
R 407	Feb 15/2025		514	Oct 15/2018		R 514	Feb 15/2025	
						R 515	Feb 15/2025	

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28-41-21 (cont)			28-41-42 (cont)			28-41-44 (cont)		
O 516	Feb 15/2025		410	Jun 15/2024		604	Oct 15/2024	
O 517	Feb 15/2025		411	Oct 15/2024		605	Oct 15/2020	
O 518	Feb 15/2025		R 412	Feb 15/2025		606	Oct 15/2018	
O 519	Feb 15/2025		413	Jun 15/2024		607	Oct 15/2018	
R 520	Feb 15/2025		414	Oct 15/2024		608	Oct 15/2018	
O 521	Feb 15/2025		R 415	Feb 15/2025		609	Oct 15/2018	
R 522	Feb 15/2025		416	BLANK		610	Oct 15/2018	
O 523	Feb 15/2025		28-41-42			611	Oct 15/2020	
R 524	Feb 15/2025		501	Oct 15/2017		612	Oct 15/2020	
A 525	Feb 15/2025		502	Jun 15/2023		613	Oct 15/2020	
A 526	Feb 15/2025		503	Oct 15/2017		614	Oct 15/2020	
A 527	Feb 15/2025		504	Oct 15/2017		615	Oct 15/2020	
A 528	BLANK		505	Oct 15/2017		616	Oct 15/2020	
28-41-21			506	Oct 15/2017		617	Oct 15/2020	
701	Oct 15/2023		507	Oct 15/2017		618	Oct 15/2020	
702	Oct 15/2023		508	BLANK		619	Oct 15/2020	
703	Oct 15/2024		28-41-44			620	Oct 15/2020	
704	BLANK		401	Jun 15/2024		621	Oct 15/2020	
28-41-41			402	Jun 15/2024		622	BLANK	
R 401	Feb 15/2025		403	Oct 15/2024		28-41-61		
402	Feb 15/2024		404	Oct 15/2024		401	Jun 15/2023	
403	Oct 15/2015		405	Jun 15/2024		402	Jun 15/2023	
404	Oct 15/2015		406	Jun 15/2024		403	Oct 15/2015	
405	Jun 15/2023		407	Jun 15/2024		404	Jun 15/2023	
R 406	Feb 15/2025		408	Jun 15/2024		405	Oct 15/2024	
407	Oct 15/2024		409	Jun 15/2024		406	Jun 15/2023	
R 408	Feb 15/2025		410	Jun 15/2024		407	Jun 15/2023	
28-41-42			411	Jun 15/2024		408	BLANK	
R 401	Feb 15/2025		412	Jun 15/2024		28-41-81		
R 402	Feb 15/2025		413	Oct 15/2024		401	Feb 15/2020	
O 403	Feb 15/2025		414	Oct 15/2024		402	Feb 15/2020	
O 404	Feb 15/2025		415	Oct 15/2024		403	Oct 15/2024	
405	Oct 15/2015		416	BLANK		404	Oct 15/2024	
406	Oct 15/2015		28-41-44			405	Oct 15/2015	
407	Oct 15/2015		601	Oct 15/2018		406	Oct 15/2015	
408	Oct 15/2015		602	Oct 15/2024		407	Oct 15/2015	
409	Oct 15/2015		603	Oct 15/2024		408	Jun 15/2023	

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28-41-81 (cont)			28-42-11 (cont)			28-43-21		
409	Oct 15/2024		506	Feb 15/2024		401	Oct 15/2014	
410	Oct 15/2020		507	Oct 15/2024		402	Oct 15/2015	
411	Oct 15/2024		508	Oct 15/2024		403	Oct 15/2014	
412	Feb 15/2020		509	Oct 15/2024		404	BLANK	
28-42-11			510	Oct 15/2024		28-44-11		
401	Oct 15/2023		511	Feb 15/2024		401	Oct 15/2020	
402	Oct 15/2024		512	Oct 15/2024		402	Oct 15/2020	
403	Oct 15/2024		513	Oct 15/2024		403	Oct 15/2020	
404	Oct 15/2024		514	Oct 15/2024		404	Oct 15/2020	
405	Oct 15/2024		515	Oct 15/2024		405	Oct 15/2020	
406	Oct 15/2024		516	Oct 15/2024		406	Oct 15/2020	
407	Oct 15/2024		517	Feb 15/2024		407	Oct 15/2020	
408	Oct 15/2024		518	Feb 15/2024		408	Oct 15/2020	
409	Oct 15/2024		519	Feb 15/2024		409	Oct 15/2020	
410	Oct 15/2024		520	Feb 15/2024		410	Oct 15/2020	
411	Feb 15/2024		28-43-00			411	Oct 15/2020	
412	Oct 15/2023		501	Jun 15/2015		412	Oct 15/2022	
413	Oct 15/2023		502	Oct 15/2014		413	Oct 15/2022	
414	Oct 15/2023		503	Jun 15/2015		414	Oct 15/2022	
415	Oct 15/2023		504	Oct 15/2015		415	Oct 15/2022	
416	Oct 15/2024		505	Oct 15/2015		416	BLANK	
417	Oct 15/2024		506	Oct 15/2015		28-44-11		
418	Feb 15/2024		507	Jun 15/2015		801	Feb 15/2021	
419	Oct 15/2024		508	Oct 15/2014		802	Feb 15/2021	
420	Feb 15/2024		509	Feb 15/2024		803	Feb 15/2021	
421	Feb 15/2024		510	Jun 15/2015		804	Oct 15/2015	
422	Oct 15/2024		511	Jun 15/2021		805	Oct 15/2015	
423	Feb 15/2024		512	Jun 15/2021		806	Oct 15/2015	
424	Oct 15/2024		28-43-11					
425	Oct 15/2024		401	Oct 15/2014				
426	BLANK		402	Oct 15/2015				
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501	Oct 15/2023		404	Oct 15/2024				
502	Feb 15/2024		405	Oct 15/2022				
503	Oct 15/2024		406	BLANK				
504	Oct 15/2024							
505	Oct 15/2024							

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

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Rework the Electrical Faying Surface Bonds for the Spar Valve TASK 28-22-11-300-801				477	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
<u>SPAR VALVE - INSPECTION/CHECK</u>	28-22-11			601	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207
Spar Valve Actuator - Bonding Resistance Check TASK 28-22-11-200-801				601	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207
<u>WATER SCAVENGE JET PUMP - REMOVAL/INSTALLATION</u>	28-22-13			401	LOM ALL
Center Tank Water Scavenge Jet Pump Nozzle Assembly Removal TASK 28-22-13-000-801				401	LOM ALL
Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation TASK 28-22-13-400-801				406	LOM ALL
No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Removal TASK 28-22-13-000-802				408	LOM ALL
No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Installation TASK 28-22-13-400-802				412	LOM ALL
Center Tank Water Scavenge Jet Pump Removal TASK 28-22-13-000-803				414	LOM ALL
Center Tank Water Scavenge Jet Pump Installation TASK 28-22-13-400-803				419	LOM ALL

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TASK 28-22-13-000-804					
No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation				428	LOM ALL
TASK 28-22-13-400-804					
WATER SCAVENGE JET PUMP - INSPECTION/CHECK	28-22-13			601	LOM ALL
Center Tank Water Scavenge Jet Pump - Check				601	LOM ALL
TASK 28-22-13-200-801					
No. 1 or No. 2 Tank Water Scavenge Jet Pump - Check				608	LOM ALL
TASK 28-22-13-200-802					
EMERGENCY FUEL SHUTOFF BATTERY - REMOVAL/INSTALLATION	28-22-14			401	LOM ALL
Emergency Fuel Shutoff Battery Removal				401	LOM ALL
TASK 28-22-14-000-801					
Emergency Fuel Shutoff Battery Installation				405	LOM ALL
TASK 28-22-14-400-801					
FUEL FEED MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION	28-22-15			401	LOM ALL
Fuel Line, Fitting and Coupling Removal				401	LOM ALL
TASK 28-22-15-000-801					
Fuel Line, Fitting and Coupling Installation				413	LOM ALL
TASK 28-22-15-400-801					
FUEL FEED MANIFOLD COUPLINGS - INSPECTION/CHECK	28-22-15			601	LOM ALL
Engine Fuel Feed Manifold - Leak Test				601	LOM ALL
TASK 28-22-15-710-801					
Engine and APU Fuel Feed, Shroud, Fuel Vent Line and Couplings, and NEADS Lines (if installed) Dent Criteria - Inspection/Check				614	LOM ALL
TASK 28-22-15-700-801					
Fuel Pressure Leak Check in Strut with Fuel Pumps				616	LOM ALL
TASK 28-22-15-790-801					

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<u>FUEL SCAVENGE FLOAT-OPERATED SHUTOFF VALVE - REMOVAL/INSTALLATION</u>		28-22-16		401	LOM ALL
Fuel Scavenge Float-Operated Shutoff Valve Removal				401	LOM ALL
TASK 28-22-16-000-801					
Fuel Scavenge Float-Operated Shutoff Valve Installation				405	LOM ALL
TASK 28-22-16-400-801					
<u>FUEL SCAVENGE JET PUMP - REMOVAL/INSTALLATION</u>	28-22-17			401	LOM ALL
Nozzle Assembly of the Fuel Scavenge Jet Pump Removal				401	LOM ALL
TASK 28-22-17-020-801					
Nozzle Assembly of the Fuel Scavenge Jet Pump Installation				405	LOM ALL
TASK 28-22-17-420-801					
Fuel Scavenge Jet Pump Removal				406	LOM ALL
TASK 28-22-17-000-801					
Fuel Scavenge Jet Pump Installation				407	LOM ALL
TASK 28-22-17-400-801					
<u>GROUND FAULT INTERRUPTER (GFI) RELAY - REMOVAL/INSTALLATION</u>	28-22-18			401	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
GFI Relay Removal				401	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
TASK 28-22-18-000-801					
GFI Relay Installation				406	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
TASK 28-22-18-400-801					
<u>ENGINE FUEL CROSSFEED VALVE - REMOVAL/INSTALLATION</u>	28-22-21			401	LOM ALL
Actuator of the Engine Fuel Crossfeed Valve Removal				401	LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
TASK 28-22-21-000-801					

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Actuator of the Engine Fuel Crossfeed Valve Installation TASK 28-22-21-400-801					405	LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Actuator of the Engine Fuel Crossfeed Valve Removal TASK 28-22-21-000-804					409	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Actuator of the Engine Fuel Crossfeed Valve Installation TASK 28-22-21-400-804					415	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Engine Fuel Crossfeed Valve Adapter Removal TASK 28-22-21-000-802					423	LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Engine Fuel Crossfeed Valve Adapter Installation TASK 28-22-21-400-802					430	LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Engine Fuel Crossfeed Valve Adapter Removal TASK 28-22-21-000-805					436	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Engine Fuel Crossfeed Valve Adapter Installation TASK 28-22-21-400-805					444	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Crossfeed Valve Alignment TASK 28-22-21-820-801					453	LOM ALL

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Install the Engine Fuel Crossfeed Valve Body TASK 28-22-21-400-803				466	LOM ALL
Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve TASK 28-22-21-300-801	468				LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017
Crossfeed Valve Operational Test TASK 28-22-21-710-801				473	LOM ALL
<u>ENGINE FUEL CROSSFEED VALVE - INSPECTION/CHECK</u>	28-22-21			601	LOM ALL
Engine Fuel Crossfeed Valve Actuator - Bonding Resistance Check TASK 28-22-21-200-801				601	LOM ALL
<u>FUEL BOOST PUMP - REMOVAL/INSTALLATION</u>	28-22-41			401	LOM ALL
Motor Impeller Removal TASK 28-22-41-000-801				401	LOM ALL
Motor Impeller Installation TASK 28-22-41-400-801				420	LOM ALL
Fuel Boost Pump and Override Pump Priming TASK 28-22-41-420-801				430	LOM ALL
Fuel Boost Pump Housing Removal TASK 28-22-41-000-802				432	LOM ALL
Fuel Boost Pump Housing Installation TASK 28-22-41-400-802				441	LOM ALL
Fuel Boost Pump Operational Test TASK 28-22-41-710-801				448	LOM ALL

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<u>FUEL BOOST PUMP - ADJUSTMENT/TEST</u>		28-22-41		501	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
Ground Fault Interrupter (GFI) - Operational Test TASK 28-22-41-720-802				501	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
Fuel Boost Pump Output Pressure Check TASK 28-22-41-700-801				509	LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201
<u>FUEL SYSTEM MODULE, P5-2 - REMOVAL/INSTALLATION</u>		28-22-43		401	LOM ALL
Fuel System Module, P5-2 Removal TASK 28-22-43-020-801				401	LOM ALL
Fuel System Module, P5-2 Installation TASK 28-22-43-420-801				407	LOM ALL
Fuel System Module P5-2 Operational Test TASK 28-22-43-710-801				407	LOM ALL
<u>BOOST PUMP REMOVAL CHECK VALVE - REMOVAL/INSTALLATION</u>		28-22-51		401	LOM ALL
Removal Check Valve Removal TASK 28-22-51-000-801				401	LOM ALL
Removal Check Valve Installation TASK 28-22-51-400-801				406	LOM ALL
<u>MAIN TANK FUEL BOOST PUMP BYPASS VALVE - REMOVAL/INSTALLATION</u>		28-22-61		401	LOM ALL
Fuel Boost Pump Bypass Valve Removal TASK 28-22-61-000-801				401	LOM ALL
Fuel Boost Pump Bypass Valve Installation TASK 28-22-61-400-801				405	LOM ALL
<u>BOOST PUMP DISCHARGE CHECK VALVE - REMOVAL/INSTALLATION</u>		28-22-71		401	LOM ALL
Discharge Check Valve Removal TASK 28-22-71-000-801				401	LOM ALL

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APU FUEL FEED SYSTEM - ADJUSTMENT/TEST	28-25-00				501	LOM ALL
Operational Test - APU Fuel Feed System TASK 28-25-00-710-801					501	LOM ALL
APU DC Fuel Pump - Insulation Resistance Test TASK 28-25-00-760-801					509	LOM 412, 415, 423, 424, 450-452
APU DC FUEL PUMP - REMOVAL/INSTALLATION	28-25-01				401	LOM 412, 415, 423, 424, 450-452
APU DC Boost Pump Impeller Removal TASK 28-25-01-000-801					401	LOM 412, 415, 423, 424, 450-452
APU DC Boost Pump Impeller Installation TASK 28-25-01-400-801					407	LOM 412, 415, 423, 424, 450-452
APU DC Fuel Pump (Housing) Removal TASK 28-25-01-000-802					410	LOM 412, 415, 423, 424, 450-452
APU DC Fuel Pump (Housing) Installation TASK 28-25-01-400-802					412	LOM 412, 415, 423, 424, 450-452
APU FUEL SHUTOFF VALVE - REMOVAL/INSTALLATION	28-25-02				401	LOM ALL
APU Shutoff Valve Actuator Assembly Removal TASK 28-25-02-000-801					401	LOM ALL
APU Shutoff Valve Actuator Assembly Installation TASK 28-25-02-400-801					405	LOM ALL
APU Shutoff Valve Operational Test TASK 28-25-02-710-801					407	LOM ALL
APU Shutoff Valve Body Assembly Removal TASK 28-25-02-000-802					408	LOM ALL
APU Shutoff Valve Body Assembly Installation TASK 28-25-02-400-802					413	LOM ALL
APU FUEL SHUTOFF VALVE - INSPECTION/CHECK	28-25-02				601	LOM ALL
APU Fueling Shutoff Valve Actuator - Bonding Resistance Check TASK 28-25-02-200-801					601	LOM ALL

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<u>APU FUEL FEED LINE - REMOVAL/INSTALLATION</u>						
APU Fuel Line (No. 1 Tank and Center Tank) Removal	28-25-04		401			LOM ALL
TASK 28-25-04-000-801			401			LOM ALL
APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation			412			LOM ALL
TASK 28-25-04-400-801						
APU Fuel Line (Center Wing Section to APU Firewall) Removal			414			LOM ALL
TASK 28-25-04-000-802						
APU Fuel Line (Center Wing Section to APU Firewall) Installation			416			LOM ALL
TASK 28-25-04-400-803						
APU Fuel Line Leak Test (with Air)			418			LOM ALL
TASK 28-25-04-790-801						
<u>APU FUEL FEED LINE SHROUD - REMOVAL/INSTALLATION</u>	28-25-05		401			LOM ALL
Main APU Fuel Feed Line Shroud Removal			401			LOM ALL
TASK 28-25-05-000-801						
Main APU Fuel Feed Line Shroud Installation			407			LOM ALL
TASK 28-25-05-400-801						
Aft APU Fuel-Feed Line Shroud Removal			409			LOM ALL
TASK 28-25-05-000-802						
Aft APU Fuel Feed Line Shroud Installation			410			LOM ALL
TASK 28-25-05-400-802						
Aft APU Fuel-Feed Line Flexible Shroud Removal			412			LOM ALL
TASK 28-25-05-000-803						
Aft APU Fuel-Feed Line Flexible Shroud Installation			417			LOM ALL
TASK 28-25-05-400-803						
APU Fuel Line Shroud and Drain Line Leak Test			420			LOM ALL
TASK 28-25-05-790-801						
<u>APU CHECK VALVE - REMOVAL/INSTALLATION</u>	28-25-06		401			LOM ALL
APU Check Valve Removal			401			LOM ALL
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<u>APU FUEL FEED LINE SHROUD DRAIN MAST - REMOVAL/INSTALLATION</u>	28-25-07				401	LOM ALL
APU Fuel Feed Line Shroud Drain Mast Removal TASK 28-25-07-020-801					401	LOM ALL
APU Fuel Feed Line Shroud Drain Mast Installation TASK 28-25-07-420-801					405	LOM ALL
<u>DEFUELING - MAINTENANCE PRACTICES</u>	28-26-00				201	LOM ALL
Precautions and Limits for the Defuel Operation TASK 28-26-00-600-801					202	LOM ALL
Fuel Tank Defueling TASK 28-26-00-650-801					203	LOM ALL
Tank to Tank Fuel Transfer TASK 28-26-00-650-802					220	LOM ALL
<u>DEFUELING VALVE - REMOVAL/INSTALLATION</u>	28-26-11				401	LOM ALL
Actuator Handle Assembly Removal TASK 28-26-11-010-801					401	LOM ALL
Actuator Handle Installation TASK 28-26-11-400-801					405	LOM ALL
Adapter Shaft Removal TASK 28-26-11-010-802					406	LOM ALL
Adapter Shaft Installation TASK 28-26-11-410-801					414	LOM ALL
Adapter Shaft Alignment TASK 28-26-11-820-801					419	LOM ALL
Valve Body Removal TASK 28-26-11-020-801					425	LOM ALL
Valve Body Installation TASK 28-26-11-420-801					426	LOM ALL

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Operational Test - Fuel Quantity Indicating System					501	LOM ALL
TASK 28-41-00-710-801						
Comparison Check - Fuel Quantity Indicating System (FQIS) with the Fuel Measuring Sticks					514	LOM ALL
TASK 28-41-00-720-801						
System Test - Fuel Quantity Indicating System					515	LOM ALL
TASK 28-41-00-730-801						
Wet Capacitance System Check - Fuel Quantity Indicating System					516	LOM ALL
TASK 28-41-00-730-802						
<u>TANK AND COMPENSATOR UNITS - REMOVAL/INSTALLATION</u>	28-41-21				401	LOM ALL
Tank Unit or the Compensator Unit Removal					401	LOM ALL
TASK 28-41-21-000-801						
Tank Unit or Compensator Unit Installation					409	LOM ALL
TASK 28-41-21-400-801						
<u>TANK AND COMPENSATOR UNITS - ADJUSTMENT/TEST</u>	28-41-21				501	LOM ALL
Tank and Compensator Units - Resistance and Capacitance Check					501	LOM ALL
TASK 28-41-21-710-801						
Tank and Compensator Units Wet Capacitance Check					512	LOM ALL
TASK 28-41-21-710-802						
Tank and Compensator Units - Fuel Quantity Indicating System Health Check					517	LOM ALL
TASK 28-41-21-710-803						
<u>TANK AND COMPENSATOR UNITS - CLEANING/PAINTING</u>	28-41-21				701	LOM ALL
Tank Unit or Compensator Unit Cleaning					701	LOM ALL
TASK 28-41-21-110-801						

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<u>TANK AND COMPENSATOR UNIT BUSSING PLUG - REMOVAL/INSTALLATION</u>	28-41-41		Bussing Plug Removal TASK 28-41-41-000-801		401	LOM ALL
			Bussing Plug Installation TASK 28-41-41-400-801		405	LOM ALL
<u>FQIS SPAR PENETRATION CONNECTOR - REMOVAL/INSTALLATION</u>	28-41-42		FQIS Spar Penetration Connector Removal TASK 28-41-42-020-801		401	LOM ALL
			FQIS Spar Penetration Connector Installation TASK 28-41-42-420-801		410	LOM ALL
<u>FQIS SPAR PENETRATION CONNECTOR - ADJUSTMENT/TEST</u>	28-41-42		FQIS Shield Ground Terminal - Test TASK 28-41-42-700-801		501	LOM ALL
<u>FUEL TANK BULKHEAD (SPAR) RECEPTACLE WIRE HARNESS - REMOVAL/INSTALLATION</u>	28-41-44		FQIS Wire Harness Replacement TASK 28-41-44-400-801		401	LOM ALL
<u>FUEL TANK BULKHEAD (SPAR) RECEPTACLE WIRE HARNESS - INSPECTION/CHECK</u>	28-41-44		FQIS Wiring and Component Visual Inspection TASK 28-41-44-210-801		601	LOM ALL
			FQIS, No. 1 Tank - Inspection TASK 28-41-44-280-801		604	LOM ALL
			FQIS, No. 2 Tank - Inspection TASK 28-41-44-280-802		611	LOM ALL
			FQIS, Center Tank - Inspection TASK 28-41-44-280-803		618	LOM ALL
<u>REFUEL QUANTITY INDICATOR - REMOVAL/INSTALLATION</u>	28-41-61		Refuel Quantity Indicator Removal TASK 28-41-61-000-801		401	LOM ALL

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FQIS PROCESSOR - REMOVAL/INSTALLATION	28-41-81				401	LOM ALL
Fuel Quantity Processor Unit Removal TASK 28-41-81-000-801					401	LOM ALL
Fuel Quantity Processor Unit Installation TASK 28-41-81-400-801					408	LOM ALL
FUEL BOOST PUMP PRESSURE SWITCH - REMOVAL/INSTALLATION	28-42-11				401	LOM ALL
Fuel Boost Pump Pressure Switch Removal TASK 28-42-11-000-801					401	LOM ALL
Fuel Boost Pump Pressure Switch Installation TASK 28-42-11-420-801					418	LOM ALL
FUEL BOOST PUMP PRESSURE SWITCH - ADJUSTMENT/TEST	28-42-11				501	LOM ALL
Fuel Boost Pump Pressure Switch - Operational Test TASK 28-42-11-700-801					501	LOM ALL
FUEL TEMPERATURE INDICATING SYSTEM - ADJUSTMENT/TEST	28-43-00				501	LOM ALL
Fuel Temperature Indicating System Test (Master Thermometer) TASK 28-43-00-710-801					501	LOM ALL
Fuel Temperature Indicator Functional Test (Spare Temperature Indicator) TASK 28-43-00-720-801					507	LOM ALL
Fuel Temperature Indicator Functional Test (Decade Resistor) TASK 28-43-00-710-802					509	LOM ALL
Fuel Temperature Bulb Resistance Test TASK 28-43-00-760-801					511	LOM ALL
FUEL TEMPERATURE BULB - REMOVAL/INSTALLATION	28-43-11				401	LOM ALL
Fuel Temperature Bulb Removal TASK 28-43-11-000-801					401	LOM ALL

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Fuel Temperature Bulb Installation TASK 28-43-11-400-801					404	LOM ALL
<u>FUEL TEMPERATURE INDICATOR - REMOVAL/INSTALLATION</u>	28-43-21				401	LOM ALL
Fuel Temperature Indicator Removal TASK 28-43-21-020-801					401	LOM ALL
Fuel Temperature Indicator Installation TASK 28-43-21-020-802					403	LOM ALL
<u>MEASURING STICK - REMOVAL/INSTALLATION</u>	28-44-11				401	LOM ALL
Fuel Measuring Stick Removal TASK 28-44-11-000-801					401	LOM ALL
Fuel Measuring Stick Installation TASK 28-44-11-400-801					408	LOM ALL
Fuel Measuring Stick Mounting Base Removal TASK 28-44-11-000-802					410	LOM ALL
Fuel Measuring Stick Mounting Base Installation TASK 28-44-11-400-802					412	LOM ALL
<u>FUEL MEASURING STICK - REPAIRS</u>	28-44-11				801	LOM ALL
Replacement of the O-Ring Seal Between the Housing and the Base Assembly TASK 28-44-11-360-802					801	LOM ALL

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FUEL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.

TASK 28-00-00-910-801

2. Airworthiness Limitation Precautions

A. General

(1) Critical Design Configuration Control Limitations (CDCCLs)

- (a) All occurrences of CDCCLs found in this chapter of the AMM are identified by this note after each applicable CDCCL design feature:
- 1) NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

- (b) Design features that are identified as CDCCLs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. CDCCLs are a means of identifying certain design configuration features intended to preclude a fuel tank ignition source for the operational life of the airplane. These design features are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. A critical fuel tank ignition source prevention feature may exist in the fuel system and its related installation or in systems that, if a failure condition were to develop, could interact with the fuel system in such a way that an unsafe condition would develop without this limitation. Strict adherence to configuration, methods, techniques, and practices as prescribed is required to ensure the CDCCL is complied with. Any use of parts, methods, techniques or practices not contained in the applicable CDCCL must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.

(2) Airworthiness Limitation Instructions (ALIs)

- (a) All occurrences of fuel tank system ALIs found in this chapter of the AMM are identified by this note after each applicable ALI inspection feature:

- 1) NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

- (b) Inspection features that are ALIs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. These ALIs identify inspection features related to fuel tank ignition source prevention which must be done to maintain the design level of safety for the operational life of the airplane. These inspection features are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. Strict adherence to methods, techniques and practices as prescribed is required to ensure the ALI is complied with. Any use of methods, techniques or practices not contained in these ALIs must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.

B. Location Zones

Zone	Area
100	Lower Half of Fuselage

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Zone Area

200	Upper Half of Fuselage
500	Left Wing
600	Right Wing

C. Critical Design Configuration Control Limitations (CDCCLs)

SUBTASK 28-00-00-910-003



WARNING

OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO MAINTENANCE THAT HAS AN EFFECT ON A CDCCL. IF YOU DO NOT OBEY THE PROCEDURES, IT CAN INCREASE THE RISK OF A SOURCE OF FUEL TANK IGNITION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR IF THERE IS A FIRE OR EXPLOSION.

- (1) Make sure you follow the procedures for items identified as CDCCLs.

D. Airworthiness Limitation Instructions (ALIs)

SUBTASK 28-00-00-910-002



WARNING

OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO MAINTENANCE THAT HAS AN EFFECT ON AN ALI. IF YOU DO NOT OBEY THE PROCEDURES, IT CAN INCREASE THE RISK OF A SOURCE OF FUEL TANK IGNITION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR IF THERE IS A FIRE OR EXPLOSION.

- (1) Make sure you follow the procedures for items identified as ALIs.

———— END OF TASK ————

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THIS STEP IS CONTROLLED BY
CDCCL AND CANNOT BE
DEVIATED FROM.

THESE STEPS ARE NOT
CONTROLLED BY CDCCL.

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WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS(MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve adapter [11] and the front spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-11-430-005

(3) On the outside of the airplane, do these steps:

(a) Put a thin layer of petroleum grease, D00504, on the new O-ring [26].

(b) Put the O-ring [26] in the O-ring groove of the valve adapter [11].

(c) Put the adapter shaft attached to the valve adapter [11] through the hole in the front spar.

(d) Make sure the shoulder of the valve adapter [11] does not bind in the opening of the front spar

SUBTASK 28-22-11-430-005

WARNING: DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Go into the applicable main tank to the spar valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-11-420-007

(5) Do these steps to install the valve adapter [11]:

(a) Make sure that the index marks on the spar valve body [20] are aligned (View E).
 NOTE: A small misalignment of the index marks is satisfactory.

(b) Engage the adapter shaft of the valve adapter [11] with the spar valve body [20] (ViewC).
 NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions
 TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

(c) Apply sealant to the shank and the threads of the four bolts [21].
 NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

(d) Install the four bolts [21] and washers [22] to attach the valve adapter [11].

SUBTASK 28-22-11-765-005

(6) On the outside of the fuel tank, measure the bonding resistance between one of the raised serrated surfaces of the valve adapter [11] (bare metal surface) and the front spar (View F).
 (a) Use an electrical bonding bonding meter, COM-1550 (SWPM 20-20-00).

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(4) Go into the applicable main tank to the spar valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-11-420-027

(5) Do these steps to install the valve adapter [11]:

(a) Make sure that the index marks on the spar valve body [20] are aligned (View E).
 NOTE: A small misalignment of the index marks is satisfactory.

(b) Engage the adapter shaft of the valve adapter [11] with the spar valve body [20] (ViewC).
 NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions

TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

(1) Use BMS5-45 Class B sealant, A00767, for the wet installation of the bolts [21].

(2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524mm) thick.

(d) Install the four bolts [21] and washers [22] to attach the valve adapter [11].

SUBTASK 28-22-11-765-005

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AMM CDCCL Example
Figure 201/28-00-00-990-822

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TASK 28-00-00-200-801

3. Electrical Bonding Jumpers in the Fuel System - Inspection

A. General

- (1) This task has visual and mechanical inspections of the bonding jumpers in the fuel system.
- (2) Do not flex, bend or kink the bonding jumper more than is necessary. If the bonding jumpers are moved too much, it can cause the loss of tin plating on the wire braid of the bonding jumper.
- (3) When you inspect the bonding jumpers, you may see black or brown deposits on the wire braid. This can occur when there is a deterioration of the tin plating on the bonding jumper and the copper in the wire reacts with any sulfur compounds. This is not a problem unless the wire braid has broken strands. If the bonding jumper has broken strands, then you must replace the bonding jumper.
- (4) When you inspect the bonding jumpers, inspect for loose clamps and corrosion.

B. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Prepare for the Inspection

SUBTASK 28-00-00-010-001



WARNING CAREFULLY DO ALL OF THE SAFETY PROCEDURES TO PREPARE TO GO INTO THE FUEL TANK. IF YOU DO NOT OBEY THE SAFETY PROCEDURES, YOU CAN CAUSE AN EXPLOSION. AN EXPLOSION WILL CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Go into the fuel tank (TASK 28-11-00-910-802).
 - (a) Remove the applicable access doors to get access to the fuel tank (TASK 28-11-11-000-801, TASK 28-11-31-000-801).

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E. Electrical Bonding Jumper Visual Inspection

SUBTASK 28-00-00-210-006

- (1) Visually inspect the bonding jumper and clamp for color and deterioration.
 - (a) If the bonding jumper is silver in color and is free from black or brown deposits, then the bonding jumper is satisfactory.
 - (b) If the wire braid on the bonding jumper has black or brown deposits, then inspect the bonding jumper for broken strands.
 - 1) If the wire braid does not have broken strands, then the bonding jumper is satisfactory.
 - 2) If the bonding jumper braid has broken strands, then do this task: Electrical Bonding Jumpers in the Fuel System - Replacement, TASK 28-00-00-960-801.

F. Electrical Bonding Jumper Mechanical Inspection

SUBTASK 28-00-00-280-001

- (1) Try to turn the bonding jumper lugs and tube clamps, if applicable, with light finger pressure.

SUBTASK 28-00-00-280-002

- (2) If the bonding jumper is loose, rework the electrical bonding path (SWPM 20-20-00 or SWPM 20-20-10).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-00-00-410-001

- (1) If it is not necessary for subsequent tasks, go out of and close the fuel tank (Fuel Tank Closure, TASK 28-11-00-410-801).
 - (a) Install the access doors you removed (Main Tank Access Door Installation, TASK 28-11-11-400-801, TASK 28-11-31-400-801).

————— END OF TASK ————

TASK 28-00-00-960-801

4. Electrical Bonding Jumpers in the Fuel System - Replacement

A. General

- (1) This task contains steps for the bonding jumpers in the system to:
 - (a) Replace the electrical bonding jumpers
 - (b) Do a check of the electrical integrity of the electrical bond path.

B. References

Reference	Title
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

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Zone	Area
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Replacement of the Bonding Jumpers in the Fuel System

SUBTASK 28-00-00-020-004

- (1) Remove the bonding jumper.
 - (a) Keep all the parts necessary for the installation of the bonding jumper.

SUBTASK 28-00-00-020-005

- (2) For the bonding jumpers used to bond electrical equipment, follow the applicable installation procedure in the AMM.

SUBTASK 28-00-00-020-006

- (3) For the bonding jumpers used to bond mechanical equipment or tubing, install the new bonding jumper and hardware (SWPM 20-20-00 or SWPM 20-20-10).
 - (a) Make sure the mating surfaces are correctly prepared.
 - (b) Make sure bonding jumper installation gives sufficient clearance from the structure, tubing or all fuel system parts.

NOTE: This will prevent abrasion.

 - (c) Do the "Electrical Integrity Check of the Fuel System Bond Path" procedure.

E. Electrical Integrity Check of the Fuel System Bond Path

NOTE: (SWPM 20-20-00 and SWPM 20-20-10) define the measurement processes necessary for installation of electrical bonding hardware. The fuel system tubing and components often incorporate multiple electrical bonds in series between the component and the primary structure. The measurement of the tubing or component bond is a separate requirement.

SUBTASK 28-00-00-760-003

- (1) For bonding jumper hardware installations, do the resistance measurement for electrical integrity (SWPM 20-20-00 or SWPM 20-20-10).

SUBTASK 28-00-00-760-004

- (2) For the fuel system tubing or components, do these steps:
 - (a) Measure the total resistance from the tubing or component, to the adjacent primary structure (SWPM 20-20-00).
 - (b) Make sure the resistance is not more than 0.10 ohms.

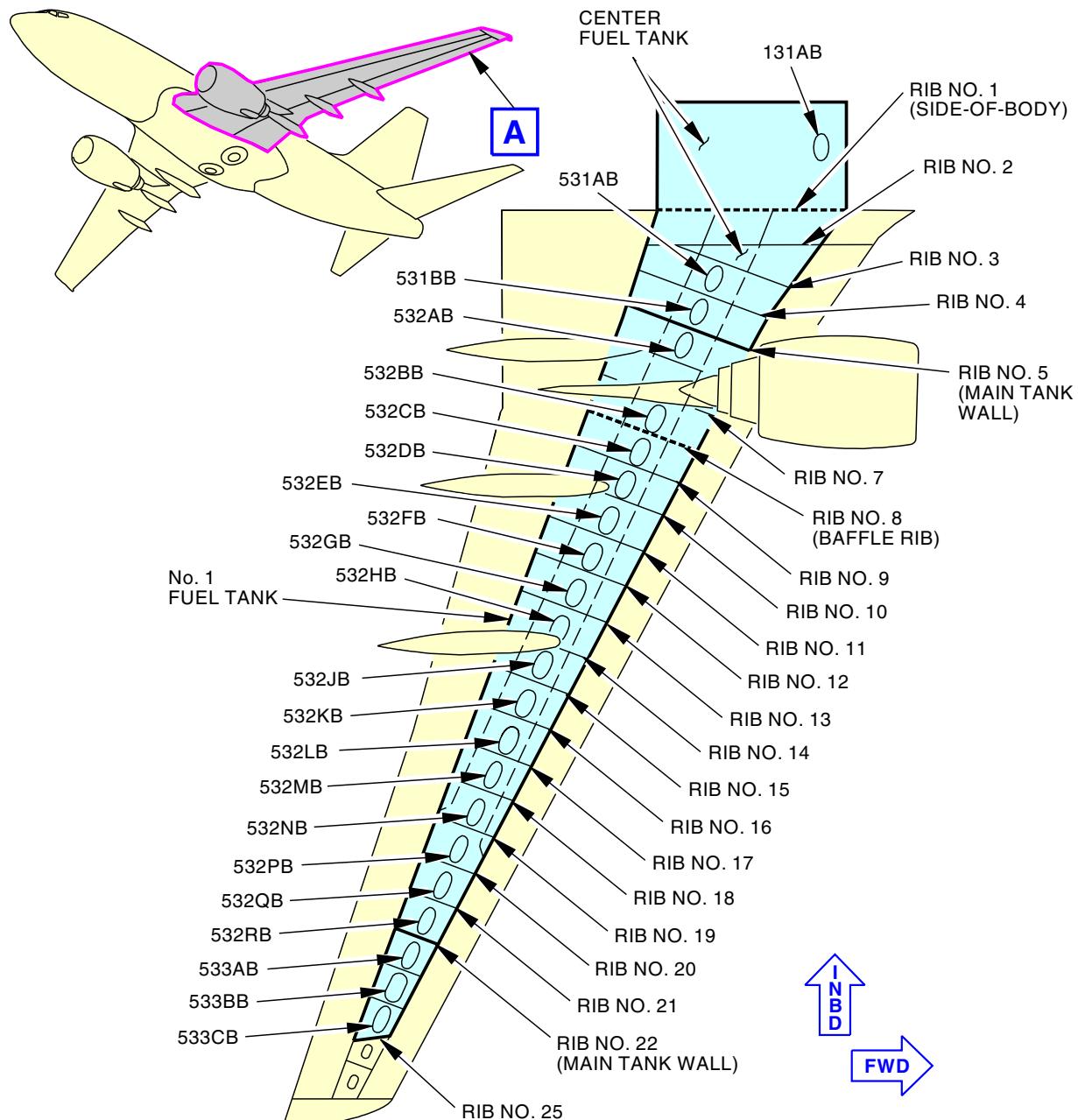
— END OF TASK —



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FUEL TANK ACCESS DOORS
(LEFT WING, BOTTOM VIEW)

A

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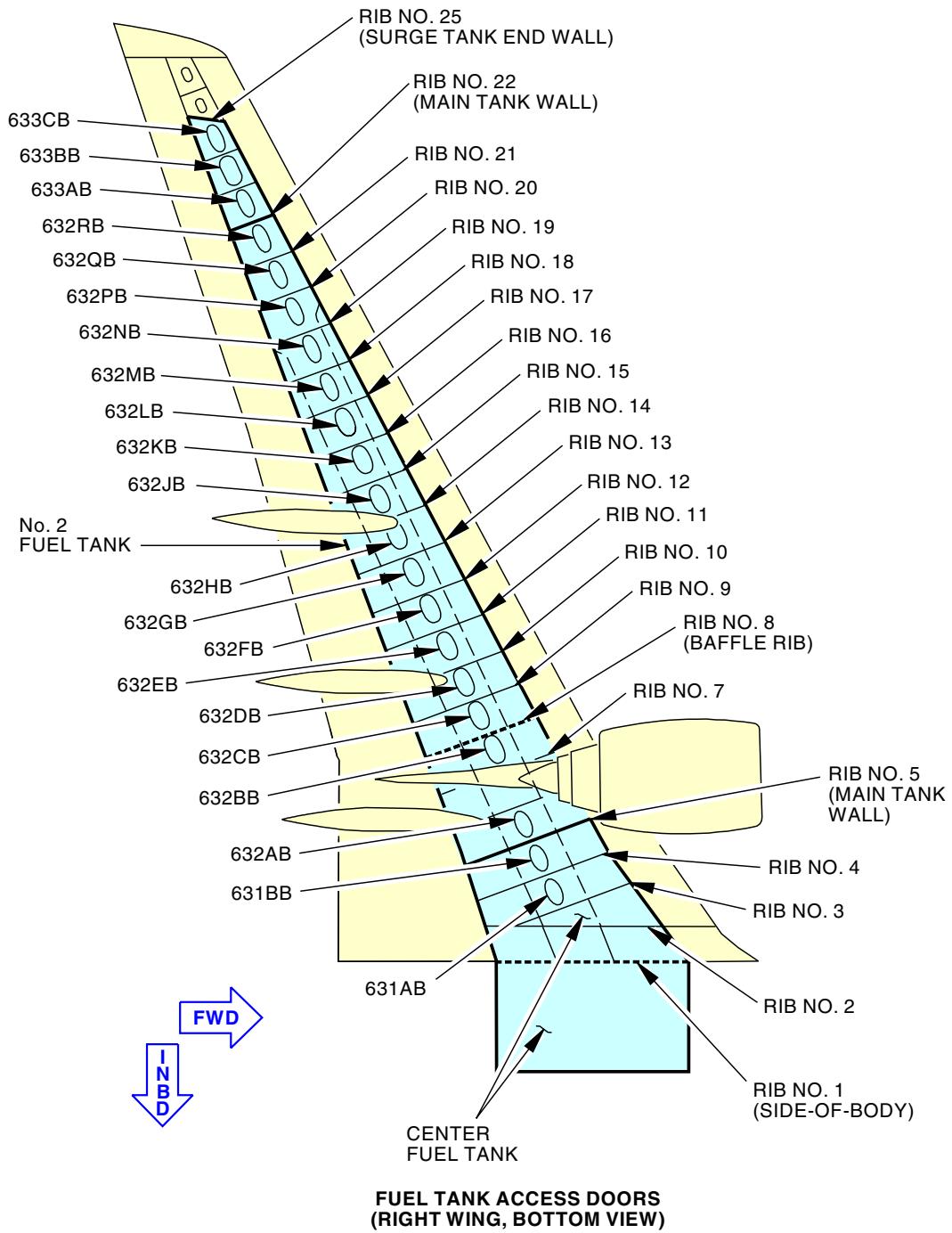
Fuel Tank - Left Wing
Figure 202/28-00-00-990-805

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Fuel Tank - Right Wing
Figure 203/28-00-00-990-816

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TASK 28-00-00-280-801

5. Fuel System Static Bond Path No. 1 Tank - Inspection

(Figure 202 or Figure 203)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

C. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
532AB	Main Tank Access Door - Wing Station 216
532AZ	Main Tank Inner Access at Rib 6
532BB	Main Tank Access Door - Wing Station 265
532BZ	Main Tank Inner Access at Rib 6
532PB	Main Tank Access Door - Wing Station 576

D. Procedure

SUBTASK 28-00-00-280-004

- (1) For the area in the No. 1 fuel tank between rib No. 5 (inboard tank end) and rib No. 7, do these steps:

- (a) Remove this access panel:

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216

- (c) For the area in the No. 1 fuel tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

Number	Name/Location
532AZ	Main Tank Inner Access at Rib 6
532BZ	Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

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- (d) For all bonding jumpers between Rib No. 5 and Rib No. 7, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.
- (e) If it is removed and access is not necessary for subsequent tasks, install the applicable access panel(s) on rib No. 6:

Number Name/Location

532AZ Main Tank Inner Access at Rib 6
532BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

- (f) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-005

- (2) For the area in the No. 1 fuel tank between rib No. 7 and rib No. 8, do these steps:

- (a) Open this access panel:

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

- (b) Remove this access panel:

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (c) Go into the opening for:

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

- (d) For all bonding jumpers between Rib No. 7 and Rib No. 8, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (e) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

- (f) Close this access panel:

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

SUBTASK 28-00-00-280-017

- (3) For the area in the No. 1 fuel tank between rib No. 19 and rib No. 20, do these steps:

- (a) Remove this access panel:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

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To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

- (c) For all bonding jumpers between Rib No. 19 and Rib No. 20, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.
(d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

———— END OF TASK ————



TASK 28-00-00-280-802

6. Fuel System Static Bond Path No. 2 Tank - Inspection

(Figure 202 or Figure 203)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
444	Engine 2 - Aft Strut Fairing
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Access Panels

Number	Name/Location
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
632AB	Main Tank Access Door - Wing Station 216
632AZ	Main Tank Inner Access at Rib 6
632BB	Main Tank Access Door - Wing Station 265
632BZ	Main Tank Inner Access at Rib 6
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632PB	Main Tank Access Door - Wing Station 576

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D. Procedure

SUBTASK 28-00-00-280-020

- (1) For the area in the No. 2 fuel tank between rib No. 5 (inboard tank end) and rib No. 7, do these steps:

- (a) Remove this access panel:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

- (c) For the area in the No. 2 fuel tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

Number Name/Location

632AZ Main Tank Inner Access at Rib 6

632BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

- (d) For all bonding jumpers between Rib No. 5 and Rib No. 7, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (e) If it is removed and access is not necessary for subsequent tasks, install the applicable access panel(s) on rib No. 6:

Number Name/Location

632AZ Main Tank Inner Access at Rib 6

632BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

- (f) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-021

- (2) For the area in the No. 2 fuel tank between rib No. 7 and rib No. 8, do these steps:

- (a) Open this access panel:

Number Name/Location

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

- (b) Remove this access panel:

Number Name/Location

632BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.



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- (c) Go into the opening for:

Number **Name/Location**

632BB Main Tank Access Door - Wing Station 265

- (d) For all bonding jumpers between Rib No. 7 and Rib No. 8, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (e) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

- (f) Close this access panel:

Number **Name/Location**

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

SUBTASK 28-00-00-280-022

- (3) For the area in the No. 2 fuel tank between rib No. 8 and rib No. 9, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

- (c) For all bonding jumpers between Rib No. 8 and Rib No. 9, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-023

- (4) For the area in the No. 2 fuel tank between rib No. 9 and rib No. 10, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number **Name/Location**

632DB Main Tank Access Door - Wing Station 313

- (c) For all bonding jumpers between Rib No. 9 and Rib No. 10, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

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- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-024

- (5) For the area in the No. 2 fuel tank between rib No. 10 and rib No. 11, do these steps:

- (a) Remove this access panel:

Number Name/Location

632EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

632EB Main Tank Access Door - Wing Station 337

- (c) For all bonding jumpers between Rib No. 10 and Rib No. 11, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-025

- (6) For the area in the No. 2 fuel tank between rib No. 11 and rib No. 12, do these steps:

- (a) Remove this access panel:

Number Name/Location

632FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

632FB Main Tank Access Door - Wing Station 367

- (c) For all bonding jumpers between Rib No. 11 and Rib No. 12, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-00-00-280-033

- (7) For the area in the No. 2 fuel tank between rib No. 19 and rib No. 20, do these steps:

- (a) Remove this access panel:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

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- (b) Go into the opening for:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

- (c) For all bonding jumpers between Rib No. 19 and Rib No. 20, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801.

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

———— END OF TASK ————

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TASK 28-00-00-280-803

7. Fuel System Static Bond Center Tank - Inspection

(Figure 202 or Figure 203)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

D. Procedure

SUBTASK 28-00-00-280-036

- (1) For the area in the center tank on the left side between rib No. 4 and rib No. 5 (tank end), do these steps:

- (a) Remove this access panel:

Number Name/Location

531BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

531BB Center Tank Access Door - Wing Station 192

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- (c) For all bonding jumpers between Rib No. 4 and Rib No. 5, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

531BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-00-00-280-037

- (2) For the area in the center tank on the left side between rib No. 1 (side of body rib) and rib No. 4, do these steps:

- (a) Remove this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

- (c) For all bonding jumpers between Rib No. 1 and Rib No. 4, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-00-00-280-038

- (3) For the area in the center tank on the right side between rib No. 4 and rib No. 5 (tank end), do these steps:

- (a) Remove this access panel:

Number Name/Location

631BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

631BB Center Tank Access Door - Wing Station 192

- (c) For all bonding jumpers between Rib No. 4 and Rib No. 5, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

631BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-00-00-280-039

- (4) For the area in the center tank on the right side between rib No. 1 (side of body rib) and rib No. 4, do these steps:

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- (a) Remove this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168

- (c) For all bonding jumpers between Rib No. 1 and Rib No. 4, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-00-00-280-040

- (5) For the area of the center tank in the center wing section, do these steps:

- (a) Remove this access panel:

Number Name/Location

131AB Center Tank Access

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

131AB Center Tank Access

- (c) For all bonding jumpers in the center wing section of the center fuel tank, do this task: Electrical Bonding Jumpers in the Fuel System - Inspection, TASK 28-00-00-200-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

131AB Center Tank Access

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

— END OF TASK —



TASK 28-00-00-760-801

8. Fuel System Fault Current, Left Side - Inspection

(Figure 204, Figure 205, Figure 206, Figure 207, Figure 208)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-11-00-820-802	Pogo and Power Control Unit (PCU) Adjustment (P/B 501)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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(Continued)

Reference	Title
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Procedure

SUBTASK 28-00-00-760-005

- (1) Do these steps to do an inspection of the aft boost pump for the No. 1 tank:
 - (a) To get access to the motor impeller of the aft fuel boost pump for the No. 1 tank, go through the applicable left main shock strut door.
 - (b) Do a check of the electrical bond between the aft fuel boost pump for the No. 1 tank and the airplane structure with an electrical intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.

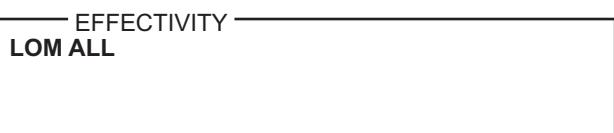
SUBTASK 28-00-00-760-006

- (2) Do these steps to do an inspection of the forward boost pump for the No. 1 tank:



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) To get access to the motor impeller of the forward fuel boost pump for the No. 1 tank, do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.
- (b) Do a check of the electrical bond between the forward fuel boost pump for the No. 1 tank and the airplane structure (SWPM 20-20-00, SWPM 20-20-10).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.



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SUBTASK 28-00-00-760-007

- (3) Do these steps to do an inspection of the left center boost pump:



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (a) If downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.
- (b) If you are unable to get access to the left center tank fuel boost pump, do the steps that follow:
 - 1) Remove the pin [28], nut [27], washer [26], bushing [24], washers [22], and bolts [23] to disconnect the pogo [21] from the power control unit [25]:

NOTE: Be careful not to change the length of the pogo. If you change the length of the pogo, it will be necessary to re-adjust the length when you re-install it.
 - 2) Remove the bolts [29] and washers [30] to disconnect the bracket assembly from the power control unit [1].
 - 3) Pull the pogo [21] aft, away from the rear spar of the center tank to get access to the left center tank boost pump.

NOTE: It is not necessary to remove the bolt at the left of the pogo that attaches the pogo to the aileron feel and centering unit.
- (c) Do a check of the electrical bond between the left center fuel boost pump and the airplane structure (SWPM 20-20-00, SWPM 20-20-10).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.
- (d) If you removed the pogo [21], then do these steps to install the pogo [21]:

NOTE: Be careful not to change the length of the pogo.

 - 1) Connect the bracket assemblies to the power control unit [25] with bolts [29] and washers [30].
 - 2) Connect the pogo [21] to the power control unit [25] with bolt [23], washer [22], bushing [24], washer [26], nut [27] and pin [28].

NOTE: You must install the bolt [23] with the bolt head up.
 - 3) Make sure you can easily install and remove the rig pin A/S-4, from the rigging pin kit, SPL-1585, in the aileron bus drum (TASK 27-11-00-820-802).
 - 4) If you cannot easily install and remove the rig pin A/S-4, do this task: Pogo and Power Control Unit (PCU) Adjustment, TASK 27-11-00-820-802.

NOTE: This step should not be necessary if the length of the pogo was not changed while it was removed.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 28-00-00-860-030

- (1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

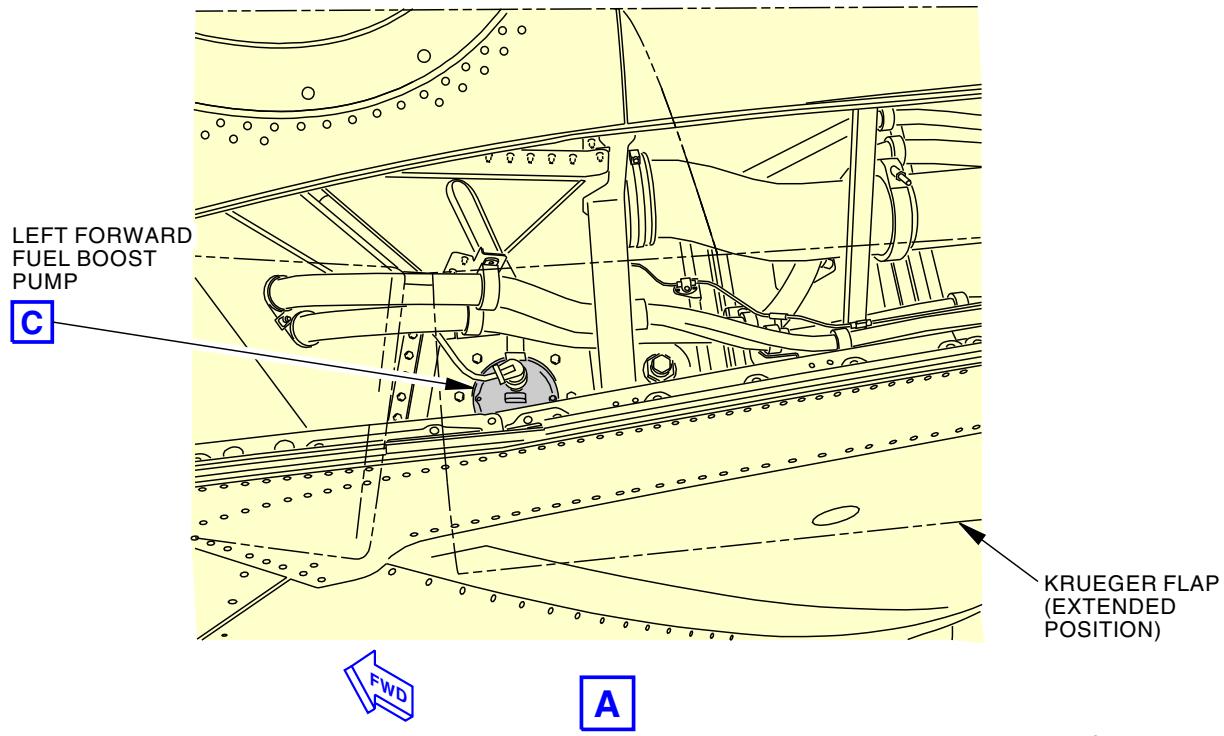
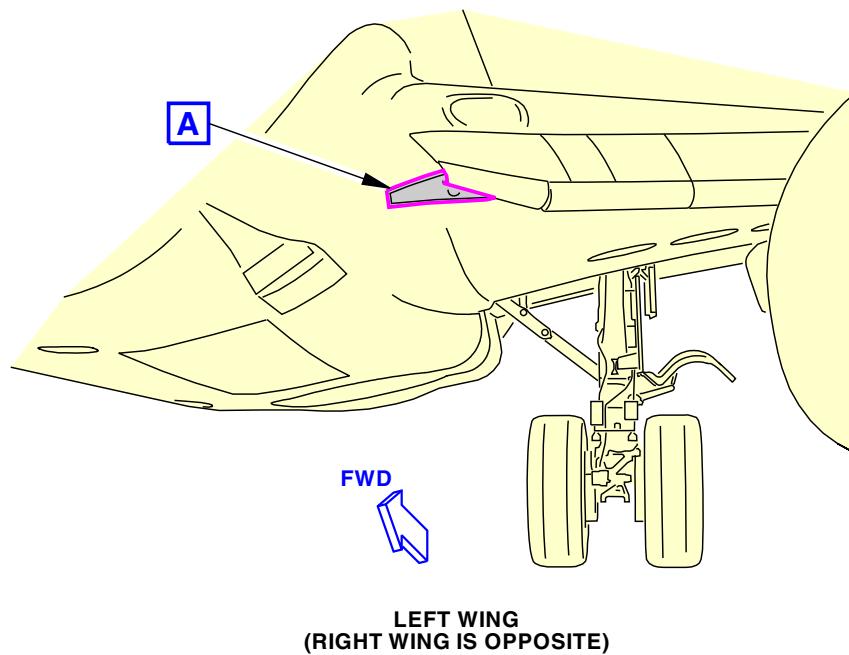
— END OF TASK —

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M26431 S0006571159_V3

No. 1 or 2 Tank Fuel Boost Pump Location
Figure 204/28-00-00-990-817 (Sheet 1 of 3)

EFFECTIVITY
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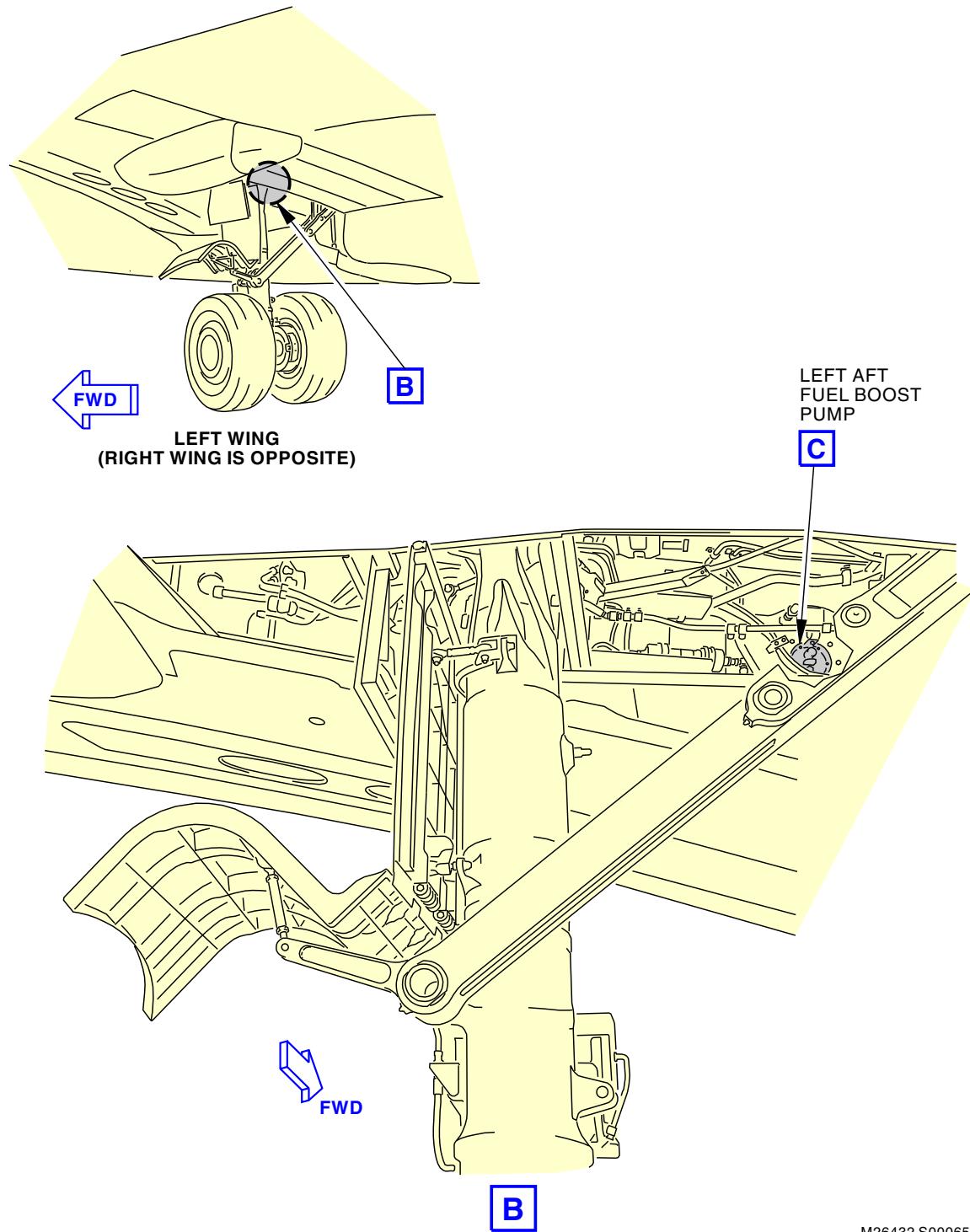
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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M26432 S0006571160_V2

No. 1 or 2 Tank Fuel Boost Pump Location
Figure 204/28-00-00-990-817 (Sheet 2 of 3)

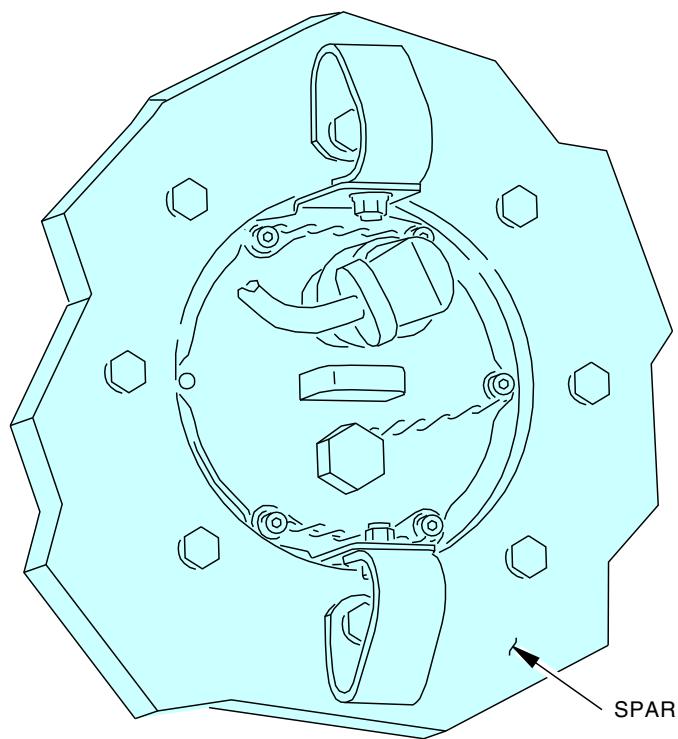
EFFECTIVITY
LOM ALL

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FUEL BOOST PUMP
(EXAMPLE)

C

M26433 S0006571161_V2

No. 1 or 2 Tank Fuel Boost Pump Location
Figure 204/28-00-00-990-817 (Sheet 3 of 3)

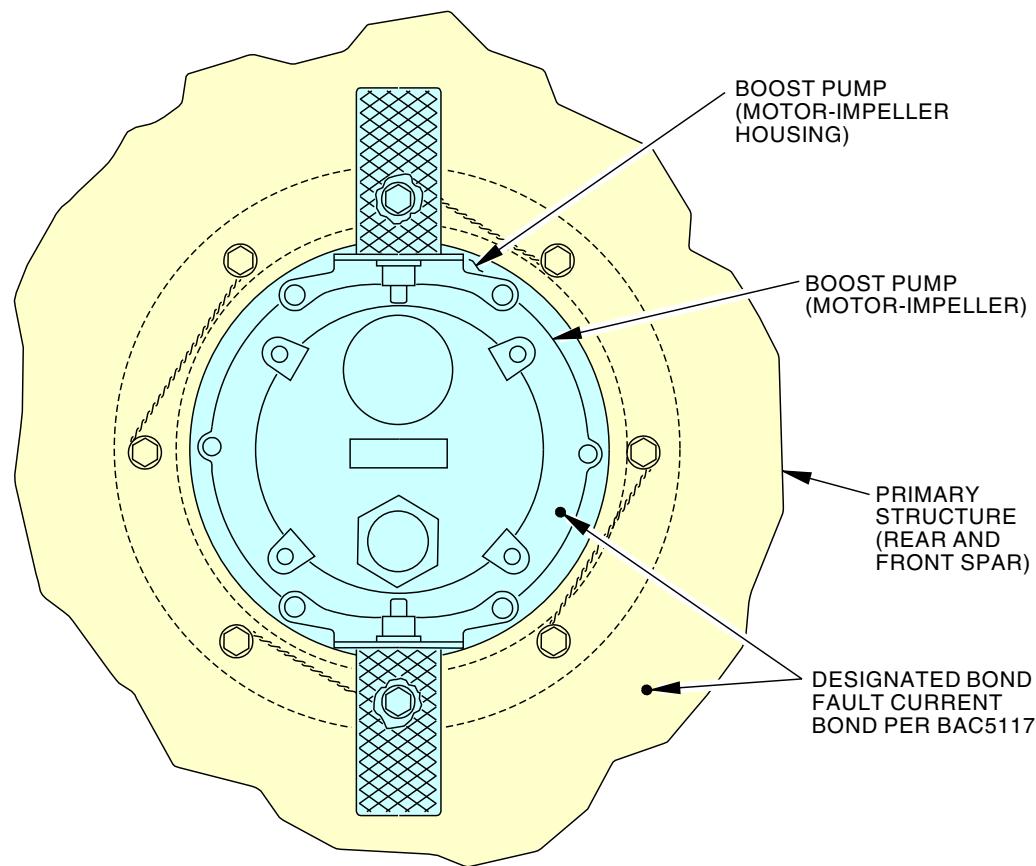
EFFECTIVITY
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**NOTE:**

MEASURE RESISTANCE PER BAC5117-4. MEASURE PUMP
MOTOR-IMPELLER AT POINTS INDICATED TO THE
PRIMARY STRUCTURE $<0.001\Omega$.

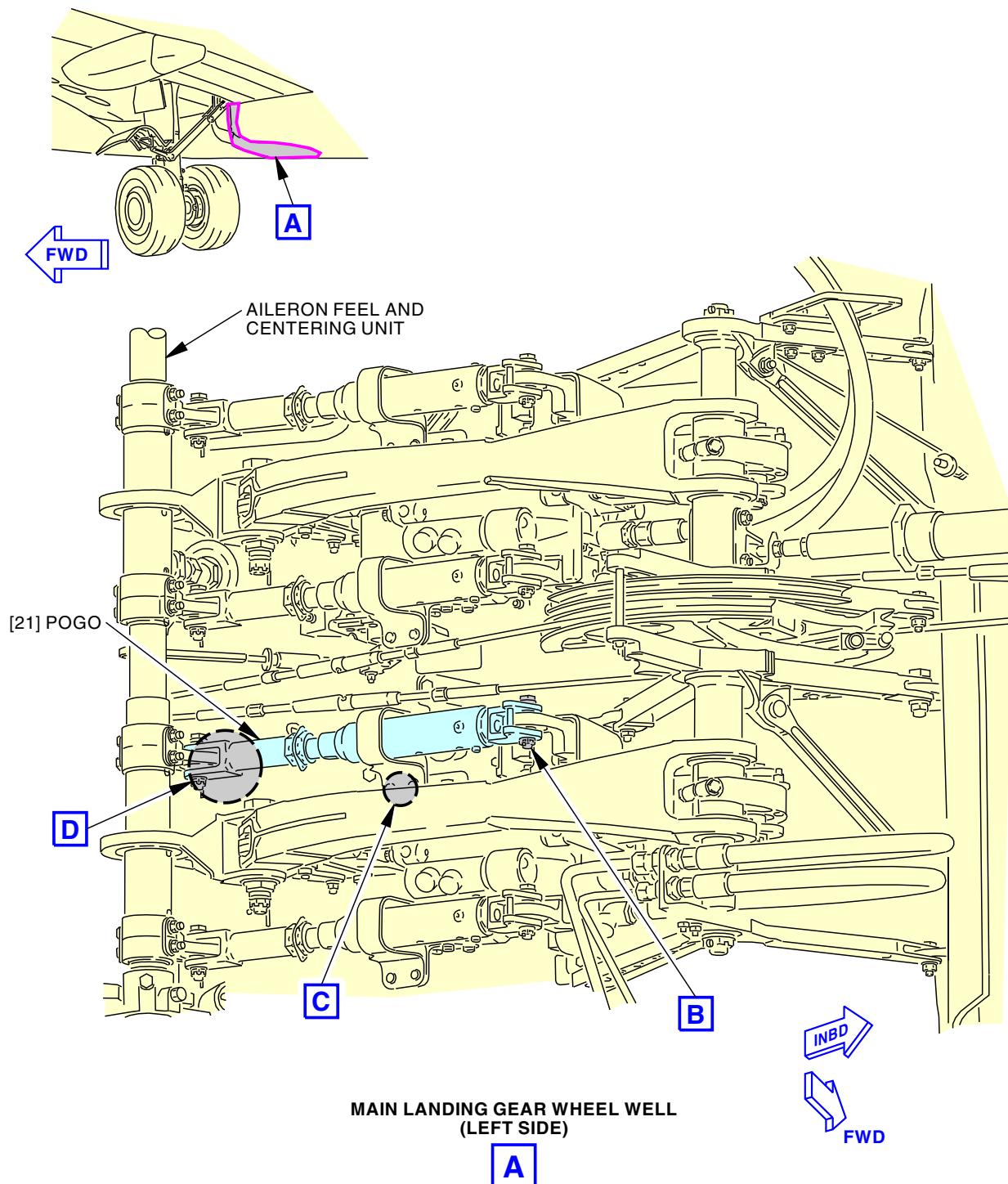
W24268 S0006571162_V4

No. 1 or No. 2 Tank Boost Pump Resistance Measurement - Probe Locations
Figure 205/28-00-00-990-818

EFFECTIVITY	LOM ALL
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M26434 S0006571163_V2

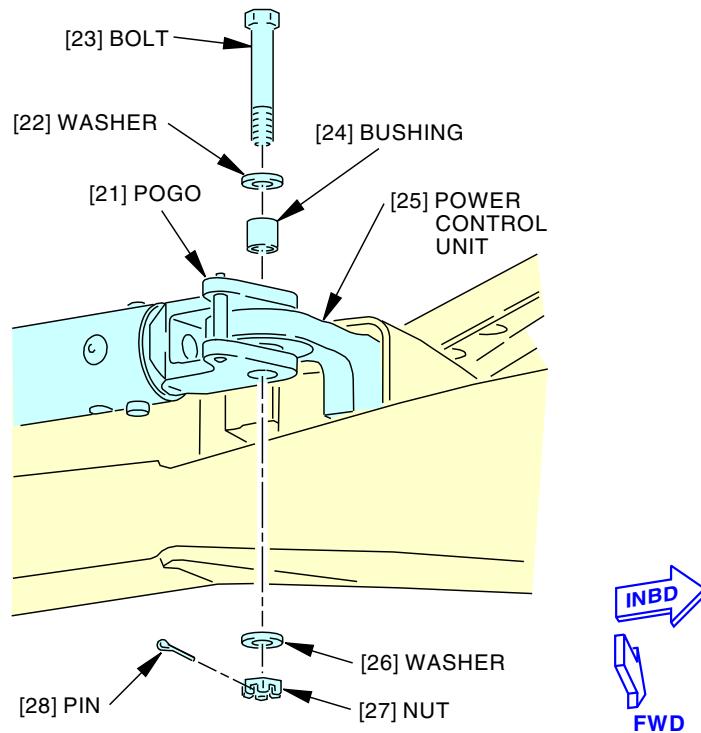
Left Center Tank Fuel Boost Pump Access
Figure 206/28-00-00-990-819 (Sheet 1 of 3)

EFFECTIVITY
 LOM ALL

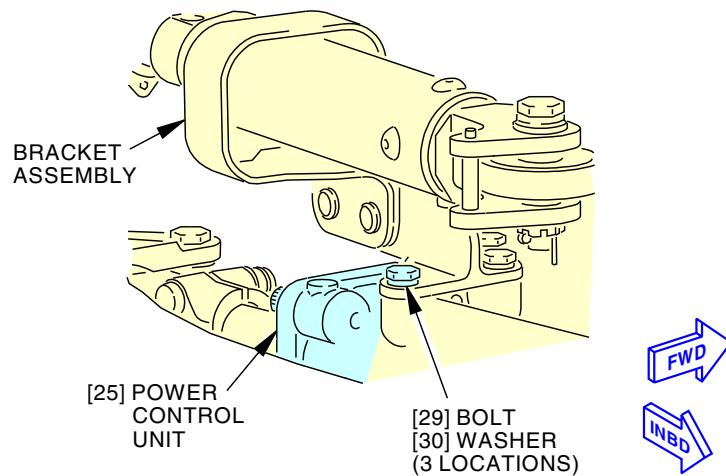
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B



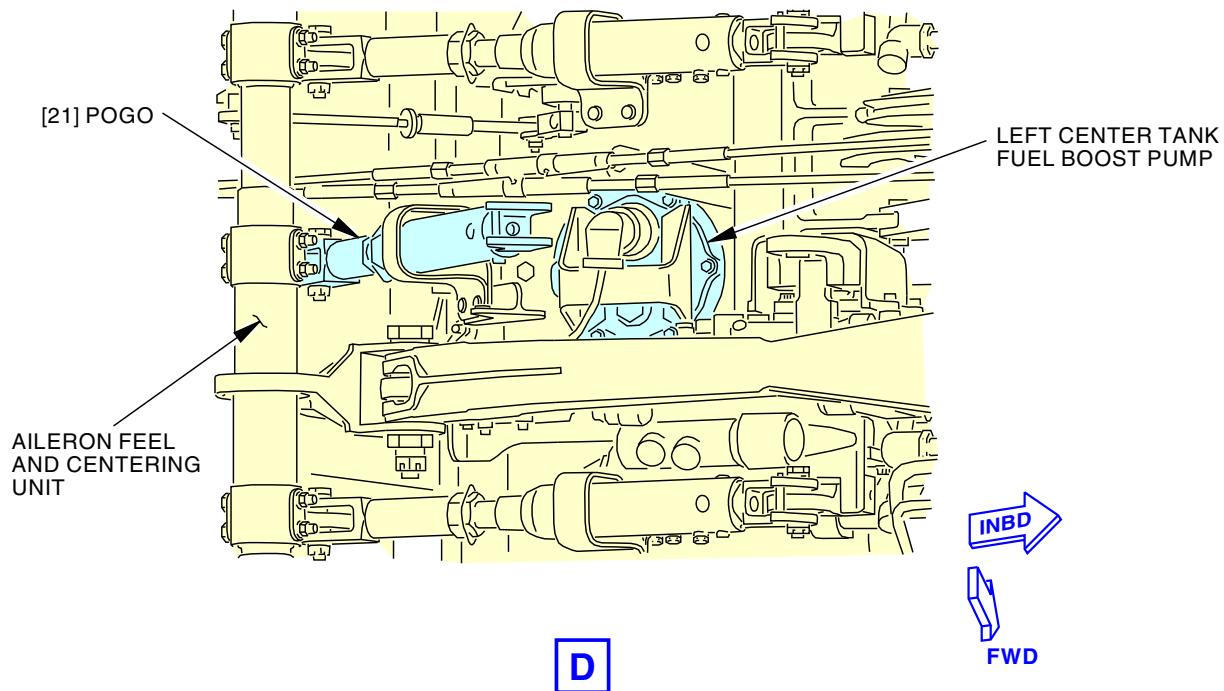
C

M26435 S0006571164_V2

Left Center Tank Fuel Boost Pump Access
Figure 206/28-00-00-990-819 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

28-00-00



M26438 S0006571165_V2

Left Center Tank Fuel Boost Pump Access
Figure 206/28-00-00-990-819 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

28-00-00

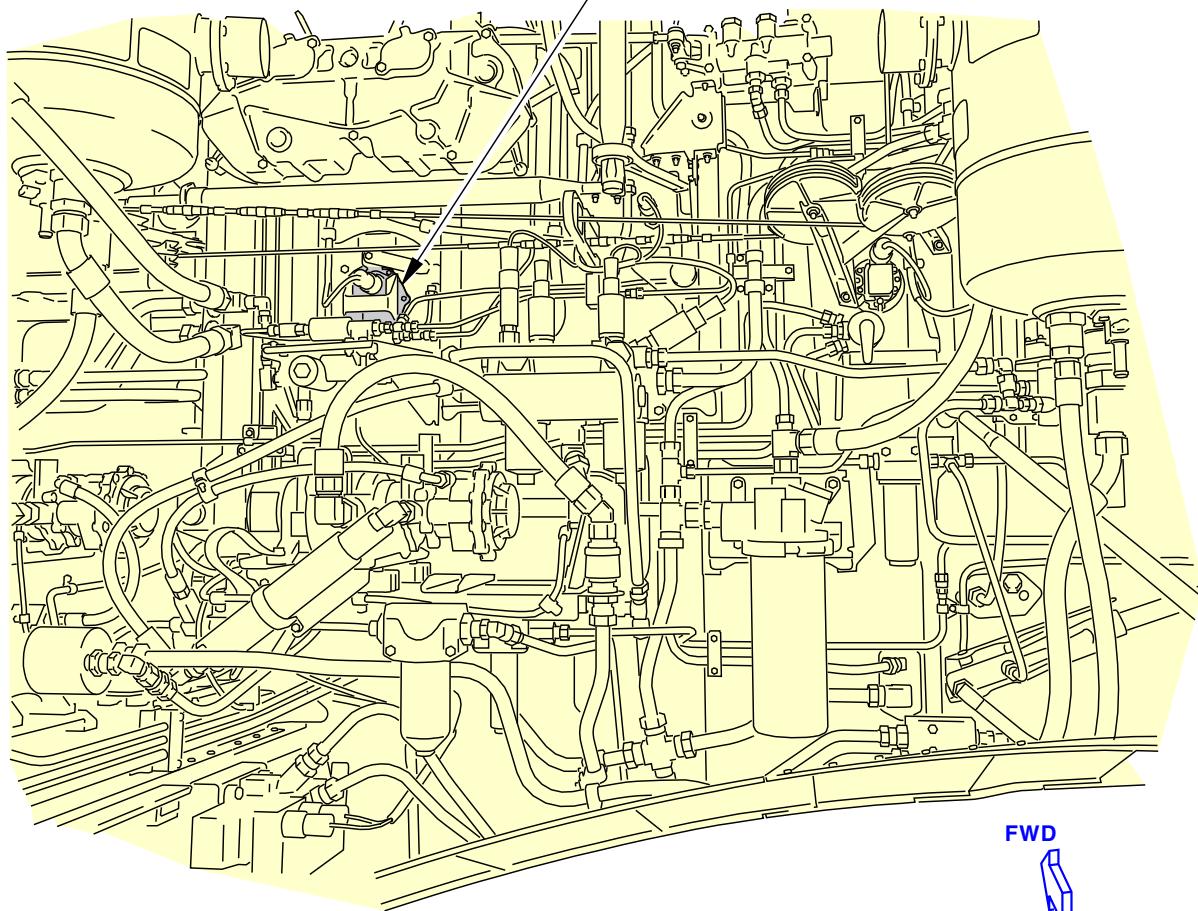
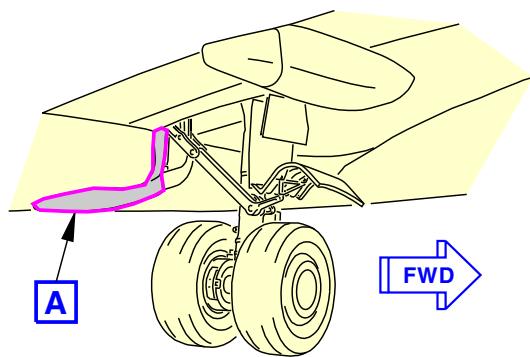
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MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)

A

M26441 S0006571166_V2

Right Center Tank Fuel Boost Pump Location
Figure 207/28-00-00-990-820 (Sheet 1 of 2)

EFFECTIVITY
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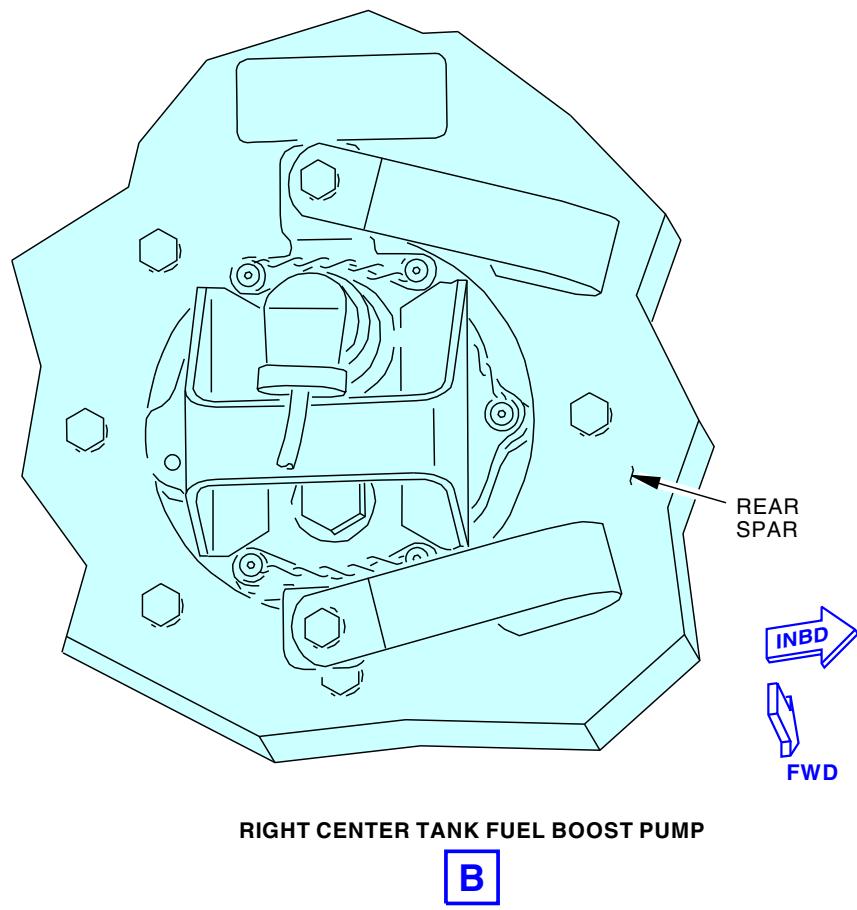
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M26443 S0006571167_V2

Right Center Tank Fuel Boost Pump Location
Figure 207/28-00-00-990-820 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-00-00

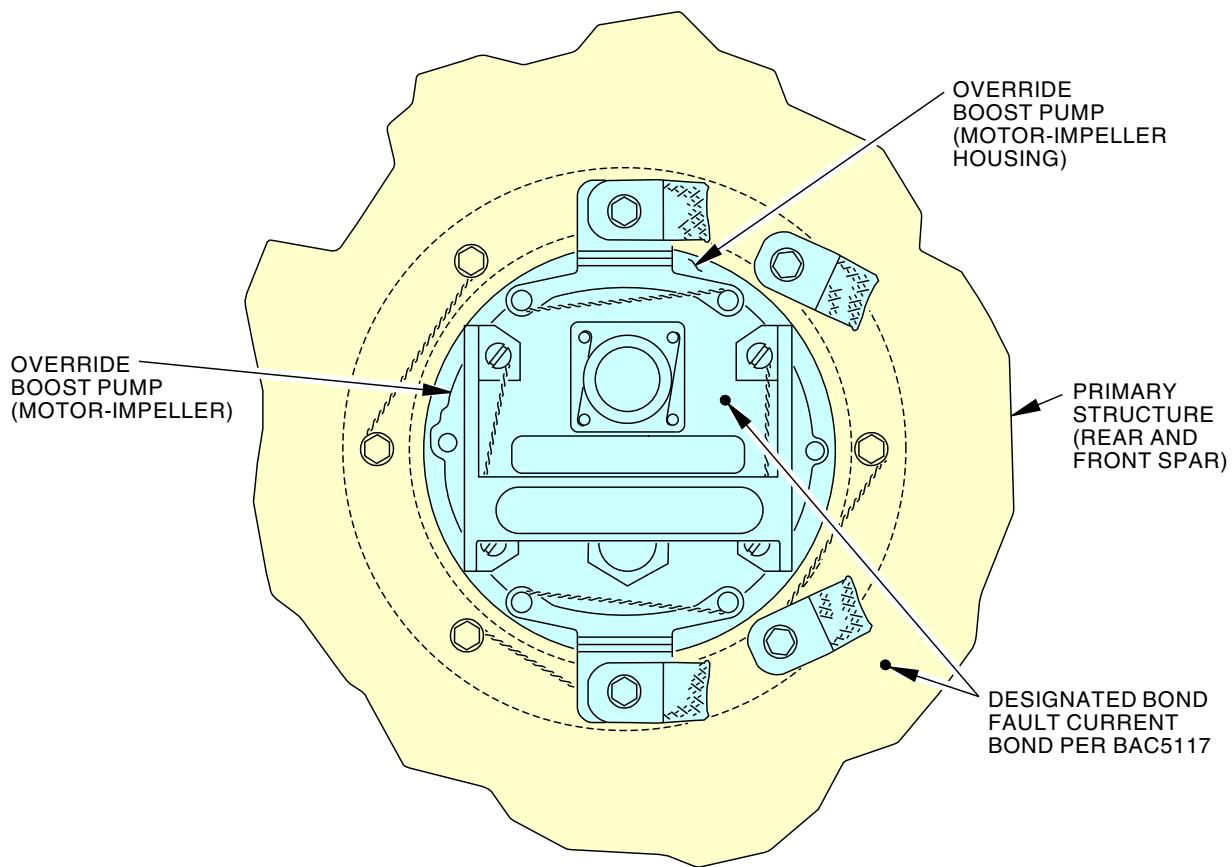
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NOTE:

MEASURE RESISTANCE PER BAC5117-4. MEASURE PUMP
MOTOR-IMPELLER AT POINTS INDICATED TO THE PRIMARY
STRUCTURE $<0.001\Omega$.

W24269 S0006571168_V4

Center Tank Boost Pump Resistance Measurement - Probe Locations
Figure 208/28-00-00-990-821

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TASK 28-00-00-760-802

9. Fuel System Fault Current, Right Side - Inspection

(Figure 204, Figure 205, Figure 207, Figure 208)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Location Zones

Zone	Area
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Procedure

SUBTASK 28-00-00-760-008

- (1) Do these steps to do an inspection of the aft boost pump for the No. 2 tank:
 - (a) To get access to the motor impeller of the aft fuel boost pump for the No. 2 tank, go through the applicable right main shock strut door.
 - (b) Do a check of the electrical bond between the aft fuel boost pump for the No. 2 tank and the airplane structure with an electrical intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00, SWPM 20-20-10).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.

SUBTASK 28-00-00-760-009

- (2) Do these steps to do an inspection of the forward boost pump for the No. 2 tank:

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WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) To get access to the motor impeller of the forward fuel boost pump for the No. 2 tank, do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803
- (b) Do a check of the electrical bond between the forward fuel boost pump for the No. 2 tank and the airplane structure (SWPM 20-20-00, SWPM 20-20-10).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.

SUBTASK 28-00-00-760-010

- (3) Do these steps to do an inspection of the right center boost pump:



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (a) If downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.
- (b) Do a check of the electrical bond between the right center fuel boost pump and the airplane structure (SWPM 20-20-00, SWPM 20-20-10).
 - 1) Make sure the resistance is 0.001 ohm (1 milliohm) or less.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 28-00-00-860-031

- (1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

— END OF TASK —



SFAR 88

LOM 412, 415, 423, 424, 450-452

TASK 28-00-00-760-803

10. APU DC Boost Pump Fault Current - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.



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LOM 412, 415, 423, 424, 450-452 (Continued)

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Location Zones

Zone	Area
551	Left Wing - Rear Spar To Landing Gear Support Beam

D. Procedure

SUBTASK 28-00-00-480-001



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (1) If downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-00-00-220-001

- (2) Measure the bonding resistance between the motor impeller unit of the APU DC boost pump and the airplane structure with an electrical intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00, SWPM 20-20-10).
 - (a) Make sure the bonding resistance is 0.01 ohm (10 milliohms) or less.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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FUEL SYSTEM - DDG MAINTENANCE PROCEDURES

1. General

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with systems/components that are inoperative.
- B. This procedure also has tasks that put the airplane back to its usual condition.
- C. These are the tasks for the components in the fuel system:
 - (1) MMEL 28-1 (DDPG) Preparation - Fuel Boost Pump (Main Tank) Inoperative
 - (2) MMEL 28-1 (DDPG) Restoration - Fuel Boost Pump (Main Tank) Inoperative
 - (3) MMEL 28-2 (DDPG) Preparation - Fuel Boost Pump (Center Tank) Inoperative
 - (4) MMEL 28-2 (DDPG) Restoration - Fuel Boost Pump (Center Tank) Inoperative
 - (5) MMEL 28-3 (DDPG) Preparation - Fuel Boost Pump Low Pressure Warning Light Inoperative
 - (6) MMEL 28-3 (DDPG) Restoration - Fuel Boost Pump Low Pressure Warning Light Inoperative
 - (7) MMEL 28-4 (DDPG) Preparation - APU Fuel Valve Inoperative
 - (8) MMEL 28-4 (DDPG) Restoration - APU Fuel Valve Inoperative
 - (9) MMEL 28-5 (DDPG) Preparation - Crossfeed Lights Inoperative
 - (10) MMEL 28-5 (DDPG) Restoration - Crossfeed Lights Inoperative
 - (11) MMEL 28-6 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Main Tanks) Inoperative
 - (12) MMEL 28-6 (DDPG) Restoration - Flight Deck Fuel Quantity Indicators (Main Tanks) Inoperative
 - (13) MMEL 28-7 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Center Tank) Inoperative
 - (14) MMEL 28-7 (DDPG) Restoration - Flight Deck Fuel Quantity Indicators (Center Tank) Inoperative
 - (15) MMEL 28-10-01 (DDPG) Preparation - Pressure Fueling System, Fueling Manifold Check Valve(s) Inoperative
 - (16) MMEL 28-10-01 (DDPG) Restoration - Pressure Fueling System, Fueling Manifold Check Valve(s) Inoperative
 - (17) MMEL 28-10-02 (DDPG) Preparation - Pressure Fueling System, Fueling Shutoff Valve(s) Inoperative
 - (18) MMEL 28-10-02 (DDPG) Restoration - Pressure Fueling System, Fueling Shutoff Valve(s) Inoperative
 - (19) MMEL 28-12 (DDPG) Preparation - Refueling Control Panel Quantity Indicators Inoperative
 - (20) MMEL 28-12 (DDPG) Restoration - Refueling Control Panel Quantity Indicators Inoperative
 - (21) MMEL 28-16 (DDPG) Preparation - Fuel Measuring Stick Inoperative
 - (22) MMEL 28-16 (DDPG) Restoration - Fuel Measuring Stick Inoperative
 - (23) MMEL 28-22 (DDPG) Preparation - SPAR VALVE CLOSED Lights Inoperative
 - (24) MMEL 28-22 (DDPG) Restoration - SPAR VALVE CLOSED Lights Inoperative
 - (25) MMEL 28-26 (DDPG) Preparation - Fuel Shutoff Valve Battery and Charger Inoperative
 - (26) MMEL 28-26 (DDPG) Restoration - Fuel Shutoff Valve Battery and Charger Inoperative

EFFECTIVITY	LOM ALL
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TASK 28-00-00-040-817

2. **MMEL 28-1 (DDPG) Preparation - Fuel Boost Pump (Main Tank) Inoperative**

A. General

- (1) This task is for the operation of an aircraft with an inoperative fuel boost pump.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Fuel Boost Pump Deactivation

SUBTASK 28-00-00-040-005

- (1) Put the applicable fuel boost pump switch, on the P5 overhead panel, to the OFF position:
- (a) FUEL PUMP TANK 1 - AFT
 - (b) FUEL PUMP TANK 1 - FWD
 - (c) FUEL PUMP TANK 2 - AFT
 - (d) FUEL PUMP TANK 2 - FWD.
- (2) Install a DO NOT OPERATE tag, STD-858, at the applicable boost pump switch.

SUBTASK 28-00-00-010-003

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-00-00-040-006



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open the applicable circuit breakers and install safety locks:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00827	FUEL BOOST PUMP TANK 1 FWD
LOM 402, 404, 406	D	2	C00827	FUEL BOOST PUMP TANK 1 FWD
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	3	C00828	FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406	D	4	C00828	FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406	D	2	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406	D	4	C00829	FUEL BOOST PUMP TANK 2 FWD

LOM ALL

SUBTASK 28-00-00-410-003

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

TASK 28-00-00-440-807

3. MMEL 28-1 (DDPG) Restoration - Fuel Boost Pump (Main Tank) Inoperative

A. General

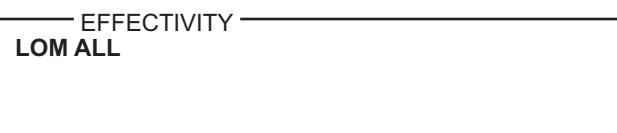
- (1) This task restores an aircraft with an inoperative fuel boost pump.

B. Location Zones

Zone

Area

117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right



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(Continued)

Zone Area

211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

D. Fuel Boost Pump Restoration

SUBTASK 28-00-00-010-002

- (1) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

SUBTASK 28-00-00-440-002



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Remove the safety locks and close the applicable circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD
LOM 402, 404, 406			
D	2	C00827	FUEL BOOST PUMP TANK 1 FWD
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406			
D	4	C00828	FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406			
D	2	C00826	FUEL BOOST PUMP TANK 1 AFT



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LOM 402, 404, 406 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
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LOM 402, 404, 406

D	4	C00829	FUEL BOOST PUMP TANK 2 FWD
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LOM ALL

SUBTASK 28-00-00-410-002

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
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117A	Electronic Equipment Access Door
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SUBTASK 28-00-00-741-001

- (4) Remove the DO NOT OPERATE tag, from the applicable boost pump switch.

———— END OF TASK ————

TASK 28-00-00-040-818

4. MMEL 28-2 (DDPG) Preparation - Fuel Boost Pump (Center Tank) Inoperative

A. General

- (1) This task is for the operation of an aircraft with an inoperative fuel boost pump.

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-858	Tag - DO NOT OPERATE

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

E. Fuel Boost Pump Deactivation

SUBTASK 28-00-00-040-007

- (1) Put the applicable fuel boost pump switch, on the P5 overhead panel, to the OFF position:
- FUEL PUMP CENTER TANK - LEFT
 - FUEL PUMP CENTER TANK - RIGHT.
- (2) Install a DO NOT OPERATE tag, STD-858, at the applicable boost pump switch.

— EFFECTIVITY —

LOM ALL

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SUBTASK 28-00-00-010-004

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-00-00-040-008

WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open the applicable circuit breakers and install safety locks:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-00-00-410-004

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

TASK 28-00-00-440-808

5. MMEL 28-2 (DDPG) Restoration - Fuel Boost Pump (Center Tank) Inoperative

A. General

- (1) This task restores an aircraft with an inoperative boost pump.

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LOM ALL

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B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

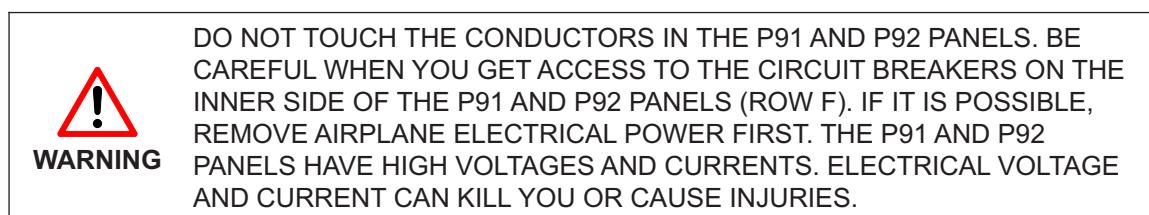
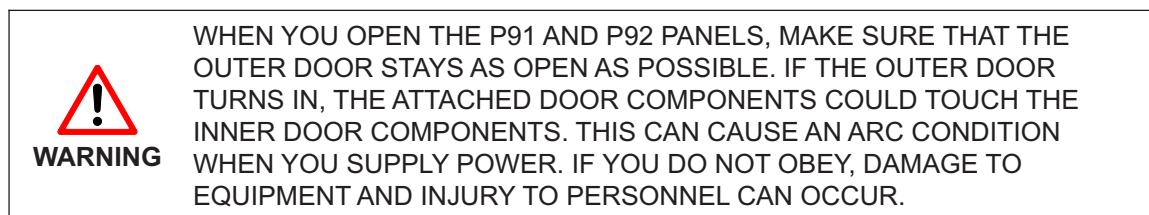
D. Fuel Boost Pump Restoration

SUBTASK 28-00-00-010-005

- (1) To get access to the P91 and P92 panel, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 28-00-00-440-003



- (2) Remove the safety locks and close the applicable circuit breakers:

Power Distribution Panel Number 1, P91

Row **Col** **Number** **Name**

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row **Col** **Number** **Name**

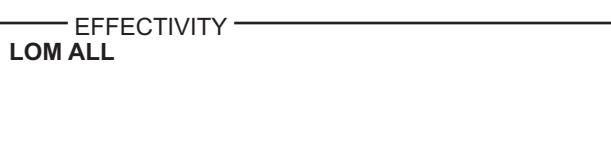
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL



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SUBTASK 28-00-00-410-005

- (3) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-00-00-740-004

- (4) Remove the DO NOT OPERATE tag, from the applicable boost pump switch.

— END OF TASK —

TASK 28-00-00-040-819

6. MMEL 28-3 (DDPG) Preparation - Fuel Boost Pump Low Pressure Warning Light Inoperative

A. General

- (1) This task is for the operation of an aircraft with a broken low pressure warning light for the fuel boost pump.

B. References

Reference	Title
SWPM 20-41-01	ELECTROSTATIC SENSITIVE DEVICE IDENTIFICATION

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-10741	Cap - Protective Part #: M83723-60-210AN Supplier: 06324

D. Consumable Materials

Reference	Description	Specification
G51678	Wire - ETFE Insulated with Coated Conductor	BMS13-48 Type 12 Class 1
G51679	Wire - Insulated with Nickel Coated Copper Conductor	BMS13-58 Type 1 Class 1
G51680	Wire - Insulated with Nickel Coated Copper Conductor	BMS13-60 Type 2 Class 1
G51681	Wire - Insulated with Nickel Coated Copper Conductor	BMS13-60 Type 7 Class 1
G51682	Wire - Insulated with Nickel Coated Copper Conductor	BMS13-60 Type 10 Class 1
G51684	Pin - Contact	BACC47CN1S

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

— EFFECTIVITY —
LOM ALL

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F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Fuel Boost Pump Low Pressure Warning Light (Main Tank) Deactivation

SUBTASK 28-00-00-720-006

- (1) Make sure that the MASTER CAUTION lights and FUEL annunciator light operate correctly, do these steps:
 - (a) Push the MASTER CAUTION light on one of the two panels to reset the Master Caution panel.
 - 1) Make sure that the two MASTER CAUTION lights (right and left) are off.
 - 2) Make sure that the FUEL annunciator light is off.
 - (b) Put the applicable FWD and AFT fuel boost pump switches in the affected tank to the OFF position.
 - (c) Make sure that the MASTER CAUTION lights and FUEL system annunciator panel light illuminate.
 - (d) If the MASTER CAUTION lights and FUEL system annunciator panel light do not come on, install a jumper plug to the related boost pump low pressure switch connector.
 - 1) Remove the connector from the related boost pump low pressure switch.
 - 2) Install a 4M Sigma Corporation jumper plug 4MS-737NG-1 or equivalent.
 - a) If the jumper plug 4MS-737NG-1 is not available fabricate an equivalent jumper as follows:
 - <1> Crimp two contact pins, G51684, to a single short piece of wire, G51678, wire, G51680, wire, G51681, wire, G51682, or wire, G51679.
 - <2> Insert on pins 2 and 3 of the related ship side electrical connector plug.
 - 3) Secure the jumper plug and its wire.
 - 4) Install protective cap, COM-10741, on the connector of the low pressure switch for the main tank.
 - a) If the protective cap, COM-10741, is not available, cover with a conductive cap MS90376-XX, or NAS837-XX, or equivalent.
 - b) Secure with self-fusing electrical tape (SWPM 20-41-01).
NOTE: It is necessary to clean the pressure switch body to provide better retention of the self-fusing electrical tape.
 - 5) Push the MASTER CAUTION light on one of the two panels to reset the Master Caution panel.
 - 6) Set the switch for the fuel boost pump for the main tank to ON (the boost pump without the jumper plug on the low pressure switch).
 - a) Make sure that the LOW PRESSURE light goes off.
 - 7) Set the switch for the fuel boost pump for the main tank to OFF (the boost pump without the jumper plug on the low pressure switch).
 - a) Make sure that the LOW PRESSURE light comes on.
 - b) Make sure that the MASTER CAUTION lights and FUEL system annunciator panel light come on.

EFFECTIVITY
LOM ALL

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H. Fuel Boost Pump Low Pressure Warning Light (Center Tank) Deactivation

SUBTASK 28-00-00-720-008

- (1) Make sure that the MASTER CAUTION lights and FUEL annunciator light operate correctly, do these steps:
- Put the two CTR FUEL PUMP switches to the OFF position.
 - To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (c) Open the applicable circuit breaker and install a safety tag:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT
LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT
LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

- Push the MASTER CAUTION light on one of the two panels to reset the Master Caution panel.
- Put the applicable CTR FUEL PUMP switch to the ON position.
- Make sure that the right and left MASTER CAUTION lights and FUEL annunciator light come on after approximately 10 seconds.
- Put the applicable CTR FUEL PUMP switch to the OFF position.
- Make sure that the right and left MASTER CAUTION lights and FUEL annunciator light go off.

EFFECTIVITY
LOM ALL

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WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (i) Remove the safety tag and close the applicable circuit breaker:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

- (j) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

- (k) Push the MASTER CAUTION light on one of the two panels to reset the Master Caution panel.

———— END OF TASK ————

TASK 28-00-00-440-809

7. MMEL 28-3 (DDPG) Restoration - Fuel Boost Pump Low Pressure Warning Light Inoperative

A. General

- (1) This task restores an airplane with an inoperative fuel boost pump low pressure warning light.

B. References

<u>Reference</u>	<u>Title</u>
28-22-41-710-801	Fuel Boost Pump Operational Test (P/B 401)

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LOM ALL

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C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Fuel Boost Pump Low Pressure Warning Light Restoration

SUBTASK 28-00-00-710-003

- (1) Do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.
 - (a) Make sure the applicable fuel boost pump low pressure warning light comes on.
- (2) If it is necessary, replace the applicable fuel boost pump low pressure warning light and do this task again: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.

———— END OF TASK ————

TASK 28-00-00-040-805

8. **MMEL 28-4 (DDPG) Preparation - APU Fuel Valve Inoperative**

(Figure 901)

A. General

- (1) This task is for the operation of an airplane with an inoperative APU fuel valve (also referred to as "the APU Fuel Shutoff Valve").

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
212	Flight Compartment - Right

D. APU Fuel Shutoff Valve Deactivation

SUBTASK 28-00-00-210-001



MAKE SURE THAT THE GROUND LOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-00-00-860-019

- (2) On the P5 panel, make sure the APU master switch is set to OFF.

SUBTASK 28-00-00-040-001

- (3) Do these steps to deactivate the APU fuel shutoff valve:

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- (a) Open these circuit breakers and install safety locks:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- (b) Remove, cap, and stow the electrical connector, D920, for the APU fuel shutoff valve.
- (c) Move the manual override handle on the valve actuator to the CLOSED position if it is not in the closed position.
- (d) Install lockwire on the manual override handle to hold it in the CLOSED position (TASK 20-10-44-400-801).

SUBTASK 28-00-00-210-002



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

———— END OF TASK ————

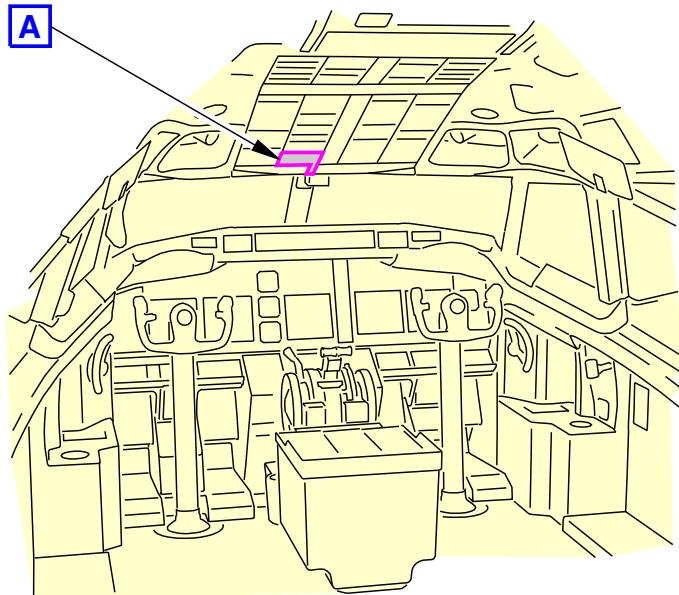
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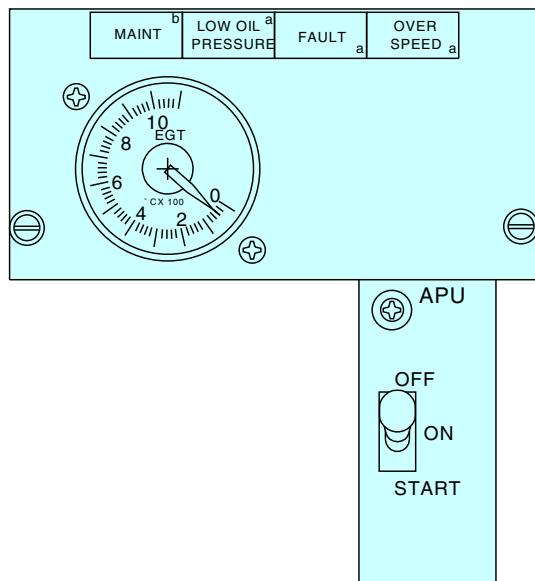


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APU START SWITCH
AND INDICATORS



FLIGHT COMPARTMENT



APU START SWITCH AND INDICATORS



G28198 S0006571178_V2

APU Fuel Feed System Components
Figure 901/28-00-00-990-813 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

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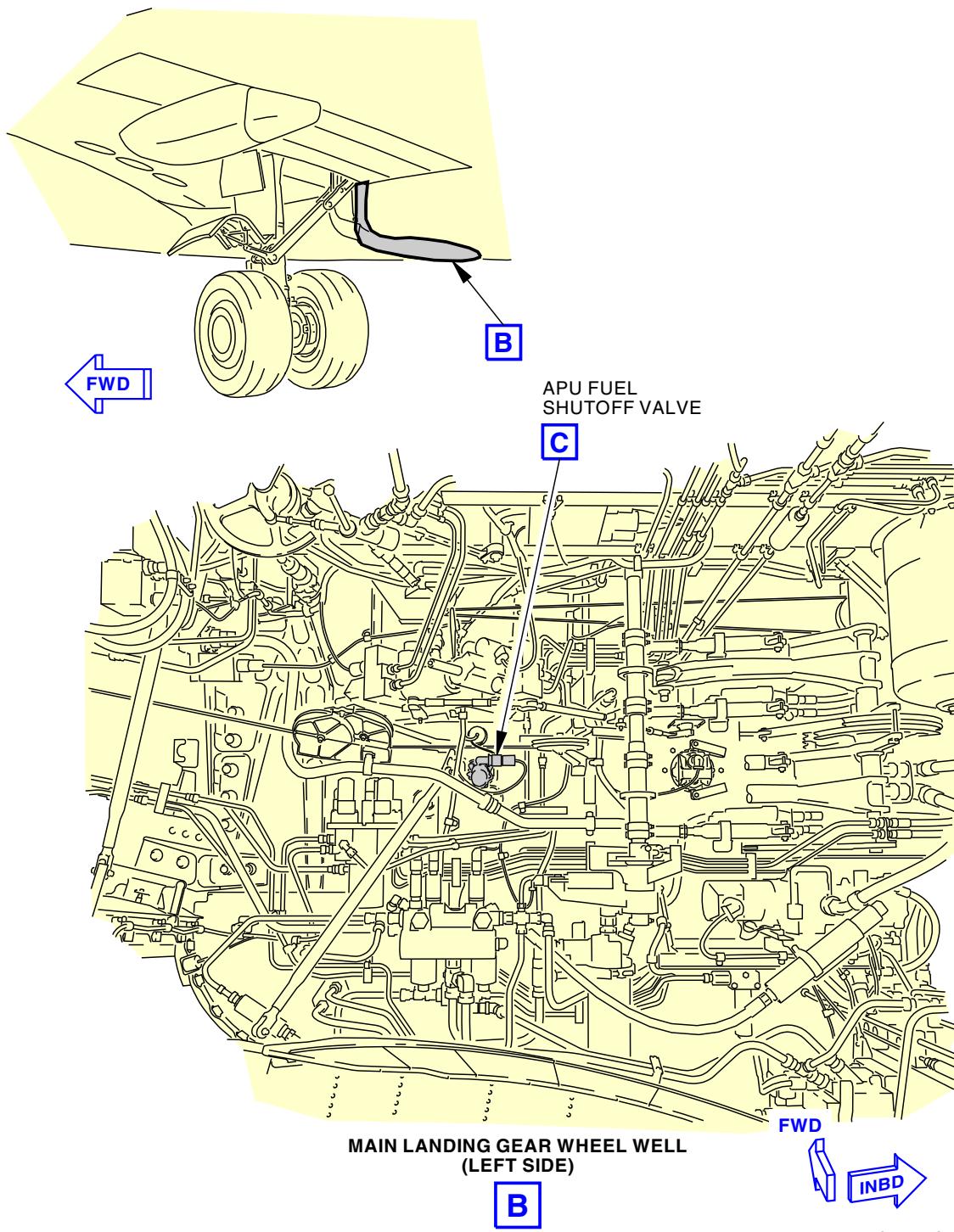
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G28199 S0006571179_V2

APU Fuel Feed System Components
Figure 901/28-00-00-990-813 (Sheet 2 of 3)

EFFECTIVITY
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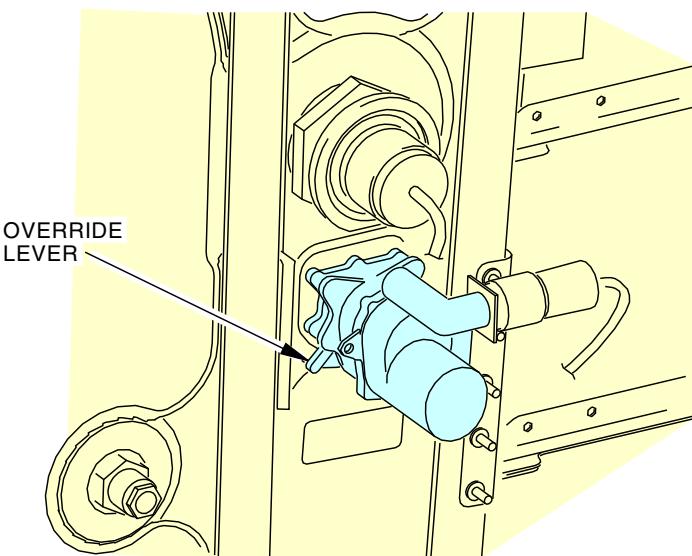
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APU FUEL SHUTOFF VALVE

C

G28202 S0006571180_V2

APU Fuel Feed System Components
Figure 901/28-00-00-990-813 (Sheet 3 of 3)

EFFECTIVITY
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TASK 28-00-00-440-801

9. MMEL 28-4 (DDPG) Restoration - APU Fuel Valve Inoperative

(Figure 901)

A. General

- (1) This task restores an airplane with an inoperative APU fuel valve (also referred to as "the APU Fuel Shutoff Valve").

B. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
212	Flight Compartment - Right

D. APU Fuel Shutoff Valve Restoration

SUBTASK 28-00-00-860-020

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-00-00-210-003



MAKE SURE THAT THE GROUND LOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-00-00-860-021

- (3) On the P5 panel, make sure the APU master switch is set to OFF.

SUBTASK 28-00-00-440-001

- (4) Do these steps to activate the APU fuel shutoff valve:
 - (a) Remove the lockwire on the manual override handle of the APU fuel shutoff valve (TASK 20-10-44-000-801).
 - (b) Connect the electrical connector, D920, to the APU fuel shutoff valve actuator.
 - (c) Remove the safety locks and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

Row Col Number Name

A 14 C00033 AUX POWER UNIT CONT

- (d) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (e) Do the applicable corrective action for the fault(s) shown.

SUBTASK 28-00-00-210-004



OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (5) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

SUBTASK 28-00-00-860-022

- (6) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812

— END OF TASK —

TASK 28-00-00-040-806

10. MMEL 28-5 (DDPG) Preparation - Crossfeed VALVE OPEN Lights Inoperative
(Figure 902)

A. General

- (1) This task is for the operation of an airplane with an inoperative VALVE OPEN light for the crossfeed valve on the Fuel System Panel (P5).

B. Location Zones

<u>Zone</u>	<u>Area</u>
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
621EB	Defuel Access Panel - Slat Station 95.15
621GB	Refuel Access Panel - Slat Station 143.27

D. Crossfeed VALVE OPEN light Deactivation

SUBTASK 28-00-00-720-001

- (1) Do these steps to make sure the crossfeed valve opens and closes correctly:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

621GB	Refuel Access Panel - Slat Station 143.27
-------	---

- (b) On the wing fueling panel, P15, put the switch for the fueling shutoff valve for the No. 2 tank in the OPEN position.
 - (c) Do these steps to open the defuel valve:

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- 1) Open this access panel:

Number **Name/Location**

621EB Defuel Access Panel - Slat Station 95.15

- 2) Set the defueling valve handle to OPEN.

- (d) On the P5 Overhead Panel, set the CROSSFEED valve switch to the OPEN position.

- 1) Make sure the override handle on the crossfeed valve moves fully to the open position.

- (e) Push the L FWD PUMP switch, on the P5 Overhead Panel, to the ON position.

- 1) Make sure a minimum of 200 LB (100 KG) of fuel is transferred from the No. 1 tank to the No. 2 tank.

NOTE: The fuel will transfer in approximately 2 minutes.

- (f) Push the L FWD PUMP switch, on the P5 Overhead Panel, to the OFF position.

- (g) Set the CROSSFEED switch, on the P5 Overhead Panel, to the CLOSED position.

- 1) Make sure the manual override handle on the crossfeed valve moves fully to the closed position.

- (h) Set the L FWD PUMP switch, on the P5 Overhead Panel, to the ON position.

- 1) Make sure no fuel is transferred, as shown on the fuel quantity indicators, from the No. 1 tank to the No. 2 tank.

NOTE: Three minutes is sufficient time to make sure there is no fuel transfer.

- (i) Set the L FWD PUMP switch, on the P5 Overhead Panel, to the OFF position.

- (j) On the wing fueling panel, P15, set the switch for the fueling shutoff valve for the No. 2 tank to the CLOSED position.

- (k) Close this access panel:

Number **Name/Location**

621GB Refuel Access Panel - Slat Station 143.27

- (l) Put the defuel valve handle to the closed position.

- (m) Close this access panel:

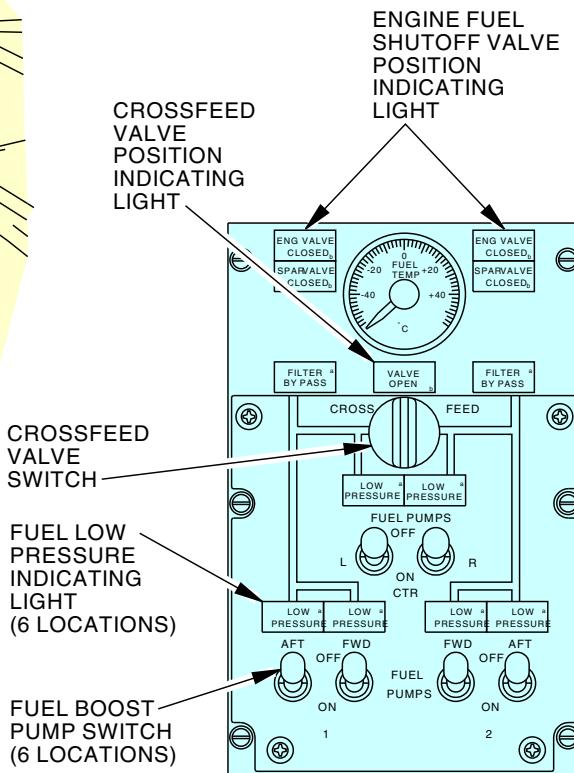
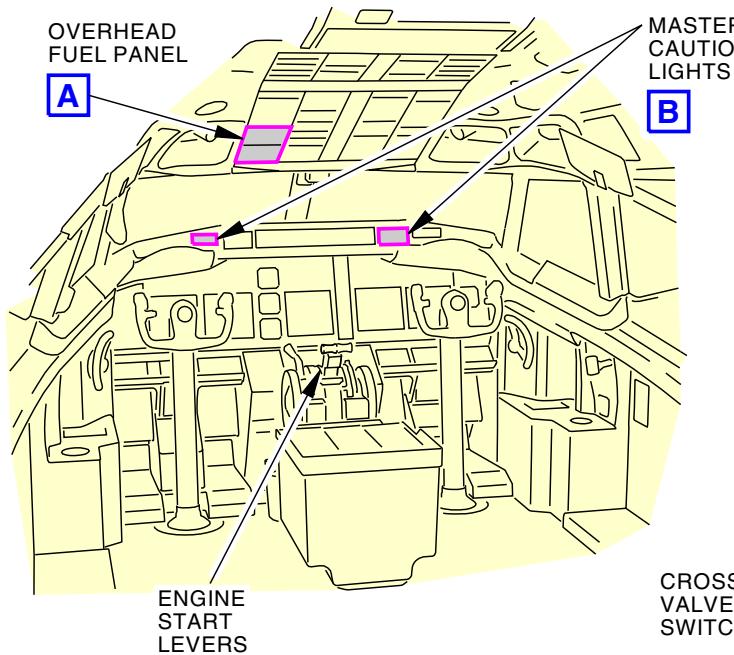
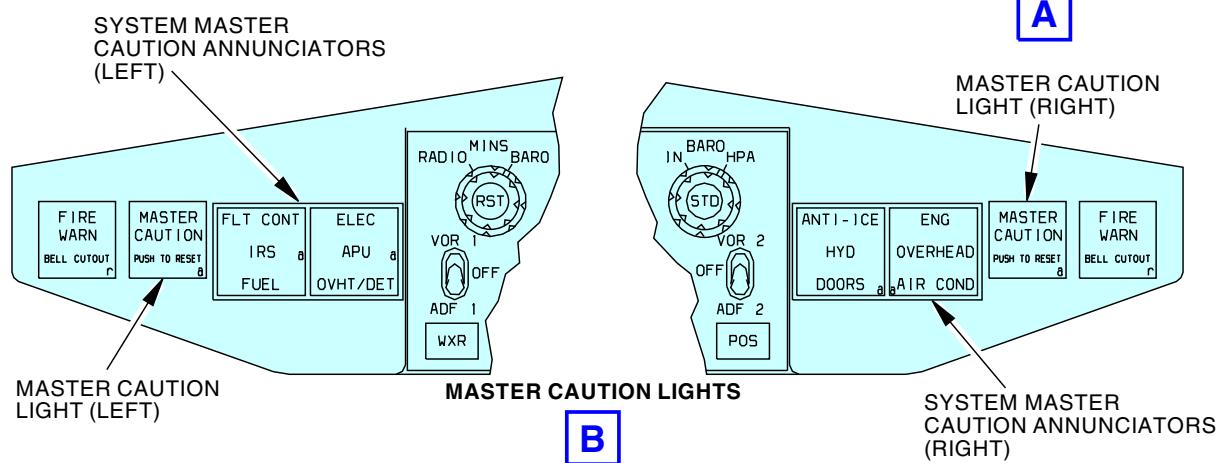
Number **Name/Location**

621EB Defuel Access Panel - Slat Station 95.15

———— END OF TASK ————

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OVERHEAD FUEL PANEL


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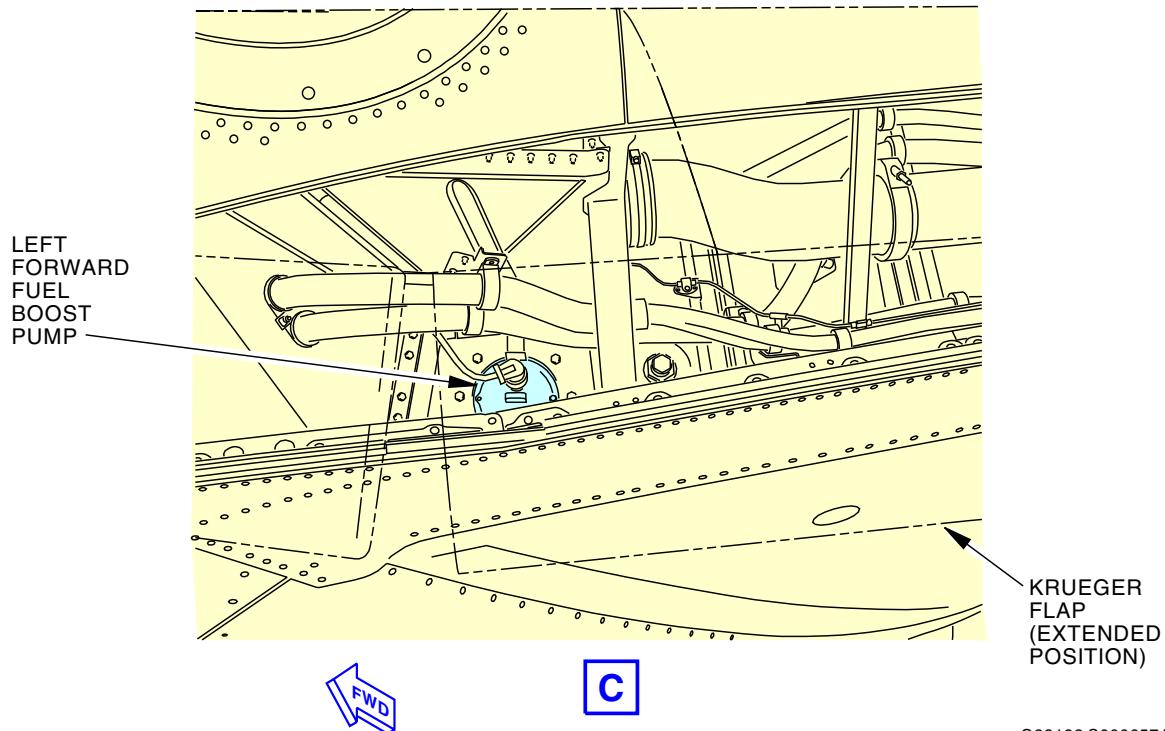
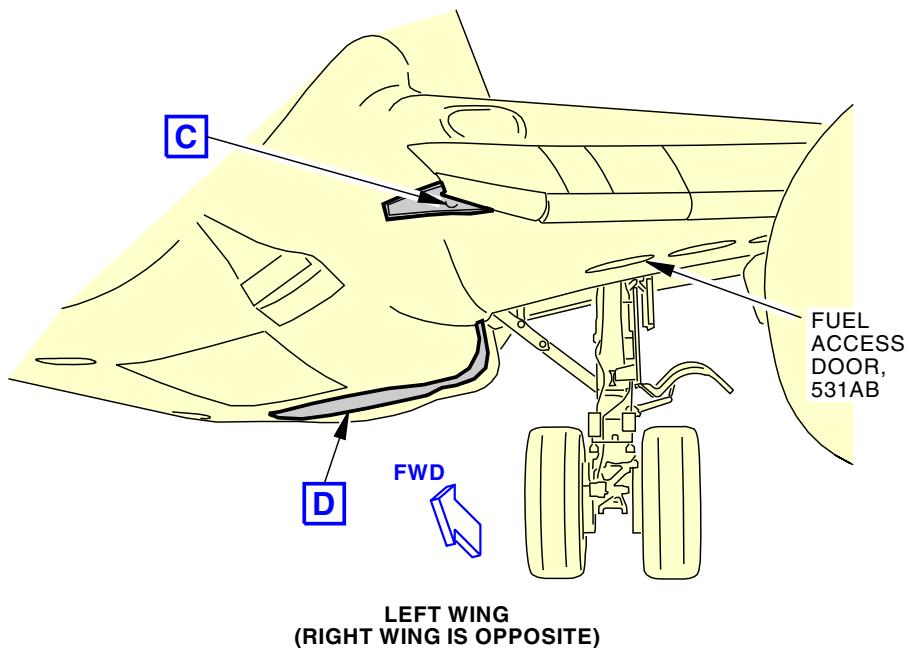
Engine Fuel Feed System Components
Figure 902/28-00-00-990-812 (Sheet 1 of 4)

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Engine Fuel Feed System Components
Figure 902/28-00-00-990-812 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

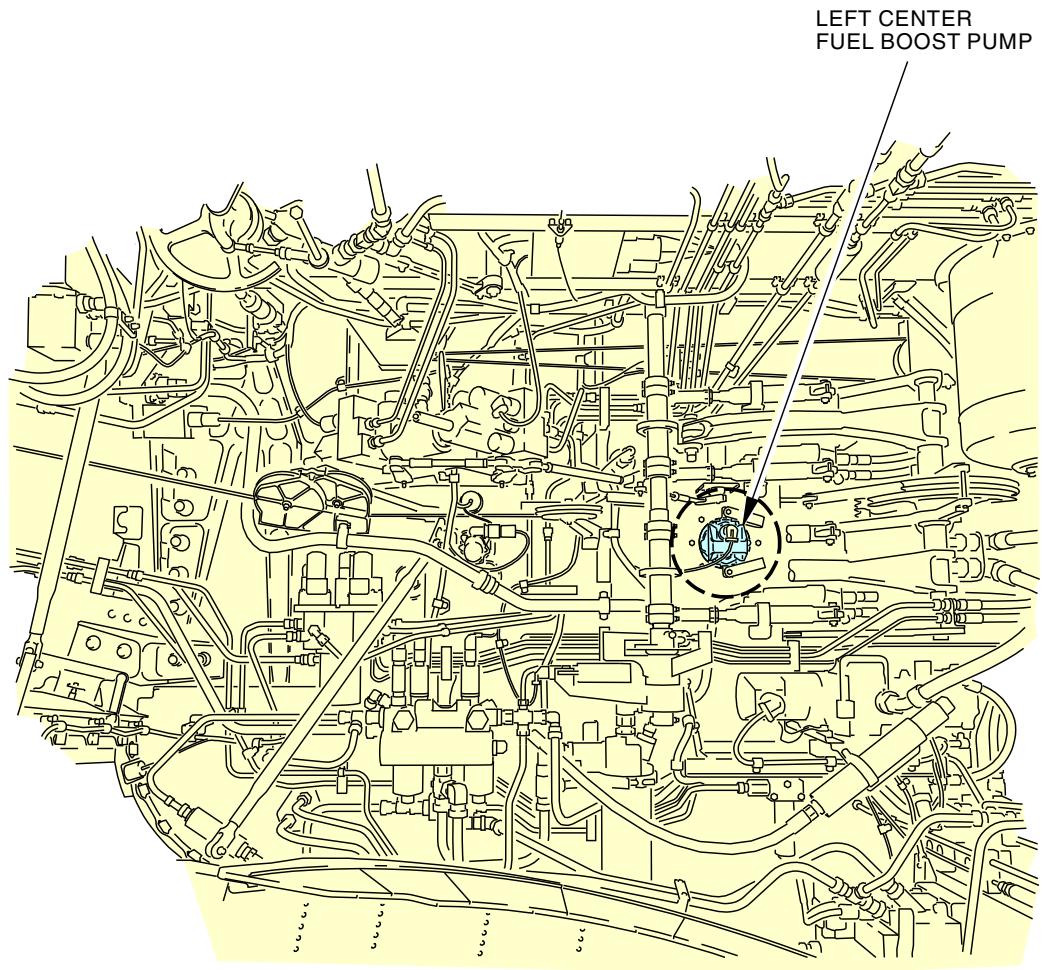
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MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

D

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Engine Fuel Feed System Components
Figure 902/28-00-00-990-812 (Sheet 3 of 4)

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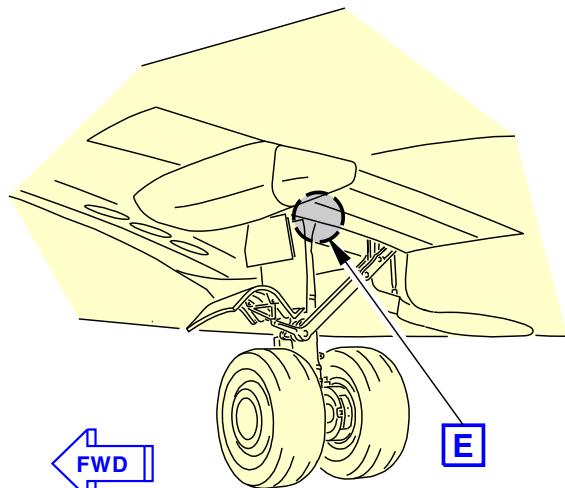
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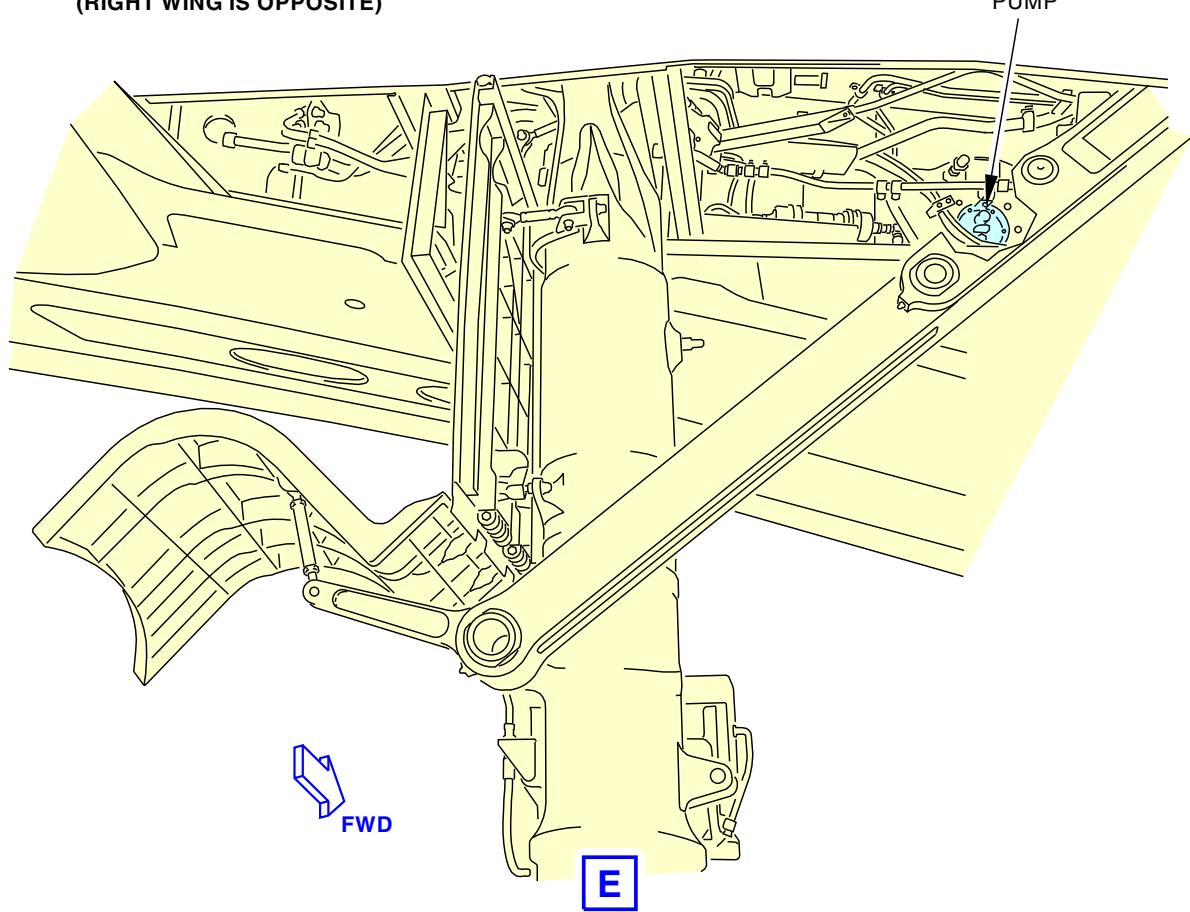
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LEFT WING
(RIGHT WING IS OPPOSITE)



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Engine Fuel Feed System Components
Figure 902/28-00-00-990-812 (Sheet 4 of 4)

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TASK 28-00-00-440-802

11. MMEL 28-5 (DDPG) Restoration - Crossfeed VALVE OPEN Light Inoperative
(Figure 902)

A. General

- (1) This task restores an airplane with an inoperative VALVE OPEN light for the crossfeed valve on the Fuel System Panel (P5).

B. References

Reference	Title
FIM 28-22 TASK 808	VALVE OPEN Light for the Crossfeed Valve Does Not Come On During Valve Transit - Fault Isolation

C. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

D. Crossfeed VALVE OPEN light Restoration

SUBTASK 28-00-00-810-001

- (1) Do this task: FIM 28-22 TASK 808.

———— END OF TASK ————

TASK 28-00-00-040-807

12. MMEL 28-6 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Main Tank) Inoperative
(Figure 903Figure 904Figure 905)

A. General

- (1) This task is for operation of the airplane with any of these conditions:
- (a) An inoperative (blank) fuel quantity indicator display (Main Tank) on the Center Instrument Panel in the Flight Compartment.
 - (b) An intermittent or non-functional FQIS for main tank 1.
 - (c) An intermittent or non-functional FQIS for main tank 2.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

B. References

Reference	Title
12-11-00-650-803	Refuel Operation When the Fuel Quantity Indicating System Does not Operate (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
28-41-41-000-801	Bussing Plug Removal (P/B 401)

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(Continued)

Reference	Title
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-30-11	Standard Wiring Practices Manual
SWPM 20-61-11	MIL-C-26500 Front Release Connectors
WDM 28-41-11	Wiring Diagram Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-17017	Jumper Harness - FQIS Deactivation, Basic Part #: CN1159-003 Supplier: 71785

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Flight Deck Fuel Quantity Indicator Deactivation (Main Tank)

SUBTASK 28-00-00-650-001

- (1) Do this step to put the correct quantity of fuel into the tank with the blank display:
 - (a) Do this task: Refuel Operation When the Fuel Quantity Indicating System Does not Operate, TASK 12-11-00-650-803.
 - (b) If the fuel quantity indicator blanks or if the fuel quantity indicator shows an incorrect fuel quantity, then do the steps that follow.

F. Main Tank FQIS Deactivation

NOTE: This procedure uses a bussing plug jumper harness for the main tank 1 or main tank 2 deactivation.

NOTE: You can make a pre-fabricated bussing plug jumper harness or use basic FQIS deactivation jumper harness, COM-17017.

SUBTASK 28-00-00-040-011

- (1) If a main tank fuel quantity indicator blanks intermittently or if the fuel quantity indicator shows an incorrect fuel quantity, then do the steps that follow to deactivate the intermittent or non-functioning FQIS:

NOTE: Only one of these procedures can be used at a time, if two of the three tank FQIS indications on the airplane are intermittent or non-functional, the airplane cannot be dispatched.

NOTE: Refer to WDM 28-41-11 to identify the connectors and pin number functions.

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- (a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

- (b) Disconnect the external fuel tank bussing plug (Bussing Plug Removal, TASK 28-41-41-000-801).
- 1) For main tank 1 disconnect D11312.
 - 2) For main tank 2 disconnect D11314.
- (c) Cap and stow the external fuel tank bussing plug connector and wiring (SWPM 20-10-11, Section 18).
- (d) Leave the wiring shields connected to ground stud (WDM 28-41-11) if the wire can be safely stowed without damaging the shield ground wire.
- (e) Prepare the pre-fabricated bussing plug jumper harness or basic FQIS deactivation jumper harness, COM-17017.

NOTE: Refer to SUBTASK 28-00-00-760-011 for pre-fabricated jumper harness instructions.

NOTE: Fold excess wires. Do not coil the wires.

► 28-AWL-36: CDCCL

- (f) Connect the jumper harness terminal lug to a ground stud at the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

NOTE: The recommended ground stud for main tank 1 is GD3982-ST or GD3950-ST.

NOTE: The recommended ground stud for main tank 2 is GD3986-ST or GD3952-ST.

NOTE: Maximum of 4 terminal lugs per ground stud.

► 28-AWL-36: CDCCL

- 1) Return ground studs must not be used for terminating the jumper harness.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

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28-AWL-36: CDCCL

- (g) Measure the electrical resistance from each of the jumper harness connector contacts, 1, C1, 2, and 3 (Hi-Z, Hi-Z shield, Lo-Z, and compensator) to the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

NOTE: The Hi-Z is measured at the center conductor of the coax contact.

NOTE: The Hi-Z shield is measured at the outer conductor of the coax contact, C1.

28-AWL-36: CDCCL

- 1) Make sure that the electrical resistance is 1.0 ohm (1000 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

28-AWL-36: CDCCL

- (h) Connect the bussing plug jumper harness to the feed through connector at the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

28-AWL-36: CDCCL

- (i) Install the lockwire to attach the bussing plug jumper harness to the jambnut of the feed through connector (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

- (j) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

- (k) Make sure that the display on the refuel indicator is blank and does NOT show fuel quantity for the fuel quantity indicator that is inoperative (Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801).
- (l) Make sure that the CDU on the flight deck does NOT show total fuel quantity for the fuel quantity indicator that is inoperative and that the fuel is blank for the upper display.

SUBTASK 28-00-00-760-011

- (2) With the applicable spare bussing plug connector, make a pre-fabricated bussing plug connector jumper harness.

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► 28-AWL-36: CDCCL

- (a) The wire harness must be no longer than 24 in. (609 mm).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

- (b) Make a shielded wire with a coax contact on one end, using 20 gauge wire (BMS 13-60, type 8, class 1 or type 11, class 1; or BMS 13-48, type 12, class 1).

- 1) Terminate the wire and the shield to coax contact S283U007-7 (SWPM 20-61-11).

NOTE: These wires will connect to the tank connections that follow: Hi-Z and shield.

- (c) Make two unshielded wires, using 20 gauge wire (BMS 13-60, type 10, class 1; or BMS 13-48, type 31, class 1; or BMS 13-48, type 65, class 1).

- 1) Terminate one end of each wire to contact BACC47CP2T (SWPM 20-61-11).

NOTE: These wires will connect to the tank connections that follow: Lo-Z and compensator.

- (d) Terminate the other end of the wires into suitable terminal lugs (SWPM 20-30-11).

- 1) The terminal lug configuration that follows contributes to the operation of the suggested ground studs GD3950-ST or GD3982-ST for main tank 1 and GD3952-ST or GD3986-ST for main tank 2.

NOTE: One terminal lug is installed at these locations.

NOTE: Maximum of 4 terminal lugs per ground stud.

- a) Two terminal lugs with two wires each (4 wires total).

NOTE: Wire counts include the shield ground terminations.

- (e) Insert the wires with the contacts into the bussing plug connector (SWPM 20-61-11).

- 1) Insert the shielded wire with the coax contact into connector position 1 (Hi-Z and Hi-Z shield).

- 2) Insert the unshielded wires into connector positions 2 and 3 (Lo-Z and compensator).

NOTE: The bussing plug has jumpers that are visible in the following connector positions: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17.

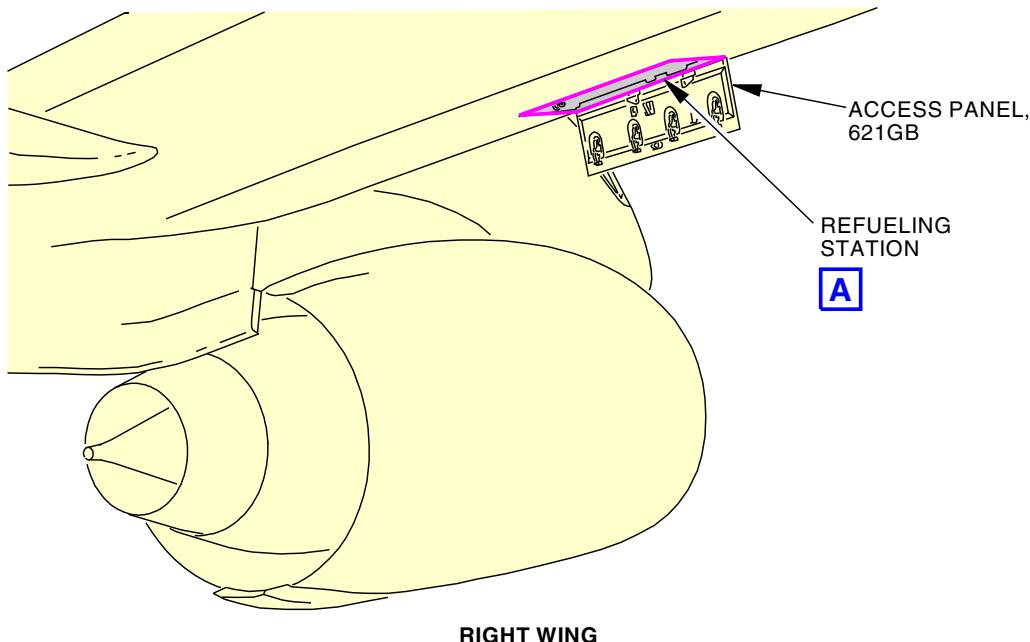
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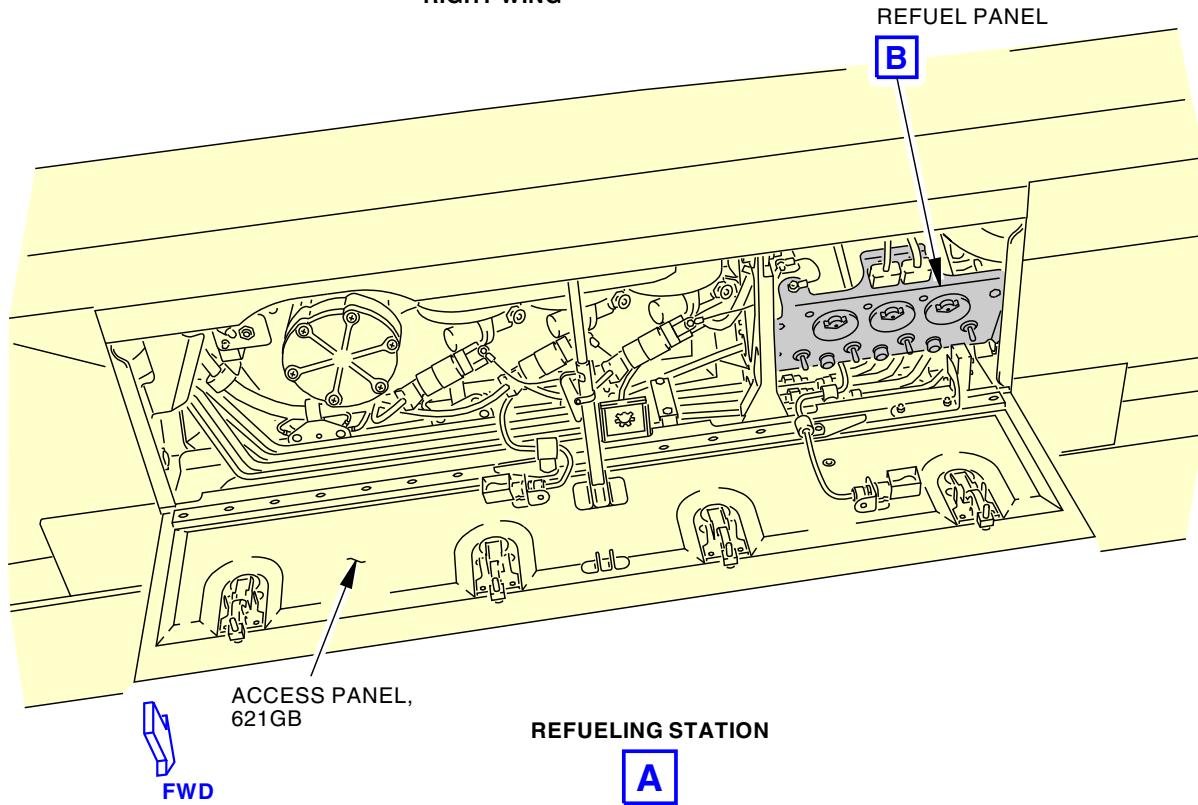
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RIGHT WING



G19495 S0006572235_V3

Refuel Panel
Figure 903/28-00-00-990-823 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-00-00

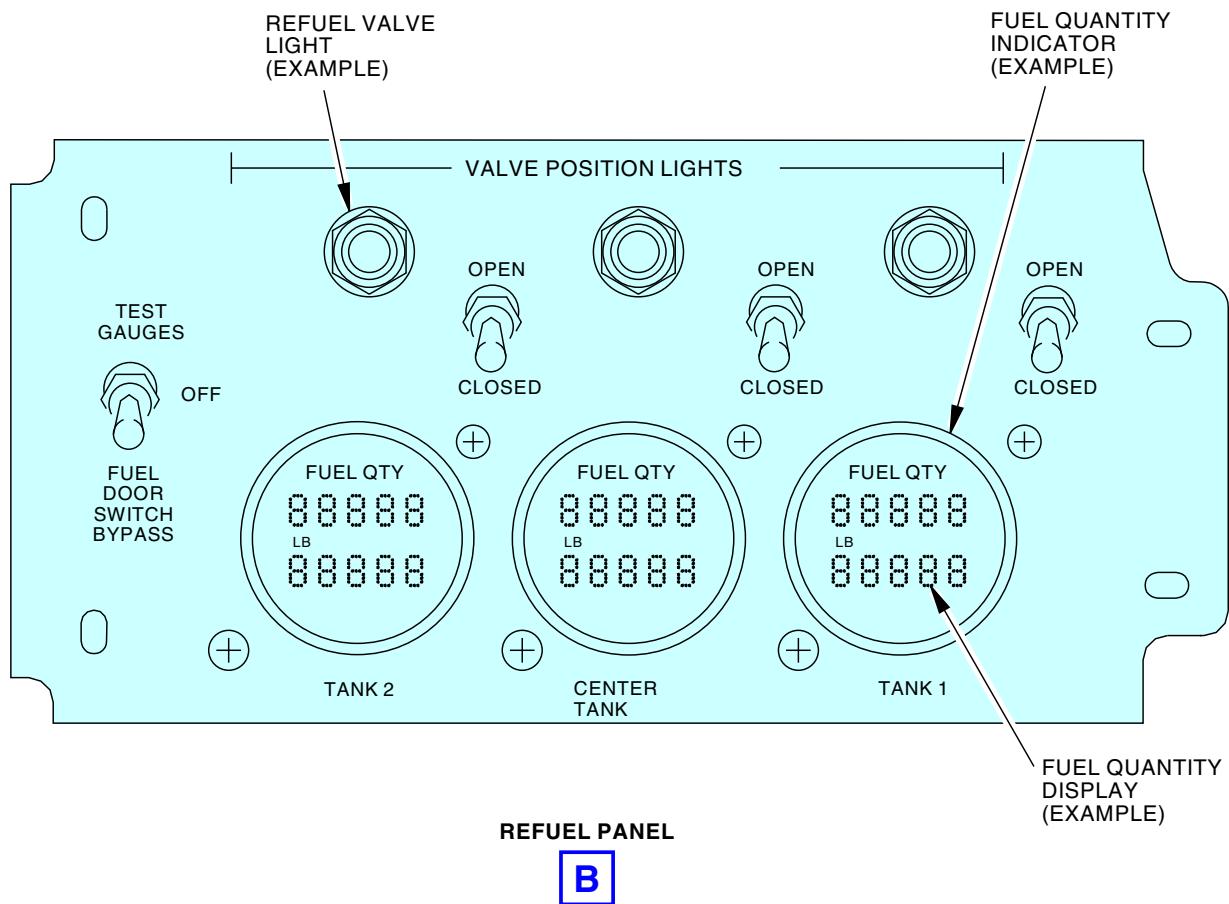
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G19595 S0006572236_V3

Refuel Panel
Figure 903/28-00-00-990-823 (Sheet 2 of 2)

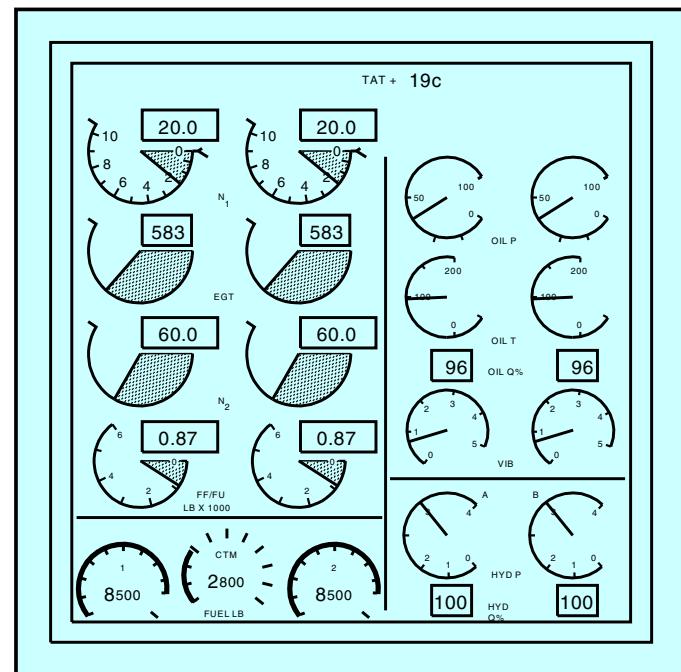
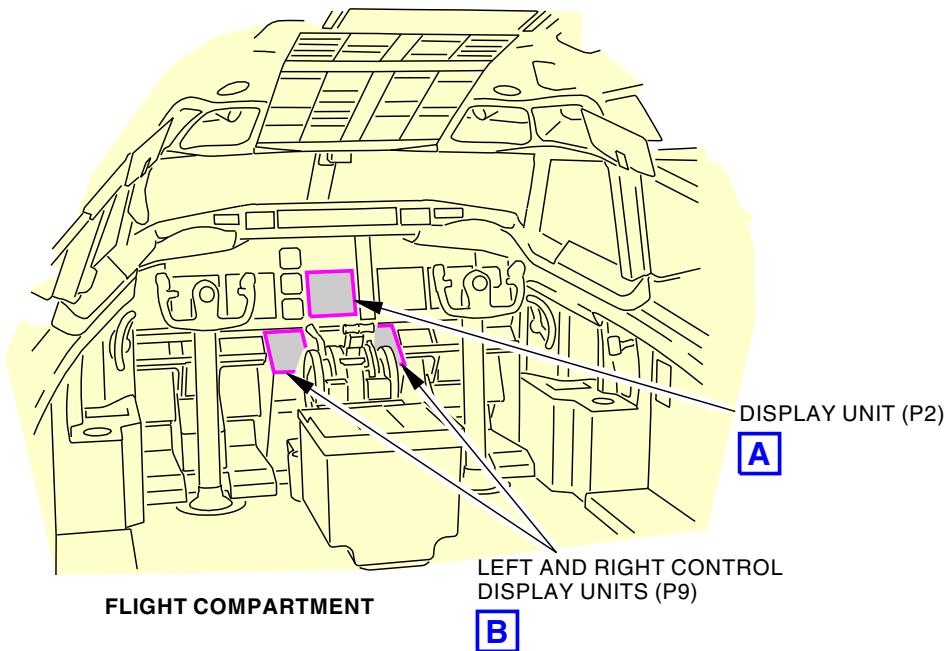
EFFECTIVITY
LOM ALL

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DISPLAY UNIT (P2)
A

G19802 S0006572237_V2

Fuel Quantity Indicating System Test
Figure 904/28-00-00-990-824 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

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FQIS BITE TEST MAIN MENU		1/2
1L	< CURRENT STATUS	1R
2L	< INFLIGHT FAULTS/ FAULT HISTORY	2R
3L	< GROUND TEST	3R
4L	< IDENT/CONFIG	4R
5L	< INPUT MONITORING	5R
6L	< INDEX	6R

NEXT **PREV**

CONTROL DISPLAY UNIT (P9)

B

G19966 S0006572238_V2

Fuel Quantity Indicating System Test
Figure 904/28-00-00-990-824 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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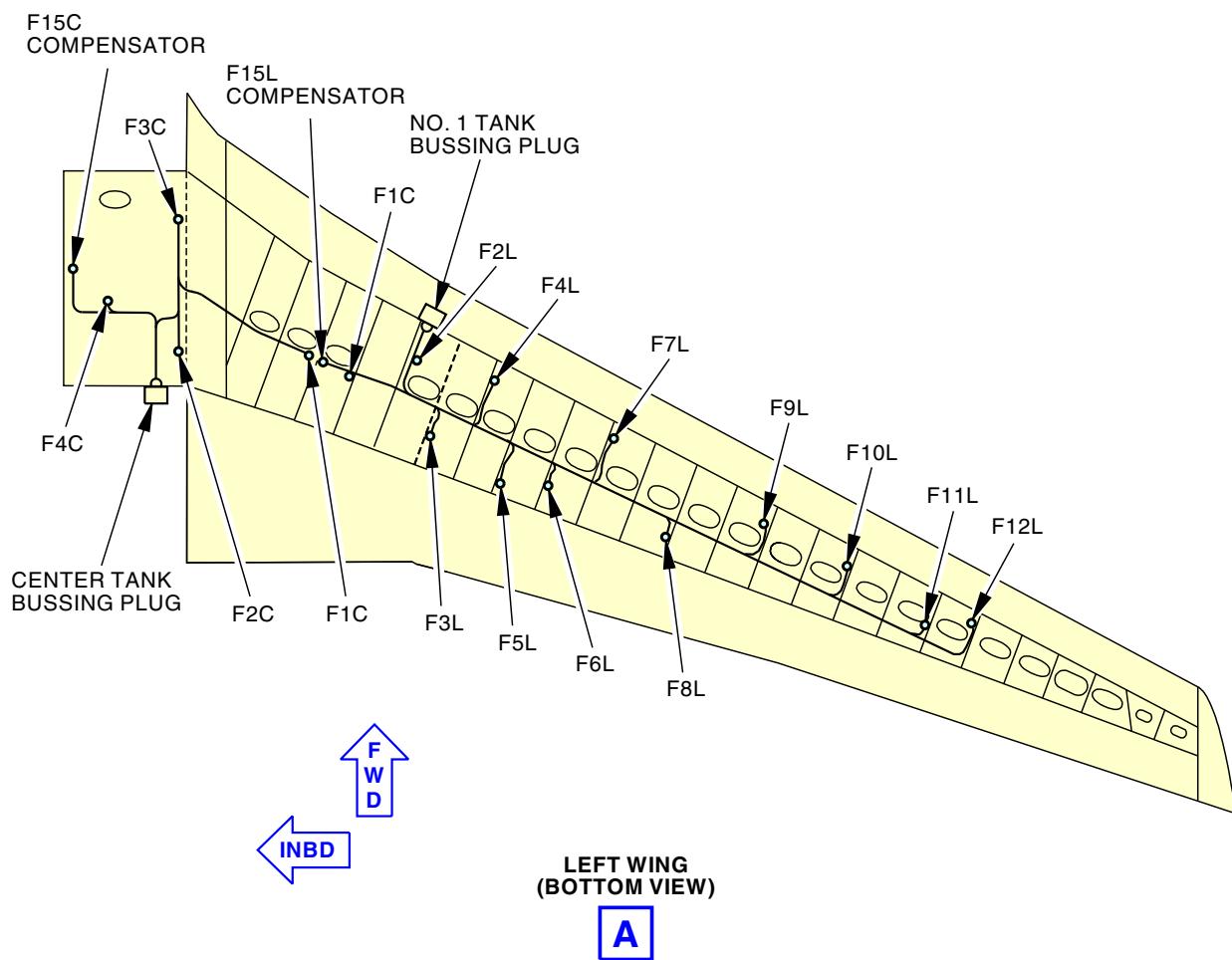
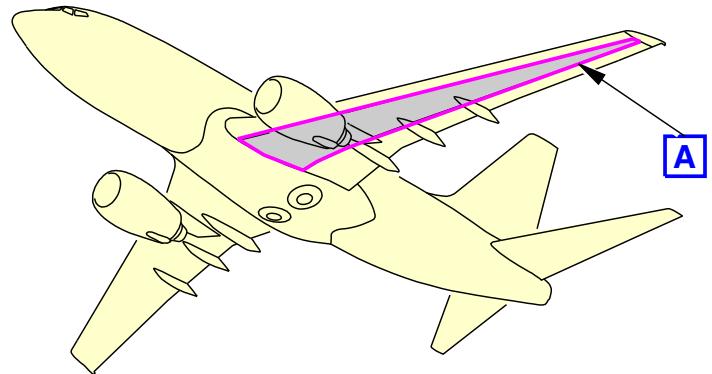
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G19971 S0006572239_V2

Fuel Quantity Indicating System
Figure 905/28-00-00-990-825 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

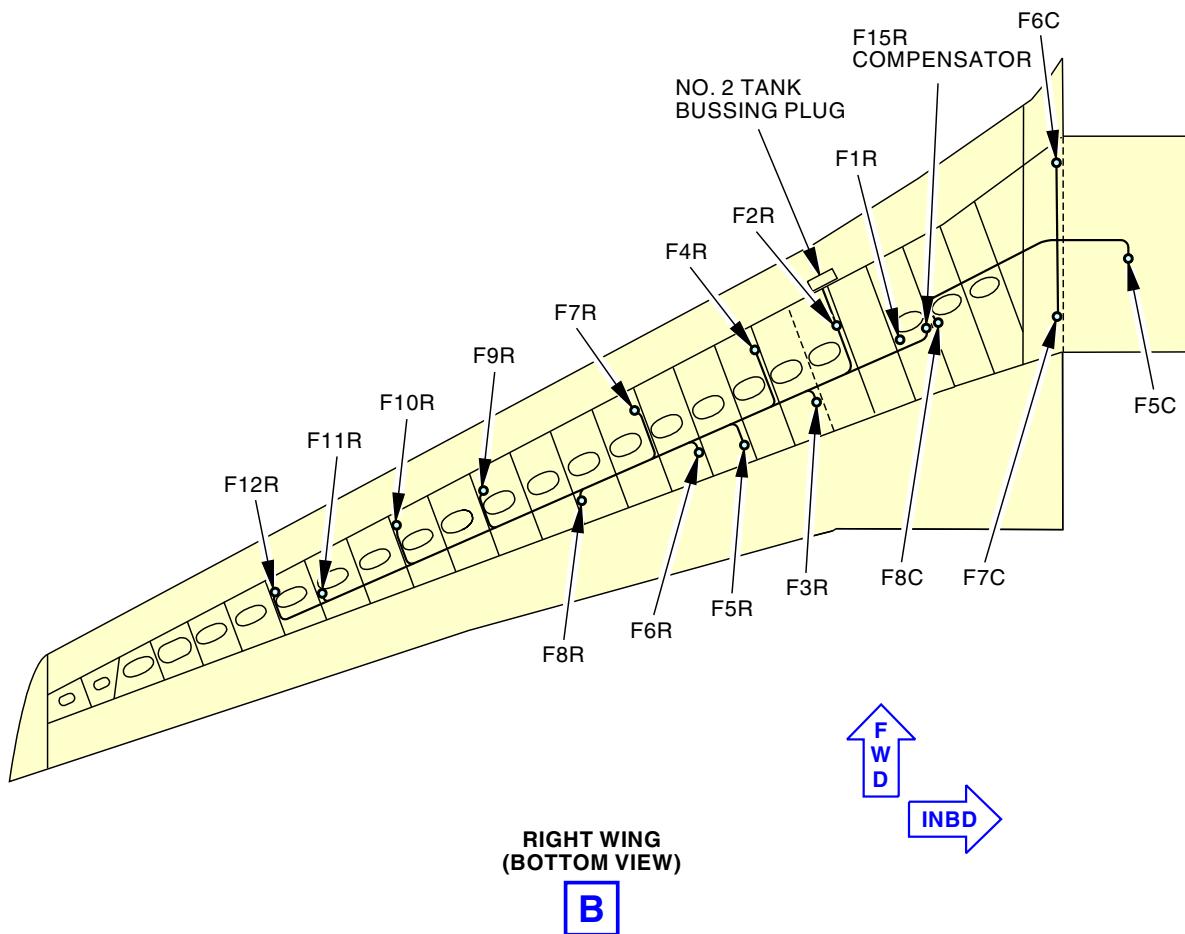
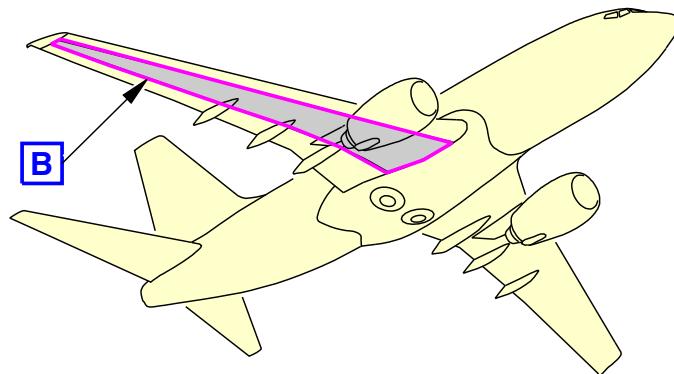
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G19983 S0006572240_V2

Fuel Quantity Indicating System
Figure 905/28-00-00-990-825 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-00-00-440-803

- 13. MMEL 28-6 (DDPG) Restoration - Flight Deck Fuel Quantity Indicators (Main Tank) Inoperative**
Figure 903Figure 904Figure 905

A. General

- (1) This task restores an airplane with these conditions:
- (a) An inoperative (blank) fuel quantity indicator display (Main Tank) on the Center Instrument Panel in the Flight Compartment.
 - (b) An intermittent or non-functional FQIS for main tank 1.
 - (c) An intermittent or non-functional FQIS for main tank 2.
- (2) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.
- NOTE: This is applicable to Airworthiness Limitations 28-AWL-03 and 28-AWL-37.
- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.
- NOTE: This is applicable to Airworthiness Limitations 28-AWL-04 and 28-AWL-38.

B. References

Reference	Title
05-55-54-200-802	FQIS - Out Tank Connectors - Electrical Bonding Resistance Check (P/B 601)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
28-41-41-400-801	Bussing Plug Installation (P/B 401)
FIM 28-41 TASK 801	FQIS BITE Procedure

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-17017	Jumper Harness - FQIS Deactivation, Basic Part #: CN1159-003 Supplier: 71785

EFFECTIVITY
LOM ALL

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D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Flight Deck Fuel Quantity Indicator Restoration

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-740-001

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (1) Do this task: FIM 28-41 TASK 801.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-740-005

- (2) Do this task: FIM 28-41 TASK 801.

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-810-002

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (3) Do the task for the fault shown by the FQIS BITE test.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-810-005

- (4) Do the task for the fault shown by the FQIS BITE test.

LOM ALL



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F. Main Tank FQIS Activation

SUBTASK 28-00-00-760-021

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-00-00-000-009

- (2) Remove the pre-fabricated bussing plug connector jumping harness or basic FQIS deactivation jumper harness, COM-17017 that was installed between the ground stud and the spar (Bussing Plug Removal, TASK 28-41-41-000-801).

SUBTASK 28-00-00-420-006

- (3) Reconnect the bussing plug with the airplane wiring to the spar connector (Bussing Plug Installation, TASK 28-41-41-400-801).
 - (a) For main tank 1 connect D11312.
 - (b) For main tank 2 connect D11314.

SUBTASK 28-00-00-420-009

- (4) Reconnect the FQIS wire shields to the ground studs, If disconnected.

► 28-AWL-04: CDCCL

- (a) If the shield terminal lug was removed and installed at the ground stud, measure the electrical bonding resistance from the shield pigtail terminal lug to the ground stud bracket (Bussing Plug Installation, TASK 28-41-41-400-801).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-04: CDCCL

- 2) Make sure that the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

► 28-AWL-03: ALI

- (b) If a rework or repair was made to the FQIS wiring or to the shields, or if the wire bundle was replaced, do the loop resistance check for the shields and the shield terminations (TASK 05-55-54-200-802).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

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SUBTASK 28-00-00-760-022

- (5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-00-00-860-028

- (6) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-740-006

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (7) Do this task: FIM 28-41 TASK 801.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-740-007

- (8) Do this task: FIM 28-41 TASK 801.

LOM ALL

— END OF TASK —

TASK 28-00-00-040-808

14. MMEL 28-7 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Center Tank) Inoperative
(Figure 903, Figure 904, and Figure 905)

A. General

- (1) This task is for operation of the airplane with any of these conditions:
- An inoperative (blank) fuel quantity indicator display (Center Tank) on the Center Instrument Panel in the Flight Compartment.
 - An intermittent or non-functional FQIS for the center tank.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

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B. References

Reference	Title
12-11-00-650-803	Refuel Operation When the Fuel Quantity Indicating System Does not Operate (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-30-11	Standard Wiring Practices Manual
SWPM 20-61-11	MIL-C-26500 Front Release Connectors
WDM 28-41-11	Wiring Diagram Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-17017	Jumper Harness - FQIS Deactivation, Basic Part #: CN1159-003 Supplier: 71785

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Flight Deck Fuel Quantity Indicator Display Deactivation (Center Tank)

SUBTASK 28-00-00-650-002

- (1) Do this step to put the correct quantity of fuel into the center tank with the blank display:
 - (a) Do this task: Refuel Operation When the Fuel Quantity Indicating System Does not Operate, TASK 12-11-00-650-803.
 - (b) If the fuel quantity indicator blanks or if the fuel quantity indicator shows an incorrect fuel quantity, then do the steps that follow.

F. Center Tank FQIS Deactivation

NOTE: This procedure uses a bussing plug jumper harness for the center tank deactivation.

NOTE: You can make a pre-fabricated bussing plug jumper harness or use basic FQIS deactivation jumper harness, COM-17017.

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SUBTASK 28-00-00-040-013

- (1) If the center tank fuel quantity indicator blanks intermittently or if the fuel quantity indicator shows an incorrect fuel quantity, then do the steps that follow to deactivate the intermittent or non-functioning FQIS:

NOTE: Only one of these procedures can be used at a time, if two of the three tank FQIS indications on the airplane are intermittent or non-functional, the airplane cannot be dispatched.

NOTE: Refer to WDM 28-41-11 to identify the connectors and pin number functions.

- (a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

- (b) Disconnect the external fuel tank bussing plug (TASK 28-41-41-000-801).
1) Disconnect D11316.
(c) Cap and stow the external fuel tank bussing plug connector and wiring (SWPM 20-10-11, Section 18).
(d) Leave the wiring shields connected to ground stud if the wire can be safely stowed without damaging the shield ground wire (WDM 28-41-11).
(e) Prepare the pre-fabricated bussing plug and jumper harness or basic FQIS deactivation jumper harness, COM-17017.

NOTE: Refer to Subtask 28-00-00-760-020 for pre-fabricated harness instructions.

NOTE: Fold excess wires. Do not coil the wires.

28-AWL-36: CDCCL

- (f) Connect the jumper harness terminal lug to a ground stud at the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

NOTE: The recommended ground stud for center tank is immediately above GD490-ST or GD1964-ST or a nearby un-used ground stud.

NOTE: Current return ground studs designated as GDXXX-AC or GDXXX-DC cannot be used.

28-AWL-36: CDCCL

- 1) Return ground studs must not be used for terminating the jumper harness.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

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► 28-AWL-36: CDCCL

- (g) Measure the electrical resistance from each of the In-Tank Harness Assembly connector contacts, 1, C1, 2, and 3 (Hi-Z, Hi-Z shield, Lo-Z and compensator) to the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

NOTE: The Hi-Z is measured at the center conductor of the coax contact.

NOTE: The Hi-Z shield is measured at the outer conductor of the coax contact: C1.

► 28-AWL-36: CDCCL

- 1) Make sure that the electrical resistance is 1.0 ohm (1000 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

► 28-AWL-36: CDCCL

- (h) Connect the bussing plug jumper harness to the feed through connector at the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

► 28-AWL-36: CDCCL

- (i) Install lockwire to attach the bussing plug to the jambnut of the feed through connector (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

- (j) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

- (k) Make sure that the display on the center tank refuel indicator is blank and does NOT show fuel quantity (Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801).

- (l) Make sure that the CDU on the flight deck does NOT show total fuel quantity for the center fuel tank and that the fuel is blank for the upper display.

SUBTASK 28-00-00-760-020

- (2) Do the steps that follow to make a pre-fabricated bussing plug connector jumper harness:

NOTE: Use an applicable spare bussing plug connector to make the bussing plug connector jumper harness.

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28-AWL-36: CDCCL

- (a) The wire harness must be no longer than 24 in. (609 mm).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-36.

- (b) Make a shielded wire with a coax contact on one end, using 20 gauge wire (BMS 13-60, type 8, class 1 or type 11, class 1; or BMS 13-48, type 12, class 1).

- 1) Terminate the wire and the shield to coax contact S283U007-7 (SWPM 20-61-11).

NOTE: These wires will connect to the tank connections that follow: Hi-Z and shield.

- (c) Make two unshielded wires, using 20 gauge wire (BMS 13-60, type 10, class 1; or BMS 13-48, type 31, class 1; or BMS 13-48, type 65, class 1).

- 1) Terminate one end of each wire to contact BACC47CP2T (SWPM 20-61-11).

NOTE: These wires will connect to the tank connections that follow: Lo-Z and compensator.

- (d) Terminate the other end of the wires into suitable terminal lugs (SWPM 20-30-11).

- 1) The terminal lug configuration that follows contributes to the operation of the suggested ground stud GD490-ST or GD1964-ST.

NOTE: One terminal lug is installed at these locations.

- a) Two terminal lugs with two wires each (4 wires total).

NOTE: Wire counts include the shield ground terminations.

- (e) Insert the wires with the contacts into the bussing plug connector (SWPM 20-61-11).

- 1) Insert the shielded wire with the coax contact into connector position 1 (Hi-Z and Hi-Z shield).

- 2) Insert the unshielded wires into connector positions 2 and 3 (Lo-Z and compensator).

NOTE: The bussing plug has jumpers that are visible in the following connector positions: 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17.

———— END OF TASK ————

TASK 28-00-00-440-804

15. MMEL 28-7 (DDPG) Restoration - Flight Deck Fuel Quantity Indicators (Center Tank) Inoperative
(Figure 903Figure 904Figure 905)

A. General

- (1) This task restores an airplane with these conditions:

- (a) An inoperative (blank) fuel quantity indicator display (Center Tank) on the Center Instrument Panel in the Flight Compartment.

- (b) An intermittent or non-functional FQIS for the center tank.

- (2) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-03 and 28-AWL-37.

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(3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801..

NOTE: NOTE: This is applicable to Airworthiness Limitations 28-AWL-04 and 28-AWL-38.

B. References

Reference	Title
05-55-54-200-802	FQIS - Out Tank Connectors - Electrical Bonding Resistance Check (P/B 601)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
28-41-41-400-801	Bussing Plug Installation (P/B 401)
FIM 28-41 TASK 801	FQIS BITE Procedure

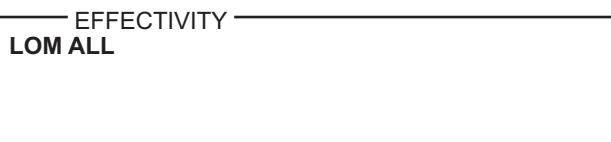
C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-17017	Jumper Harness - FQIS Deactivation, Basic Part #: CN1159-003 Supplier: 71785

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50



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E. Flight Deck Fuel Quantity Indicator Display Restoration (Center Tank)

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-740-002

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (1) Do this task: FIM 28-41 TASK 801.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-740-008

- (2) Do this task: FIM 28-41 TASK 801.

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-810-003

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (3) Do the task for the fault shown by the FQIS BITE test.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-810-006

- (4) Do the task for the fault shown by the FQIS BITE test.

LOM ALL

F. Center Tank FQIS Activation

SUBTASK 28-00-00-760-023

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1



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SUBTASK 28-00-00-000-015

- (2) Remove the pre-fabricated fuel bussing plug connector jumper harness or basic FQIS deactivation jumper harness, COM-17017 that was installed between the ground stud and the spar (Bussing Plug Removal, TASK 28-41-41-000-801).

SUBTASK 28-00-00-420-008

- (3) Reconnect the bussing plug with the airplane wiring to the center tank spar connector, D11316.(Bussing Plug Installation, TASK 28-41-41-400-801).

SUBTASK 28-00-00-420-010

- (4) Reconnect the FQIS wiring shields to the grounds studs, if disconnected.

► 28-AWL-04: CDCCL

- (a) If the shield terminal lug was removed and installed at the ground stud, measure the electrical bonding resistance from the shield pigtail terminal lug to the ground stud bracket (Bussing Plug Installation, TASK 28-41-41-400-801).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-04: CDCCL

- 2) Make sure that the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

► 28-AWL-03: ALI

- (b) If a rework or repair was made to the FQIS wiring or to the shields, or if the wire bundle was replaced, do the loop resistance check for the shields and the shield terminations (TASK 05-55-54-200-802).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

SUBTASK 28-00-00-760-024

- (5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-00-00-860-029

- (6) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.

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LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

SUBTASK 28-00-00-740-009

► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- (7) Do this task: FIM 28-41 TASK 801.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

LOM 422-434, 437-447, 450-464; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 PRE SB 737-28-1355

SUBTASK 28-00-00-740-010

- (8) Do this task: FIM 28-41 TASK 801.

LOM ALL

————— END OF TASK ————

TASK 28-00-00-040-809

16. MMEL 28-10-01 (DDPG) Preparation - Pressure Fueling System, Fueling Manifold Check Valve(s)

Inoperative

(Figure 906)

A. General

- (1) This task is for the operation of an airplane with inoperative fueling manifold check valves.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Pressure Fueling System, Fueling Manifold Check Valve Deactivation

SUBTASK 28-00-00-710-001

- (1) Make sure the fueling shutoff valves operate correctly.
- Set the switch for the fueling shutoff valve for the No. 1 tank to OPEN.
 - Make sure the indication light for the fueling shutoff valve for the No. 1 tank comes on.
 - Set the switch for the fueling shutoff valve for the No. 1 tank to CLOSE.
 - Make sure the refuel valve light for the fueling shutoff valve for the No. 1 tank goes off.
 - Set the switch for the fueling shutoff valve for the No. 2 tank to OPEN.
 - Make sure the refuel valve light for the fueling shutoff valve for the No. 2 tank comes on.
 - Set the switch for the fueling shutoff valve for the No. 2 tank to CLOSE.
 - Make sure the refuel valve light for the fueling shutoff valve for the No. 2 tank goes off.
 - Set the switch for the fueling shutoff valve for the center tank to OPEN.

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- (j) Make sure the refuel valve light for the fueling shutoff valve for the center tank comes on.
- (k) Set the switch for the fueling shutoff valve for the center tank to CLOSE.
- (l) Make sure the refuel valve light for the fueling shutoff valve for the center tank goes off.

SUBTASK 28-00-00-650-003

- (2) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-00-00-210-005

- (3) After you disconnect the refueling nozzle, make sure that there is no fuel leakage.

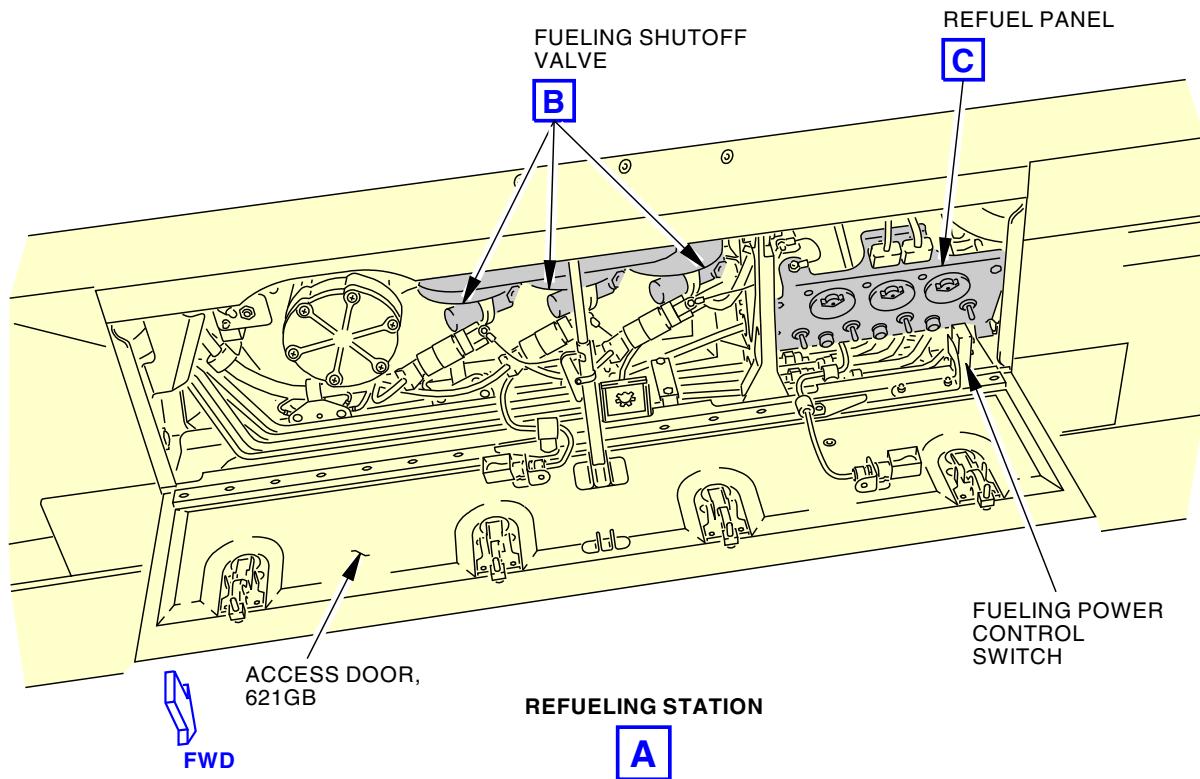
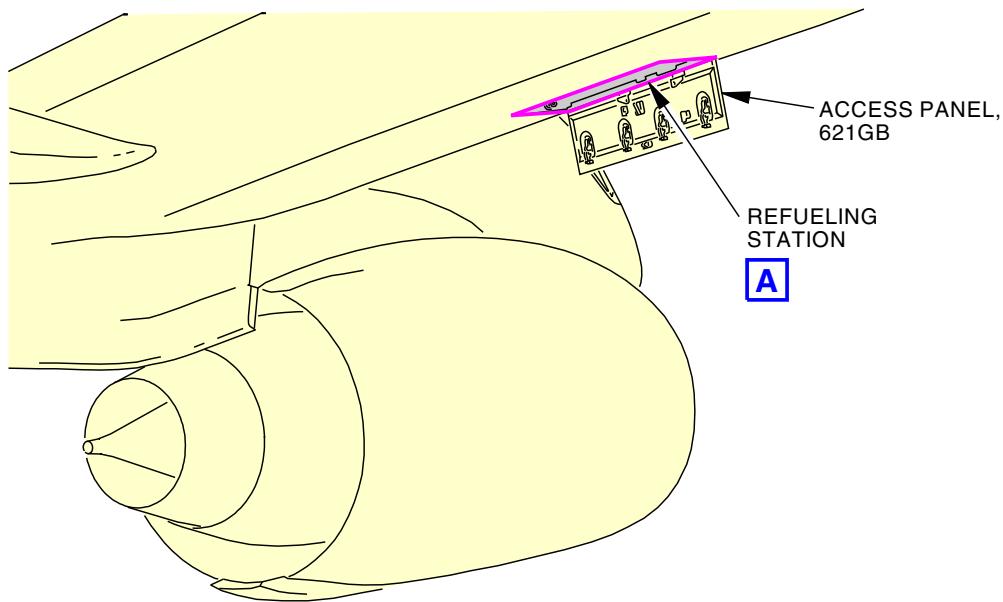
———— END OF TASK ————

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 BOEING

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Pressure Fueling System
Figure 906/28-00-00-990-815 (Sheet 1 of 2)

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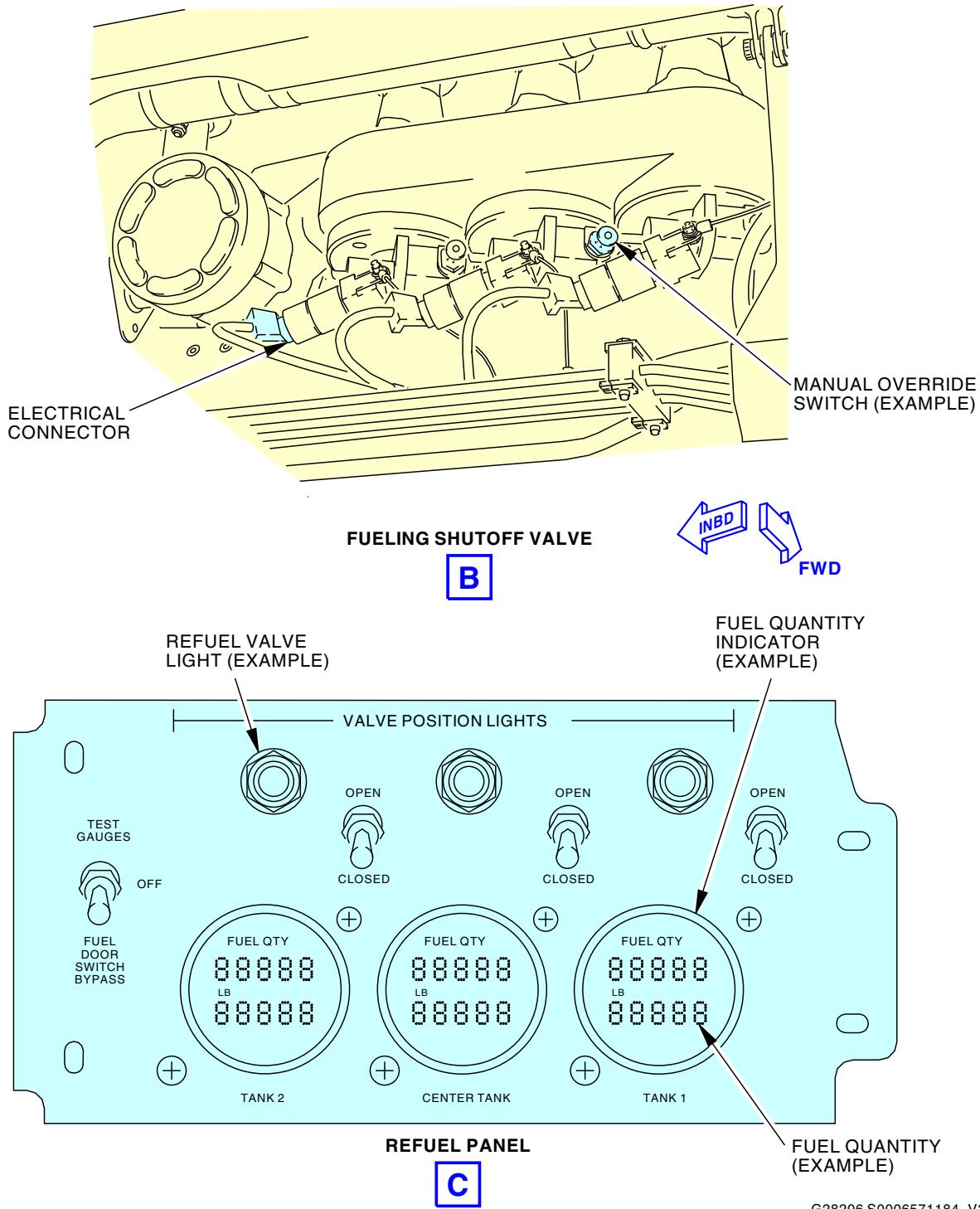
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Pressure Fueling System
Figure 906/28-00-00-990-815 (Sheet 2 of 2)

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TASK 28-00-00-040-810

17. MMEL 28-10-01 (DDPG) Restoration - Pressure Fueling System, Fueling Manifold Check Valve(s)

Inoperative

(Figure 906)

A. General

(1) This task is for the restoration of an airplane with inoperative fueling manifold check valves.

B. References

Reference	Title
28-21-32-000-801	Fueling Check Valve Removal (P/B 401)
28-21-32-400-801	Fueling Check Valve Installation (P/B 401)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Pressure Fueling System, Fueling Shutoff Valve Restoration

SUBTASK 28-00-00-960-001

(1) Replace the bad fueling check valve(s).

These are the tasks:

Fueling Check Valve Removal, TASK 28-21-32-000-801,

Fueling Check Valve Installation, TASK 28-21-32-400-801.

———— END OF TASK ————

TASK 28-00-00-040-815

18. MMEL 28-10-02 (DDPG) Preparation - Pressure Fueling System, Fueling Shutoff Valve(s)

Inoperative

(Figure 906)

A. General

(1) This task is for the operation of an airplane with inoperative fueling shutoff valves.

B. References

Reference	Title
12-11-00-650-806	Pressure Refueling Operation For A Refuel Valve That Does Not Open Electrically (P/B 301)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Pressure Fueling System, Fueling Shutoff Valve Deactivation

SUBTASK 28-00-00-710-002

(1) Make sure the fuel load(s) for the applicable fuel tank(s) is not more than its full capacity.

SUBTASK 28-00-00-650-008

(2) Make sure you stop the refueling source at the correct quantity for the applicable tank.

NOTE: There is no overfill protection. The pressure fueling system will not stop the refuel operation at a set fuel quantity, a fuel spill can occur.

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SUBTASK 28-00-00-650-006

- (3) For the applicable tank(s), do this task: Pressure Refueling Operation For A Refuel Valve That Does Not Open Electrically, TASK 12-11-00-650-806.

SUBTASK 28-00-00-210-007

- (4) After you disconnect the refueling nozzle, make sure that there is no fuel leakage.

———— END OF TASK ——

TASK 28-00-00-040-816

19. MMEL 28-10-02 (DDPG) Restoration - Pressure Fueling System, Fueling Shutoff Valve(s)

Inoperative

(Figure 906)

A. General

- (1) This task is for the restoration of an airplane with inoperative fueling shutoff valves.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-21-51-000-801	Fueling Shutoff Valve - Removal (P/B 401)
28-21-51-400-801	Fueling Shutoff Valve - Installation (P/B 401)
FIM 28-21 TASK 807	Fueling Shutoff Valve Position Indicator Light Does not Come ON when the Valve Switch is set to OPEN - Fault Isolation
FIM 28-21 TASK 808	Fuel Does Not Flow Into The Fuel Tank With Fueling Shutoff Valve Switch in the OPEN Position and Refueling Manifold Pressurized

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Pressure Fueling System, Fueling Shutoff Valve Restoration

SUBTASK 28-00-00-960-002

- (1) Replace the applicable fueling shutoff valve control unit(s).

These are the tasks:

Fueling Shutoff Valve - Removal, TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, TASK 28-21-51-400-801.

SUBTASK 28-00-00-860-023

- (2) Set the switch for the applicable fueling shutoff valve(s) to the OPEN position.

(a) If the blue refuel valve light(s) for the applicable tank(s) does not come on, then, do this task: FIM 28-21 TASK 807.

SUBTASK 28-00-00-650-007

- (3) Add fuel to the applicable tank(s). To do this, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

(a) If fuel does not go into the applicable tank(s), then, do this task: FIM 28-21 TASK 808.

———— END OF TASK ——

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TASK 28-00-00-040-811

20. MMEL 28-12 (DDPG) Preparation - Refuel Control Panel Quantity Indicators Inoperative

Figure 906

A. General

- (1) This task is for operation of the airplane with inoperative (blank) refuel control panel quantity indicators.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Refuel Control Panel Quantity Indicator Deactivation

SUBTASK 28-00-00-650-004

- (1) If the fuel quantity display is available on the Center Instrument Display panel, P2, in the flight compartment, then you can use it to find the fuel quantity in the tank(s) with the bad refuel control panel quantity indicator.

SUBTASK 28-00-00-650-005

- (2) If the fuel quantity display is not available on the Center Instrument Display panel, P2, in the flight compartment, then refer to DDG 28-6 or DDG 28-7 as applicable.

———— END OF TASK ————

TASK 28-00-00-440-805

21. MMEL 28-12 (DDPG) Restoration - Refueling Control Panel Quantity Indicators Inoperative
(Figure 906)

A. General

- (1) This task restores an airplane with an inoperative (or blank) refueling control panel quantity indicator.

B. References

Reference	Title
FIM 28-41 TASK 801	FQIS BITE Procedure

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

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D. Refueling Control Quantity Indicator Display Restoration (Center Tank)

SUBTASK 28-00-00-740-003

- (1) Do this task: FIM 28-41 TASK 801.

SUBTASK 28-00-00-810-004

- (2) Do the applicable fault correction for the fault shown by the FQIS BITE test.

———— END OF TASK ————

TASK 28-00-00-040-812

22. MMEL 28-16 (DDPG) Preparation - Fuel Measuring Sticks

A. General

- (1) This task is for the operation of an airplane with an inoperative, broken, or missing fuel measuring stick.

B. References

Reference	Title
28-11-00-300-801	Analysis of the Fuel Leak Type (P/B 601)

C. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Fuel Measuring Stick Deactivation

SUBTASK 28-00-00-040-003

- (1) Look for indications of fuel leakage in the area around the fuel measuring stick that has the problem (TASK 28-11-00-300-801).

SUBTASK 28-00-00-790-001

- (2) If you find fuel leakage, make sure the leakage is within the specified limits for airplane operation (TASK 28-11-00-300-801).

———— END OF TASK ————

TASK 28-00-00-040-813

23. MMEL 28-16 (DDPG) Restoration - Fuel Measuring Sticks

A. General

- (1) This task is for the restoration of an airplane with an inoperative, broken, or missing fuel measuring stick.

B. References

Reference	Title
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-44-11-000-801	Fuel Measuring Stick Removal (P/B 401)
28-44-11-360-802	Replacement of the O-Ring Seal Between the Housing and the Base Assembly (P/B 801)
28-44-11-400-801	Fuel Measuring Stick Installation (P/B 401)

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C. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Fuel Measuring Stick Restoration

SUBTASK 28-00-00-360-001

- (1) Replace the fuel measuring stick that has the problem.

These are the tasks:

Fuel Measuring Stick Removal, TASK 28-44-11-000-801,

Fuel Measuring Stick Installation, TASK 28-44-11-400-801.

SUBTASK 28-00-00-360-002

- (2) If there is leakage, repair the leakage at the fuel measuring stick housing (TASK 28-44-11-360-802) or repair the leakage in the tank structure (TASK 28-11-00-300-803).

———— END OF TASK ———

TASK 28-00-00-040-814

24. MMEL 28-22 (DDPG) Preparation - SPAR VALVE CLOSED Light

A. General

- (1) This task is for operation of an airplane with an inoperative SPAR VALVE CLOSED light for the spar valve on the Fuel System Panel (P5).

B. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

C. SPAR VALVE CLOSED Light Deactivation

SUBTASK 28-00-00-720-004

- (1) Do these steps to test the electrical operation of the spar valve with the inoperative SPAR VALVE CLOSED light:
 - (a) Make sure the engine start levers on the control stand are in the CUTOFF position.
 - (b) Make sure the Engine START switches are in the OFF position, on the P5 overhead panel.

LOM 429-432

- 1) The AUTO position is the OFF position.

LOM ALL

- (c) Put a DO-NOT-OPERATE placard on the left and right engine START switches, on the P5 overhead panel.

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- (d) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

- (e) On the control stand, put the applicable engine start lever (Engine Start Lever 1 or Engine Start Lever 2) to the IDLE position.
- (f) Examine the position of the manual override lever on the spar valve to make sure the valve is open.



DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (g) Pull the L and R FIRE HANDLE to the FIRE position, on the P8 Aisle Stand.
- (h) Examine the position of the manual override lever on the spar valve to make sure the valve is closed.



DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (i) Push the L and R FIRE HANDLE to the NORMAL position, on the P8 Aisle Stand.
- (j) Examine the position of the manual override lever on the spar valve to make sure the valve is open.
- (k) Put the Engine Start Lever 1 and the Engine Start Lever 2 to the CUTOFF position, on the control stand.
- (l) Examine the position of the manual override lever on the spar valve to make sure the valve is closed.
- (m) Remove the DO-NOT-OPERATE placards from the left and right engine START switches, on the P5 overhead panel.
- (n) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

———— END OF TASK ————

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TASK 28-00-00-440-806

25. MMEL 28-22 (DDPG) Restoration - FUEL/SPAR VALVE CLOSED Lights

A. General

- (1) This task restores an airplane with an inoperative SPAR VALVE CLOSED light for the spar valve on the Fuel System Panel (P5).

B. References

Reference	Title
FIM 28-22 TASK 809	Engine No. 1 SPAR VALVE CLOSED Light Stays ON Bright - Fault Isolation
FIM 28-22 TASK 810	Engine No. 2 SPAR VALVE CLOSED Light Stays ON Bright - Fault Isolation
FIM 28-22 TASK 811	Engine No. 1 SPAR VALVE CLOSED Light Does Not Come On Bright During Valve Transit or Dim When the Valve is Closed - Fault Isolation
FIM 28-22 TASK 812	Engine No. 2 SPAR VALVE CLOSED Light Does Not Come On Bright During Valve Transit or Dim When the Valve is Closed - Fault Isolation

C. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

D. SPAR VALVE CLOSED Light Restoration

SUBTASK 28-00-00-720-005

- (1) Do the applicable fault isolation for the SPAR VALVE CLOSED light that is inoperative:
- Do this task: FIM 28-22 TASK 811.
 - Do this task: FIM 28-22 TASK 812.
 - Do this task: FIM 28-22 TASK 809.
 - Do this task: FIM 28-22 TASK 810.

— END OF TASK —

TASK 28-00-00-040-820

26. MMEL 28-26 (DDPG) Preparation - Fuel Shutoff Valve Battery and Charger Inoperative

A. General

- (1) This task is for the operation of an airplane with an inoperative Fuel Shutoff Valve Battery and Charger.

B. Location Zones

Zone	Area
210	Subzone - Control Compartment - Body Station 178.00 to Body Station 259.50

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C. Fuel Shutoff Valve Battery and Charger - Deactivation

SUBTASK 28-00-00-860-024

- (1) Open this circuit breaker and install safety lock:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK

———— END OF TASK ————

TASK 28-00-00-440-810

27. MMEL 28-26 (DDPG) Restoration - Fuel Shutoff Valve Battery and Charger Inoperative

A. General

- (1) This task restores an airplane with an inoperative Fuel Shutoff Valve Battery and Charger.

B. References

<u>Reference</u>	<u>Title</u>
28-22-14-000-801	Emergency Fuel Shutoff Battery Removal (P/B 401)
28-22-14-400-801	Emergency Fuel Shutoff Battery Installation (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
210	Subzone - Control Compartment - Body Station 178.00 to Body Station 259.50
212	Flight Compartment - Right

D. Fuel Shutoff Valve Battery and Charger - Reactivation

SUBTASK 28-00-00-000-001

- (1) Do this task: Emergency Fuel Shutoff Battery Removal, TASK 28-22-14-000-801.

SUBTASK 28-00-00-400-001

- (2) Do this task: Emergency Fuel Shutoff Battery Installation, TASK 28-22-14-400-801.

SUBTASK 28-00-00-860-025

- (3) Remove the safety lock and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK

———— END OF TASK ————

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STORAGE - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Detection Test for Microbial Growth
 - (2) Treatment of Fuel Tanks Contaminated with Microbial Growth
 - (3) Biocide Treatment of Fuel Tanks - Metered Injection Cart
 - (4) Microbial Growth Removal - Manual Removal Method
 - (5) Microbial Growth Removal - Pressure Washer Method.

TASK 28-10-00-200-802

2. Detection Test for Microbial Growth

A. General

- (1) Use a microbial detection kit or laboratory standard test to check the fuel/water samples taken from each fuel tank. A positive result for microbial contamination requires action that may include retest, a biocide treatment and/or physical removal of the growth from the fuel tanks.
- (2) These are the accepted microbial test kits:
 - (a) MICROBMONITOR2 (microbial test kit, COM-4806)
 - (b) HY-LITE JET A-1 FUEL TEST (luminometer instrument, COM-21126 with fuel test kit consumables, COM-21104)
 - (c) The fuel samples can also be sent to a laboratory for testing. IP385 is the Institute for Petroleum's test for microbial contamination.
- (3) All instructions supplied with the detection kits should be followed closely. It is important to retest if a detection test shows microbial contamination. Differences in the fuel/water sample and the ability of the detection kits to consistently measure the level of microbial growth make it important to retest and verify test results. Do not compare the test results between the different types of detection kits. If re-testing, use the same type of detection kit as the original test.
- (4) All time intervals listed in this task are recommendations. There are no Master Minimum Equipment List (MMEL) or scheduled maintenance requirements for testing for microbial contamination.
- (5) Frequent removal of all water from the airplane sump drains in each fuel tank will help decrease the risk related with microbial growth.

B. References

Reference	Title
12-11-00-680-801	Fuel System Sumping (P/B 301)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1535	Equipment - Sampling, Fuel Part #: 100-0128-04 Supplier: 99321 Part #: 94-8136 Supplier: 99321 Part #: A12001-15 Supplier: 81205 Part #: F80201-1 Supplier: 81205 Opt Part #: V799 Supplier: 20661
COM-4806	Test Kit - Microbial Contamination, Fuel Tank Part #: MicrobMonitor2 Supplier: KG976
COM-21104	HY-LiTE Jet A1 Fuel Test Kit (consumables) Part #: 1.30196.0021 (consumables) Supplier: 08071 Part #: FQS-047 (consumables) Supplier: 40161
COM-21126	HY-LiTE 2 Luminometer (instrument) Part #: 1.30100.0001 (luminometer) Supplier: 08071 Part #: FQS-046A Supplier: 40161 Opt Part #: 1.30100.0221 (luminometer) Supplier: 08071 Opt Part #: 1.30100.0301 (luminometer) Supplier: 08071 Opt Part #: FQS-046 Supplier: 40161
STD-421	Goggles - Eye Protection
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-6365	Sample Bottle, Glass or Chemical Resistant Plastic
STD-7374	Gloves - Fuel and Solvent Resistant

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Clean the Fuel Sampling Equipment

SUBTASK 28-10-00-280-044

- (1) Wear protective equipment when you clean, sample and test for microbial growth:
 - (a) Pair of eye protection goggles, STD-421
 - (b) Clean fuel resistant gloves, STD-7374

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- (c) Clean protective coverall (approved cotton substitute), STD-1129, or equivalent.

SUBTASK 28-10-00-280-045

- (2) To clean the fuel sampling equipment, COM-1535, do these steps:
- (a) Mix a solution of one part tap water to three to four parts alcohol, B00130.
 - (b) Clean the fuel sampling equipment, COM-1535, and sample bottle, STD-6365, (if reused), with the alcohol solution and cotton wipers, G00034.
NOTE: Bottles should be rinsed instead of wiped. Wiping sampling equipment can deposit residual fibers which can be misinterpreted as contamination.
 - (c) Air dry the fuel sampling equipment, COM-1535, and sample bottle, STD-6365.
 - (d) Make sure that the fuel sampling equipment, COM-1535, and sample bottle, STD-6365, are free from residual alcohol.
 - (e) Protect the containers from contamination.

SUBTASK 28-10-00-280-046

- (3) To clean the sump drain area, do these steps:
- (a) Mix a solution of one part water to three to four parts alcohol, B00130.
 - (b) Thoroughly clean the exterior area of the fuel sump drain with the alcohol solution and cotton wipers, G00034.
 - (c) Air dry the sump area.
 - (d) Repeat for each sump drain

G. Collect the Fuel Sample

SUBTASK 28-10-00-280-047

- (1) Make sure that the container for the fuel sampling equipment, COM-1535, and the sample bottle, STD-6365, are clean and dry.

SUBTASK 28-10-00-280-048

- (2) To collect a fuel sample, do these steps:

NOTE: Each fuel sample must be collected separately for each fuel tank and kept in separate sample containers.

- (a) Use the fuel sump drain to get a fuel sample.
 - 1) Do this task: Fuel System Sumping, TASK 12-11-00-680-801.
- (b) Fill the container for the fuel sampling equipment, COM-1535, with approximately 1 qt (1 l) of fuel.
- (c) If necessary, make sure that the fuel sample has some visible water (free water) and some fuel.
- (d) Pour the fuel/water from the container into the sample bottle, STD-6365.
- (e) Do not add any additives, such as food coloring, to identify the presence of water.

SUBTASK 28-10-00-280-049

- (3) After you collect the fuel sample, do these steps:

- (a) Install the cover on the sample bottle, STD-6365.
- (b) Mark each sample with the date, time, airplane and fuel tank identification.

NOTE: Recording sample fuel temperature at the time of sampling can assist with future troubleshooting.

- (c) Protect the fuel samples from contamination.

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SUBTASK 28-10-00-280-050

- (4) Continue to collect fuel samples for the remaining tanks.
 - (a) Clean the fuel sampling equipment, COM-1535, again before you collect a new sample.
 - (b) Make sure to collect a fuel sample from each tank.

H. Microbial Growth Detection Test

SUBTASK 28-10-00-280-051

- (1) Test the sample within the timeline provided by the approval microbial test kit instructions.

NOTE: After you collect the fuel sample, any microbial growth in the sample will start to change or die. Some kits require testing within six hours.

- (a) Use microbial test kit, COM-4806 or luminometer instrument, COM-21126 with fuel test kit consumables, COM-21104 to test the fuel samples.

NOTE: The fuel samples can also be sent to a laboratory for testing. IP385 is the Institute for Petroleum's test for microbial contamination.

- (b) Follow all instructions supplied with the microbial test kit.

NOTE: All instructions supplied with the detection kits should be followed closely. It is important to retest if a detection test shows positive for microbial contamination. Differences in the fuel/water sample and the ability of the detection kits to consistently measure the level of microbial growth make it important to retest and verify test results. Do not compare the test results between the different types of detection kits.

I. Initial Test Results

SUBTASK 28-10-00-280-054

- (1) Use the data supplied with the test kit to define the level of microbial growth:
 - (a) Negligible contamination
 - (b) Moderate contamination
 - (c) Heavy contamination.

SUBTASK 28-10-00-280-055

- (2) If the test confirms negligible levels of contamination, do these steps:
 - (a) Continue with the usual operations.
 - (b) Continue to test the aircraft at the usual intervals.

SUBTASK 28-10-00-280-056

- (3) If the initial test results are positive for moderate or heavy levels of microbial contamination, do these steps:
 - (a) Within 10 days (after receipt of test results) get a new fuel sample.

NOTE: The airplane can continue with usual operations within this time frame before action is taken.
 - (b) Repeat the microbial detection test with the same test method.
 - (c) Confirm the level of microbial contamination.

J. Retest Results

SUBTASK 28-10-00-280-057

- (1) If the retest results are negligible levels of microbial contamination, do these steps:
 - (a) Continue with the usual operations.

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- (b) Continue to test the aircraft at the usual intervals.

SUBTASK 28-10-00-280-058

- (2) If the retest results are moderate levels of microbial contamination, do these steps:

- (a) Within 10 days (after receipt of test results) schedule a biocide treatment to kill the microbial growth.

NOTE: The airplane can continue with usual operations within this time frame before action is taken.

- (b) Do the subsequent task for moderate levels of contamination.

SUBTASK 28-10-00-280-059

- (3) If the retest results are heavy levels of microbial contamination, do these steps:

- (a) Within 10 days (after receipt of test results) schedule a task to go into the fuel tank(s) to inspect and remove the microbial growth.

NOTE: The airplane can continue with usual operations within this time frame before action is taken.

- (b) Do the subsequent task for heavy levels of microbial contamination.

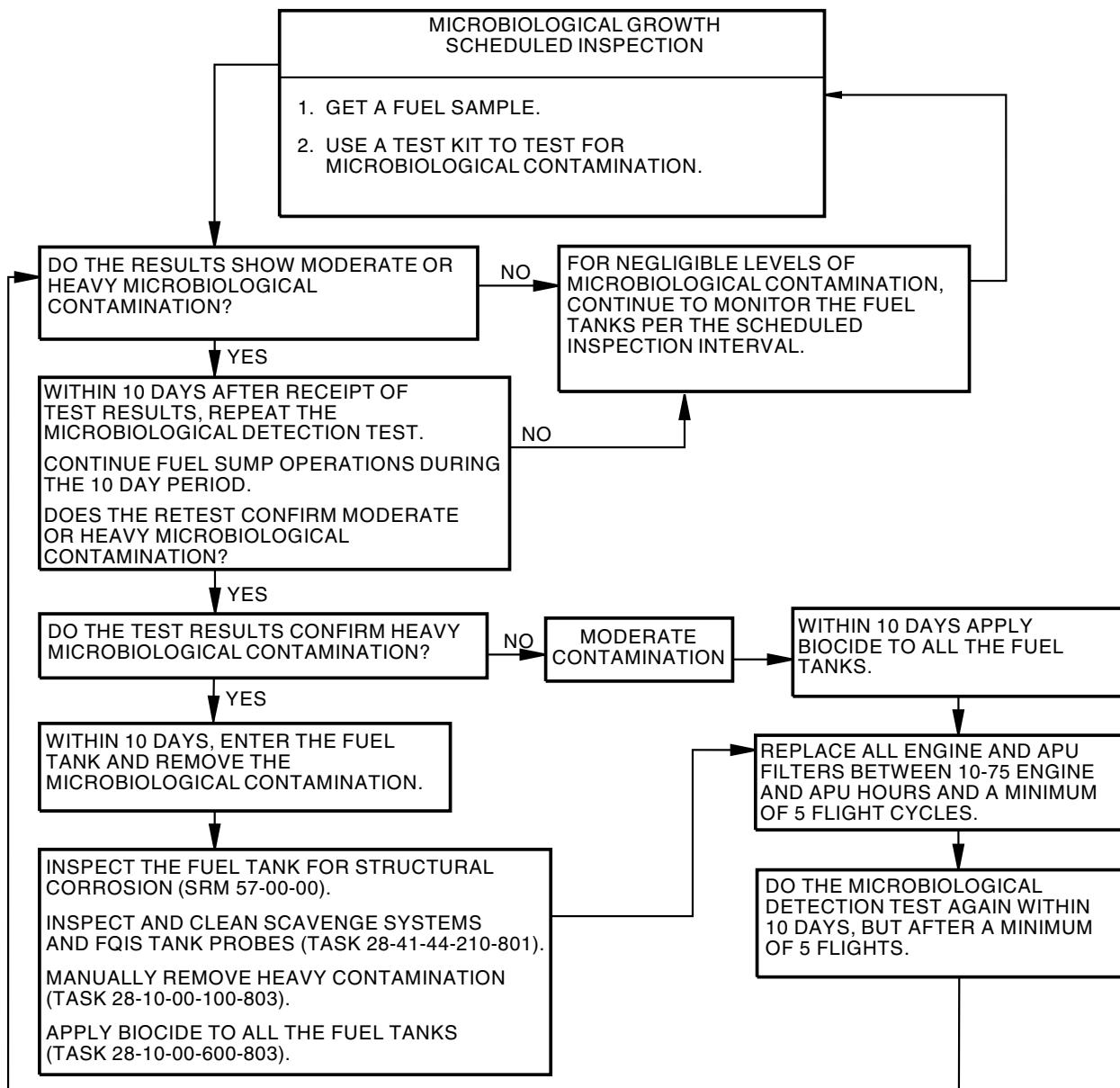
———— END OF TASK ————

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NOTE:

IF THE DETECTION TEST SHOWS MICROBIAL GROWTH, THEN DO THE SCHEDULED INSPECTION TEST MORE OFTEN.

THE RECOMMENDATION TO PERFORM A MICROBIAL CONTAMINATION RETEST AFTER 5 FLIGHT CYCLES IS TO PROVIDE SUFFICIENT FUEL TURNOVER. IF THE AIRPLANE CANNOT PERFORM 5 FLIGHT CYCLES WITHIN 10 DAYS AFTER A BIOCIDE TREATMENT, CONTACT THE TEST KIT MANUFACTURER FOR GUIDANCE ON HOW TO PERFORM TESTS AND INTERPRET RESULTS.

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Microbial Growth - In Fuel Tanks
Figure 201/28-10-00-990-803

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TASK 28-10-00-600-804

3. Treatment of Fuel Tanks Contaminated with Microbial Growth

A. General

- (1) A positive result for moderate or heavy levels of microbial contamination requires action that may include a biocide treatment or physical removal of the growth from the fuel tanks.
- (2) All time intervals listed in this task are recommendations. There are no MEL or scheduled maintenance requirements for testing for microbial contamination.

B. Equipment

- (1) Protective outer clothing to prevent skin contact with microbial contamination:
 - (a) fuel and solvent resistant gloves
 - (b) Saranex suit
 - (c) neoprene boots
 - (d) respirator - half face canister style respirators (minimum), U.S. Bureau of Mines Approved or equivalent.

C. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
49-31-21-000-801	Inlet Fuel Filter Element Removal (P/B 401)
49-31-21-400-801	Inlet Fuel Filter Element Installation (P/B 401)
73-11-02-000-801-F00	Fuel Filter - Removal (P/B 401)
73-11-02-400-801-F00	Fuel Filter - Installation (P/B 401)
SRM 57-00-00	Structural Repair Manual

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

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E. Treatment of Fuel Tanks with Moderate Levels of Microbial Contamination



MAKE SURE THAT YOU DO NOT ADD MORE THAN THE MAXIMUM CONCENTRATION OF BIOCIDE. DO NOT APPLY BIOCIDE IF YOU USE A PROCEDURE NOT IN THIS AIRCRAFT MAINTENANCE MANUAL. DAMAGE TO THE AIRFRAME AND ENGINES CAN OCCUR IF YOU INCORRECTLY APPLY THE BIOCIDE. BIOCIDE OVERDOSING CAN CAUSE AN ENGINE MALFUNCTION. THIS INCLUDES FAILURE TO START, LOSS OF THRUST, AND THE INABILITY TO CONTROL THRUST AND IN-FLIGHT SHUTDOWNS. IF YOU DO NOT FOLLOW THIS CAUTION, IT CAN CAUSE DAMAGE.

SUBTASK 28-10-00-280-034

- (1) Within 10 days (after receipt of positive test results) do these steps:
 - (a) Do a biocide treatment for all of the fuel tanks (TASK 28-10-00-600-803).
 - (b) Return the airplane to service.
 - (c) Perform a minimum of five flights to burn biocide treated fuel through the engines.
 - (d) After a minimum of 5 flights and a recommended 10 to 75 hours of engine operation, replace these items:
 - 1) Engine fuel filter element:
 - Fuel Filter - Removal, TASK 73-11-02-000-801-F00
 - Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
 - 2) APU fuel filter element:
 - Inlet Fuel Filter Element Removal, TASK 49-31-21-000-801
 - Inlet Fuel Filter Element Installation, TASK 49-31-21-400-801.

SUBTASK 28-10-00-280-035

- (2) Within 10 days and a minimum of five flight cycles after the biocide treatment, do these steps:

NOTE: The recommendation to perform a microbial contamination retest after 5 flight cycles is to provide sufficient fuel turnover. If the airplane cannot perform 5 flight cycles within 10 days after a biocide treatment, contact the test kit manufacturer for guidance on how to perform tests and interpret results.

- (a) Get a new fuel sample for each tank.
- (b) If the tests results show heavy microbial contamination, do the steps for Treatment of Fuel Tanks with Heavy Levels of Microbial Contamination.
- (c) If the tests results show moderate, do these steps within 10 days:
 - 1) Do a biocide treatment for all the fuel tanks (TASK 28-10-00-600-803).
 - 2) Completely fill the fuel tanks with biocide treated fuel.
 - 3) Use the maximum soak time.
 - a) Biobor JF - 72 Hours.
- (d) If the tests results show negligible microbial contamination, continue to test the aircraft at the usual intervals.

NOTE: After biocide treatment, frequent removal of water from the airplane sump drains and testing for microbial growth will help reduce microbial growth.

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F. Treatment of Fuel Tanks with Heavy Levels of Microbial Contamination

NOTE: If the detection test (and retest) confirms heavy levels of microbial contamination, do this procedure. It is recommended to do a fuel tank entry within 10 days after positive results for heavy levels of microbial contamination.

SUBTASK 28-10-00-280-036

- (1) Within 10 days (after receipt of test results) schedule a task to inspect the fuel tank(s) for microbial growth.

SUBTASK 28-10-00-280-037

- (2) Do these steps to prepare for the fuel tank inspection:



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Defuel and drain the applicable fuel tank(s) (TASK 28-26-00-650-801).
- (b) Prepare for a fuel tank entry (TASK 28-11-00-910-802, TASK 28-11-00-910-801).
- (c) Make sure that the fuel tank has a sufficient flow of air.
- (d) Put on this protective gear to prevent contact with microbial growth:
 - 1) respirator - half face canister style respirators (minimum)
 - 2) eye protection
 - 3) fuel resistant gloves
 - 4) Saranex suit
 - 5) neoprene boots.

SUBTASK 28-10-00-280-043

- (3) Enter the fuel tank (TASK 28-11-00-910-802, TASK 28-11-00-910-801).

SUBTASK 28-10-00-280-038

- (4) Examine the fuel tank for microbial growth.
 - (a) Microbial growth usually occurs at the fuel/water interface in the fuel tanks.
 - (b) Microbial growth can also occur in other areas such as vertical surfaces, convex shapes such as fuel tubing and other surfaces below the water line.
 - (c) Microbial growth can appear in a variety of colors.
 - (d) If a tank is wet with fuel, the microbial growth can appear as a smooth slimy transparent gel material.
 - (e) If a tank is dry, the microbial growth can appear as a dark solid material on the tank surfaces.
 - (f) Microbial growth can cause the tank protective primer coating to appear stained.

SUBTASK 28-10-00-280-039

- (5) Microbial growth is usually found in these areas:
 - (a) the bottom of the tank where water collects
 - (b) the lower surfaces of the wing structure (stringers, spars, ribs etc)
 - (c) the top surfaces of the tubing
 - (d) the flow holes and the drain tubes
 - (e) areas where water is possibly trapped

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- (f) inside or around fuel system components.

SUBTASK 28-10-00-280-040

- (6) Do these steps if you find microbial growth:

- (a) Do the applicable task to remove the microbial growth:
 - Microbial Growth Removal - Manual Removal Method, TASK 28-10-00-100-803
 - Microbial Growth Removal - Pressure Washer Method, TASK 28-10-00-100-804.
- (b) Examine the fuel tank structure for corrosion (SRM 57-00-00).

SUBTASK 28-10-00-280-041

- (7) Do these steps after you clean the fuel tank:

- (a) Do the inspection and cleaning for the remaining tanks that have tested positive for microbial growth.
- (b) Go out of and close the fuel tank (TASK 28-11-00-410-801).
- (c) Do a biocide treatment of the fuel tanks (TASK 28-10-00-600-803).
- (d) Return the airplane to service.
- (e) Within 10 days (minimum of five flights), get a new fuel/water sample and do the microbial detection test again.

NOTE: This test is necessary to make sure that the microbial growth removal and biocide treatment processes have reduced the level of microbial contamination to a negligible level in all fuel tanks.

NOTE: The biocide treated fuel will be burned through the engines after minimum five flights.

- (f) After 10 to 75 hours of engine operation, replace these filters:

- 1) Engine fuel filter cartridge:
 - Fuel Filter - Removal, TASK 73-11-02-000-801-F00
 - Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
- 2) APU fuel filter element:
 - Inlet Fuel Filter Element Removal, TASK 49-31-21-000-801
 - Inlet Fuel Filter Element Installation, TASK 49-31-21-400-801.

SUBTASK 28-10-00-280-042

- (8) Within 10 days and a minimum of five flight cycles after the biocide treatment, do these steps:

NOTE: The recommendation to perform a microbial contamination retest after 5 flight cycles is to provide sufficient fuel turnover. If the airplane cannot perform 5 flight cycles within 10 days after a biocide treatment, contact the test kit manufacturer for guidance on how to perform tests and interpret results.

- (a) Get a new fuel sample for each tank.
- (b) Do the microbial growth detection test again.
- (c) If the tests show that the biocide treatment was not successful, do these steps within 10 days:
 - 1) Do a biocide treatment of all the fuel tanks (TASK 28-10-00-600-803).
 - 2) Completely fill the fuel tanks with biocide treated fuel.
 - 3) Use the maximum soak time.
 - a) Biobor JF - 72 Hours.

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- (d) If the tests show that the biocide treatment was successful, continue to test the aircraft at the usual intervals.

———— END OF TASK ————

TASK 28-10-00-600-803

4. Biocide Treatment of Fuel Tanks - Metered Injection Cart

A. General

- (1) This task gives the instructions to add biocide treatment to the fuel tanks.
- (2) The adjustable metered injection cart is the only type of injection cart permitted for biocide application. This type of metered injection cart is equipped with an adjustable concentration setting. Only these metered injection carts are recommended for this task:
 - (a) Hammonds Technical Services' Injection carts
 - (b) Injection carts meeting the Energy Institutes' standard EI 1566, as listed in the portable biocide injection hydrant cart, COM-1781, are recommended for this task.
- (3) Biocide treatment is used to kill microbial growth within the fuel tank. The process requires that the biocide be mixed at a specified concentration with fuel and allowed to soak for a period of time. After soaking, the biocide treated fuel may be burned through the engines.
- (4) The biocide fuel additive certified by the engine manufacturer is Biobor JF additive, G00452. Follow engine manufacturer guidelines prior to use.

NOTE: Biobor JF has not been approved in some geographic areas. Local regulatory agencies should be consulted with respect to approval status.

- (5) Do not mix Biobor JF additive, G00452 with any other biocide.
- (6) Do not apply Biobor JF additive, G00452 with another biocide into the same fuel tank.
- (7) Obey all Health and Safety precautions specified by the manufacturer related to the use of biocide.
- (8) It is recommended to begin this task with no fuel or a minimum fuel load (after a flight, before fuel servicing). It is not necessary to defuel the aircraft before you begin the biocide treatment, unless it is required to allow the uplift of sufficient volume of treated fuel. Fuel quantity limits are provided in this procedure.
- (9) Do not apply undiluted biocide into the airplane fuel tanks. This can result in high concentrations of biocide and can damage equipment and tank structure.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
12-11-00-680-801	Fuel System Sumping (P/B 301)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1781	Cart - Hydrant, Portable, Biocide Injection Part #: AC800-1P10 Supplier: 47186 Part #: HC600-1P5 Supplier: 47186 Part #: HC800-1P10 Supplier: 47186 Opt Part #: 69-10-04-999 Supplier: 1X7Q9 Opt Part #: AC800-1M Supplier: 47186 Opt Part #: AC800-1S Supplier: 47186 Opt Part #: HC600-1P7 Supplier: 47186 Opt Part #: HC800-1S Supplier: 47186 Opt Part #: MODEL HC800 Supplier: 47186

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00452	Additive, Fuel - Biobor JF	

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Biocide Precautions

SUBTASK 28-10-00-620-025

- (1) Obey these personnel precautions:



DO NOT BREATHE FUMES FROM THE BIOCIDE FUEL ADDITIVE, OR
TOUCH IT. READ THE MATERIAL SAFETY DATA SHEET (MSDS) FROM
THE MANUFACTURER OF THE ADDITIVE. THE ADDITIVE CAN CAUSE
INJURIES TO PERSONNEL AND HEALTH PROBLEMS.

- (a) Do not breathe or touch the biocide fuel additive.
- (b) During maintenance with biocide fuel additives, wear these protective equipment items:
 - 1) Eye protection
 - 2) Fuel resistant gloves
 - 3) Protective outerwear

SUBTASK 28-10-00-620-026

- (2) Obey these biocide additive precautions:

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CAUTION

MAKE SURE THAT YOU DO NOT ADD MORE THAN THE MAXIMUM CONCENTRATION OF BIOCIDE. DO NOT APPLY BIOCIDE IF YOU USE A PROCEDURE NOT IN THIS AIRCRAFT MAINTENANCE MANUAL. DAMAGE TO THE AIRFRAME AND ENGINES CAN OCCUR IF YOU INCORRECTLY APPLY THE BIOCIDE. BIOCIDE OVERDOSING CAN CAUSE AN ENGINE MALFUNCTION. THIS INCLUDES FAILURE TO START, LOSS OF THRUST, AND THE INABILITY TO CONTROL THRUST AND IN-FLIGHT SHUTDOWNS. IF YOU DO NOT FOLLOW THIS CAUTION, IT CAN CAUSE DAMAGE.

- (a) Obey all requirements specified by the manufacturer related to the use of the biocide.
 - (b) Do not exceed the maximum allowable concentration of biocide (parts per million [ppm]) in a fuel tank.
 - (c) Do not uplift fuel overdosed with biocide. Do not overdose the final fuel tank load.
 - (d) If you exceed the maximum allowable concentration of biocide in a fuel tank and you cannot dilute the concentration with untreated fuel or defuel the tank, contact Boeing for corrective action.
- NOTE: Untreated fuel is defined as fuel that does not contain biocide.
- (e) If you spill biocide, then do these steps:
 - 1) Immediately contain the spill area.
 - 2) Use a cotton wiper, G00034 and water to clean the area.
 - 3) Refer to the biocide manufacturer's documentation, Safety Description Sheet and local agencies for procedures to dispose of the material.

SUBTASK 28-10-00-620-073

- (3) Make sure that the injection cart has been calibrated prior to uplifting biocide treated fuel to the aircraft.

SUBTASK 28-10-00-970-001

- (4) If the airplane was treated with Kathon FP 1.5, contact Boeing.

SUBTASK 28-10-00-970-002

- (5) If you think that biocide was applied incorrectly, send a service request with this information to Boeing for evaluation:
 - (a) Fuel quantity (volume) in each tank before applying biocide.
 - (b) Fuel quantity (volume) in each tank after applying biocide.
 - (c) Total quantity (volume) of fuel biocide applied to each airplane.
 - (d) Uplift concentration (parts per million volume [ppm (V)]) of biocide applied in each tank.
 - (e) Final target concentration (ppm (V)) of biocide applied to each tank.

G. Prepare for the Biocide Treatment

SUBTASK 28-10-00-680-001



WARNING

DO NOT BREATHE FUMES FROM THE BIOCIDE FUEL ADDITIVE, OR TOUCH IT. READ THE MATERIAL SAFETY DATA SHEET (MSDS) FROM THE MANUFACTURER OF THE ADDITIVE. THE ADDITIVE CAN CAUSE INJURIES TO PERSONNEL AND HEALTH PROBLEMS.

- (1) Sump each fuel tank until no more water drains from the fuel tank (TASK 12-11-00-680-801).

NOTE: Sump all fuel tanks prior to Biocide application, including empty tanks.

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SUBTASK 28-10-00-620-074

- (2) Apply the Biobor JF Biocide to the Fuel Tanks - Metered Injection.

H. Apply the Biobor JF Biocide to the Fuel Tanks - Metered Injection

SUBTASK 28-10-00-620-075

- (1) Obey the biocide precautions.

SUBTASK 28-10-00-620-066

- (2) Plan the refueling operation per Table 201.

Table 201/28-10-00-993-807 Minimum Tank Fuel Volume After Biocide Application

FUEL VOLUME IN AN INDIVIDUAL TANK PRIOR TO BIOCIDE APPLICATION	REQUIRED FUEL VOLUME IN AN INDIVIDUAL TANK AFTER BIOCIDE APPLICATION
Empty as indicated by the Fuel Quantity Indicating System and the tank is not being treated to address confirmed microbial contamination	Minimum 10% Tank Capacity
Empty as indicated by the Fuel Quantity Indicating System and the tank is being treated to address confirmed microbial contamination	Minimum 33% Tank Capacity
Not empty as indicated by the Fuel Quantity Indicating System but less than or equal to 5% Tank Capacity	Minimum 50% Tank Capacity
Greater than 5% but less than or equal to 10% Capacity	Volumetric Shut-Off (VSO) Capacity
Greater than 10% Capacity	Not permitted

NOTE: Fuel tanks are not subject to this table if untreated fuel has not been uplifted or transferred into the fuel tank since the last time this procedure was performed. In this case, if the tank is being treated to address microbial contamination, the required fuel volume in an individual tank after biocide application for an initial treatment is minimum 33% tank capacity and VSO for a second treatment.

- (a) If the fuel volume in an individual tank is greater than the desired fuel quantity, defuel the tank to the desired volume.
- (b) Do not perform tank-to-tank transfer with fuel that has confirmed microbial contamination.

NOTE: This could cross contaminate the fuel tanks.

SUBTASK 28-10-00-620-068

- (3) Make sure that the portable biocide injection hydrant cart, COM-1781, is set to the injection setting to achieve a biocide uplift concentration of 0.2000 ml biocide per liter of fuel (0.0256 fl.oz per US gallon of fuel).

NOTE: This is equivalent to 200 parts per million by volume (ppm (V)).

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- (a) If the portable biocide injection hydrant cart, COM-1781, injection rate is not set, use the instructions provided with the portable biocide injection hydrant cart to set the injection rate.

NOTE: Locking out the hydrant cart after calibration will minimize the risk of overdosing.

SUBTASK 28-10-00-620-069



CAUTION

MAKE SURE THAT YOU DO NOT ADD MORE THAN THE MAXIMUM CONCENTRATION OF BIOCIDE. DO NOT APPLY BIOCIDE IF YOU USE A PROCEDURE NOT IN THIS AIRCRAFT MAINTENANCE MANUAL. DAMAGE TO THE AIRFRAME AND ENGINES CAN OCCUR IF YOU INCORRECTLY APPLY THE BIOCIDE. BIOCIDE OVERDOSING CAN CAUSE AN ENGINE MALFUNCTION. THIS INCLUDES FAILURE TO START, LOSS OF THRUST, AND THE INABILITY TO CONTROL THRUST AND IN-FLIGHT SHUTDOWNS. IF YOU DO NOT FOLLOW THIS CAUTION, IT CAN CAUSE DAMAGE.

- (4) Do these steps to treat the fuel tank with biocide:
- Make sure that the tank has an appropriate initial fuel volume (Table 201).
 - Open the refuel valve(s) for one tank only (TASK 12-11-00-650-802).
 - Begin the refuel operation (TASK 12-11-00-650-802).
 - Use the calibrated portable biocide injection hydrant cart, COM-1781, to refuel the tank with Biobor JF additive, G00452, treated fuel to the desired fuel load
 - Make sure that the tank is filled to the minimum fuel volume per "REQUIRED FUEL VOLUME IN AN INDIVIDUAL TANK AFTER BIOCIDE APPLICATION" value (Table 201).
 - Stop the refuel operation (TASK 12-11-00-650-802).
 - For each tank, record the following quantities:
 - Quantity of fuel in the tank prior to biocide application.
 - Quantity of fuel uplifted into the tank during application.
 - Quantity of fuel in the tank after biocide application.
 - Quantity of biocide consumed during each tank application.
 - Continue to apply the treated fuel to all fuel tanks.
 - Add biocide treated fuel to the remaining tanks as necessary.

SUBTASK 28-10-00-620-076

- (5) Let the biocide treatment to soak per Biobor JF soak time of 72 hours.

SUBTASK 28-10-00-620-070

- (6) These factors affect how quickly the biocide kills the microbial growth:
- The longer the soak time, the better the biocide will work.
 - Additional soak time may be necessary for low temperatures.
 - A low concentration of biocide is not as effective in killing microbial growth.

SUBTASK 28-10-00-620-077

- (7) During the soak time, do not move the airplane or operate the fuel pumps or APU pumps.

SUBTASK 28-10-00-620-078

- (8) Review the maintenance records to make sure that the fuel has been dosed correctly.

SUBTASK 28-10-00-620-079

- (9) If a tank has been overdosed, contact Boeing, engine and APU OEMs for further instructions.

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I. Post-Biocide Treatment Maintenance Actions

SUBTASK 28-10-00-620-050



WARNING

DO NOT BREATHE FUMES FROM THE BIOCIDE FUEL ADDITIVE, OR TOUCH IT. READ THE MATERIAL SAFETY DATA SHEET (MSDS) FROM THE MANUFACTURER OF THE ADDITIVE. THE ADDITIVE CAN CAUSE INJURIES TO PERSONNEL AND HEALTH PROBLEMS.

- (1) After the biocide treatment soak time, sump each tank to remove water (TASK 12-11-00-680-801).

———— END OF TASK ————

TASK 28-10-00-100-803

5. **Microbial Growth Removal - Manual Removal Method**

A. General

- (1) There are two methods to remove the microbial growth. If the fuel tank inspection shows that the area that is contaminated is small, then do this task to manually remove the contamination.
- (2) If the fuel tank inspection shows that the contamination area is large or the area is inaccessible (manual removal is not practical), then do this task: Microbial Growth Removal - Pressure Washer Method.
- (3) It is only necessary to do this task for the fuel tank(s) that have microbial contamination found during the inspection.

B. Equipment

- (1) Protective outer clothing to prevent skin contact with microbial contamination:
 - (a) Saranex suit
 - (b) Fuel and alcohol resistant gloves
 - (c) Eye protection
 - (d) Neoprene boots

C. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-21-000-801	Surge Tank Fuel Sump Drain Valve Removal (P/B 401)
28-11-21-400-801	Surge Tank Fuel Sump Drain Valve Installation (P/B 401)
28-11-41-000-801	Sump Drain Valve Removal (P/B 401)
28-11-41-400-801	Sump Drain Valve Installation (P/B 401)
28-11-61-000-801	Main Tank Fuel Sump Drain Valve Removal (P/B 201)
28-11-61-400-801	Main Tank Fuel Sump Drain Valve Installation (P/B 201)
28-22-17-000-801	Fuel Scavenge Jet Pump Removal (P/B 401)
28-22-17-400-801	Fuel Scavenge Jet Pump Installation (P/B 401)
28-41-21-000-801	Tank Unit or the Compensator Unit Removal (P/B 401)
28-41-21-400-801	Tank Unit or Compensator Unit Installation (P/B 401)
28-41-44-400-801	FQIS Wire Harness Replacement (P/B 401)
SRM 57-00-00	Structural Repair Manual

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D. Tools/Equipment

Reference	Description
STD-3731	Streamer - REMOVE BEFORE FLIGHT

E. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

F. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

G. Prepare to Remove the Microbial Growth

SUBTASK 28-10-00-620-054

- (1) Do this procedure after you have completed this task: Microbial Growth Fuel Tank Inspection.

SUBTASK 28-10-00-620-055



DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Prepare the fuel tank for a tank entry Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-10-00-620-056



MAKE SURE THAT THERE IS A GOOD FLOW OF AIR IN THE FUEL TANK WHERE YOU WILL REMOVE THE MICROBIAL GROWTH. A GOOD FLOW OF AIR WILL PREVENT THE BUILD-UP OF ISOPROPYL ALCOHOL FUMES. ISOPROPYL ALCOHOL IS FLAMMABLE AND POISONOUS. INJURIES TO PERSONNEL CAN OCCUR.

- (3) Make sure the fuel tank has a sufficient flow of air.

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SUBTASK 28-10-00-620-057



WARNING

PUT ON AN APPROVED RESPIRATOR AND PROTECTIVE CLOTHING BEFORE YOU GO INTO A FUEL TANK THAT HAS MICROBIAL GROWTH CONTAMINATION. DO NOT BREATHE AIR THAT HAS MICROBIAL GROWTH RESIDUE. DO NOT GET THE MICROBIAL GROWTH ON YOUR SKIN. HEALTH PROBLEMS CAN OCCUR. MICROBIAL CONTAMINATION CAN CAUSE INJURIES TO PERSONNEL.

- (4) Put on this protective gear to prevent contact with microbial growth:

- (a) Fuel and alcohol resistant gloves
- (b) Eye protection
- (c) Neoprene boots

SUBTASK 28-10-00-620-063

- (5) Go into the fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-10-00-020-006

- (6) Remove these components for the tank(s) to be inspected and cleaned:

NOTE: Make a component removal record.

- (a) Sump drain valve
 - (Main Tank Fuel Sump Drain Valve Removal, TASK 28-11-61-000-801,
 - (Surge Tank Fuel Sump Drain Valve Removal, TASK 28-11-21-000-801,
 - (Center Tank Sump Drain Valve Removal, TASK 28-11-41-000-801).
- (b) FQIS tank units (TASK 28-41-21-000-801)
- (c) Fuel scavenge jet pump.(TASK 28-22-17-000-801)

SUBTASK 28-10-00-910-024

- (7) Put a protective cover on these fuel system components and attach a REMOVE BEFORE FLIGHT streamer, STD-3731:

- (a) Fuel pump inlets
- (b) Scavenge and water ejector pump inlets
- (c) By-pass valve inlets

SUBTASK 28-10-00-160-013

- (8) Use the applicable manufacturer's recommendations to inspect and clean these components as necessary:

- (a) Fuel scavenge jet pump
- (b) Tank units and compensator unit

H. Remove the Microbial Growth - Manual Method

SUBTASK 28-10-00-620-059

- (1) Do these steps to remove the microbial growth:

- (a) Use a fiber brush to loosen the contamination.
- (b) Apply alcohol, B00130 to a cotton wiper, G00034.
- (c) Use the minimum amount of isopropyl alcohol that is necessary.
- (d) Use the wiper to remove the microbial growth.

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- (e) Put the used cotton wiper, G00034 in a plastic bag to decrease the isopropyl alcohol fumes in the tank.
- (f) Use an air hose or a wire to make sure the flow hole areas are free of unwanted material.
- (g) Use an air hose with a nozzle (90 psi maximum) to blow any material from the inlet screen on the water and fuel scavenge pumps.

SUBTASK 28-10-00-620-060

- (2) Do a visual check of the fuel tank structure for corrosion.
 - (a) If you find corrosion, then repair the damage SRM 57-00-00.

I. Put the Airplane Back to the Usual Condition

SUBTASK 28-10-00-080-003

- (1) Remove the fuel tank cleaning equipment and material.

SUBTASK 28-10-00-910-025

- (2) Remove the protective covers from these fuel system components:
 - (a) Fuel pump inlets
 - (b) Fuel scavenge system inlets
 - (c) By-pass valve inlets

SUBTASK 28-10-00-410-009

- (3) Install these components:
 - (a) Sump drain valve
 - (Main Tank Fuel Sump Drain Valve Installation, TASK 28-11-61-400-801,
 - (Surge Tank Fuel Sump Drain Valve Installation, TASK 28-11-21-400-801,
 - (Center Tank Sump Drain Valve Installation, TASK 28-11-41-400-801)
 - (b) FQIS tank units (TASK 28-41-44-400-801, TASK 28-41-21-400-801)
 - (c) Fuel scavenge jet pump (TASK 28-22-17-400-801)

SUBTASK 28-10-00-410-005

- (4) Install any panels or structure that you removed.

SUBTASK 28-10-00-620-064

- (5) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-10-00-620-065

- (6) Do this task: Biocide Treatment of Fuel Tanks - Metered Injection Cart, TASK 28-10-00-600-803.

———— END OF TASK ————

TASK 28-10-00-100-804

6. Microbial Growth Removal - Pressure Washer Method

A. General

- (1) There are two methods to remove the microbial growth. If the fuel tank inspection shows that the area that is contaminated is small, then do this task: Microbial Growth Removal - Manual Removal Method, TASK 28-10-00-100-803.
- (2) If the fuel tank inspection shows that the contamination area is large or the area is inaccessible (manual removal is not practical), then use the pressure washer method to remove the contamination.

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- (3) If you use a pressure washer you must remove all of the in-tank FQIS components and use care not to damage the fuel tank sealant. After you finish the procedure make sure all the water is removed and the tank is completely dried.
- (4) It is only necessary to do this task for the fuel tank(s) that have microbial contamination found during the inspection.

B. References

Reference	Title
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-00-910-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-11-21-000-801	Surge Tank Fuel Sump Drain Valve Removal (P/B 401)
28-11-21-400-801	Surge Tank Fuel Sump Drain Valve Installation (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-41-000-801	Sump Drain Valve Removal (P/B 401)
28-11-41-400-801	Sump Drain Valve Installation (P/B 401)
28-11-61-000-801	Main Tank Fuel Sump Drain Valve Removal (P/B 201)
28-11-61-400-801	Main Tank Fuel Sump Drain Valve Installation (P/B 201)
28-22-17-000-801	Fuel Scavenge Jet Pump Removal (P/B 401)
28-22-17-400-801	Fuel Scavenge Jet Pump Installation (P/B 401)
28-41-21-000-801	Tank Unit or the Compensator Unit Removal (P/B 401)
28-41-21-400-801	Tank Unit or Compensator Unit Installation (P/B 401)
28-41-44-400-801	FQIS Wire Harness Replacement (P/B 401)
SRM 57-00-00	Structural Repair Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-10710	Explosion Proof Vacuum Part #: AV1-55 EX W Supplier: \$1354 Part #: EXP1-55 TC TE Supplier: 0YX65 Part #: MDL55 ITEM 23954 Supplier: 05490 Part #: SS-55 TE TC Supplier: 0YX65
STD-126	Brush - Soft-bristle, Non-metallic

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Reference	Description
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-1136	Facepiece (Mask) - Particulate Filtering, Disposable (NIOSH N95 approved)
STD-1181	Gloves - Heat Protective
STD-1425	Gloves
STD-3731	Streamer - REMOVE BEFORE FLIGHT
STD-7374	Gloves - Fuel and Solvent Resistant
STD-7377	Boots - Neoprene
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)
STD-7386	Hose - Air Supply
STD-7411	Clothing - Waterproof
STD-8424	Washer - Pressure [Hot Water Surface impact requirement (Maximum): - Temperature: 160F (71C) - Pressure: 100 psig (689 kPa) - Flow: 3 gal (11 l) - 5 gal (19 l) per min]
STD-8850	Source - Hot Water (max 140 F, 60 C), Regulated (0-100 psig, 6.8 atm)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Hot Water Pressure Washer - Precautions

NOTE: The pressure washer method is not recommended outboard of Wing Station 326.



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SUBTASK 28-10-00-860-001



WARNING

OBEY THESE PRECAUTIONS WHEN YOU CLEAN THE FUEL TANK WITH A HOT-WATER PRESSURE WASHER. HOT WATER CAN BURN YOU AND HIGH TEMPERATURES IN THE TANK CAN CAUSE HEAT-RELATED HEALTH PROBLEMS. USE THE PRESSURE WASHER CORRECTLY TO PREVENT DAMAGE TO THE FUEL TANK SEALS. HOT WATER AND HEAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) The person in the fuel tank must have these items for protection:
 - (a) heat protective gloves, STD-1181
 - (b) Waterproof outer gloves, STD-1425
 - (c) waterproof clothing, STD-7411
 - (d) Full filtering facepiece, STD-1136
 - (e) Protective gear to protect against breathing or touching microbial growth
 - (f) A regulated hot water source, 140 F max, 0-100 psig, STD-8850, line that closes automatically when you release it ("deadman" control switch).

SUBTASK 28-10-00-910-018

- (2) The fuel tank observer must monitor the person in the tank for signs of health problems related to overheating.

SUBTASK 28-10-00-860-002

- (3) Use air movers to have a good flow of air in the tanks.

SUBTASK 28-10-00-910-019

- (4) While you clean, continue to move air through the tank.

SUBTASK 28-10-00-160-008

- (5) Make sure that to use the correct pressure washer technique:
 - (a) Use a spray of approximately 100 psi (689 kPa) maximum at the tank surface.
 - (b) Keep the time you point the nozzle at one position to a minimum
 - (c) Move the spray through an area at approximately 6 in. (152 mm) per second.
 - (d) Many fast passes are better than one slow pass.
 - (e) Do not point the spray at the feathered edge of the seal compound.
NOTE: This loosens the joint.
 - (f) If you put heat or water pressure on the sealant for a long time, you can damage the sealant.

G. Prepare the Tank for the Hot Water Pressure Washing

SUBTASK 28-10-00-910-020



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Prepare to go into the fuel tank (TASK 28-11-00-910-801, TASK 28-11-00-910-802).

SUBTASK 28-10-00-020-003

- (2) Remove the applicable access doors for the fuel tank in the area that must be cleaned (TASK 28-11-11-000-801, TASK 28-11-11-000-802, TASK 28-11-31-000-801).

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SUBTASK 28-10-00-020-004

- (3) Remove the necessary fuel tank equipment and support brackets to get access to the area that must be cleaned.

SUBTASK 28-10-00-910-021



WARNING

PUT ON AN APPROVED RESPIRATOR AND PROTECTIVE CLOTHING BEFORE YOU GO INTO A FUEL TANK THAT HAS MICROBIAL GROWTH CONTAMINATION. DO NOT BREATHE AIR THAT HAS MICROBIAL GROWTH RESIDUE. DO NOT GET THE MICROBIAL GROWTH ON YOUR SKIN. HEALTH PROBLEMS CAN OCCUR. MICROBIAL CONTAMINATION CAN CAUSE INJURIES TO PERSONNEL.

- (4) Put on this protective gear to prevent contact with microbial growth:
 - (a) Half face canister style half-mask respirator, STD-7380 (minimum)
 - (b) Fuel resistant gloves, STD-7374
 - (c) coveralls (approved cotton substitute), STD-1129
 - (d) Neoprene boots, STD-7377.

SUBTASK 28-10-00-020-005

- (5) Remove these components for the tank(s) to be cleaned:

NOTE: Make a component removal record.

- (a) Sump drain valve (TASK 28-11-61-000-801, TASK 28-11-21-000-801, TASK 28-11-41-000-801)
- (b) FQIS tank units (TASK 28-41-21-000-801)
- (c) Fuel scavenge jet pump (TASK 28-22-17-000-801).

SUBTASK 28-10-00-910-022

- (6) Put a protective cover on these fuel system components and attach a REMOVE BEFORE FLIGHT streamer, STD-3731:
 - (a) Fuel pump inlets
 - (b) Scavenge and water ejector pump inlets
 - (c) By-pass valve inlets.

SUBTASK 28-10-00-110-002

- (7) Use the applicable manufacturer's recommendations to clean these components:
 - (a) Fuel scavenge jet pump
 - (b) Tank units and compensator unit.

H. Pressure Wash the Fuel Tank

SUBTASK 28-10-00-110-003



WARNING

OBEY THESE PRECAUTIONS WHEN YOU CLEAN THE FUEL TANK WITH A HOT-WATER PRESSURE WASHER. HOT WATER CAN BURN YOU AND HIGH TEMPERATURES IN THE TANK CAN CAUSE HEAT-RELATED HEALTH PROBLEMS. USE THE PRESSURE WASHER CORRECTLY TO PREVENT DAMAGE TO THE FUEL TANK SEALS. HOT WATER AND HEAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Put on this protective gear to protect against the hot water pressure spray:
 - (a) Full face canister style half-mask respirator, STD-7380 (minimum)

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- (b) heat protective gloves, STD-1181
- (c) Waterproof outer gloves, STD-1425
- (d) waterproof clothing, STD-7411
- (e) Full filtering facepiece, STD-1136.

SUBTASK 28-10-00-160-009

- (2) Use the pressure washer, STD-8424, to clean the fuel tank:
 - (a) Start at the outboard end of the tank.
 - (b) Hold the nozzle at a distance between 6 in. (152 mm) and 10 in. (254 mm) from the tank surface.
 - (c) Position the nozzle at a 45°arc (1 rad) angle to the tank surface.
 - (d) Point the nozzle in the direction of the access opening and the drain valve opening.
 - (e) Continue to clean in the direction of the drain valve opening and the access opening.
 - (f) Only use enough spray to remove the microbial growth.
 - (g) Use short bursts, not a continuous flow.
 - (h) Move the loose microbial growth and any unwanted material to the inboard end of the tank and out of the openings.
 - (i) Complete the pressure washing of the fuel tank.

SUBTASK 28-10-00-160-010

- (3) After you pressure wash the fuel tank, do these steps:



**MAKE SURE THAT YOU REMOVE ALL OF THE WASTE PARTICLES
AFTER YOU CLEAN THE FUEL TANK. THE UNWANTED MATERIAL CAN
CAUSE A BLOCKAGE OF THE EJECTOR AND SCAVENGE PUMPS.
PARTICLES CAN STOP THE OPERATION OF THESE SYSTEMS.**

- (a) Use an air supply hose, STD-7386, with a nozzle (90 psi maximum) to blow any material from the inlet screen on the water and fuel scavenge pumps.
- (b) Use an air supply hose, STD-7386, or a soft-bristle non-metallic brush, STD-126, to make sure that the flow hole areas are free of loosened microbial growth or unwanted material.
- (c) For the outboard main tanks, make sure that the drain hole in the midspar web is clear.

SUBTASK 28-10-00-160-011

- (4) Repeat these steps to pressure wash the remaining tanks as necessary.

I. Restore the Fuel Tank

SUBTASK 28-10-00-160-012

- (1) Remove the water from the fuel tank:
 - (a) Continue to have a good flow of air until the tank is dry.
 - (b) Use an explosion-proof vacuum, COM-10710, to remove the water.
 - (c) Mop-up any water that remains with a cotton wiper, G00034.
 - (d) Continue to move air through the fuel tanks until all moisture is removed.

SUBTASK 28-10-00-210-006

- (2) Do a check of the fuel tank for damage:
 - (a) Do a visual check of the fuel tank structure for corrosion.
 - 1) If you find corrosion, then repair the damage (SRM 57-00-00).

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- (b) Do a visual check for missing or damaged fuel tank sealant.
 - 1) If there is damage, repair the sealant (TASK 28-11-00-300-803).
- (c) Do a visual check for missing or loose fuel tank protective finish (topcoat).
 - 1) If there is loose finish, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-10-00-080-001

- (1) Remove the fuel tank cleaning equipment and material.

SUBTASK 28-10-00-410-006

- (2) Install these components:

- (a) Sump drain valve (TASK 28-11-61-400-801, TASK 28-11-21-400-801, TASK 28-11-41-400-801)
- (b) FQIS tank units (TASK 28-41-44-400-801, TASK 28-41-21-400-801)
- (c) Fuel scavenge jet pumps (TASK 28-22-17-400-801).

SUBTASK 28-10-00-410-007

- (3) Install the removed support brackets and fuel tank equipment.

SUBTASK 28-10-00-080-002

- (4) Remove the protective covers from these fuel system components:

- (a) Fuel pump inlets
- (b) Fuel scavenge system inlets
- (c) Bypass valve inlets.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 28-10-00-410-008

- (1) Install all panels or tank structure removed for access (TASK 28-11-11-400-801, TASK 28-11-11-400-802, TASK 28-11-11-400-803, TASK 28-11-31-400-801).

SUBTASK 28-10-00-910-023

- (2) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-10-00-210-007

- (3) Make sure that there is no fuel leakage (TASK 28-11-00-790-801).

SUBTASK 28-10-00-620-062

- (4) Do this task: Biocide Treatment of Fuel Tanks - Metered Injection Cart, TASK 28-10-00-600-803.

———— END OF TASK ————

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FUEL TANKS - MAINTENANCE PRACTICES

1. General

- A. This procedure contains these tasks:
 - (1) Purging and fuel tank entry precautions
 - (2) Purging and fuel tank entry
 - (3) Fuel tank closure.
- B. If you make a decision not to do this recommended procedure, you must have an approved alternate procedure. Make sure that the conditions during the purging and fuel tank entry operations give sufficient protection to the persons and equipment used in this procedure. It is possible that local, state, and national fire codes, standards and regulations make it necessary to use more restrictive procedures or more procedures than those given in the subsequent steps.
- C. The safety, fire, and health limits in this procedure are used by Boeing at the manufacturing sites in the State of Washington. For fuel tank and confined space entry, Boeing is required to have an aircraft confined space entry program. This program is established to control the entry into confined spaces to protect the safety and health of persons who go into fuel tanks and other closed areas. Important requirements of the program include:
 - (1) Identification and Warning Sign Placement
 - (2) Observer Communication with Persons inside Confined Spaces
 - (3) Entry Permit Requirements
 - (4) Pre-entry Procedures
 - (5) Entry Procedures
 - (6) Emergency and Rescue Service
 - (7) Fuel Tank Closure
 - (8) Training.
- D. It is recommended that a fuel tank entry program that complies with the local, state and national regulations be followed.

TASK 28-11-00-910-801

2. Purging and Fuel Tank Entry Precautions

(Figure 201,Figure 202,Figure 206)

A. General

- (1) If you make a decision not to do this recommended procedure, you must have an approved alternate procedure. Make sure the conditions during the purging and fuel tank entry operations give sufficient protection to the persons and equipment used in this procedure. It is possible that local, state, and national fire codes, standards, and regulations make it necessary to use more restrictive procedures or more procedures than those given in the subsequent steps.
- (2) The safety, fire, and health limits in this procedure are used by Boeing at the manufacturing sites in the State of Washington. For fuel tank and confined space entry, Boeing is required to have an aircraft confined space entry program. This program is established to control the entry into confined spaces to protect the safety and health of persons who go into fuel tanks and other closed areas. Important requirements of the program include:
 - (a) Identification and Warning Sign Placement
 - (b) Observer Communication with Persons inside Confined Spaces

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- (c) Entry Permit Requirements
 - (d) Pre-entry Procedures
 - (e) Entry Procedures
 - (f) Emergency and Rescue Service
 - (g) Fuel Tank Closure
 - (h) Training.
- (3) This procedure contains the precautions you must obey before you purge and enter the fuel tanks for maintenance. This task contains these procedures:
- (a) Purging and Fuel Tank Entry - Definitions
 - (b) Purging and Fuel Tank Entry - Airplane Precautions
 - (c) Purging and Fuel Tank Entry - Electrical Equipment Precautions
 - (d) Purging and Fuel Tank Entry - Equipment Precautions
 - (e) Purging and Fuel Tank Entry - Personnel Precautions
 - (f) Purging and Fuel Tank Entry - Adverse Weather Conditions Precautions.
- (4) The next task, Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802, contains the steps you must follow to purge and enter a fuel tank.

B. References

Reference	Title
12-11-00 P/B 301	FUEL - SERVICING
28-26-00 P/B 201	DEFUELING - MAINTENANCE PRACTICES

C. Tools/Equipment

Reference	Description
STD-420	Gloves - White Cotton
STD-1081	Flashlight - Explosion Proof
STD-1086	Gloves - Rubber
STD-1128	Coveralls - Cotton, No Pockets
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-3940	Air Source - Regulated, Dry Filtered, 0-150 psig
STD-7374	Gloves - Fuel and Solvent Resistant
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
500	Left Wing
600	Right Wing

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F. Purging and Fuel Tank Entry - Definitions

SUBTASK 28-11-00-910-003

(1) Approved Persons:

- (a) Persons who are trained and understand the dangers and procedures for fuel tank entry and are responsible to make sure that the airplane, equipment and the environment is safe for maintenance operations.

SUBTASK 28-11-00-910-004

(2) Approved Persons for Fuel Tank Entry:

- (a) Persons who are trained and understand the dangers and procedures for fuel tank entry.

SUBTASK 28-11-00-910-005

(3) Class I, Division 1, Hazardous Locations (or equivalent standard):

- (a) Locations where ignitable concentrations of flammable gases or vapors can exist under standard operational conditions.
- (b) Locations where ignitable concentrations of flammable gases or vapors may exist frequently because of repair or maintenance operations.
- (c) Locations where ignitable concentrations of flammable gases or vapors can exist because of leakage.
- (d) Locations where equipment problems or incorrect operation of equipment or processes can release ignitable concentrations of flammable gases or vapor, and can also cause failure of electrical equipment at the same time.

SUBTASK 28-11-00-910-006

(4) Class I, Division 2, Hazardous Locations (or equivalent standard):

- (a) Locations where flammable liquids or gases are handled, processed or used, but where the liquid, vapors, or gases will usually be in closed containers or closed systems. The containers or systems will not allow the release of liquid, gas or vapor in sufficient quantity to produce an ignitable fuel and air mixture unless the container or system fails or is damaged.

SUBTASK 28-11-00-910-007

(5) Explosion-Proof Equipment:

- (a) Equipment contained in a case that will not be damaged by an internal explosion caused by explosive vapors inside the unit.
- (b) Equipment that will not cause explosive vapors around the unit to ignite even when sparks, flashes or an explosion of vapor occurs inside the unit.
- (c) Equipment that operates at an external temperature which will not cause explosive vapors around the unit to ignite.
- (d) Equipment that has been approved by an independent test laboratory such as Underwriters Laboratories (UL) or Factory Mutual, for use in Class I Division 1 hazardous locations (or an equivalent standard).

SUBTASK 28-11-00-910-008

(6) Fire-Safe Condition:

10% or less of the Lower Explosive Limit (LEL).

Table 201/28-11-00-993-850

FIRE-SAFE CONDITION

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A FIRE-SAFE CONDITION OCCURS WHEN THE VAPOR CONCENTRATION
IS LESS THAN 10 PERCENT OF THE LOWER EXPLOSIVE LIMIT (LEL)

SUBTASK 28-11-00-910-009

(7) Health-Safe Condition:

- (a) An atmosphere where oxygen content is a minimum of 19.5% to a maximum of 23.5% by volume at sea level, and the vapor concentrations are below the Permissible Exposure Limits (PEL).
- (b) The Nitrogen Generation System (NGS) decreases the oxygen content in the fuel tanks below the health-safe limits. Fresh air is composed of approximately 21% oxygen and 79% nitrogen. An atmosphere with less than 19.5% oxygen is an oxygen-deficient (low oxygen content) environment. You must fully ventilate the applicable fuel tank before you breathe the air in that fuel tank.
- (c) Because kerosene has a low vapor pressure, the concentrations are usually within the limits needed for a Health-Safe condition. Thus, you usually get very low (safe) values at usual temperatures (less than approximately 70°F (21°C)). At tank temperatures of approximately 90°F (32°C), it is possible to get gas concentrations more than the Health-Safe value with kerosene. At tank temperatures of more than 90°F (32°C), it is possible to get gas concentrations more than the Fire-Safe value. It is also possible that a different type of fuel was kept in a tank that usually contains kerosene. If the purging procedure was not done, this causes high concentration values when you use the combustible gas indicator or air monitor with Photo Ionization Detector (PID).



WARNING THERE IS NO HEALTH-SAFE LIMIT FOR JP-4/JET-B FUEL WHICH CAN CONTAIN BENZENE. IT IS POSSIBLE THAT BENZENE CAUSES CANCER.



WARNING DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (d) Before you go into a fuel tank that contained JP-4 or JET B, wear a full-mask respirator with an attached breathing supply.

Table 202/28-11-00-993-851

HEALTH-SAFE CONDITION		
A HEALTH-SAFE CONDITION OCCURS WHEN THE OXYGEN CONTENT IS A MINIMUM OF 19.5% TO A MAXIMUM OF 23.5% BY VOLUME AT SEA LEVEL, AND THE VAPOR CONCENTRATIONS ARE BELOW THESE PERMISSIBLE EXPOSURE LIMITS:		
Fuel	Permissible Exposure Level Total Hydrocarbons TWA ^{*[1]} (ppm)	Lower Explosive Level (percent)
Aviation Gasoline	300	1.0
Jet A	30	0.7
Jet A-1	30	0.7
JP-5	30	0.7
JP-8	30	0.7

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*[1] TWA - Time Weighted Average

SUBTASK 28-11-00-910-010

(8) LEL:

- (a) The minimum concentration of flammable vapors in air below that propagation of flame does not occur on contact with a source of ignition.

SUBTASK 28-11-00-910-011

(9) PEL:

- (a) The time weighted average airborne concentrations of substances at that it is believed that nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, without adverse health effects.

NOTE: The PEL used in this procedure are the PEL used by Boeing personnel during fuel tank entry. If the local PEL are more restrictive than the ones given in this procedure, use the equivalent local PEL.

SUBTASK 28-11-00-910-012

(10) Purging or Purged (for Fuel Tank Entry):

- (a) Purging an aircraft fuel tank is defined by these two conditions:

- 1) The removal of any fuel or fuel vapor that remains after you drain the fuel tank sumps.

NOTE: A purged fuel tank contains a nonflammable atmosphere that can be maintained by mechanical ventilation.

- 2) The removal of the low oxygen content air caused by the NGS.

SUBTASK 28-11-00-910-013

(11) Potential Sources of Ignition:

- (a) Potential sources of ignition include:

- 1) open flames (matches, cigarette lighters)
- 2) electrical equipment (lights, motors, sparks from engine exhaust)
- 3) frictional hot spots
- 4) electromagnetic energy (radio transmissions or radars)
- 5) static electricity
- 6) lightning.

G. Purging and Fuel Tank Entry - Airplane Precautions

SUBTASK 28-11-00-910-014

- (1) Do the maintenance on the fuel tanks in areas that allow the free movement of air, fire fighting equipment, and other emergency equipment.

SUBTASK 28-11-00-910-015

- (2) A rope barrier must be placed around the airplane, to identify the Class I, Division 1 hazardous locations. See Figure 201 for the distance requirements. The rope barrier must include signs or placards that state: DANGER - OPEN FUEL TANKS.

SUBTASK 28-11-00-910-016

- (3) The airplane must be correctly grounded to an approved ground before you defuel the airplane or open any fuel tanks.

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SUBTASK 28-11-00-910-017



WARNING

DO NOT USE AIRPLANE ELECTRICAL POWER WHEN FUEL TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL VAPOR AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Before the fuel tank access doors are opened, all of the electrical power to and from the airplane must be removed. Placards which state that power should not be restored on the airplane until the fuel tank(s) are closed should be attached to applicable locations.

SUBTASK 28-11-00-910-018

- (5) The main, and auxiliary batteries must be disconnected. Placards which state not to connect the batteries until the fuel tanks are closed should be attached to all disconnected battery locations.

SUBTASK 28-11-00-910-019

- (6) All safety, support, and maintenance equipment must be in place before you open the fuel tank access doors. Movement of equipment can cause sparks that can cause fuel vapors to ignite.

SUBTASK 28-11-00-910-020

- (7) No painting operations are permitted on airplanes with open fuel tanks.

H. Purging and Fuel Tank Entry - Electrical Equipment Precautions

SUBTASK 28-11-00-910-021



WARNING

FOLLOW THE SUBSEQUENT RADIO AND RADAR LIMITS. FAILURE TO FOLLOW THE SUBSEQUENT RADIO AND RADAR LIMITS CAN CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE SERIOUS INJURY OR DEATH TO PERSONS AND CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) No radio or radar equipment should operate nearer to an open fuel tank than the distances specified in Table 203.

Table 203/28-11-00-993-842

	SEPARATION DISTANCE (FT,M)	
POWER (EIRP ^[1]) OF EQUIPMENT TRANSMITTING RADAR OR RADIO ^[2]	MAINTENANCE WITH OPEN FUEL TANKS PURGED	MAINTENANCE WITH OPEN FUEL TANKS NOT PURGED (or during purging)
More than 100 watts	200 ft (61 m)	200 ft (61 m)
25 to 100 watts	50 ft (15 m)	50 ft (15 m)
Less than 25 watts ^[3]	10 ft (3 m)	50 ft (15 m)
Radiating ground approach control or pattern surveillance radar	300 ft (91 m)	300 ft (91 m)
Open flame, heat sources, lighted smoking material, and any other potential ignition sources	50 ft (15 m)	50 ft (15 m)

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- *[1] EIRP is Effective Isotropic Radiated Power in watts.
- *[2] This separation distance does not apply to airplane installed radio transmitters. Any limits on operations for the airplane VHF, SATCOM, HF, weather radar, etc., are listed in the airplane operations manuals.
- *[3] This category includes mobile phones, pagers, two-way radios, etc. There are low power (explosion proof) radios that are approved for use in Class I division 1 hazardous locations that can be used safely in the vicinity of open, not purged, fuel cells and other areas containing fuel vapors.

SUBTASK 28-11-00-910-022

- (2) Fuel in the beam of operational high-powered radar that can produce a peak power density that exceeds 5 watts per square centimeter is hazardous. Electromagnetic energy of this intensity can ignite fuel vapors and cause a fire.

SUBTASK 28-11-00-910-023

DURING OPEN FUEL TANK OPERATIONS, THE ENTIRE AREA AROUND THE AIRPLANE AND ANY ADJACENT AREAS THAT COULD COLLECT FUEL VAPORS ARE CLASSIFIED AS CLASS I DIVISION 1 HAZARDOUS LOCATIONS. THE HAZARDOUS LOCATION CLASSIFICATION APPLIES TO AIRPLANES BEFORE AND AFTER A FUEL TANK IS PURGED.

WARNING

THE CLASS I DIVISION 1 HAZARDOUS LOCATION EXTENDS FROM THE GROUND UP TO 18 INCHES (45.7 CM) ABOVE THE GROUND. ONLY USE ELECTRICAL EQUIPMENT WHICH IS APPROVED FOR THE APPLICABLE HAZARDOUS LOCATION.

- (3) Electrical equipment that is energized or operated within 50 ft (15 m) horizontally and 18 in. (457 mm) or less above the ground of an open fuel tank, must be rated explosion-proof for Class I, Division 1 hazardous locations. This includes energized plugs and receptacles. For radio and radar equipment (transmitting equipment), see Table 203 for separation distance requirements.

SUBTASK 28-11-00-910-024

- (4) Figure 201 shows the different classification of hazardous locations around airplanes with open fuel tanks.

SUBTASK 28-11-00-910-025

- (5) Only use approved explosion proof flashlight, STD-1081, that operates correctly in the fuel tanks.

NOTE: The use of explosion-proof lights in or near an open fuel tank is permitted only by approved persons. The air in the fuel tank must be 10 percent or less of the LEL.

SUBTASK 28-11-00-910-026

- (6) Only use explosion-proof flood extension lights and power cords that are approved to supply external light.

SUBTASK 28-11-00-910-027

- (7) Do not connect or disconnect electrical equipment from energized outlets (within 100 ft (30 m) of an open fuel tank) unless the equipment is fitted with explosion-proof plugs.

SUBTASK 28-11-00-910-028

- (8) Do not use electrical test equipment that can cause sparks in a fuel tank.

I. Purging and Fuel Tank Entry - Equipment Precautions

SUBTASK 28-11-00-910-029

- (1) All metal work platforms or stands used for entry into the fuel tanks or located within a 50 ft (15 m) radius of an open fuel tank (before and after the fuel tank purging) must be bonded to the airplane and grounded to an approved earth ground.

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SUBTASK 28-11-00-910-030

- (2) Before you use ventilation equipment, make sure that the blower or venturi is connected to the airplane ground. The ventilation blower or venturi must be explosion-proof.

SUBTASK 28-11-00-910-031

- (3) Air ducts must be bonded to form a continuous electrical conductor and grounded in at least one place to a static electrical ground.

SUBTASK 28-11-00-910-032

- (4) If you use the ventilation equipment to exhaust fuel vapors from the tank, static build-up on or in the air ducts can reach a level where a spark can ignite the vapors and an explosion can occur. It is strongly recommended that the air ducts be coated inside and out with a conductive coating. Each section of the air duct must be correctly bonded to each other. Air ducts made from vinyl fabric are not recommended because vinyl is an insulator of static charges. If the air duct uses a metal helical wire to create a non-collapsible duct, make sure that the wire is permanently attached to a metal or conductive plastic connection on each end of the duct section.

SUBTASK 28-11-00-910-033



WARNING

DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

- (5) Equipment used to ventilate the fuel tanks or provide warm or cool air must not be turned off with the air duct in the fuel tank. The fuel vapor from the fuel tank can enter the air duct and cause an explosion at the motor. Make sure the blower is on before you put the air duct in the fuel tank. Make sure the blower remains on until the air duct is removed from the fuel tank.

SUBTASK 28-11-00-910-034

- (6) When you remove an air duct from the fuel tank or disconnect the air duct at the blower, turn the duct 180 degrees away from the purging area. This will stop the flow of fuel vapor into the air duct line.

SUBTASK 28-11-00-910-035

- (7) During fuel tank maintenance, make sure that there is continuous mechanical ventilation. The fresh air flow from the ventilation equipment must maintain the oxygen levels between 19.5% and 23.5% by volume and the fuel vapor levels below 10% LEL (fire safe limit).

SUBTASK 28-11-00-910-036

- (8) Use a combustible gas indicator or air monitor with PID to monitor the environment inside the fuel tank. The combustible gas indicator or air monitor with PID must be designed for Class I, Division 1 hazardous locations and calibrated for the correct type of jet fuel. The combustible gas indicator or air monitor with PID must be securely attached to a ladder or stand at the fuel tank entry location. As an alternate procedure, you can take an additional combustible gas indicator or air monitor with PID into the fuel tank to monitor the environment where you will do the maintenance.

SUBTASK 28-11-00-910-037

- (9) Obey these precautions for equipment used to do maintenance in the fuel tanks:
 - (a) Always use a checklist to record all equipment, tooling, and material that you bring into the fuel tank. Use the checklist to make sure that all maintenance items are removed before you close the fuel tank.

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- (b) Do not use steel wool in the fuel tank. A piece of wire from steel wool is a potential ignition source.
- (c) Only use approved non-static plastic containers with rounded corners to hold tools and supplies.
- (d) Keep all sharp edged tools in the container at all times when not in use. Sharp edged tools can cause damage to equipment and sealant.
- (e) Only use a cotton wiper, G00034, in open fuel tanks. When you wipe up fuel in the fuel tank, use a clean cotton wiper, G00034.

NOTE: Do not use paper towels or other paper products.



WARNING

DO NOT GET THE SEALANT ON YOUR SKIN OR IN YOUR EYES. PUT ON PROTECTIVE CLOTHING, GOGGLES AND A FACE MASK. USE IN A WELL VENTILATED AREA. DO NOT BREATHE THE GAS. IF YOU GET THE SEALANT ON YOUR SKIN OR IN YOUR EYES, WIPE IT AWAY. GET MEDICAL AID IF YOUR SKIN OR EYES BECOME IRRITATED.

- (f) Solvents, sealants, or other materials used in the fuel tank can be a health and fire hazard. Use the correct protective equipment for the solvent or material that is used. Protective equipment includes: respirators, eye protection, protective clothes, gloves etc.
- (g) Keep the quantity of solvents that you use to a minimum. Only bring enough solvent in the tank to complete the maintenance. Apply the solvent to a clean cotton wiper, G00034, not the airplane structure or sealant. After you finish with the cotton wiper, G00034, put it in a polyethylene bag or remove the cotton wiper, G00034, from the airplane. This will keep the solvent vapor to a minimum.
- (h) Powered tools must be air-driven.



WARNING

ONLY USE SHOP AIR OR BOTTLED AIR AS THE SOURCE OF GAS TO POWER AIR DRIVEN EQUIPMENT. GASES OTHER THAN SHOP OR BOTTLED AIR CAN REMOVE OXYGEN FROM A CLOSED AREA. IF YOU GO INTO A CLOSED AREA WITHOUT ENOUGH OXYGEN , YOU CAN BECOME UNCONSCIOUS OR IT CAN KILL YOU.

- (i) Only use regulated air source, STD-3940, or bottled air as a gas source for air-driven tools. Do not use nitrogen, oxygen, carbon dioxide (CO₂), or any other non-air source of gas.

J. Purging and Fuel Tank Entry - Personnel Precautions

(Figure 202)

SUBTASK 28-11-00-910-038

- (1) Make sure that the persons who will go into fuel tanks are approved persons for fuel tank entry.

SUBTASK 28-11-00-910-039

- (2) Make sure that observers who will watch persons in the fuel tank(s) are approved as fuel tank entry observers.

SUBTASK 28-11-00-910-040

- (3) The fuel vapors in and from the fuel tank are explosive and hazardous to your health. The fuel tanks must be in a fire-safe condition when an initial fuel tank entry is made. You must wear an approved respirator with a breathing-air supply when you go into a fuel tank that is in a fire-safe condition. It is necessary to have a good flow of air through the fuel tank to get a fire-safe condition. The air must flow continuously during the fuel tank entry procedure.

EFFECTIVITY
LOM ALL

28-11-00



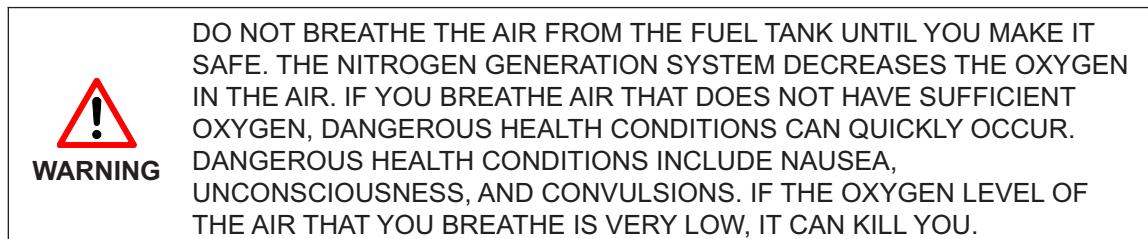
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SUBTASK 28-11-00-910-041

- (4) The fuel tank must be in a health-safe condition before you can go into the fuel tank without a breathing-air supply. When the fuel tank is in a health-safe condition, at a minimum, it is recommended that a half-mask respirator with an organic vapor filter be used. It is necessary to have a good flow of air through the fuel tank to get a health-safe condition. The air must flow continuously during the fuel tank entry procedure.

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

SUBTASK 28-11-00-910-088



- (5) The NGS decreases the oxygen content of the center fuel tank. Obey these precautions before you breathe the air inside a fuel tank:
- (a) The NGS uses Nitrogen Enriched Air (NEA) to decrease the flammability of the center wing tank. NEA is a hazard in a confined space. NEA increases the nitrogen content and decreases the oxygen. If you breathe air without enough oxygen, it can have serious and immediate effects.
- (b) Table 204 shows the physiological effects of a low oxygen content environment.

Table 204/28-11-00-993-859 Physiological Effects of a Low Oxygen Environment

	Sea Level Oxygen Content %	7000 ft (2134 m) Oxygen Content %
Decrease in night vision		
Increase in breathing volume	17 -19%	19.5 - 21%
Increase in heartbeat rate (pulse)		
Increase in breathing and pulse rates	13 -16%	16 - 19%
Decrease in muscular coordination		
Emotional upset		
Unusual fatigue	11 -12%	13 - 15%
Trouble breathing		
Nausea and vomiting		
Unable to do tasks	7 - 10%	9 - 12%
Loss of consciousness		
Intermittent breathing		
Unable to move	0 - 6%	0 - 8%
Convulsions		
Death in minutes		

- (c) If a person breathes air with a very low oxygen content (4 - 6%), it can cause the person to become unconscious in 40 seconds. The person must be rescued and given oxygen immediately. Even after the person is given oxygen, life-threatening health problems can still occur.

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LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003
(Continued)

- (d) The low oxygen content air will remain in the fuel tank even when the nitrogen generation system is not active. The NEA is designed to flow into the center wing tank only. The flow path of the NEA is from vent channels in the center wing tank to the surge tanks. From the surge tanks, the NEA is vented overboard and can enter the main tanks through the main tank vents. An oxygen level, below health-safe limits, can exist in the center fuel tank or the main tanks. You must always fully ventilate the fuel tank before you do a fuel tank entry. Mechanical ventilation will remove the NEA from the fuel tank and supply air with an oxygen content within health-safe limits.
- (e) A person that breathes air with a low oxygen content cannot sense that the oxygen level is too low. You must use an oxygen sensor to detect a hazardous low oxygen environment. Do not go into a fuel tank if you hear the aural alarm for the oxygen sensor.
- (f) Fully ventilate the applicable fuel tank before you do a fuel tank entry.
- (g) Before you go into a fuel tank, open and collar the NGS circuit breakers:
Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-3

Row Col Number Name

LOM 406, 407, 412, 415; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

D 17 C01657 NITROGEN GEN CONT

LOM 422-434, 437-447, 450-999

D 17 C01657 NITROGEN GENERATION CONTROL

LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

E 15 C01680 NGS ALT PWR

- (h) You must also install the manual lock bolt into the NGS shutoff valve in the closed position.
- (i) Continuously monitor the oxygen sensor (aural alarm and % oxygen) on the combustible gas indicator or air monitor with PID. Make sure that the oxygen level in the fuel tank remains between 19.5% and 23.5% by volume. Make sure that there is an oxygen sensor at the fuel tank entry location for the observer. As an alternative procedure, a second sensor can be used inside the fuel tank. Get out of the fuel tank immediately if the ventilation equipment stops or you hear the oxygen sensor alarm.
- (j) An organic vapor filter respirator is helpful for fuel vapor, but will not help you breathe in a low oxygen environment.
- (k) If you are the observer and the person in the tank does not respond, do not enter the tank before additional help is available. Make sure that medical help is alerted. Do not try to rescue a person in the fuel tank without a breathing-air supply respirator and a lifeline.

LOM ALL

SUBTASK 28-11-00-910-042

- (6) Hydrocarbon fuels that touch the skin can remove protective oils. Without protective oils, the skin can become dry, chapped, cracked, or possibly become infected. If a person breathes too much fuel vapor, the person can become dizzy, get a headache or lose his or her coordination. Jet fuel is composed of many different kinds of hydrocarbon molecules. Exposure to some of these molecules for a long time is known to cause cancer.

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SUBTASK 28-11-00-910-043

- (7) Vapors from fuel or other materials (solvents etc.) used for fuel tank maintenance can replace oxygen from a confined area such as a fuel tank or dry bay. If a person goes into a confined area that contains fuel vapor (or other vapors) without an air supply, the person may not get enough oxygen. This may cause unconsciousness or death. Make sure the environment is continuously monitored with a approved combustible gas indicator or air monitor with PID.

SUBTASK 28-11-00-910-044

- (8) No one is permitted to go into or remain in a fuel tank if:
- (a) the flammable vapor concentration is more than 10% of the lower explosive limit
 - (b) the oxygen content of the fuel tank is below 19.5% or above 23.5%
 - (c) the air ventilation system fails
 - (d) a strong fuel odor is noticed
 - (e) a person feels any physical problems, such as trouble breathing, dizziness, irritation, confusion, light-headedness, fullness in the head, ringing sensation on the ears, nausea, headache, difficulty in breathing, sensation of apparent suffocation, immobility, unusual behavior, failure to respond to communication, or other signs of illness.
 - (f) there is an observed or reported hazard that may reduce the level of safety.

SUBTASK 28-11-00-910-045

- (9) Persons who work in or near an open fuel tank must not
- (a) Slide metal objects, such as tool boxes, ladders, etc.
 - (b) Carry matches or pocket warmers.
 - (c) Wear shoes with metal clips or exposed nails.
 - (d) Wear or use battery-operated devices such as hearing aids, electrical pacemakers or watches, pocket radios, cellular phones or paging equipment unless it is explosion-proof and permitted by approved persons.
 - (e) Use the tank wiring harnesses as handholds.

SUBTASK 28-11-00-910-046

- (10) Persons who work in an open fuel tank must wear approved fuel tank protective clothing. Protective clothing includes:
- (a) A set no pockets cotton coveralls, STD-1128, with non-sparking zippers or buttons. Do not wear wool, silk, nylon or other synthetic clothing.



MAKE SURE THAT THE TEMPERATURE IN THE FUEL TANK DOES NOT BECOME TOO HOT. SARANEX 23P COVERALLS WILL KEEP BODY HEAT IN. IF THE FUEL TANK TEMPERATURE BECOMES TOO HOT, A PERSON CAN HAVE A HEAT STROKE. GET THE PERSON OUT OF THE FUEL TANK. DETERMINE IF MEDICAL AID IS NECESSARY. IF NOT, IT CAN CAUSE AN INJURY.

- (b) Saranex coverall (approved cotton substitute), STD-1129, are also approved for use in fuel tanks.
- (c) Clean cotton boot socks or fuel cell boots.
NOTE: It is recommended that boot socks be worn over fuel cell boots when you stand in a fuel tank. This will reduce the chance that you will slip and fall down.
- (d) Clean cotton head cover (doctor-type hats) with tie strings or a lint free shower-type cap with an attached elastic headband.

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- (e) Clean white cotton gloves, STD-420, or rubber glove, STD-1086.

SUBTASK 28-11-00-100-006

- (11) If a fuel tank entry is necessary before two flights after a biocide treatment, do one of these:

- (a) Flush the fuel tank with untreated fuel a minimum of two times (FUEL - SERVICING, PAGEBLOCK 12-11-00/301, DEFUELING - MAINTENANCE PRACTICES, PAGEBLOCK 28-26-00/201).

NOTE: After a biocide treatment, the concentration of biocide decreases to a lower level after the fuel tank is refueled two times.

- (b) Or, move the treated fuel to a different fuel tank or defuel the applicable fuel tank (DEFUELING - MAINTENANCE PRACTICES, PAGEBLOCK 28-26-00/201).



WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOOGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- 1) Before fuel tank entry, put on this specific equipment: a full face half-mask respirator, STD-7380, coverall (approved cotton substitute), STD-1129, and gloves, STD-7374.

NOTE: The biocide manufacturers Material Safety Data Sheet (MSDS) has information regarding the handling of the product. However, the MSDS is intended for the product before it is diluted in fuel. Once diluted, the concentration is greatly reduced.

SUBTASK 28-11-00-910-047

- (12) Persons who work in or near an open fuel tank must not remove or change clothes near an open fuel tank. You can create sufficient static electricity in the clothes to cause fuel vapor to ignite.

SUBTASK 28-11-00-910-048

- (13) Persons who work in fuel tanks must wear the correct respiratory protection for the fuel tank conditions.

- (a) Persons that use respiratory protection must be trained and know the correct use and limitations of respiratory protection.
- (b) An approved respirator with an attached breathing-air supply is necessary for each person who goes into a fuel tank that is in a fire-safe condition.
- (c) An approved half-mask respirator with a organic vapor filter, at a minimum, is recommended for each person who goes into a fuel tank that is in a health-safe condition.
- (d) Airline Hoods (or equivalent) should be worn by persons if the respirator does not fit correctly due to facial hair or other facial configurations.

SUBTASK 28-11-00-910-049

- (14) At each fuel tank entry location there must be an observer who is outside of the fuel tank. The observer's responsibility is to make sure that person(s) in the fuel tank are safe. The observer must remain outside of the fuel tank in visual contact with the access opening. The observer must be able to communicate with the person(s) inside the fuel tank at all times.

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- (a) There are two ways the observer and the person(s) in the fuel tank can communicate:
 - 1) A confined space communication system designed for aircraft fuel tank use.
 - 2) The observer and the person who will go into the tank can agree on a communication plan such as tugs on the safety rope at a set time interval.

SUBTASK 28-11-00-910-050

- (15) The observer must also keep a report that shows who is in the fuel tank and when that person comes out. A sign attached to the ladder or support equipment which states, "CAUTION - PERSONNEL INSIDE - MOVE NO EQUIPMENT", must be placed at the location of a fuel tank entry. When the personnel in the tank come out, the observer should remove the sign or place it where it does not show.

SUBTASK 28-11-00-910-051

- (16) Many local, state and national regulatory agencies require a confined space entry permit to be signed and approved before a person goes into a fuel tank. A pre-entry checklist is often required by the confined space entry permit. It is recommended that a pre-entry checklist be used before you go into a fuel tank. Figure 206 is an example of a pre-entry checklist used at Boeing facilities.

K. Purgung and Fuel Tank Entry - Adverse Weather Conditions

SUBTASK 28-11-00-910-052

- (1) When thunderstorms or lightning are within a 10 mi (16 km) radius of the immediate area, open fuel tank maintenance procedures must stop. Persons inside of the fuel tanks must get out. Do these steps:
 - (a) Remove the air ducts from the fuel tanks.
 - (b) Switch off the power for all support equipment.
 - (c) Close all of the access openings for the fuel tank.

SUBTASK 28-11-00-910-053

- (2) Open fuel tank maintenance procedures must stop if there are strong wind conditions.

NOTE: Strong wind conditions can cause static electricity to collect. Large quantities of static electricity can collect on support equipment while parked, from the movement of dust particles and air currents during strong wind conditions.

NOTE: Strong wind conditions can also cause the unwanted movement of items or equipment, that can cause injury to personnel or damage to the airplane.

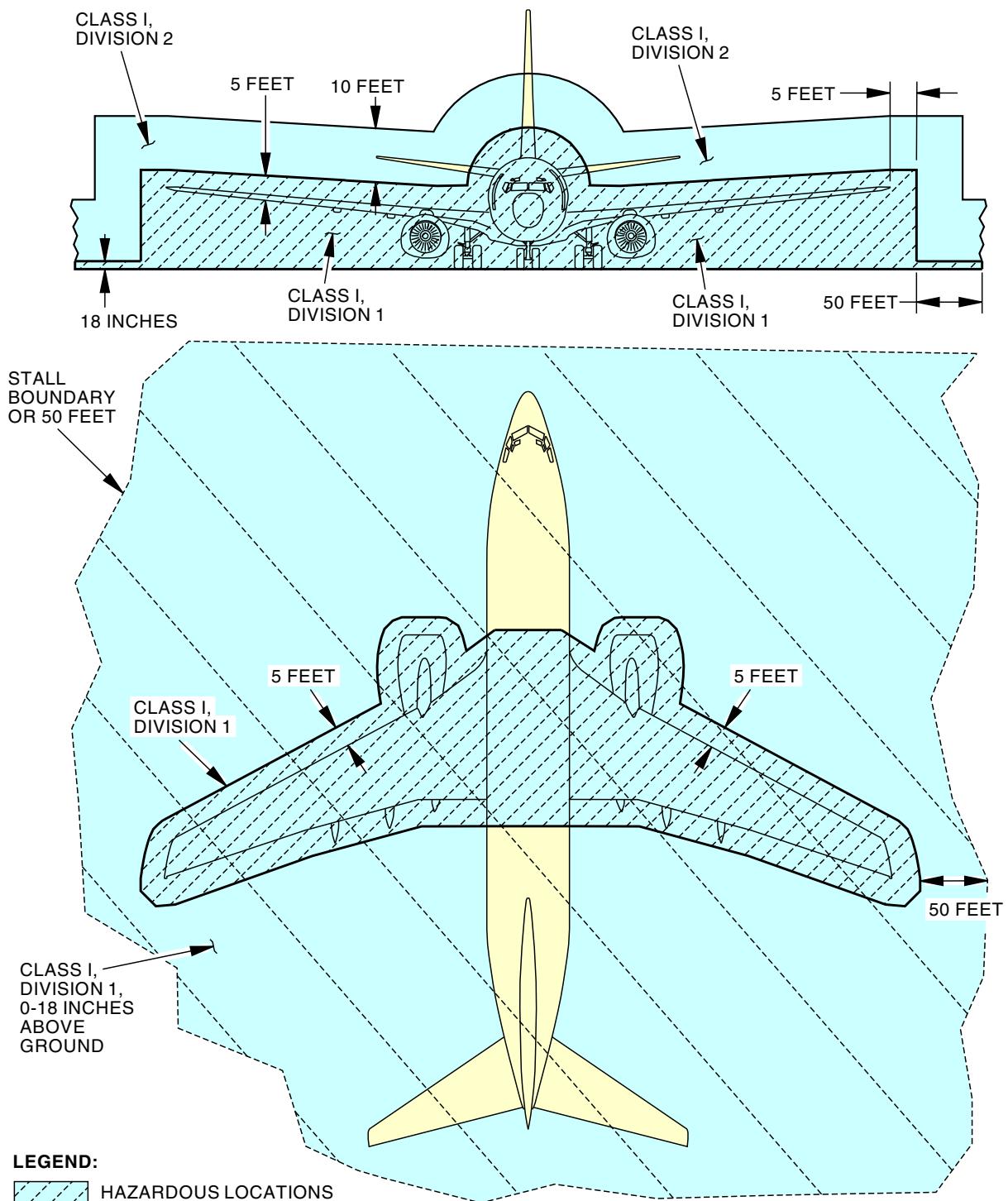
———— END OF TASK ————

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Hazardous Locations - Open Fuel Tank(s)
Figure 201/28-11-00-990-850

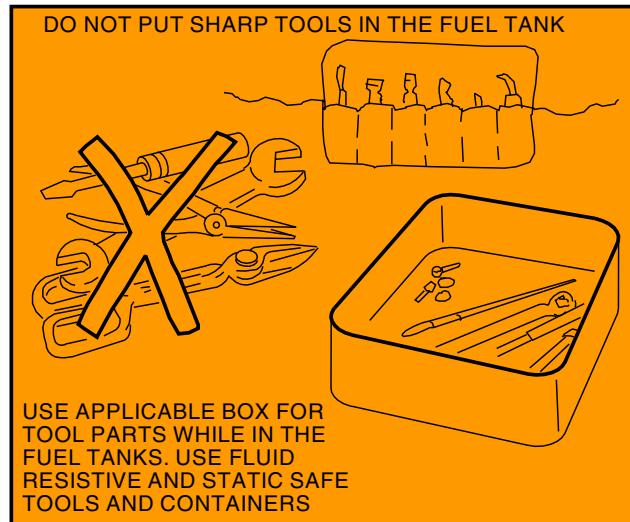
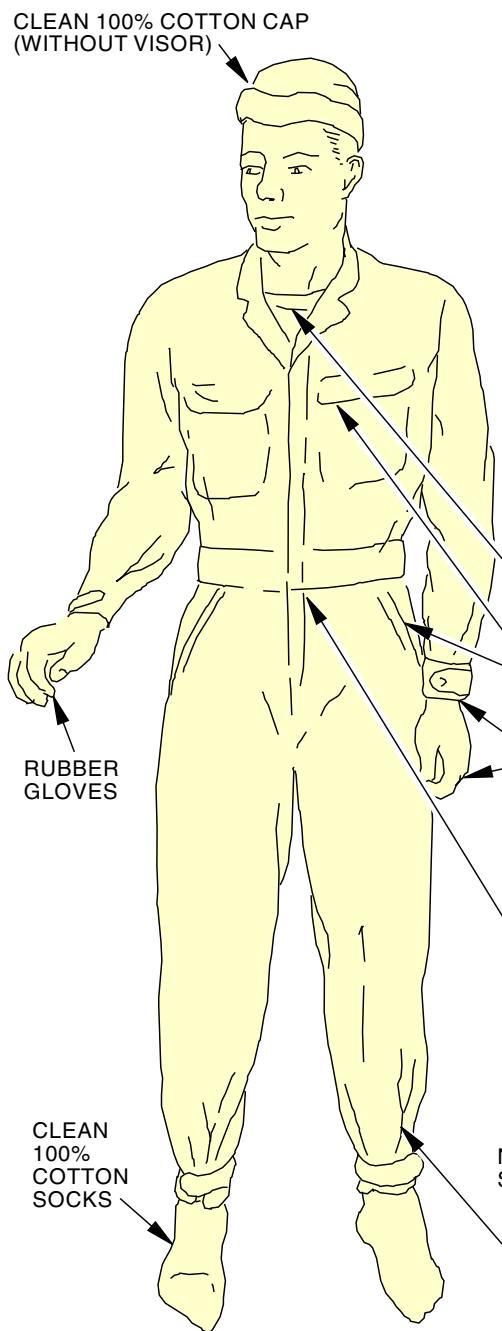
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**737-600/700/800/900
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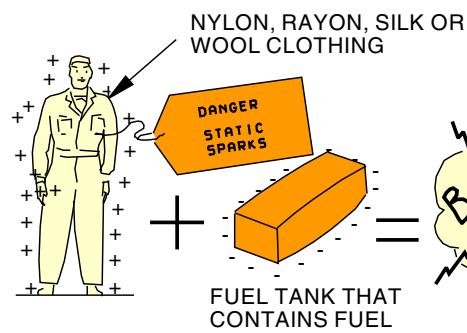


WEAR ONLY 100% COTTON CLOTHING

WEAR ONLY COTTON SHORTS AND COTTON TEE SHIRTS WITHOUT POCKETS UNDER COVERALS

NO POCKETS (IF THERE ARE POCKETS, REMOVE ALL CONTENTS FROM POCKETS AND SEW CLOSED)

REMOVE ALL RINGS AND WATCHES



WARNING:

DO NOT WEAR WOOL, SILK, OR NYLON CLOTHING. WEAR A 100% COTTON COVERALL, FITTED SNUGLY AT WRIST AND ANKLES, WITH NON-SPARKING ZIPPER OR BUTTONS. WOOL, SILK OR NYLON CLOTHING CAN RELEASE STATIC ELECTRICITY AND CAUSE AN EXPLOSION.

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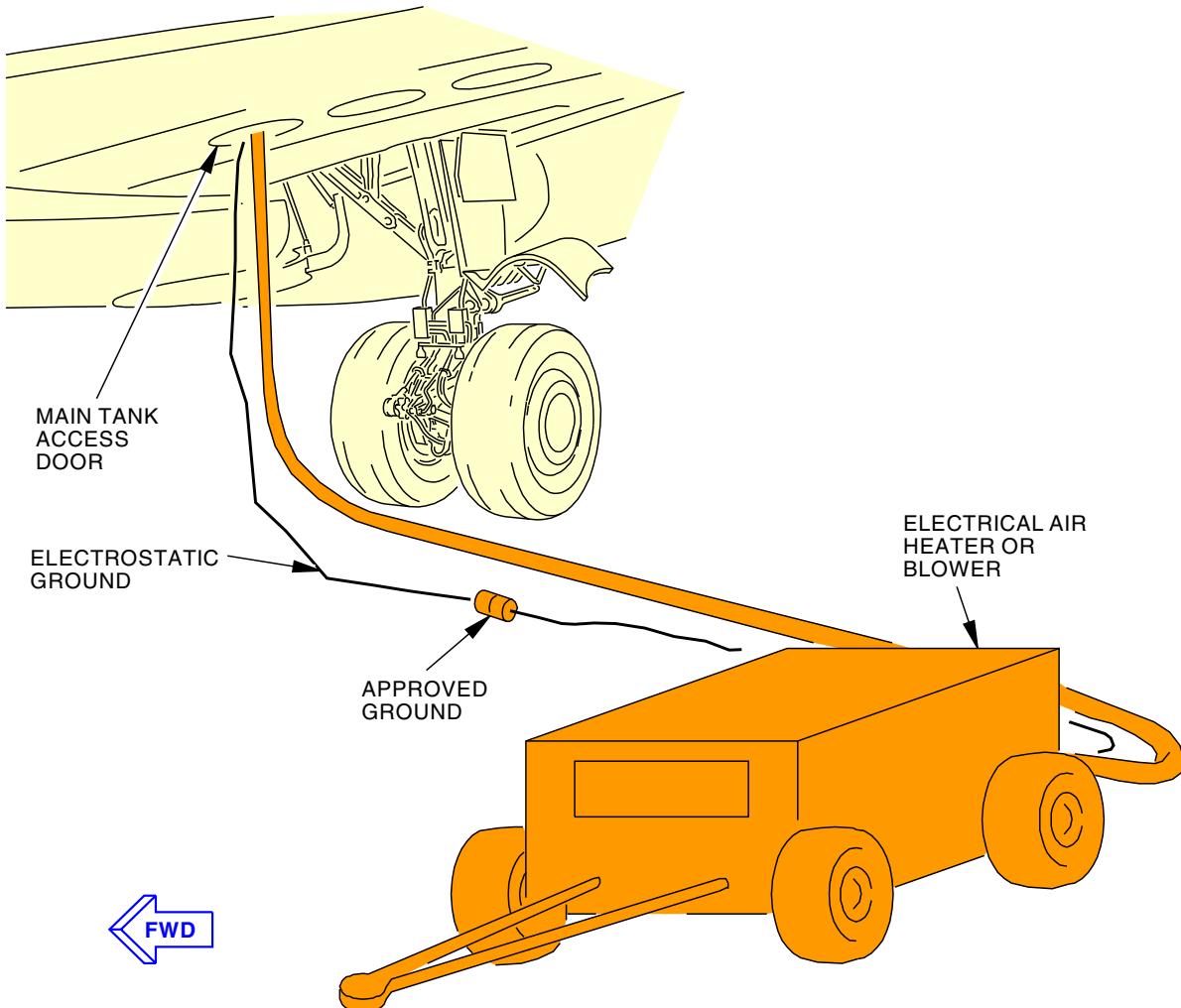
Fuel Tank Entry Precautions
Figure 202/28-11-00-990-851

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Tank Ventilation Equipment
Figure 203/28-11-00-990-803 (Sheet 1 of 5)

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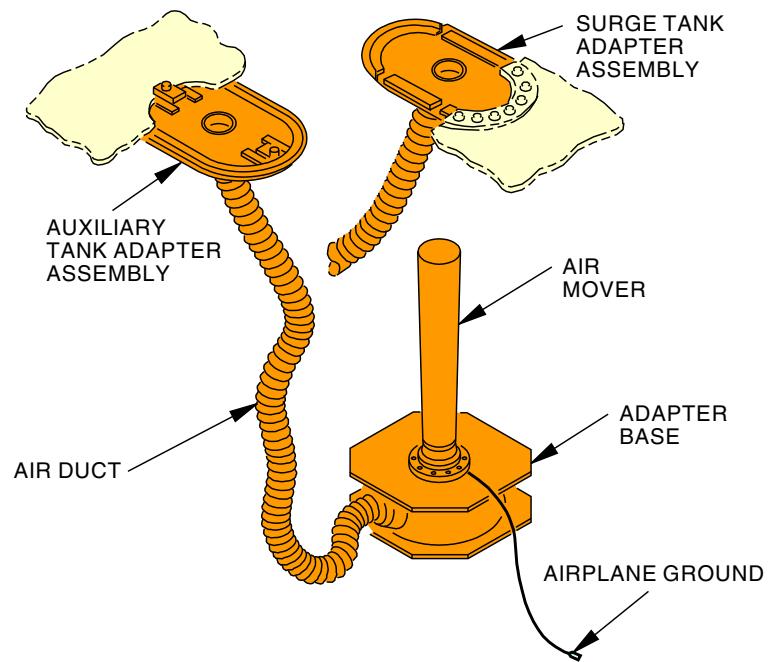
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Tank Ventilation Equipment
Figure 203/28-11-00-990-803 (Sheet 2 of 5)

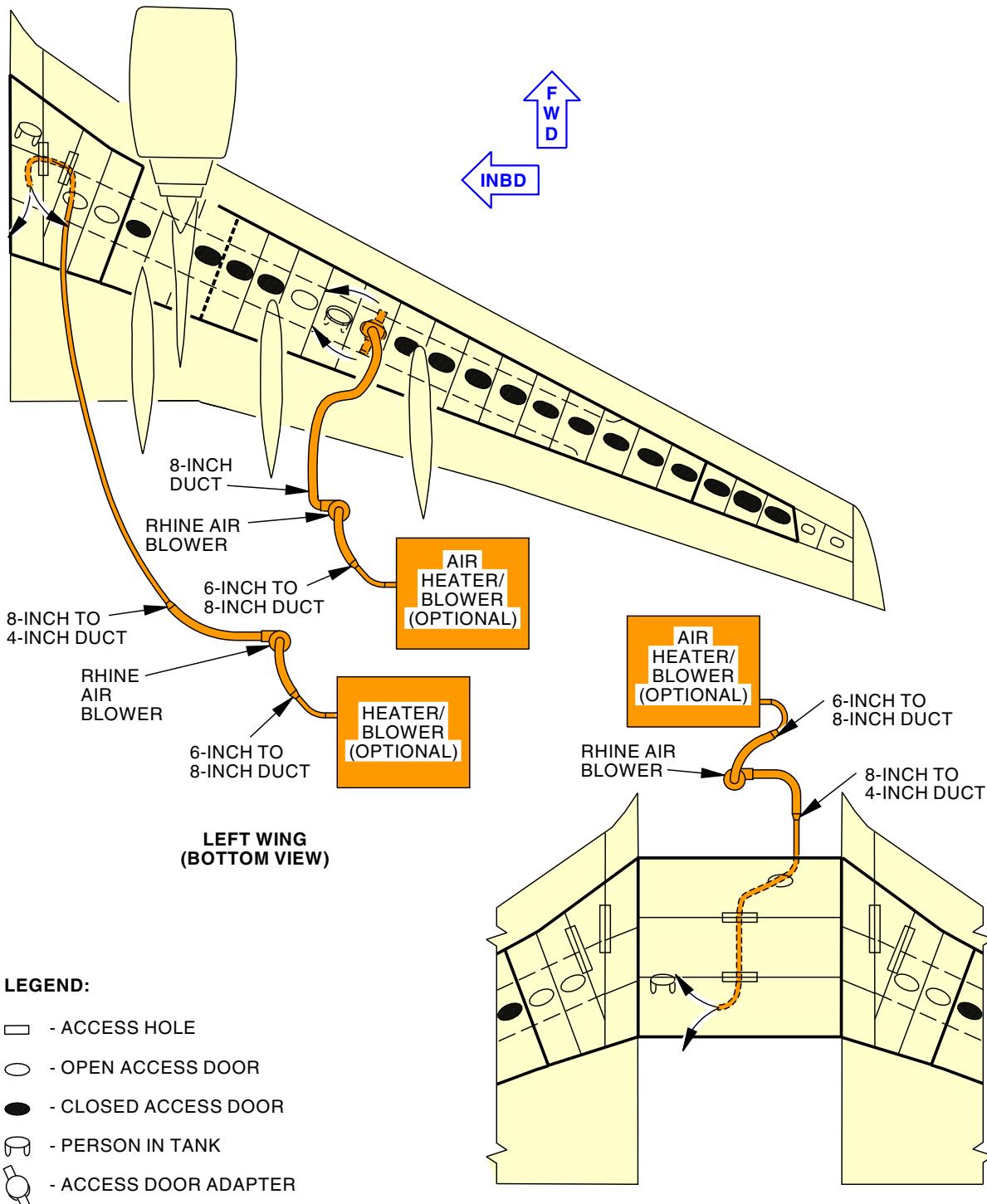
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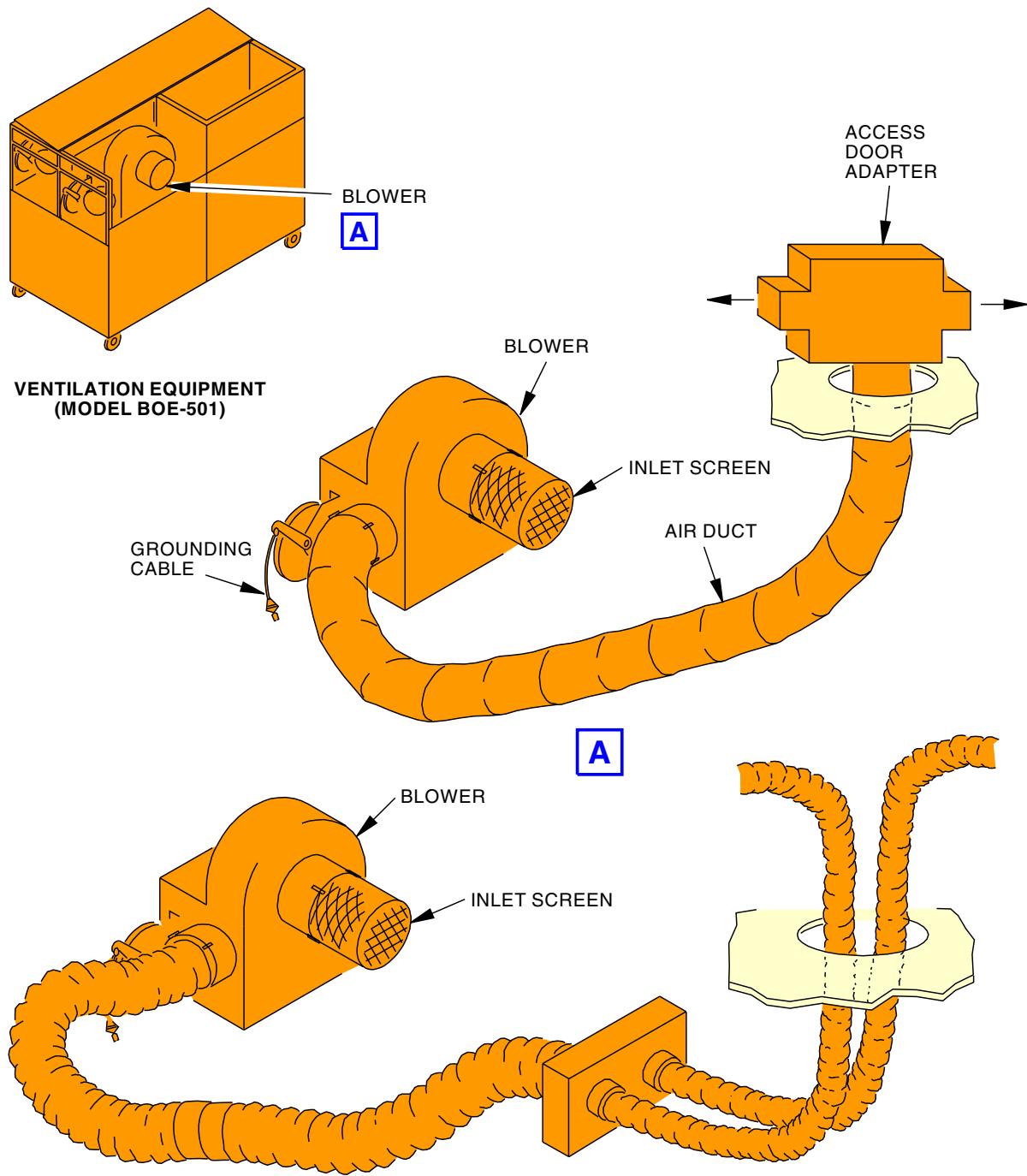


Tank Ventilation Equipment
Figure 203/28-11-00-990-803 (Sheet 3 of 5)

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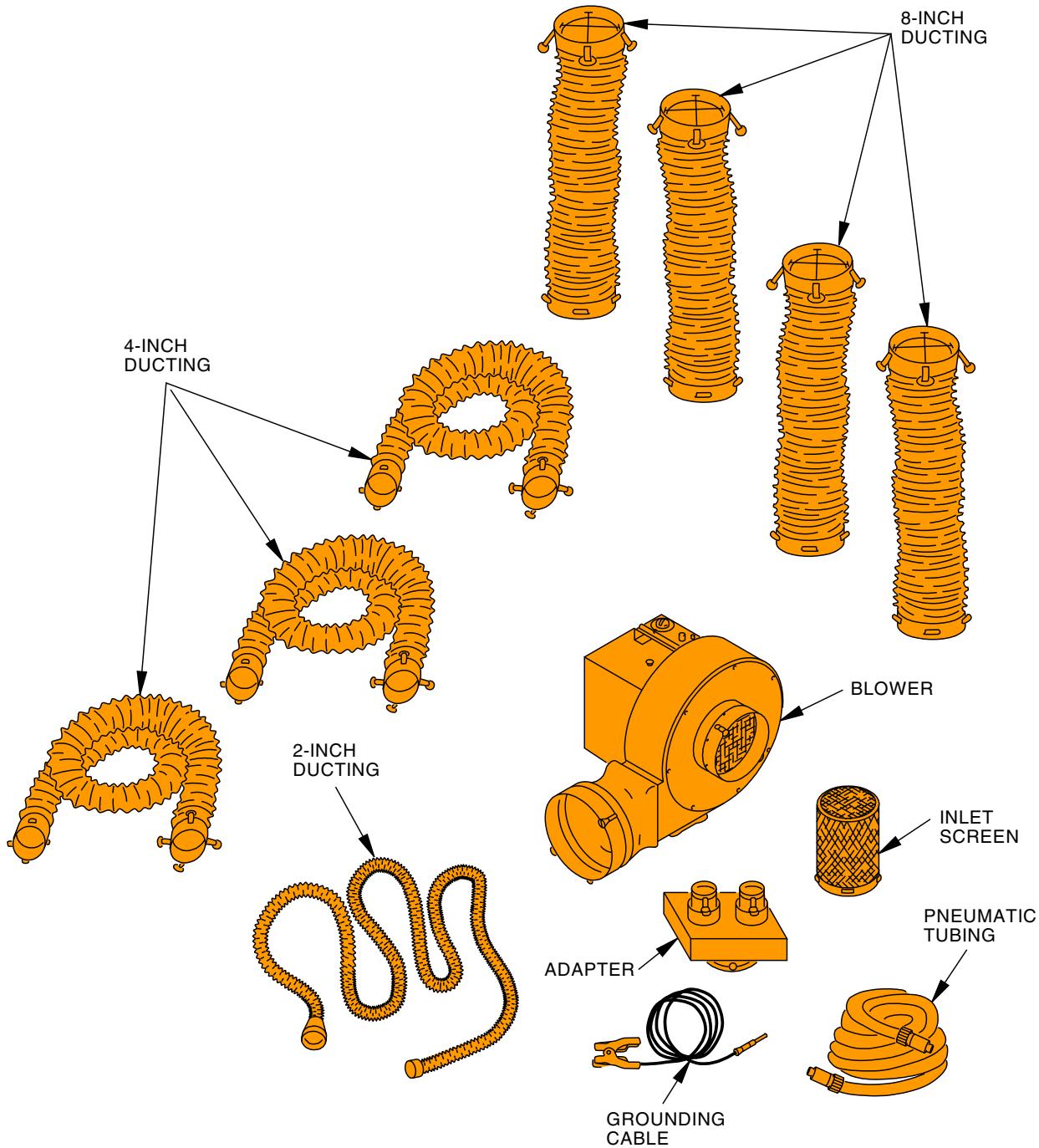
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Tank Ventilation Equipment
Figure 203/28-11-00-990-803 (Sheet 4 of 5)

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AVAILABLE VENTILATION EQUIPMENT

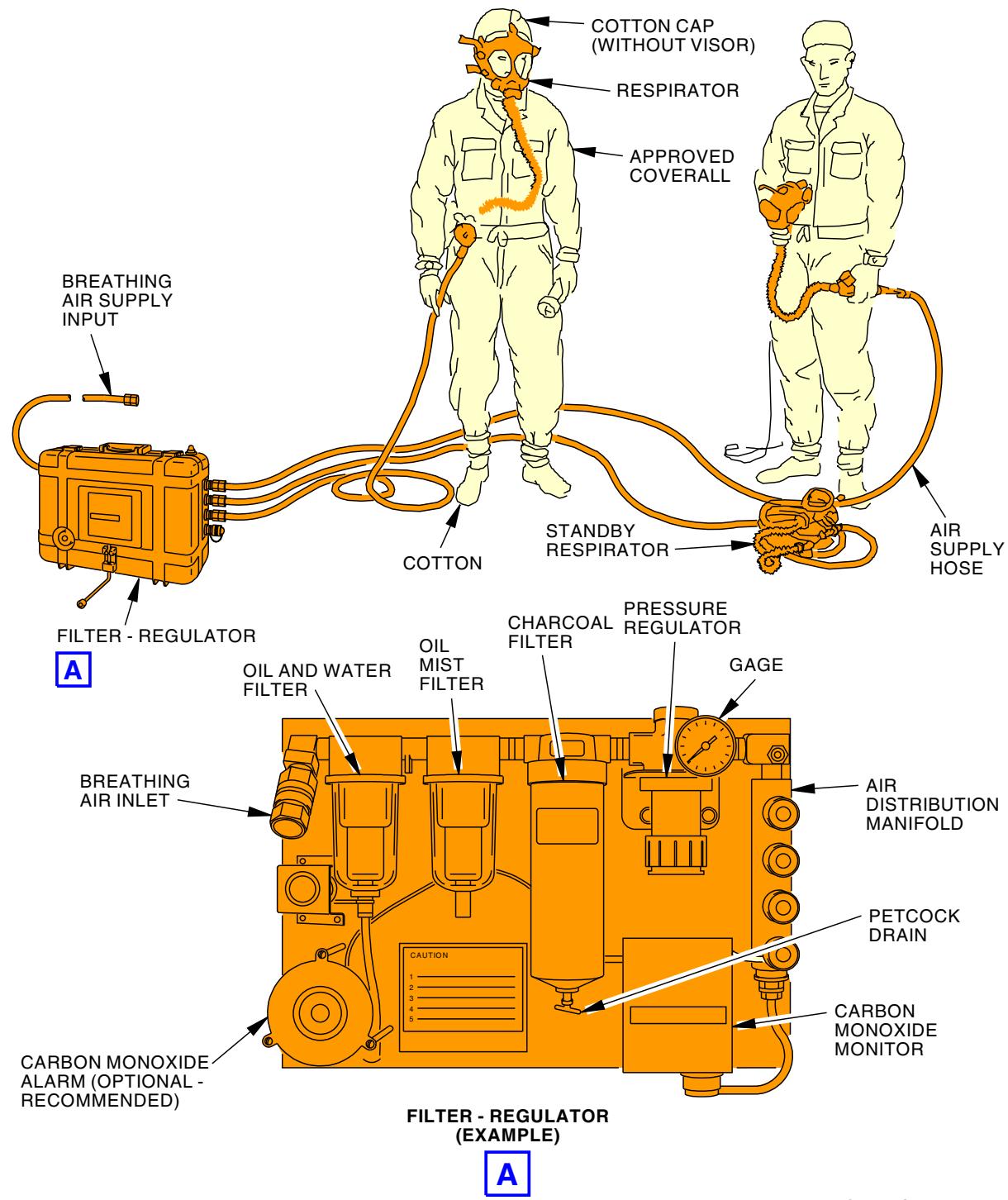
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**Tank Ventilation Equipment
Figure 203/28-11-00-990-803 (Sheet 5 of 5)**

 EFFECTIVITY
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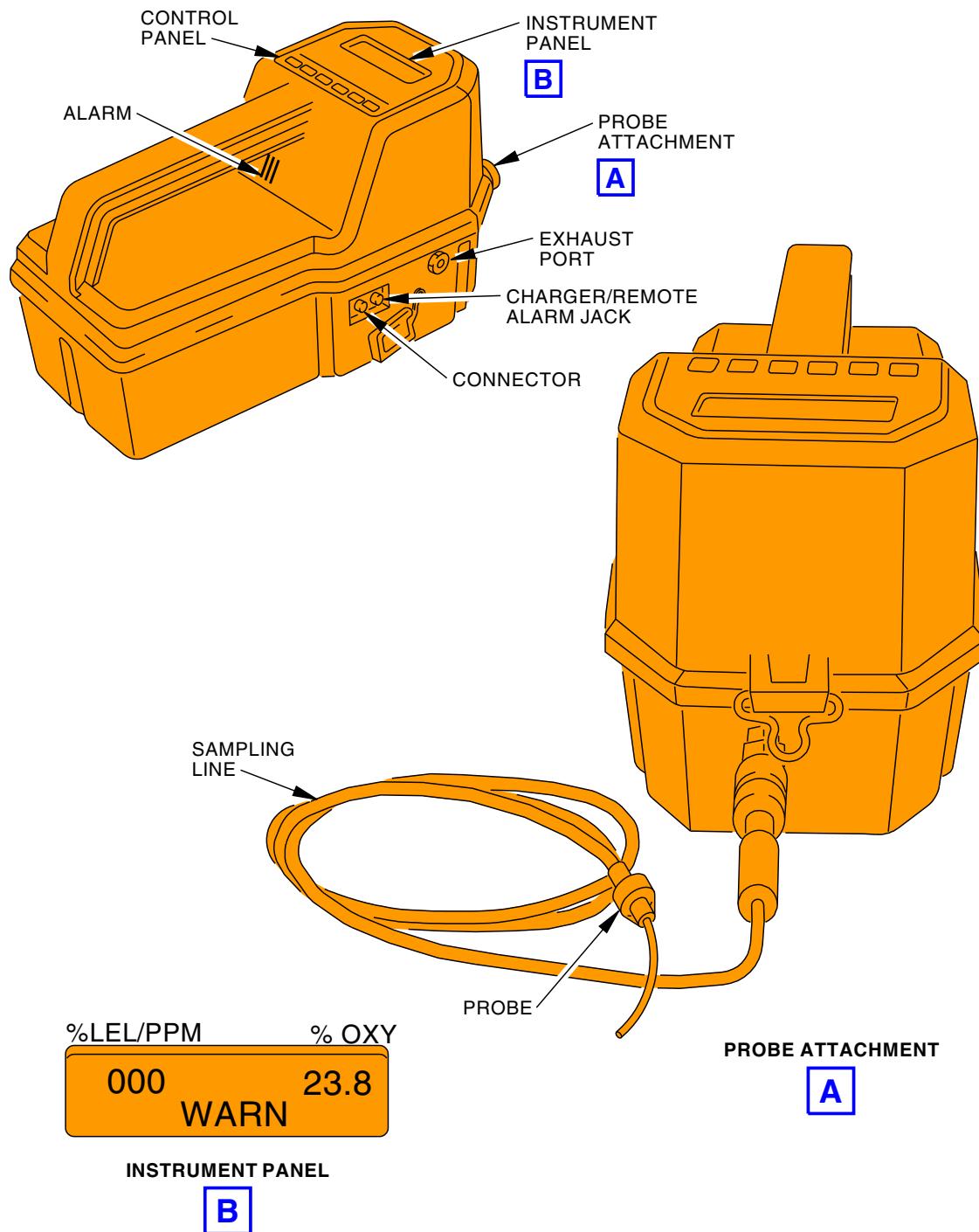
Respiratory Equipment and Clothing (Example)
Figure 204/28-11-00-990-804

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Combustible Gas Indicator (Example)
Figure 205/28-11-00-990-805

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EXAMPLE OF A WET FUEL CELL PRE-ENTRY CHECKLIST

This checklist must be completed prior to start of wet fuel cell entry and/or at shift change PRIOR to work assignment for the continuation of tank work started by a previous shift.

Wet Fuel Cell Entry Location

Area or Building: _____ Stall: _____ Airplane: _____ Tank: _____

Shift: _____ Date: _____ Supervisor: _____

- 1. Airplane and adjacent equipment properly grounded.
- 2. Area secured and warning signs positioned.
- 3. Boost pump switches off and circuit breakers pulled and placarded.
- 4. No power on airplane: battery disconnected, external Power Cord disconnected from airplane, and external power receptacle placarded.
- 5. Radio and radar equipment off (see separation distance requirements).
- 6. Only approved explosion proof equipment and tools will be used for fuel cell entry (lights, blowers, pressure and test equipment, etc.).
- 7. Ensure requirements listed on Aircraft Confined Space Entry Permit are complied with, including appropriate personal protective equipment: OSH class 110 respirator at a minimum, approved coveralls, caps and foot coverings, and eye protection.
- 8. Trained attendant and confined space logsheet required for all wet fuel cell entries.
- 9. Aerators checked for cleanliness prior to use.
- 10. Sponges available for residual fuel mop out.
- 11. All plugs used have streamers attached.
- 12. Mechanical ventilation (venturis or blowers) installed to ventilate all open fuel cells.
NOTE: Ventilation system must remain in operation at all times while fuel cells are open. If ventilation system fails or any ill effects such as dizziness, irritation, or excessive odors are noted, all work shall stop and fuel cells must be evacuated.
- 13. Shop personnel entering cells and standby observers have current "fuel cell entry" certification cards. Certification requires the following training:
 - Aircraft Confined Space Entry Safety
 - Respirator Use and Maintenance
 - Wet Fuel Cell Entry
- 14. Fire Department notified.

Meter Readings

- 15. Oxygen reading (%): _____ By: _____
- 16. Fuel vapor level reading (ppm): _____ By: _____
- 17. Combustible gas meter (LEL) reading: _____ By (FD): _____

I confirm that all entry requirements were met prior to any entry.

Signature of Supervisor or Designee

Date

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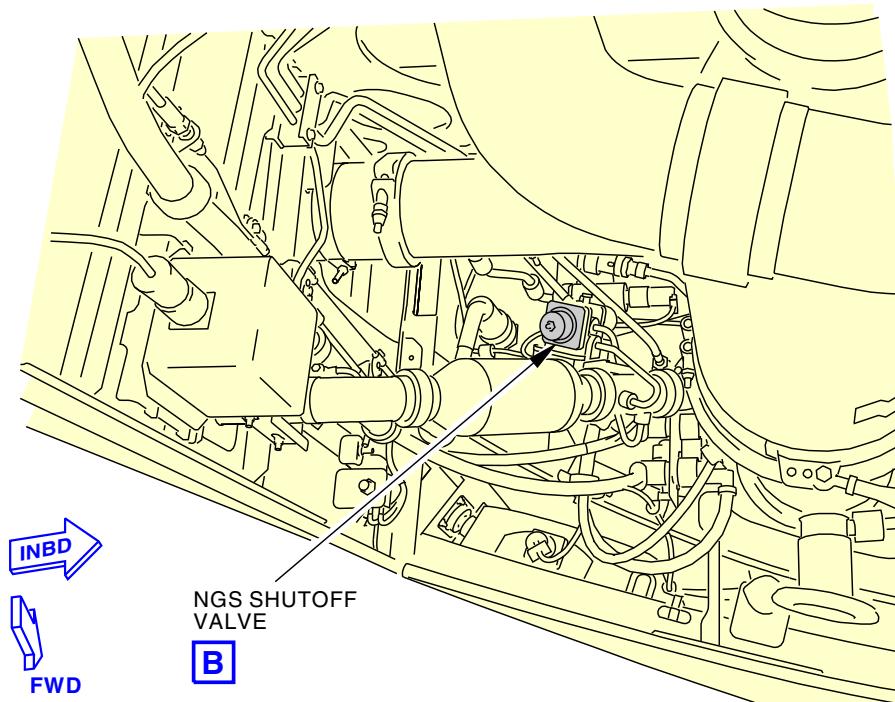
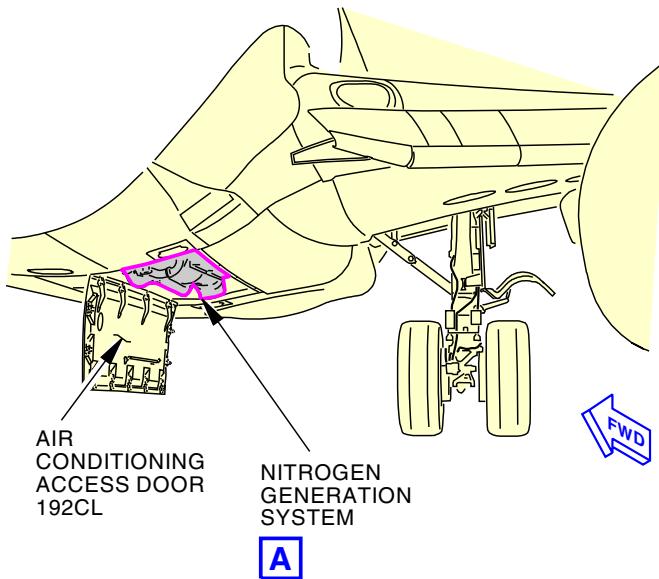
Fuel Tank Pre-Entry Checklist (Example)
Figure 206/28-11-00-990-839

EFFECTIVITY
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NITROGEN GENERATION SYSTEM

A

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NGS Shutoff Valve Deactivation
Figure 207/28-11-00-990-854 (Sheet 1 of 2)

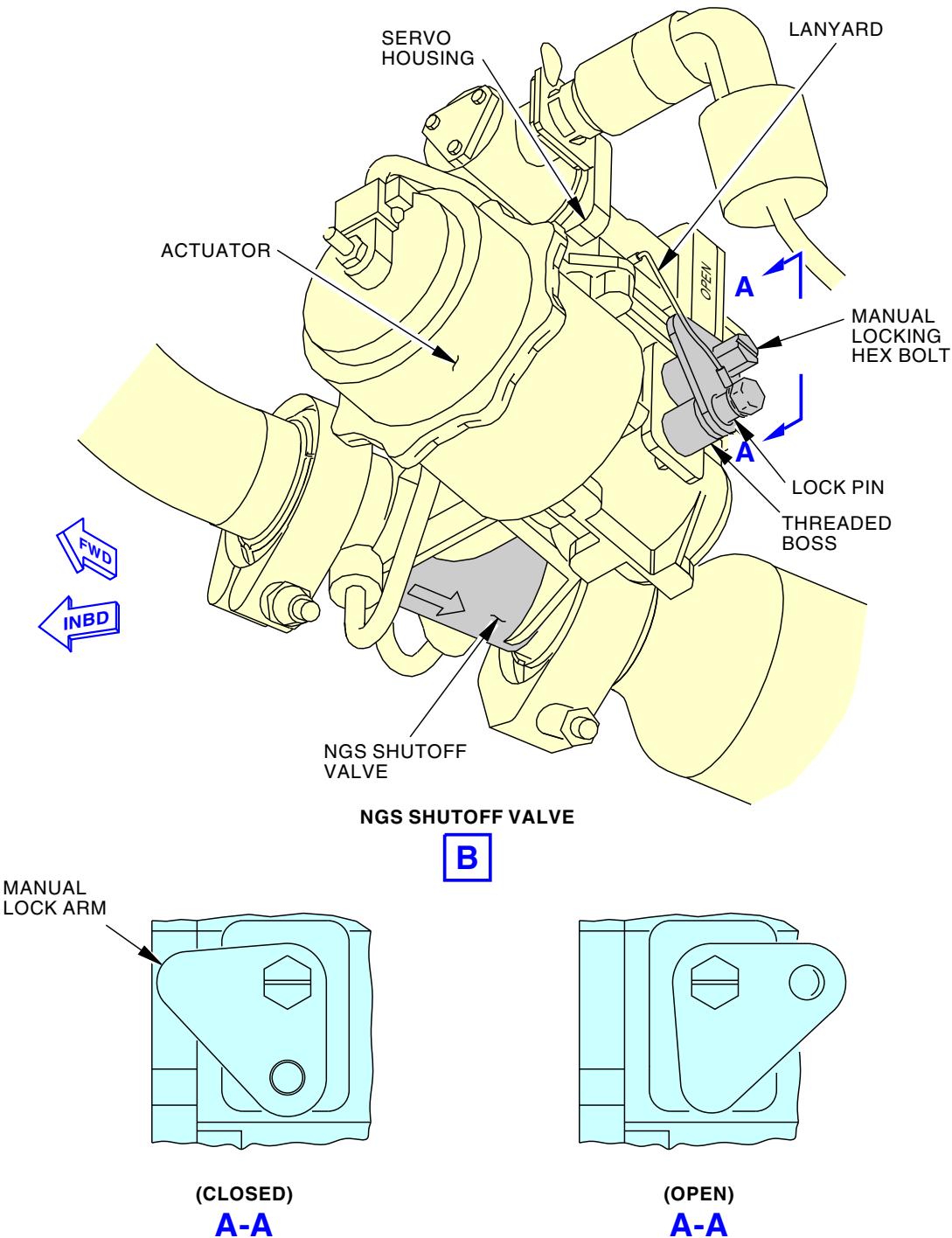
EFFECTIVITY

LOM 406, 407, 412, 415, 422-434, 437-447, 450-999;
LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

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NGS Shutoff Valve Deactivation
Figure 207/28-11-00-990-854 (Sheet 2 of 2)

EFFECTIVITY

 LOM 406, 407, 412, 415, 422-434, 437-447, 450-999;
 LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL

TASK 28-11-00-910-802

3. Fuel Tank - Purging and Tank Entry

A. General

- (1) This task contains these procedures:
 - (a) Prepare the Airplane for Fuel Tank Purging
 - (b) Prepare the Equipment for Fuel Tank Purging
 - (c) Fuel Tank Purging
 - (d) Fuel Tank Entry.
- (2) Make sure that you read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.
- (3) An unexpected fuel transfer from the center tank to the No. 1 tank can occur during maintenance.
 - (a) To prevent fuel transfer from the center tank to the No. 1 tank through the fuel scavenge system, do not have more than 23,000 lb (10,433 kg) of fuel in the center tank when the No. 1 tank is empty for maintenance.

B. References

Reference	Title
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
20-40-11-760-801	Electrical Bonding (P/B 201)
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
24-31-11-000-801-001	Battery Removal (P/B 401)
24-31-11-000-802-002	Battery Removal (P/B 401)
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-81-00-040-801	Leading Edge Flaps and Slats Deactivation (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-14-000-801	Emergency Fuel Shutoff Battery Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1768	Alarm - Combustible Gas and Oxygen Opt Part #: 1314 Supplier: ZAV19 Opt Part #: 1314 SMPN Supplier: ZAV19 Opt Part #: 711409 Supplier: 8F723 Opt Part #: 72-0026-49 Supplier: 0HTS3 Opt Part #: 72-6201-10 Supplier: ZAV19





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(Continued)

Reference	Description
COM-7844	Equipment - Communication, Confined Space Part #: 0113-01-041 Supplier: 7RGX6 Part #: 0113-01-045 Supplier: 7RGX6 Opt Part #: 1120-01-050 Supplier: 0V3X2 Opt Part #: 1120-01-055 Supplier: 0V3X2
COM-11427	Respiratory Protection Equipment - Breathable Air, Fuel Tank Entry Part #: CAB50 Supplier: 8K196 Part #: MAV-50C Supplier: 58501 Opt Part #: MAV-5C Supplier: 58501 Opt Part #: NF-1100A Supplier: 58501 Opt Part #: SYSTEM #5 Supplier: 58501 Opt Part #: TRAVELPANEL 50 Supplier: 62170
COM-14039	Gas Detector with Photionization Detector (PID) Part #: 10165446 Supplier: 55799 Part #: A-ALT5X-DLK021EC010 Supplier: 55799 Part #: MX6-K103R211 Supplier: 65147 Part #: MX6KIT-K103R211 Supplier: 65147 Opt Part #: MX6-K003R211 Supplier: 65147
COM-14940	Mask - Full Face Respirator, Continuous Flow, Supplied Air Part #: SPEC35L Supplier: 8K196 Opt Part #: M4535L Supplier: 8K196
SPL-1778	Ventilation Equipment, Fuel Tank Part #: A28003-91 Supplier: 81205 Part #: CAN-50 Supplier: 58501 Part #: MAV-1C Supplier: 58501 Part #: SYSTEM #2 Supplier: 58501 Opt Part #: A28003-89 Supplier: 81205 Opt Part #: BOE-501 Supplier: 58501 Opt Part #: MAC-1 Supplier: 58501
SPL-7828	Door Assembly - Purging, Center Integral Wing Fuel Tank Part #: F80145-4 Supplier: 81205
SPL-8436	Protective Ring - Access Door Opening, Wing Lower Panel Part #: C28013-3 Supplier: 81205
STD-189	Compressor - Clean Air
STD-420	Gloves - White Cotton
STD-858	Tag - DO NOT OPERATE
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1081	Flashlight - Explosion Proof
STD-1086	Gloves - Rubber
STD-1119	Blower - Air, Explosion Proof, 90-100 Cubic Feet per Minute, Includes sufficient hose to reach all areas of Fuel Tanks
STD-1121	Compressor - Air, Portable, Explosion Proof
STD-1122	Thermometer - Alcohol/Mercury (or equivalent meter meets task requirements)
STD-1123	Source - Breathing Air, 125 PSIG Max Output
STD-1124	Container - Non-static, with Rounded Edges (used to hold tools and rags)

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Reference	Description
STD-1128	Coveralls - Cotton, No Pockets
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-1137	Glasses - Safety
STD-7374	Gloves - Fuel and Solvent Resistant
STD-7377	Boots - Neoprene
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)
STD-7386	Hose - Air Supply
STD-11392	Fire Extinguisher - 150lb Portable, Carbon Dioxide, Dry Chemical, Halon, or Aqueous Film Forming Foam (AFFF)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
500	Left Wing
600	Right Wing

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
192CL	ECS Access Door
531BB	Center Tank Access Door - Wing Station 192
532AZ	Main Tank Inner Access at Rib 6
532BZ	Main Tank Inner Access at Rib 6
631BB	Center Tank Access Door - Wing Station 192
632AZ	Main Tank Inner Access at Rib 6
632BZ	Main Tank Inner Access at Rib 6





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G. Prepare the Airplane for Fuel Tank Purgung

SUBTASK 28-11-00-940-027



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003



WARNING

DO NOT BREATHE THE AIR FROM THE FUEL TANK UNTIL YOU MAKE IT SAFE. THE NITROGEN GENERATION SYSTEM DECREASES THE OXYGEN IN THE AIR. IF YOU BREATHE AIR THAT DOES NOT HAVE SUFFICIENT OXYGEN, DANGEROUS HEALTH CONDITIONS CAN QUICKLY OCCUR. DANGEROUS HEALTH CONDITIONS INCLUDE NAUSEA, UNCONSCIOUSNESS, AND CONVULSIONS. IF THE OXYGEN LEVEL OF THE AIR THAT YOU BREATHE IS VERY LOW, IT CAN KILL YOU.

LOM ALL

- (1) Read and obey the tank entry precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.

SUBTASK 28-11-00-650-018

- (2) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-019

- (3) Drain the fuel tank sumps (TASK 12-11-00-650-804).

SUBTASK 28-11-00-940-028

- (4) Make sure that the airplane is correctly grounded to an approved and identified ground (TASK 20-40-11-910-801).

SUBTASK 28-11-00-480-011



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE TRAILING EDGE FLAP BEFORE YOU DO WORK ON THE FLAP SYSTEM. THE FLAPS MOVE QUICKLY. THEY CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (5) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 28-11-00-480-012



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE LEADING EDGE FLAPS. THE ACCIDENTAL MOVEMENT OF THE FLAPS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Leading Edge Flaps and Slats Deactivation, TASK 27-81-00-040-801.

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SUBTASK 28-11-00-480-049



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (7) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-11-00-940-049

- (8) Make a barrier around the airplane to identify the hazardous location areas (Figure 201).

SUBTASK 28-11-00-940-029

- (9) Attach these signs, to the barrier, with words that are clearly written on the two sides:

NOTE: Signs with equivalent words can be used.

- (a) DANGER - OPEN FUEL TANKS - NO SMOKING.
(b) AUTHORIZED PERSONNEL ONLY.

SUBTASK 28-11-00-860-006

- (10) Make sure that the fuel pump LOW PRESSURE lights, on the P5 overhead panel, are OFF.
(a) Attach a DO NOT OPERATE tags, STD-858, to the fuel pump switches.

SUBTASK 28-11-00-860-031

- (11) Make sure that CTR FUEL PUMPS and FUEL PUMPS switches, on the P5 overhead panel, are in the OFF position.

SUBTASK 28-11-00-010-014

- (12) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-11-00-860-007



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (13) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

SUBTASK 28-11-00-860-026

- (14) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-3

Row Col Number Name

LOM 406, 407, 412, 415; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

D 17 C01657 NITROGEN GEN CONT

LOM 422-434, 437-447, 450-999

D 17 C01657 NITROGEN GENERATION CONTROL

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
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E 15 C01680 NGS ALT PWR

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SUBTASK 28-11-00-860-008

- (15) Open the applicable circuit breakers for the system on that you will do maintenance.

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SUBTASK 28-11-00-940-030

- (16) Look at the maintenance history of the airplane.
- (a) Open the applicable circuit breakers for any system(s) that show a problem with wiring or electrical faults.

SUBTASK 28-11-00-860-009

- (17) Remove the electrical power from the airplane before you remove the fuel tank access doors (TASK 24-22-00-860-812).

SUBTASK 28-11-00-940-031



WARNING

DO NOT USE AIRPLANE ELECTRICAL POWER WHEN FUEL TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL VAPOR AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (18) Do not supply electrical power again until this task is completed:
- Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-00-860-010

- (19) Disconnect the main battery (TASK 24-31-11-000-801-001 or TASK 24-31-11-000-802-002).

SUBTASK 28-11-00-860-030

- (20) Disconnect the fuel emergency shutoff (TASK 28-22-14-000-801).

SUBTASK 28-11-00-940-032

- (21) Attach this sign to each of the battery locations:

NOTE: Signs with equivalent words can be used.

- (a) OPEN FUEL TANKS - DO NOT CONNECT.

SUBTASK 28-11-00-940-033

- (22) Attach this sign to the external power receptacle:

NOTE: Signs with equivalent words can be used.

- (a) OPEN FUEL TANKS - DO NOT PUT POWER ON.

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
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SUBTASK 28-11-00-040-001

- (23) Manually close and lock the Nitrogen Generation System (NGS) shutoff valve:

- (a) Open this access panel:

Number Name/Location

192CL ECS Access Door

- (b) Go to the location of the NGS shutoff valve (Figure 207).

- (c) Remove the lock pin from the servo housing (View B, Figure 207).

- (d) Turn the manual lock arm to the closed position (View A-A, Figure 207).

- 1) Make sure that the hole on the manual lock arm aligns with the threaded boss.

- (e) Install the lock pin on the threaded boss to lock the NGS shutoff valve in the closed position.

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H. Prepare the Equipment for Fuel Tank Purging

SUBTASK 28-11-00-910-083



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.

SUBTASK 28-11-00-910-095

- (2) You may need one or more of these items to do work in the fuel tank:

- explosion proof flashlight, STD-1081
- non-static container, STD-1124
- no pockets cotton coveralls, STD-1128
- coverall (approved cotton substitute), STD-1129
- thermometer, STD-1122.

SUBTASK 28-11-00-940-034

- (3) Make sure that one of these fire extinguishers, STD-11392, is available:

- (a) one - 150 lb (68 kg) dry chemical wheeled extinguisher
- (b) one - 150 lb (68 kg) CO₂ wheeled extinguisher
- (c) one - 150 lb (68 kg) Halon wheeled extinguisher
- (d) one - 150 lb (68 kg) Aqueous Film Forming Foam (AFFF) portable fire extinguisher.

SUBTASK 28-11-00-940-035

- (4) Make sure that the electrical equipment is approved and is appropriate for the hazardous location as shown in Figure 201.

SUBTASK 28-11-00-860-011

- (5) Make sure that all radio or radar equipment is off and locked out if it is closer than the minimum separation distance permitted in Table 203.

SUBTASK 28-11-00-940-036

- (6) Do these steps to prepare metal support equipment such as work platforms/stands, ladders etc:

NOTE: These steps apply to all metal support equipment within a 50 ft (15 m) radius of an open fuel tank.

- (a) All support equipment must be in place before you begin the fuel purging procedure.
- (b) Bond the support equipment at an approved airplane bonding location (TASK 20-40-11-760-801).
- (c) Ground the support equipment to the same earth ground as the airplane.

SUBTASK 28-11-00-480-014

- (7) VENTURI TYPE VENTILATION EQUIPMENT:

- (a) Prepare the ventilation equipment, SPL-1778, for purging.

- 1) Assemble these ventilation equipment, SPL-1778, components (Figure 203):
 - a) tank adapter assembly (-34)
 - b) air mover assembly (-94)

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- c) air supply hose, STD-7386.
- 2) Make sure that each flexible air duct section is attached correctly and that each section is bonded correctly.



WARNING

MAKE SURE THAT THE AIR MOVER ASSEMBLY IS AWAY FROM THE AIRPLANE. POINT THE EXHAUST AIR FROM THE EXHAUST HORN OF THE AIR MOVER AWAY FROM THE AIRPLANE STRUCTURE. EXHAUST AIR FLOW ON THE AIRPLANE STRUCTURE CAUSES STATIC ELECTRICITY. STATIC ELECTRICITY CAN CAUSE THE IGNITION OF THE FUEL FUMES AND AN EXPLOSION. AN EXPLOSION WILL CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 3) Set-up the air mover assembly away from the airplane.
- 4) Ground the air mover assembly to the airplane ground.
- 5) Put the air compressor, STD-189, a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof. Example:
 - a) portable explosion-proof air compressor, STD-1121.
- 6) Connect the air compressor to the air mover assembly with the air hose.
- 7) Connect a power supply to the air compressor.

SUBTASK 28-11-00-480-015

- (8) AIR BLOWER TYPE VENTILATION EQUIPMENT (BOE-501 OR EQUIVALENT):
- (a) Prepare the ventilation equipment, SPL-1778, for purging (Figure 203).
 - 1) Set-up the ventilation blower(s), ventilation equipment, SPL-1778, in an area where the fuel tank entry will be made.
 - a) Make sure that the ventilation blower will be in an area free from fuel vapor when the access doors are open.
 - 2) Attach the static grounding cable on the ventilation blower(s) to an approved ground source.
 - 3) Do these steps to connect an air supply to the ventilation blower:
 - a) If shop air is used, connect an air supply hose, STD-7386, to the ventilation blower.
 - b) If a portable air compressor is used, do these steps:
 - <1> Put the air compressor, STD-189, a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof. Example:
 - <a> portable explosion-proof air compressor, STD-1121.
 - <2> Connect an air supply hose, STD-7386, from the air compressor to the ventilation blower.
 - <3> Connect the portable air compressor to a power source.
 - 4) Do these steps to connect the air ducts to the ventilation blower:
 - a) Connect the 8 in. (203 mm) air duct to the ventilation blower outlet port.
 - b) Connect enough air duct segments to get to the access door where you will do maintenance.

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- c) Use the attached bonding connections to electrically bond each air duct segment.
- 5) FOR MAIN TANK MAINTENANCE:
 - a) Attach the access door adapter to the end of the air duct.
- 6) FOR CENTER TANK MAINTENANCE:
 - a) Do these steps to prepare the air ducts that will go inside the fuel tank:
NOTE: The air ducts will be positioned inside the fuel tank at the location where you will do the maintenance.
 - <1> Attach an adapter/reducer to the end of the 8 in. (203 mm) air duct segments.
 - <2> Attach the 4 in. (102 mm) air ducts.
 - <3> Use the attached bonding connections to electrically bond each air duct segment.
 - <4> Make sure that you have enough segments to route the air ducts to the maintenance area.

SUBTASK 28-11-00-480-016

(9) HEATER AIR/BLOWER EQUIPMENT:

- (a) If it is necessary do these steps to prepare the heater/air explosion proof, 90-100 CFM air blower, STD-1119, for purging:

NOTE: The use of a heater/air blower is for the comfort of persons in the fuel tank. It is not part of the ventilation equipment, SPL-1778, that is used to remove hazardous fuel vapor during the fuel purging procedure.

- 1) Set-up the heater/air blower in the area where the fuel tank entry will be made.
 - a) Make sure that the heater/air blower will be in an area free from fuel vapor when the access doors are open.
- 2) Attach the static grounding cable on the heater/air blower(s) to an approved ground source.
- 3) Do these steps to connect an air supply to the heater/air blower:
 - a) If shop air is used, connect an air supply hose, STD-7386, to the heater/air blower.
 - b) If a portable explosion-proof air compressor, STD-1121, is used, do these steps:
 - <1> Put the air compressor, STD-189, a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof. Example:
 - <a> portable explosion-proof air compressor, STD-1121.
 - <2> Connect an air supply hose, STD-7386, from the air compressor to the heater/air blower.
 - <3> Connect the portable air compressor to a power source.
- 4) Do these steps to connect the air ducts to the heater/air blower.
 - a) Connect the air duct to the heater/air blower outlet port.
 - b) Connect enough air duct segments to get to the maintenance area.

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- c) Connect the air duct segments to the inlet port on the ventilation blower (if it is necessary for your ventilation system set-up).
- d) Use the attached bonding connections to electrically bond each air duct segment.
- 5) Connect a power supply to the heater/air blower.
- 6) FOR MAIN TANK MAINTENANCE:
 - a) Attach the access door adapter to the end of the air duct.
- 7) FOR CENTER TANK MAINTENANCE:
 - a) Do these steps to prepare the air ducts that will go inside the fuel tank:

NOTE: The air ducts will be positioned inside the fuel tank at the location where you will do the maintenance.

 - <1> Attach an adapter/reducer to the end of the 8 in. (203 mm) air duct segments.
 - <2> Attach the 4 in. (102 mm) air ducts.
 - <3> Use the attached bonding connections to electrically bond each air duct segment.
 - <4> Make sure that you have enough segments to route the air ducts to the maintenance area.
 - <5> Attach the fuel tank door assembly, SPL-7828, to the end of the air duct (optional).

NOTE: Do not use the air supply until the fuel vapor concentration (indicated by an air monitor with Photo Ionization Detector (PID) or a combustible gas indicator) is less than 25% of the lower explosive limit.

SUBTASK 28-11-00-480-048



WARNING

MAKE SURE THE FLAMMABLE GAS INDICATOR IS EXPLOSION-PROOF (CLASS I, DIVISION 1 OR EQUIVALENT STANDARD) AND IS SATISFACTORY FOR USE IN A FUEL TANK. IF YOU USE A FLAMMABLE GAS INDICATOR THAT IS NOT FOR USE IN A FUEL TANK, AN EXPLOSION CAN OCCUR. AN EXPLOSION CAN CAUSE SERIOUS INJURY OR DEATH TO PERSONS AND DAMAGE TO EQUIPMENT.

- (10) Prepare an air monitor with PID or combustible gas indicator.

NOTE: An air monitor with PID is the recommended tool.

- (a) Do these steps to prepare the gas detector, COM-14039, with PID (Figure 203):

NOTE: Use the instruction manual supplied with the air monitor with PID.

- 1) Make sure that the air monitor with PID is calibrated for each of these sensors:
 - a) Oxygen
 - b) Lower Explosive Limit (LEL)
 - c) Parts Per Million (PPM) (set the response factor of the PID to the applicable jet fuel).
 - 2) Make sure that the alarm values are set to these limits:
 - a) 19.5% oxygen by volume
 - b) 10% of the LEL

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- c) 30 PPM.
 - 3) Make sure that the air monitor with PID operates correctly:
 - a) Zero the air monitor in clean air.
 - b) Do a functional check (bump test) of the oxygen, LEL and PPM sensors.
 - 4) Put the air monitor with PID on a stand or ladder next to the access door where you will go into the fuel tank.
 - a) To prevent the accidental movement of the air monitor with PID, safely attach the air monitor with PID to the stand or ladder.
- (b) Do these steps to prepare the combustible gas and oxygen alarm, COM-1768 (Figure 205):
- NOTE: Use of the combustible gas and oxygen alarm is permitted, the use of the air monitor with PID is recommended.
- NOTE: These steps are for the combustible gas indicators called out in the equipment section of this procedure. If you use a different combustible gas indicator use the instruction manual supplied with the indicator.
- NOTE: GASTECH GT-series combustible gas indicators correspond to 72-6201-XX optional tool numbers for combustible gas and oxygen alarm, COM-1768.
- 1) Make sure that the indicator is calibrated for each of these scales:

NOTE: Make sure that the GASTECH GT-series combustible gas indicators are labeled for calibration with hexane gas, and that the PPM range in the channel set-up menu is set to 5000 PPM hexane.

 - a) Oxygen
 - b) LEL
 - c) PPM.
 - 2) Make sure that the calibration on the combustible scales are specific to hexane gas.
 - 3) Make sure that the alarm values are set to these limits:
 - a) 160 PPM
 - b) 10% of the LEL
 - c) 19.5% oxygen by volume.
 - 4) Do these steps to make sure that the combustible gas indicator operates correctly:
 - a) Make sure that the combustible gas indicator, sampling line, and sampling probe (with dust filter) are clean and not damaged.
 - b) Put the combustible gas indicator switch to the ON position.
 - c) Make sure that there is enough charge on the battery for the scheduled time in the fuel tank.
 - d) Let the combustible gas indicator warm-up for 20 minutes before you look at the readings.
 - e) Adjust the indicator to zero in clean air for these scales:
 - <1> Oxygen
 - <2> PPM
 - <3> LEL.

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- f) If there is a negative value during the use of the combustible gas indicator, adjust the combustible gas indicator scale(s) to zero in clean air.
NOTE: Do not turn the combustible gas indicator off before you adjust the scales.
- 5) Do these steps to do a check of the alarms:
 - a) To do a check of the oxygen alarm, blow across the probe until the alarm comes on (19.5%).
 - b) To do a check of the PPM and LEL scales, hold the tip of the probe over a solvent bottle or some solvent on a cotton wiper, G00034, until the alarm comes on.
- 6) Put the combustible gas indicator on a stand or ladder next to the access door where you will enter the fuel tank.
 - a) To prevent the accidental movement of the combustible gas indicator, safely attach the combustible gas indicator to the stand or ladder.

I. Fuel Tank Purging

SUBTASK 28-11-00-910-084



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.

SUBTASK 28-11-00-480-018

(2) VENTURI TYPE VENTILATION EQUIPMENT:

- (a) Install the ventilation equipment, SPL-1778 (Figure 203).
 - 1) For the main fuel tanks, do these steps:
 - a) Remove one or more main tank access doors to have a good flow of air through the fuel tank (TASK 28-11-11-000-801).
 - b) Install a protective ring, SPL-8436, around the openings of the main tank access doors.
 - c) Start the air supply connected to the air mover.
 - 2) For the surge tanks, do these steps:
 - a) Remove the surge tank access doors (TASK 28-11-11-000-802).
 - b) Install a protective ring, SPL-8436, around the openings of the surge tank access doors.
 - c) Install the tank adapter assembly to one of the surge tank access doors (Figure 203).
 - d) Start the air supply connected to the air mover.
 - 3) For the center fuel tank, do these steps:
 - a) Remove all of the center tank access doors (TASK 28-11-31-000-801).

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- b) Install the air mover assembly to one of these center tank access doors:

Number Name/Location

531BB	Center Tank Access Door - Wing Station 192
631BB	Center Tank Access Door - Wing Station 192

- c) Start the air supply connected to the air mover.

SUBTASK 28-11-00-480-019

(3) AIR BLOWER TYPE VENTILATION EQUIPMENT (BOE-501 OR EQUIVALENT):

- (a) Install the air ventilation equipment (Figure 204).



WARNING

DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

- 1) Start the ventilation blower before you put the air duct in the fuel tank.
- 2) FOR THE SURGE TANK AND MAIN TANK OUTBOARD OF THE ENGINE:
 - a) Do these steps:
 - <1> At the location where you will do maintenance, remove three adjacent access doors (TASK 28-11-11-000-801).
NOTE: Usually the middle access door is the door where you will go into the fuel tank.
 - <2> Install a protective ring, SPL-8436, around the openings of the main tank and surge tank access doors.
 - <3> Install the access door adapter to the access door (the outboard access door is the preferred door).
 - <4> Bond the access door adapter to the airplane structure.
 - <5> Make sure that there will be a flow of air into the area where you will do the maintenance.
- 3) FOR THE MAIN TANK INBOARD OF THE ENGINE:
 - a) Do these steps:
 - <1> Remove the access door where you will do the maintenance (TASK 28-11-11-000-801).
 - <2> Install all protective ring, SPL-8436, around the openings of the main tank access doors.
 - <3> Put the air duct inside the open access door.
 - <4> Use the pigtail on the end of the air duct to bond the duct to the airplane structure.
 - <5> Make sure that there will be a flow of air into the area where you will do the maintenance.
- 4) FOR THE CENTER FUEL TANK:
 - a) Do these steps:
 - <1> Remove all of the center tank access doors (TASK 28-11-31-000-801).

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- <2> Put the 4 in. (102 mm) air duct inside the open access door where you will do the maintenance.
- <3> Use the pigtail on the end of the air duct to bond the air duct to the airplane structure.
- <4> Make sure that there will be a flow of air into the area where you will do the maintenance.

SUBTASK 28-11-00-480-020

- (4) After the air supply has operated for approximately 30 minutes, put the sampling line of the gas detector, COM-14039, with PID, or the combustible gas and oxygen alarm, COM-1768, as far into the fuel tank as possible (Figure 205).

NOTE: The gas detector, COM-14039, with PID is the recommended tool.

NOTE: It is recommended that you take the gas detector, COM-14039, with PID or combustible gas indicator value regardless of the type of fuel that was contained in the fuel tank. If the fuel tank had contained kerosene only, then the combustible gas indicator should show zero. This shows that the tank atmosphere is in fire-safe and health-safe condition.

SUBTASK 28-11-00-480-021

- (5) Wait one minute for each 1 ft (30.5 cm) of sampling line before you take a reading.

SUBTASK 28-11-00-480-022

- (6) If you use a combustible gas and oxygen alarm, COM-1768, convert the values from the GASTECH combustible gas indicator to get the actual value.
(a) Use Table 205 to convert the values on the GASTECH combustible gas indicator to the actual values.

Table 205/28-11-00-993-855 COMBUSTION GAS CALCULATIONS

COMBUSTIBLE GAS INDICATOR	FOR PPM, MULTIPLY VALUE BY:	FOR LEL, MULTIPLY VALUE BY:
GASTECH 1314	2	3
GASTECH 1314SMPN	2	3
GASTECH GT SERIES	2	3

- (b) If you use a combustible gas indicator not made by GASTECH follow the manufacturer's instructions to get the actual values.

SUBTASK 28-11-00-480-023



WARNING DO NOT USE A HEATER/AIR BLOWER UNTIL THE FUEL FUME CONCENTRATION IS 10% OR LESS OF THE LOWER EXPLOSIVE LIMIT. IF THE FUEL FUME CONCENTRATION IS NOT 10% OR LESS OF THE LOWER EXPLOSIVE LIMIT, IGNITION OF THE FUEL FUME COULD OCCUR.

- (7) When the gas detector, COM-14039, with PID or combustible gas indicator shows the fuel vapor concentration is 10% or less of the lower explosive limit, you can put warm or cool air in the fuel tank through the tank access opening with an explosion-proof heater/air blower.

NOTE: The use of warm or cool air is for the comfort of persons in the fuel tank. It is not part of the purging procedure.

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SUBTASK 28-11-00-480-024



WARNING

DO NOT STOP OR START THE HEATER/AIR BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK COULD CAUSE AN EXPLOSION AT THE HEATER OR BLOWER MOTOR. A FIRE OR EXPLOSIONS CAN KILL OR CAUSE INJURIES TO PERSONNEL AND CAN CAUSE DAMAGE TO EQUIPMENT.

- (8) Start the heater/air blower before you put the air duct in the fuel tank.

SUBTASK 28-11-00-480-025

- (9) Put the air duct for the heater/air blower in the fuel tank through the tank access opening.

SUBTASK 28-11-00-480-026

- (10) Bond the air duct to the airplane structure.

SUBTASK 28-11-00-940-037

- (11) Continue to have a good flow of air through the fuel tank with the air mover until you prepare to close the fuel tank.

- (a) Read the air monitor with PID or combustible gas indicator values every half hour or less.

SUBTASK 28-11-00-940-038

- (12) If fuel vapors get into the fuel tank that was in a fire-safe condition, get all persons out of the fuel tank until you make sure the air in the fuel tank is in a fire-safe condition again.

SUBTASK 28-11-00-940-039

- (13) Go into the fuel tank per the "Fuel Tank Entry" procedure to do maintenance.

J. Fuel Tank Entry

SUBTASK 28-11-00-910-085



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.

SUBTASK 28-11-00-970-004

- (2) Complete the confined space entry permit (if it is a requirement).

SUBTASK 28-11-00-970-005

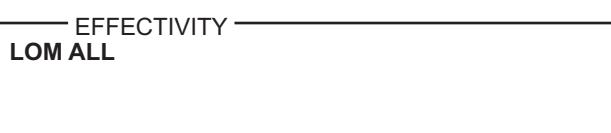
- (3) Use the pre-entry checklist (an example is given in Figure 206).

SUBTASK 28-11-00-480-027

- (4) Prepare the respirators for fuel tank entry.

- (a) Use Table 207 to find out what level of respiratory protection is necessary.

- (b) If the fuel tank is in a fire-safe condition, but not a health-safe condition, wear a respirator with an attached 125 psig max. output breathing air source, STD-1123.





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WARNING

DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (c) If the fuel tank was previously filled with JP-4 or JET B, wear a respirator with an attached 125 psig max. output breathing air source, STD-1123.
- NOTE: There is not a health-safe limit for JP-4 or JET B.
- 1) Use one of these respirators for the applicable respiratory protection equipment, COM-11427, that you use:
 - a) half-mask respirator, STD-7380
 - b) mask, COM-14940
 - c) respirator provided with the respiratory protection equipment, COM-11427.
- (d) If the fuel tank was not previously filled with JP-4 or JET B and the fuel tank is in a health-safe condition, a respirator is not required, but a full or half-face respirator with an organic vapor filter is recommended.
- (e) Connect the subsequent respirators to the air supply (Figure 204).
 - 1) One respirator for the person who goes into the fuel tank.
 - 2) Two emergency rescue respirators.
- (f) Make sure that air gets to the respirator.
- (g) Make sure that the respirator system (respiratory protection equipment, COM-11427, respirator, etc.) is clean.
- (h) Make sure that the emergency air supply and respirators operate correctly.

Table 206/28-11-00-993-852

FIRE-SAFE CONDITION

A FIRE-SAFE CONDITION OCCURS WHEN THE VAPOR CONCENTRATION IS LESS THAN 10 PERCENT OF THE LOWER EXPLOSIVE LIMIT (LEL)

Table 207/28-11-00-993-844

HEALTH SAFE CONDITION

A HEALTH SAFE CONDITION OCCURS WHEN THE OXYGEN CONTENT IS A MINIMUM OF 19.5% TO A MAXIMUM OF 23.5% BY VOLUME AT SEA LEVEL, AND THE VAPOR CONCENTRATIONS ARE BELOW THESE PERMISSIBLE EXPOSURE LIMITS ^{*[1]}:

Fuel	Permissible Exposure Level Total Hydrocarbons TWA ^{*[2]} (ppm)	Lower Explosive Level (percent)
Aviation Gasoline	300	1.0
Jet A	30	0.7

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Table 207/28-11-00-993-844 (Continued)

Jet A-1	30	0.7
JP-5	30	0.7
JP-8	30	0.7

*[1] Permissible Exposure Level is based on the American Conference of Governmental Industrial Hygienist's Threshold Limit Value (TLV) for kerosene/jet fuel total aerosol and vapor. The TLV is a health-based advisory standard that may be used as a guideline for limiting exposure where there is no appropriate regulatory standard. Check with your local occupational safety and health jurisdiction for an applicable exposure limit for jet fuel.

*[2] TWA - Time Weighted Average

SUBTASK 28-11-00-940-040

- (5) Remove these items before you go into a fuel tank:
 - (a) all jewelry - rings, bracelets, wrist watches etc
 - (b) matches
 - (c) pocket warmers
 - (d) battery-operated devices such as hearing aids, electrical pacemakers or watches, pocket radios, cellular phones or paging equipment unless it is explosion-proof and allowed by approved persons.

SUBTASK 28-11-00-940-041

- (6) Remove any clothes made of this material:
 - (a) wool
 - (b) silk
 - (c) nylon
 - (d) synthetic clothing.

SUBTASK 28-11-00-940-042

- (7) Put on these approved protective clothes (Figure 202):
 - (a) no pockets cotton coveralls, STD-1128, or coverall (approved cotton substitute), STD-1129 (non-sparking zippers or buttons)
 - (b) clean cotton head cover with tie strings or a lint free shower-type cap with an attached elastic headband
 - (c) approved white cotton gloves, STD-420, or rubber glove, STD-1086, or gloves, STD-7374
 - (d) safety glasses, STD-1137, if you will not use a full-face respirator.



DO NOT PUT ON THE COTTON SOCKS UNTIL IMMEDIATELY BEFORE YOU GO INTO THE FUEL TANK. IF THE COTTON SOCKS ARE NOT CLEAN, YOU CAN CAUSE DAMAGE TO THE FUEL TANK.

- (e) Clean 100% cotton socks and/or boots, STD-7377
- (f) Put rubber bands around your wrists and ankles to hold clothes tight.

SUBTASK 28-11-00-940-043

- (8) Make sure that the person who goes into the fuel tank and the person who watches agree on safety signals.

SUBTASK 28-11-00-940-044

- (9) If a confined space communication equipment, COM-7844, is used, attach the system.

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- (a) Do a check to make sure that the system operates correctly.

SUBTASK 28-11-00-480-029

- (10) Put on the necessary respiration protection.
(a) Make sure that the respirator operates.

SUBTASK 28-11-00-910-086

- (11) Do these steps if you are the observer:
(a) Make sure that the confined space entry permit is complete and approved (if this is a requirement).
(b) Make a record that shows the time and who is inside the fuel tank.
(c) Attach this sign at the fuel tank entry location where it can be seen:
 1) CAUTION - PERSONNEL INSIDE - MOVE NO EQUIPMENT.
(d) Make sure that you and the person(s) who will go into the tank agree that the checklist items are complete.
(e) Make sure that you and the person(s) who will go into the tank agree on communication signals and set a communication time interval.
(f) Look at the respiratory protection equipment, COM-11427, to make sure that the supplied air system operates correctly.
(g) Keep visual contact with the fuel tank entry location.
(h) Keep in constant communication with the person(s) in the fuel tank.
(i) Look at the combustible gas indicator or air monitor with PID to make sure that the air in the fuel tank is at 10% or less of the LEL.
(j) Do not put your head in the fuel tank access hole unless you have the correct respirator on, for the condition of the tank, and there is another observer to watch you.
 NOTE: This is considered the same as a fuel tank entry.
(k) Look out for any changes that could cause a dangerous condition.
(l) Make sure that person(s) in the fuel tank get out if there is a dangerous condition.

SUBTASK 28-11-00-940-045

- (12) Persons with respirators must touch the identified airplane ground to release static electricity before they go into the fuel tank.

SUBTASK 28-11-00-480-030



CAUTION BE CAREFUL WHEN YOU ARE IN THE FUEL TANK. MAKE SURE THAT YOU DO NOT TOUCH THE COMPONENTS WITH YOUR HANDS OR TOOLS. IF YOU DO NOT OBEY, DAMAGE TO COMPONENTS CAN OCCUR.

- (13) Go into the fuel tank.

- (a) To get access to the area in the No. 1 tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

(TASK 06-44-00-800-801)

Number **Name/Location**

532AZ	Main Tank Inner Access at Rib 6
532BZ	Main Tank Inner Access at Rib 6

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- (b) To get access to the area in the No. 2 tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

(TASK 06-44-00-800-801)

Number Name/Location

632AZ	Main Tank Inner Access at Rib 6
632BZ	Main Tank Inner Access at Rib 6

SUBTASK 28-11-00-480-031

- (14) As an alternate procedure, you can take an additional air monitor with PID or combustible gas indicator into the fuel tank to monitor the environment where you will do the maintenance.

SUBTASK 28-11-00-480-032

- (15) If it is necessary for your air ventilation system, route the air duct to the maintenance area (Figure 204).
(a) Bond the air duct to the airplane structure.

SUBTASK 28-11-00-940-046



WARNING

MAKE SURE THAT THE TEMPERATURE IN THE FUEL TANK DOES NOT GET TOO HOT. SARANEX 23P COVERALLS WILL KEEP BODY HEAT IN. IF THE FUEL TANK TEMPERATURE GETS TOO HOT, PERSONNEL CAN BECOME TOO HOT.

- (16) The observer must keep in communication with person(s) in the tank and watch for changes in conditions or a signal of danger.

SUBTASK 28-11-00-680-002



WARNING

DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.



WARNING

MAKE SURE THAT THERE IS A GOOD FLOW OF AIR WHEN YOU ARE IN THE FUEL TANK. DO NOT REMOVE THE RESPIRATOR WHILE YOU ARE IN THE FUEL TANK. DO NOT DO MAINTENANCE IN THE FUEL TANK UNTIL YOU REMOVE ALL FUEL FROM THE AREA. FUEL FUMES CAN KILL YOU.

- (17) Do these steps to remove any fuel that remains in the fuel tank:

NOTE: In the No. 1 tank, fuel can be trapped in refueling manifold if the drain float valve and check valve stay closed on the end of the refueling manifold. If you want to make sure that there is no trapped fuel, put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the check valve and open the check valve by hand. Remove all drained fuel from the tank and close the check valve.

- (a) Put the cotton wipers, G00034, on the bottom of the fuel tank to absorb any fuel that remains in the tank.
- (b) Count the number of cotton wipers, G00034, as they are put into the fuel tank.
- (c) Remove the cotton wipers, G00034, when they are soaked.
- (d) Count the number of cotton wipers, G00034, as they are removed from the fuel tank.
- (e) Make sure that the counts agree.
- (f) Make sure that you remove all cotton wipers, G00034, from the fuel tank.

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WARNING

OBEY THE APPROVED PROCEDURES FOR FUEL-SOAKED COTTON WIPERS, G00034. PUT FUEL-SOAKED COTTON WIPERS, G00034 IN APPROVED BARRELS ONLY. COTTON WIPERS, G00034 THAT YOU USE TO CLEAN THE FUEL TANK CAN CAUSE FIRES. FIRES CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (g) Follow approved procedures to dispose of or clean the fuel soaked cotton wipers, G00034.

SUBTASK 28-11-00-860-033

- (18) Be careful not to cause damage to the in-tank wire harnesses for the Fuel Quantity Indication System (FQIS).
(a) Do not pull on the FQIS wire harness or move the tie straps that hold the wires.
(b) Do not let clothing or tools catch on the wires, tie straps, or supports.

SUBTASK 28-11-00-860-032

- (19) Do these steps if you will do maintenance in the center fuel tank:
(a) Be careful not to cause damage to the heat exchangers for the hydraulic system.
(b) Put a hard plastic cover on the heat exchanger before you move across it.

SUBTASK 28-11-00-360-009

- (20) Do the necessary repair or maintenance procedures.

SUBTASK 28-11-00-080-026

- (21) After you complete the maintenance, do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

———— END OF TASK ————

TASK 28-11-00-410-801

4. Fuel Tank Closure

A. General

- (1) This task has one or more steps that are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-25.

- (2) After you do maintenance, do this task to close the fuel tank.
(3) Make sure that you read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-910-801.

B. References

Reference	Title
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-50-11 P/B 201	STANDARD TORQUE VALUES - MAINTENANCE PRACTICES
24-31-11-400-801-001	Battery Installation (P/B 401)
24-31-11-400-802-002	Battery Installation (P/B 401)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

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Reference	Title
27-81-00-440-801	Leading Edge Flaps and Slats - Activation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-14-400-801	Emergency Fuel Shutoff Battery Installation (P/B 401)
49-31-21 P/B 401	INLET FUEL FILTER ELEMENT - REMOVAL/INSTALLATION
73-11-02 P/B 401	FUEL FILTER - REMOVAL/INSTALLATION

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-10710	Explosion Proof Vacuum
	Part #: AV1-55 EX W Supplier: \$1354
	Part #: EXP1-55 TC TE Supplier: 0YX65
	Part #: MDL55 ITEM 23954 Supplier: 05490
	Part #: SS-55 TE TC Supplier: 0YX65

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
500	Left Wing
600	Right Wing

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
192CL	ECS Access Door
532AZ	Main Tank Inner Access at Rib 6
532BZ	Main Tank Inner Access at Rib 6
632AZ	Main Tank Inner Access at Rib 6
632BZ	Main Tank Inner Access at Rib 6

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G. Clean the Fuel Tank

SUBTASK 28-11-00-090-001



WARNING

REMOVE ALL MAINTENANCE ITEMS, AND UNWANTED MATERIAL FROM THE FUEL TANK BEFORE YOU CLOSE IT. EQUIPMENT, TOOLS, LOOSE PARTS, OR CONTAMINATION CAN CAUSE DAMAGE TO THE FUEL SYSTEM. UNWANTED FLAMMABLE MATERIALS ARE POSSIBLE IGNITION SOURCES. AN IGNITION SOURCE IN A FUEL TANK CAN CAUSE A FIRE OR EXPLOSION. THIS CAN INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Each time you go into a fuel tank, you must examine the fuel tank very carefully before you close it.

SUBTASK 28-11-00-200-002

- (2) Remove all of the equipment used to perform maintenance (for example, tools, solvent, containers, plugs, brushes and other equipment).

NOTE: Keep a written record of all the tools, equipment, materials, and persons when they go into the tank. Before you close the tank, make sure that the records show that there are no unwanted items in the tank.

SUBTASK 28-11-00-100-005

- (3) Use a cotton wiper, G00034, to clean any unwanted solvents, liquids or grease.

SUBTASK 28-11-00-490-001



WARNING

GROUND ALL OF THE EQUIPMENT AND HOSES THAT YOU USE IN THE FUEL TANK. IF YOU DO NOT GROUND ALL OF THE EQUIPMENT AND HOSES, AN EXPLOSION CAN OCCUR. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Make sure that all hoses and equipment used in the maintenance are grounded.

SUBTASK 28-11-00-100-004



WARNING

WHEN YOU DO WORK IN A FUEL TANK, MAKE SURE YOU USE ONLY FILTERED SHOP/COMPRESSED AIR TO OPERATE AIR-DRIVEN TOOLS AND VACUUMS. DO NOT USE DRY NITROGEN OR OTHER GASES. THIS WILL HELP PREVENT DEATH AND INJURY TO PERSONS.

- (5) Use only shop air or bottled air as a gas source for air-driven tools.

SUBTASK 28-11-00-160-021

- (6) Use an explosion-proof vacuum, COM-10710, to remove unwanted particles and pieces of used sealant.

H. Inspect the Fuel Tank

SUBTASK 28-11-00-212-001

- (1) Examine all the repairs, sealant and finishes to make sure that they are correct and complete.

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SUBTASK 28-11-00-211-004



WARNING

REMOVE ALL CONTAMINATION, UNWANTED PARTICLES, AND MATERIALS FROM THE FUEL TANK. UNWANTED MATERIALS CAN COLLECT IN THE FUEL TANK. THIS CAN CAUSE A BLOCKAGE, OR CAUSE THE SYSTEM TO OPERATE INCORRECTLY. MATERIALS CAN BE AN IGNITION SOURCE. THIS CAN CAUSE A FIRE OR EXPLOSION.

- (2) Make sure that these components are free from unwanted material or objects:

- (a) Fuel and water drain holes and paths
- (b) Fuel quantity indicating system components
- (c) Fuel scavenge system components.

SUBTASK 28-11-00-211-005

► 28-AWL-25: CDCCL

- (3) If any maintenance, preventative maintenance, or alteration was done in the fuel tanks, do these checks in the affected areas (this includes the touchpoints during transit to and from the tank access point) where work is done:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-25.

► 28-AWL-25: CDCCL

- (a) Make sure the fillet seals around the periphery of the equipment interface with structure inside the fuel tank are not damaged (peeling off or cracking).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-25.

► 28-AWL-25: CDCCL

- (b) Make sure the cap seals installed on the fasteners and fittings inside the fuel tank are not damaged (peeling off or cracking).

NOTE: Not all fasteners and fittings have cap seals. If the fastener or fitting sealant is damaged, there will be residual evidence of a previously installed cap seal on the fasteners and fittings in areas where installation is necessary.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-25.

SUBTASK 28-11-00-211-002

- (4) Do a check of the areas of the fuel tank that were accessed for any damage to in-tank components, bonding jumpers, wiring and structure.

- (a) Repair all problems that you find.

SUBTASK 28-11-00-210-042

- (5) Do a final inspection of the fuel tank to make sure that you removed all unwanted materials and equipment.

- (a) Make sure that the necessary approved persons do an inspection of the tank before you close it.

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SUBTASK 28-11-00-210-043

- (6) Do a check of the record to make sure that no unwanted items remain in the tank.

I. Close the Fuel Tank

SUBTASK 28-11-00-090-006

- (1) If you used an air duct at the maintenance area, move the air duct to the access door opening.

SUBTASK 28-11-00-410-024

- (2) Install these components (if removed):

(a) For torque values refer to: STANDARD TORQUE VALUES - MAINTENANCE PRACTICES, PAGEBLOCK 20-50-11/201.

(b) If removed, install the applicable access panel on rib No. 6 in the No. 1 fuel tank:
(TASK 06-44-00-800-801)

Number Name/Location

532AZ Main Tank Inner Access at Rib 6

532BZ Main Tank Inner Access at Rib 6

(c) If removed, install the applicable access panel on rib No. 6 in the No. 2 tank:
(TASK 06-44-00-800-801)

Number Name/Location

632AZ Main Tank Inner Access at Rib 6

632BZ Main Tank Inner Access at Rib 6

SUBTASK 28-11-00-910-089

- (3) Go out of the fuel tank.

SUBTASK 28-11-00-970-009

- (4) If you are the observer, do these steps:

(a) Make a report that shows the time and that all persons are out of the tank.

(b) Remove the sign that states: CAUTION - PERSONNEL INSIDE TANK - MOVE NO EQUIPMENT.

SUBTASK 28-11-00-090-002



WARNING

DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

- (5) If you used a heater or ventilation blower, do these steps:

(a) Remove the air duct from the fuel tank.

(b) Turn the air duct 180 degrees away from the open fuel tank.

(c) Stop the heater/air and ventilation blower, if used.

(d) Stop the air compressor.

(e) Disconnect the air supply hose from the air mover or blower(s).

SUBTASK 28-11-00-090-003

- (6) VENTURI TYPE VENTILATION EQUIPMENT, do these steps:

(a) Stop the air supply connected to the air mover.

(b) Remove the tank adapter assembly from the opening where you installed it.

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- (c) Remove the air mover from the adapter base.
- (d) Remove the ground from the air mover.

SUBTASK 28-11-00-090-004

- (7) AIR BLOWER TYPE VENTILATION EQUIPMENT, do these steps:
 - (a) Remove the air blower equipment.
 - (b) Stop the ventilation blower after you remove the air duct from the fuel tank.
 - 1) Remove power from the air blower type ventilation equipment.
 - (c) Remove the ground from the airplane to the ventilation blower.

SUBTASK 28-11-00-410-025

- (8) Install the applicable access doors (TASK 28-11-11-400-801, TASK 28-11-11-400-802, TASK 28-11-11-400-803, TASK 28-11-31-400-801).

SUBTASK 28-11-00-910-090

- (9) Follow approved procedures to clean and return all respiratory equipment.

J. Put the Airplane Back to Its Usual Condition

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

SUBTASK 28-11-00-440-002

- (1) Manually unlock and open the Nitrogen Generation System (NGS) shutoff valve:
 - (a) Go to the location of the NGS shutoff valve (Figure 207).
 - (b) Remove the lock pin from the threaded boss (View B, Figure 207).
 - (c) Install the lock pin back on the servo housing.
 - (d) Turn the manual lock arm to the open position to unlock the NGS shutoff valve (View A-A, Figure 207).
 - (e) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CL	ECS Access Door

LOM ALL

SUBTASK 28-11-00-866-001

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 28-11-00-440-001

- (3) Do this task: Leading Edge Flaps and Slats - Activation, TASK 27-81-00-440-801.

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

SUBTASK 28-11-00-860-027

- (4) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

LOM 406, 407, 412, 415; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003

D	17	C01657	NITROGEN GEN CONT
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LOM 422-434, 437-447, 450-999

D	17	C01657	NITROGEN GENERATION CONTROL
---	----	--------	-----------------------------

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LOM 422-434, 437-447, 450-999 (Continued)

(Continued)

CAPT Electrical System Panel, P18-3

Row Col Number Name

LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003

E 15 C01680 NGS ALT PWR

LOM ALL

SUBTASK 28-11-00-865-001

WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

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LOM 402, 404, 406 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
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LOM 402, 404, 406

D	4	C00829	FUEL BOOST PUMP TANK 2 FWD
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT
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LOM 402, 404, 406

D	6	C00846	FUEL BOOST PUMP CTR TANK RIGHT
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LOM ALL

SUBTASK 28-11-00-410-027

- (6) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

117A	Electronic Equipment Access Door
------	----------------------------------

SUBTASK 28-11-00-865-002

- (7) Close any other circuit breakers that you opened in this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-00-861-001

- (8) Connect these airplane batteries:

- Main (TASK 24-31-11-400-801-001 or TASK 24-31-11-400-802-002)
- Fuel spar valve (TASK 28-22-14-400-801).

SUBTASK 28-11-00-910-091

- (9) Remove all precautionary signs and placards.

SUBTASK 28-11-00-090-007

- (10) Remove all support equipment, stands, ladders, ropes etc.

SUBTASK 28-11-00-650-031

- (11) Do these steps for each fuel boost pump for the No. 1 or 2 fuel tank to remove (purge) air from the engine fuel feed system:

NOTE: This step is necessary when tanks are fully drained. If not, it is an optional step.

- Refuel the applicable No. 1 or 2 fuel tank to approximately 3000 lb (1361 kg) (TASK 12-11-00-650-802).
- Transfer fuel through the refuel system back to the applicable No. 1 or 2 fuel tank, with the fuel boost pump, for approximately 10 minutes.

NOTE: This will remove (purge) air from the engine fuel feed lines.

NOTE: The 10 minute time can be adjusted based upon experience.

- Repeat these steps for each fuel boost pump for the No. 1 or No. 2 fuel tank (left forward fuel boost pump (No.1 tank), left aft fuel boost pump (No. 1 tank), right forward fuel boost pump (No. 2 tank), and right aft fuel boost pump (No. 2 tank)).

SUBTASK 28-11-00-910-092

- (12) If a major fuel tank repair was done during the fuel tank entry, do these steps:

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- (a) Schedule the replacement of the engine and Auxiliary Power Unit (APU) fuel filters after major fuel tank repair, approximately 50 flight hours.
- (b) Replace the engine and APU fuel filters at the scheduled replacement date (PAGEBLOCK 73-11-02/401 and PAGEBLOCK 49-31-21/401).

———— END OF TASK ————

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FUEL TANKS - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks.
 - (1) Analysis of Fuel Leak Type
 - (2) Analysis of Fuel Leak Cause
 - (3) Fuel Leak Detection Procedures
 - (4) Surge Tank Access Door Leak Test Procedure
 - (5) Helitest Leak Detection Procedure
 - (6) Fuel Tank Closure Leak Check
 - (7) General Visual Inspection of the Fuel Tanks
 - (8) External Wires Over the Center Tank Inspection.
- C. After you have identified the leaks, refer to these procedures to repair the fuel tanks:
 - (1) To make sealant repairs in the fuel tank, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-803.
 - (2) For cleaning and painting of the fuel tank, do the applicable tasks: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802, Microbial Growth Removal - Manual Removal Method, TASK 28-10-00-100-803, Microbial Growth Removal - Pressure Washer Method, TASK 28-10-00-100-804 or Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

TASK 28-11-00-300-801

2. Analysis of the Fuel Leak Type

(Figure 601, Figure 602)

A. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

B. Fuel Leak Area Examination

SUBTASK 28-11-00-790-001

- (1) Fuel leakage is divided into four groups to calculate flight safety.

NOTE: The dimension patterns of fuel leaks (Figure 601, Figure 602) are based on an examination 15 minutes after the leak area was rubbed clean.

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SUBTASK 28-11-00-220-002

- (2) The four groups are stain, seep, heavy seep, and running leak and are defined as follows (Figure 601):
- (a) A stain is a leak where the wetted area is not more than 1 1/2 inches (38.1 mm) wide after the time interval noted above.
 - (b) A seep is a leak where the wetted area is not more than 4 inches (101.6 mm) wide after the time interval noted above.
 - (c) A heavy seep is a leak where the wetted area is not larger than 6 inches (152.4 mm) wide after the time interval noted above.
 - (d) A running leak is all fuel leaks that are larger than 6 inches (152.4 mm) wide after the time interval noted above.

NOTE: Fuel will usually come into view again immediately after being wiped dry and can run or drip from the surface.

SUBTASK 28-11-00-790-002

- (3) Examine the wet area around the leak source to find the group of the fuel leak.

SUBTASK 28-11-00-790-003

- (4) After you examine the leak area, rub the area clean and examine the leak area again.

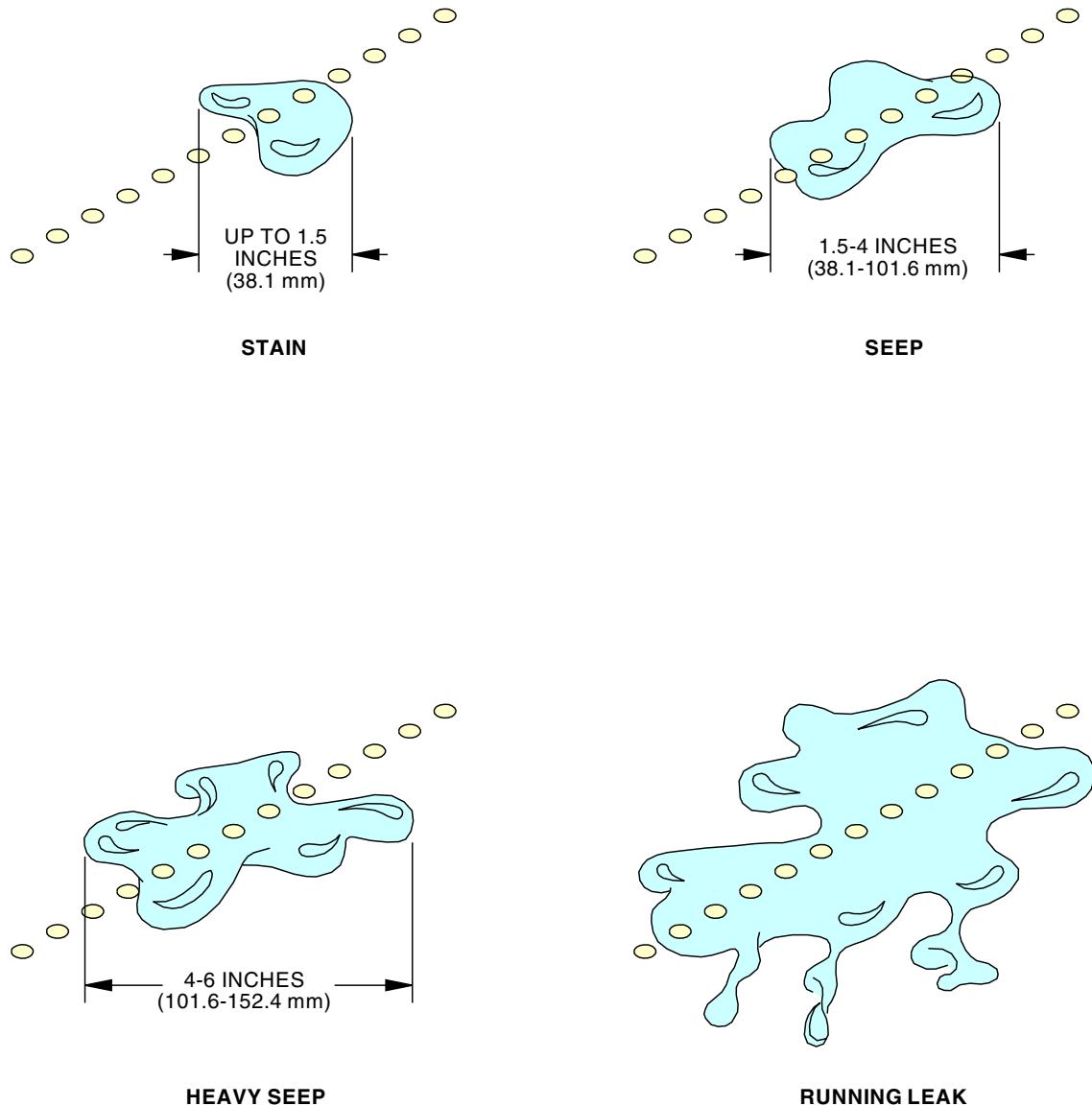
———— END OF TASK ———

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Fuel Leak Types
Figure 601/28-11-00-990-806

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LEAKAGE LOCATION	STAIN	SEEP	HEAVY SEEP	RUNNING LEAK
OPEN AREAS WITH A GOOD FLOW OF AIR WHERE FUEL LEAKAGE CANNOT MOVE TO A POSSIBLE FIRE SOURCE. EXAMPLE: UPPER AND LOWER WING SURFACES THAT DO NOT HAVE FAIRINGS.	1	1	2	3
AREAS THAT ARE NOT FULLY CLOSED AND DO NOT HAVE A GOOD FLOW OF AIR. EXAMPLE: REAR SPAR AT THE TRAILING EDGE FLAPS AND WHEEL WELLS.	1	2 TWO LOCATIONS MAXIMUM 3	3	3
CLOSED AREAS WITHOUT A FLOW OF AIR. EXAMPLE: WING LOWER SURFACE WITH FAIRINGS, AIR CONDITIONING BAY, WING/BODY FAIRINGS, FRONT AND REAR SPAR, AND THE REFUELING STATION(S).	2	3	3	3
PRESSURIZED AREA OF THE CENTER FUEL TANK.	4	4	4	4
PYLON AREA ABOVE AND AROUND THE ENGINES	4	4	4	4

- 1** NO REPAIR PROCEDURE IS NECESSARY; EXAMINE THE FUEL LEAK FREQUENTLY TO MAKE SURE IT DOES NOT GET LARGER.
- 2** IT IS NOT NECESSARY TO REPAIR THE FUEL LEAK IMMEDIATELY. EXAMINE THE FUEL LEAK FREQUENTLY TO MAKE SURE IT DOES NOT GET LARGER. MAKE THE NECESSARY REPAIRS DURING THE NEXT SCHEDULED MAINTENANCE.
- 3** REPAIR THE FUEL LEAK IMMEDIATELY TO A MINIMUM OF **1** OR **2** CLASSIFICATION.
- 4** REPAIR THE FUEL LEAK IMMEDIATELY. NO FUEL LEAKAGE IS PERMITTED.

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Fuel Leak Evaluation
Figure 602/28-11-00-990-807

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TASK 28-11-00-200-801

3. Analysis of Fuel Leak Cause

(Figure 603)

A. General

- (1) This task lists the causes of the fuel leaks and discusses leak path analysis.
- (2) The cause of fuel tank leaks is usually incorrect fitting installations, damaged sealant, incorrectly installed or damaged O-rings, or loose fasteners.
- (3) Before you defuel a fuel tank which has a leak, try to find all of the leaks in the fuel tank.
- (4) Repair all leaks each time a fuel tank is defueled to repair leaks.
- (5) The causes of most of the fuel leaks in the fuel tank structure are:
 - (a) Surfaces are prepared incorrectly
 - (b) Sealants are mixed or kept incorrectly
 - (c) Sealants are applied incorrectly
 - (d) Fasteners are loose
 - (e) Fittings and connections are installed incorrectly.

B. References

Reference	Title
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Procedure - Fuel Leak Causes

SUBTASK 28-11-00-280-001

- (1) Surfaces are prepared incorrectly.
 - (a) The surfaces must not contain unwanted materials such as grease, metal particles, hair, loose paint or wax.
 - (b) Unwanted materials can cause the sealant not to bond correctly.

SUBTASK 28-11-00-280-002

- (2) Sealants are mixed or kept incorrectly (TASK 28-11-00-300-803).
 - (a) Synthetic rubber makes the base for most sealing compounds.

NOTE: The manufacturer adds ingredients to control strength, cure time, plasticity, usable life, and fuel resistance.

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- (b) Sealants are supplied in two parts; base material and accelerator.

NOTE: You must be very careful to make sure the correct proportions of the base material and the accelerator recommended by the manufacturer are used. If you do not obey the manufacturer's instructions, you can change the physical properties of the mixture which can cause a seal failure and a fuel tank leak.

- (c) Sealing compounds have a specified shelf life.

NOTE: After the specified time, you must do a test of the sealing compounds to find out if you can use them.

- (d) You can keep some sealants in refrigeration for a short time after they are mixed with the accelerator.

NOTE: You must discard these sealants after the specified time.

SUBTASK 28-11-00-280-003

- (3) Sealants are applied incorrectly (TASK 28-11-00-300-803).

- (a) If you do not do the subsequent steps, fuel leaks can occur:

- 1) Follow all manufacturer's instructions.
- 2) Use a brush to apply precoat when recommended.
- 3) Do all the steps to apply the sealant.
- 4) Make sure there are no air bubbles in the sealant.
- 5) Make sure you fill all the spaces completely with sealant.
- 6) Make sure you do not make an overlap with the sealants.
- 7) Make sure the sealant touches all the surfaces.

SUBTASK 28-11-00-280-004

- (4) The fasteners are loose.

- (a) Loose fasteners start fuel leaks because they let attached surfaces move.
- (b) Faying surface seals get cracks and let fuel leak through the seal plane (TASK 28-11-00-300-803).
- (c) Loose rivets are not self-sealing.
- (d) Sealant or metal seal covers do not bond with loose fasteners.

SUBTASK 28-11-00-280-005

- (5) Fittings and connections are installed incorrectly.

- (a) Fittings and connections attached to or that go through the fuel tank structure are sealed with O-rings.

NOTE: Damaged or incorrectly installed O-rings can cause fuel leaks.

E. Leak Path Analysis

SUBTASK 28-11-00-790-004

- (1) After you find the external leak point and the internal leak source, find the point where fuel goes through the seal plane.

- (a) The internal area where you see the bubble or dye usually shows the point where fuel goes through the seal plane.
- (b) If there is an injection, prepack or hidden seal failure, the fuel can move along the tank structure and leak at a point far from the leak source.

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- (c) If you repair the internal area where you see the bubble or dye and do not repair the injection, prepack or hidden seal failure, you can only temporarily repair the leak.
- (d) You must find all possible leak paths between the external leak point and internal leak source to repair the seal failure.

NOTE: You can increase the height of the seal plane as an alternative to a repair of the seal.

SUBTASK 28-11-00-210-004

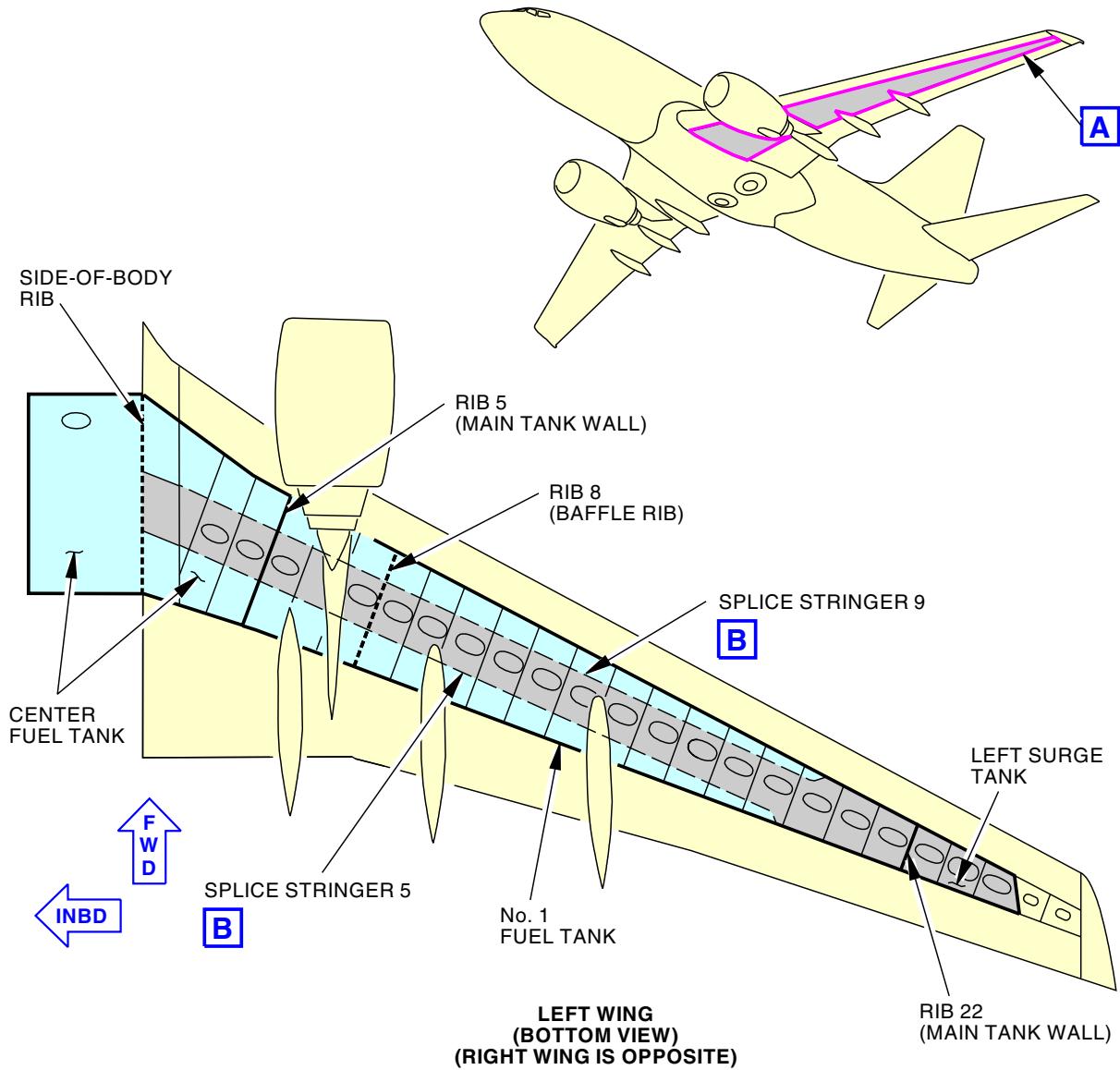
- (2) The seal plane stops the fuel leaks from the fuel tank.
 - (a) When there is a seal plane failure, the mating surfaces of the tank structure, external to the seal plane, get wet.

NOTE: The area that gets wet extends in all directions from the point fuel goes through until it finds an injection, faying surface, prepack or hidden seal.
 - (b) There are no seals on the external side of the seal plane and fuel that goes through the seal plane follows the path of least resistance.
 - 1) For example, a row of fasteners in a groove are wet but only one fastener has a leak.
 - 2) If the fastener with the leak is sealed, then the fastener with the subsequent least resistance will leak.
 - (c) If you find the leak path you can see how fuel gets from the internal leak source to the external leak point.
 - (d) To understand the leak, examine the tank structure and sealant.

———— END OF TASK ————

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Skin Joints and Fillet Seals of the Wing
Figure 603/28-11-00-990-808 (Sheet 1 of 2)

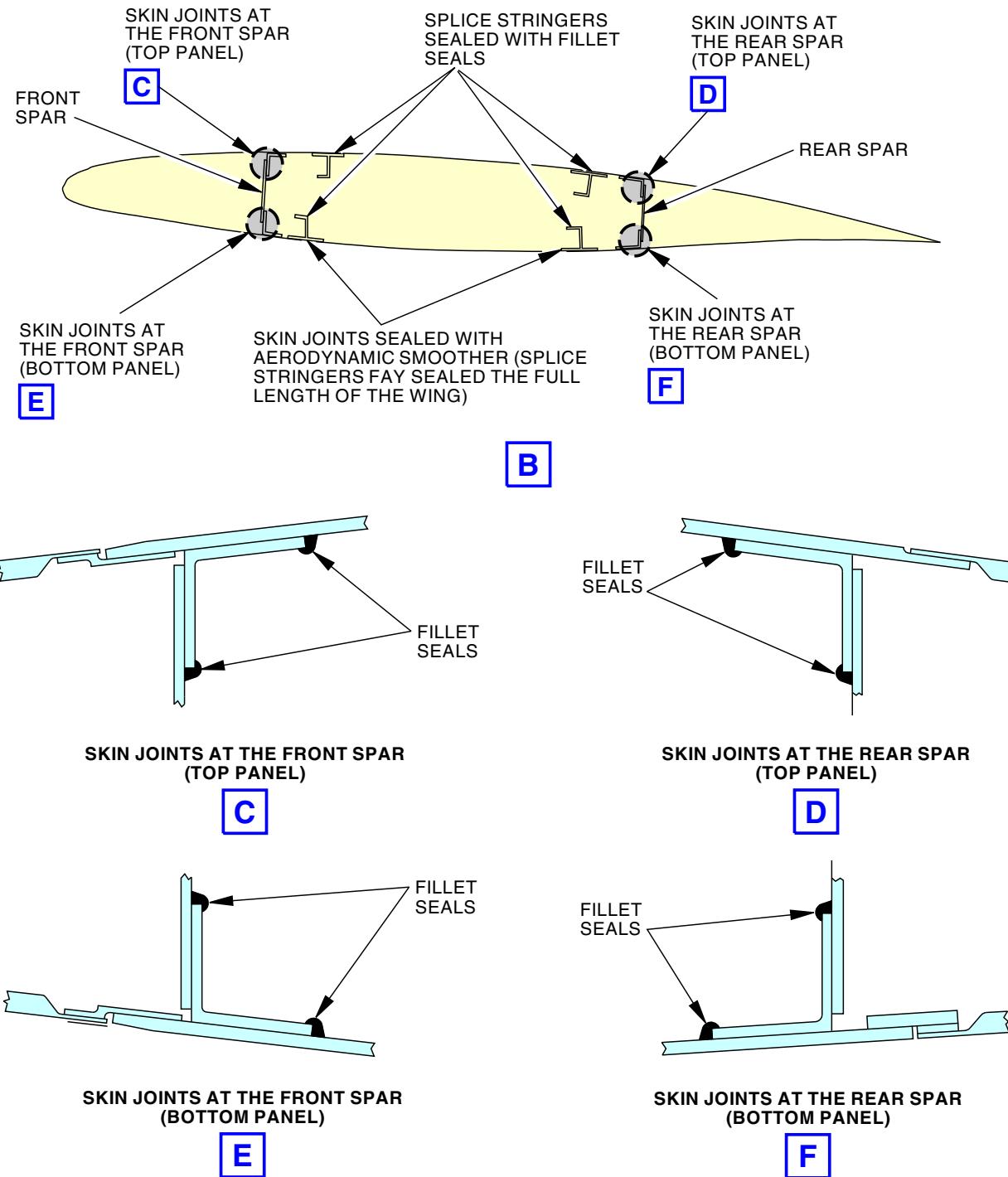
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Skin Joints and Fillet Seals of the Wing
Figure 603/28-11-00-990-808 (Sheet 2 of 2)

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TASK 28-11-00-790-801

4. Fuel Leak Detection Procedures

(Figure 604, Figure 605, Figure 606, Figure 607, and Figure 608)

A. General

- (1) This task has procedures used to find a leak as follows:

NOTE: The procedures recommended to find the leak and the leak paths are "Find the External Leaks with Talcum Powder" and the "Air Pressure and Bubble Solution (Backblowing)" procedures.

- (a) Find the External Leaks with Talcum Powder
- (b) Air Pressure and Bubble Solution (Backblowing) procedure
- (c) Air Bubble Hollow Bolt procedure

NOTE: This procedure finds leaks in areas with complex structure.

- (d) Dye Injection with Hollow Bolt

NOTE: This procedure finds leaks in areas with complex structure.

- (e) Dye Injection procedure

NOTE: This procedure puts dye into the leak from outside the fuel tank and looks for dye inside the fuel tank.

- (f) Internal Pressure procedure

NOTE: This procedure pressurizes the fuel tank to help find leaks on the outside of the fuel tank with soap solution. After the leaks are found, the backblowing procedure can be used to find the internal leaks. This procedure can help find leaks after the other procedures have been tried and when there is no fuel in the fuel tanks.

- (g) Fuel Tank Access Doors

NOTE: This procedure gives fuel quantities to find access doors that leak.

- (h) Leak Check.

NOTE: This check fuels the airplane to make sure that the leak is corrected.

B. References

Reference	Title
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-13-31-000-801	Flame Arrestor Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)



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C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1761	Leakage Tracing Device, Integral Tank Leakage Test Part #: F71329 Supplier: 81205
SPL-1774	Water Manometer - Test Equipment Part #: F72951-1 Supplier: 81205
SPL-12783	Test Equipment - Fuel Tank and Vent System Part #: C28008-1 Supplier: 81205
STD-77	Air Source, Regulated - Dry Filtered, 0-50 psig
STD-123	Brush - Soft Bristle
STD-1081	Flashlight - Explosion Proof
STD-3940	Air Source - Regulated, Dry Filtered, 0-150 psig

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G50304	Dye - T-100/OS-80 Fluorescent Tracer Dye (Blue-White Color)	BSS7074 (Supersedes BMS10-34)
G50464	Talcum Powder (White)	
G50957	Dye - T-100/OS-31 Fluorescent Tracer Dye (Green Color)	BSS7074 (Supersedes BMS10-34)

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

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G. Prepare to Find the Leaks

SUBTASK 28-11-00-650-006

- (1) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-007

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-00-010-003

- (3) To remove the applicable main tank access doors, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

SUBTASK 28-11-00-010-004

- (4) To remove the applicable center tank access doors, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.

SUBTASK 28-11-00-010-005

- (5) To remove the applicable surge tank access doors, do this task: Surge Tank Access Door Removal, TASK 28-11-11-000-802.

SUBTASK 28-11-00-210-006

- (6) Visual Procedure

- (a) Examine the area you think has a leak for seal defects such as cracked or loose fillets, pinholes, or loose fasteners.

NOTE: If it is necessary, use mirrors to examine seals which are difficult to see.



CAUTION HOLD THE AIR HOSE A MINIMUM OF $\frac{1}{2}$ IN. (13 MM) FROM THE AIRPLANE STRUCTURE. IF THE AIR HOSE IS TOO NEAR THE AIRPLANE STRUCTURE, DAMAGE TO THE SEALS CAN OCCUR.

- (b) Do a check of the fillet seals that you think have a bad bond.
 - (c) Rub the edges with a pencil eraser, or supply air at a maximum of 100 psig (689 kPa) and a minimum 0.5 in. (12.7 mm) from seal.
 - (d) Look at the tank structure for cracks or distortion.

H. Find External Leaks with Talcum Powder

SUBTASK 28-11-00-150-001

- (1) Remove aerodynamic smoother if applied over the applicable seam or joint.

SUBTASK 28-11-00-160-001

- (2) Rub the leak dry with an absorbent cotton wiper, G00034.

SUBTASK 28-11-00-360-001

- (3) With a soft-bristle or camel-hair soft bristle brush, STD-123, apply Powder - Talc, G50464, on the area you think contains the leak.

SUBTASK 28-11-00-210-005

- (4) Look at the area with the Powder - Talc, G50464, and see if the Powder - Talc, G50464, changes color.

SUBTASK 28-11-00-930-001

- (5) Make a mark on each leak and do the same procedure again until each external leak is found.

I. Air Pressure and Bubble Solution (Backblowing) Procedure

NOTE: This procedure gives good results for leak detection.

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SUBTASK 28-11-00-280-006

- (1) Two persons are necessary to do this task:
 - (a) One person must be out of the fuel tank at the external location of the leak.
 - (b) One person must go into the fuel tank(s) and find the internal leak location(s).
 - 1) The person(s) that goes into the fuel tank must have these items:
 - a) An explosion-proof explosion proof flashlight, STD-1081
 - b) Non-corrosive soap Snoop Leak Detector compound, G00091, or bubble bath
 - c) Marking pen (Berol Filmograph or equivalent).
 - (c) If the external leak location is near a tank boundary or the side-of-body rib, the leak can be on one side of the rib or the other.

NOTE: It can be faster to put one person in each fuel tank to find the leaks.

SUBTASK 28-11-00-700-001

- (2) The two persons must agree on a procedure to communicate.
 - (a) The person that is out of the fuel tank can knock on the airplane skin to make it easier for the person in the fuel tank to find the correct location.
 - (b) The person in the fuel tank must tell the person out of the fuel tank when to blow air through the external leak.
 - (c) Agree on a system of knocks.

NOTE: For example, the person in the fuel tank can knock one time to start blowing air, two times if he finds a leak, and three times if the leak is not found.

SUBTASK 28-11-00-700-002

- (3) The person in the fuel tank must apply the soap solution to a large area near the external leak location.

NOTE: The internal leak can easily be as far as 3 feet (1 meter) or more from the external location of the leak. Examine the internal surface of the tank for loose sealant or bad sealant or a bad fastener. This can help you make a decision about where to look for the internal leak. If the external leak is a fastener, find the fastener in the fuel tank. Examine this fastener before you try to find leaks in a different location.

- (a) If the external leak location is in a skin joint , examine the fillet seal on the nearest splice stringer (Figure 603).

NOTE: Splice stringers are stringers that cover the joints of the airplane skin. There are three splice stringers in each wing. Faying surface seals (isolation seals) are applied full length along the splice stringers. These seals are applied between the splice stringers and the airplane skin. The purpose of these faying surface seals are to provide a secondary seal if the fillet seals fail and to limit a fastener leak path to the fastener itself.

- (b) If the external leak location is the front or rear spar, examine the fillet seals on the internal surface of the applicable spar.

- (c) If the external leak location is at rib 5 or rib 1 (side-of-body) examine both sides of these ribs for leakage.

NOTE: Examine the full length of the fillet seals in the fuel tank. It is possible for the head pressure of the fuel in the fuel tank to cause the fuel to show at an external location that is higher than the internal leak location.

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SUBTASK 28-11-00-700-003



CAUTION

HOLD THE AIR HOSE A MINIMUM OF $\frac{1}{2}$ IN. (13 MM) FROM THE AIRPLANE STRUCTURE. IF THE AIR HOSE IS TOO NEAR THE AIRPLANE STRUCTURE, DAMAGE TO THE SEALS CAN OCCUR.

- (4) The person out of the fuel tank must use a regulated air source, STD-77, with a nozzle to blow air through the external location of the leak (Figure 604).
 - (a) If the leak is small, it can be necessary to use the maximum pressure (100 psi (689 kPa)).
 - (b) If the leak is larger, it is easier to find the leak with less pressure (for example 50 psi (345 kPa)).

SUBTASK 28-11-00-700-004

- (5) Have the person(s) in the fuel tank look for bubbles.
 - (a) Look for bubbles that show the location of the leak.
 - (b) It is also possible to feel for blowing air to find the leak.
 - (c) Find all the leak locations on the internal surface of the fuel tank.

NOTE: It is possible that three or four internal leaks are related to one external leak. Make a signal to the person out of the fuel tank to stop the blowing of air when you find all of the leaks.
 - (d) Make a mark on these leak locations with a marking pen.

NOTE: If you are not sure you found the correct leak path, you can apply the bubble solution to the external leak location and blow air through the internal leaks. If the air blows through the external leak location, you found the correct leak path.

SUBTASK 28-11-00-700-005

- (6) Make a mark in and out of the fuel tank at the area with bubbles.

SUBTASK 28-11-00-700-006

- (7) After the check on the full area, do a check again on the areas with bubbles to make sure that the leaks are isolated.

SUBTASK 28-11-00-700-007

- (8) Clean the bubble solution in the fuel tank.

SUBTASK 28-11-00-700-008

- (9) Repair the leaks that you find (TASK 28-11-00-300-803).

J. Air Bubble with Hollow Bolt Procedure

SUBTASK 28-11-00-280-007

- (1) Remove the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-280-008

- (2) Install the hollow bolt assembly.

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SUBTASK 28-11-00-700-009



WARNING

BLOW INTO THE MANOMETER HOSE AND MAKE SURE THAT THE WATER LEVEL CHANGES. THIS WILL SHOW THAT THE MANOMETER IS FREE OF ALL BLOCKAGES AND OPERATES SAFELY. IF THE MANOMETER IS NOT CLEAR, INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT COULD OCCUR.

- (3) Connect the water manometer, SPL-1774, to the hollow bolt (Figure 605, Figure 606).

SUBTASK 28-11-00-700-010

- (4) Apply the noncorrosive soap solution to the area in the fuel tank that you think has the leak.

SUBTASK 28-11-00-700-011



CAUTION

DO NOT USE MORE THAN THE SPECIFIED PRESSURE. IF YOU USE MORE PRESSURE, YOU CAN CAUSE DAMAGE TO EQUIPMENT.

- (5) Supply air pressure with a regulated air source, STD-3940, to the hollow bolt and look for air bubbles in the fuel tank.

- (a) Do not use more than a maximum pressure of 4 psig (28 kPa).

SUBTASK 28-11-00-700-012

- (6) Make a mark at the locations where you see air bubbles in the fuel tank.

SUBTASK 28-11-00-700-013

- (7) Remove the hollow bolt assembly.

SUBTASK 28-11-00-700-014

- (8) Install the fastener.

NOTE: Refer to the structural repair manual for fastener installation.

SUBTASK 28-11-00-700-015

- (9) Clean the bubble solution from the fuel tank.

K. Dye Injection with Hollow Bolt Procedure

NOTE: Use this procedure only after you use the Air Bubble with Hollow Bolt Procedure.

SUBTASK 28-11-00-280-009

- (1) Remove the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-280-010

- (2) Install the hollow bolt assembly.

SUBTASK 28-11-00-700-016

- (3) Connect the leakage tracing device, SPL-1761, to the hollow bolt (Figure 605, Figure 606).

SUBTASK 28-11-00-700-017

- (4) Make sure that you monitor the dye container, gage, and equipment while they are in position.

SUBTASK 28-11-00-700-018

- (5) Add one of the dyes that follow, through the hollow bolt:

- (a) T-100/OS-31 green fluorescent tracer dye, G50957

- (b) T-100/OS-80 blue-white fluorescent tracer dye, G50304.

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SUBTASK 28-11-00-700-019

- (6) Remove the leakage tracing device, SPL-1761.

SUBTASK 28-11-00-700-020

- (7) Remove the hollow bolt assembly.

SUBTASK 28-11-00-700-021

- (8) Install the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-700-022

- (9) Make a mark at the location where you first see the dye.

SUBTASK 28-11-00-700-023

- (10) Use cotton wiper, G00034, to remove all the dye.

SUBTASK 28-11-00-700-024

- (11) To repair or replace the sealant, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-803.

L. Dye Injection Procedure

NOTE: This method injects dyed fuel through the external leak point to find the internal leak source.

You can use dye in maximum concentrations of 2 fluid ounces per 100 gallons of fuel (0.16 liters dye per 100 liters of fuel).

SUBTASK 28-11-00-280-011

- (1) Put the leakage tracing device, SPL-1761, in position near external leak (Figure 605).

SUBTASK 28-11-00-790-005

- (2) Use the leakage tracing device, SPL-1761, to add one of the dyes that follows, through the external leak.
 - (a) T-100/OS-31 green fluorescent tracer dye, G50957
 - (b) T-100/OS-80 blue-white fluorescent tracer dye, G50304.

SUBTASK 28-11-00-790-006

- (3) Continue to add pressure until the dye shows in the fuel tank.

SUBTASK 28-11-00-790-007

- (4) Make a mark at the point where dye is first seen.

SUBTASK 28-11-00-790-008

- (5) Remove the leakage tracing device, SPL-1761.

SUBTASK 28-11-00-790-009

- (6) Use cotton wiper, G00034, to remove all the dye.

SUBTASK 28-11-00-790-010

- (7) To repair or replace the sealant, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-803.

M. Internal Pressure and Bubble Procedure

NOTE: Use this method after all other methods are tried. When it is difficult to find the leaks on the outside surface of the wing, the fuel tank can be pressurized and a bubble solution applied to the wing. Bubbles will show the external leak points.

NOTE: This procedure can also be used to do a leak repair check without refueling the airplane.

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SUBTASK 28-11-00-480-002

- (1) Do these steps to install the test equipment, SPL-12783 (Figure 607):

- (a) Remove the seven screws [1] from this access panel:

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

- (b) With the seven screws [1] that you removed, install the tank cover assembly C28008-2 over this access panel:

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

- (c) Remove the seven screws [1] from this access panel:

Number Name/Location

633BB Surge Tank Access Door - Wing Station 679

- (d) With the seven screws [1] that you removed, install the tank cover assembly C28008-3 over this access panel:

Number Name/Location

633BB Surge Tank Access Door - Wing Station 679

- (e) Make sure the test equipment, SPL-12783, tank cover assemblies (C28008-2 and C28008-3) have a good seal over the surge tank access doors.

SUBTASK 28-11-00-410-005

- (2) Install all other fuel tank access doors that are removed (TASK 28-11-11-400-801, TASK 28-11-11-400-802 or TASK 28-11-11-400-803).

SUBTASK 28-11-00-480-003



WARNING

BLOW INTO THE MANOMETER HOSE AND MAKE SURE THAT THE WATER LEVEL CHANGES. THIS WILL SHOW THAT THE MANOMETER IS FREE OF ALL BLOCKAGES AND OPERATES SAFELY. IF THE MANOMETER IS NOT CLEAR, INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT COULD OCCUR.

- (3) Connect the water manometer, SPL-1774, assembly to the adapter on the test equipment, SPL-12783, tank cover assembly (C28008-2) (Figure 606).

- (a) Fill the manometer with water to the fill mark on the manometer for the applicable pressure or vacuum (5.20 psig (35.85 kPa)).

NOTE: Colored water or a small floating ball makes it easier to monitor the water level in the manometer. Use antifreeze solution in the manometer when the weather is cold.

SUBTASK 28-11-00-780-001



WARNING

REMOVE ALL PERSONNEL FROM THE FUEL TANK BEFORE YOU PRESSURIZE IT. DO NOT PRESSURIZE IT TO MORE THAN THE MAXIMUM SAFE PRESSURE OF 5.20 PSI (35.85 KPA). INJURIES TO PERSONNEL CAN OCCUR.

- (4) Pressurize the tank to a maximum of 5.0 psig (34.5 kPa).

NOTE: The use of negative (vacuum) pressure is not recommended for this test because it can cause more damage to sealant. However, if negative pressure is used, do not apply more negative pressure than -2.0 psig (-13.8 kPa).

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SUBTASK 28-11-00-700-025

- (5) Apply the bubble solution to the area out of the fuel tank that you think has the leak.

SUBTASK 28-11-00-210-007

- (6) Watch the area that you think has the leak for bubbles.

NOTE: The size of the leak can cause the bubbles to show very slowly. It can be necessary to constantly watch to see the leak.

SUBTASK 28-11-00-200-001

- (7) Make a mark at the locations where you see bubbles.

SUBTASK 28-11-00-100-001

- (8) Use a moist cotton wiper, G00034, to remove the bubble solution from the external surface of the fuel tank.

SUBTASK 28-11-00-780-002

- (9) Remove the pressure from the fuel tank.

SUBTASK 28-11-00-080-004

- (10) Do these steps to remove the test equipment, SPL-12783:

- (a) Disconnect the water manometer, SPL-1774, from the test equipment, SPL-12783, surge tank access cover (C28008-2).
(b) To remove the test equipment, SPL-12783, surge tank access cover (C28008-2), do this step:
1) Remove the seven screws [1] that attach the surge tank access cover to this access panel:

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

- (c) Put the seven screws [1] that you removed back into their positions in this access panel:

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

- (d) Tighten each bolt to 35 ± 5 in-lb (4 ± 1 N·m).

- (e) To remove the test equipment, SPL-12783, surge tank cover (C28008-3), do this step:

- 1) Remove the seven screws [1] that attach the surge tank access cover to this access panel:

Number Name/Location

633BB Surge Tank Access Door - Wing Station 679

- (f) Put the seven screws [1] that you removed back into their positions in this access panel:

Number Name/Location

633BB Surge Tank Access Door - Wing Station 679

- (g) Tighten each bolt to 35 ± 5 in-lb (4 ± 1 N·m).

SUBTASK 28-11-00-700-026

- (11) Use one of the procedures given above to find the internal leak source.

SUBTASK 28-11-00-700-027

- (12) Repair or replace the sealant as necessary (TASK 28-11-00-300-803).

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N. Find the Leaks at the Fuel Tank Access Doors

SUBTASK 28-11-00-650-008

- (1) Fill the applicable fuel tank to a level that will cover the access door that you think has a fuel leak (Table 601, Table 602).

NOTE: The fuel quantities in Table 601 and Table 602 are approximate values when the airplane is at the nominal attitude of -1.14 degrees pitch and 0 degrees wing roll. The fuel quantities required to cover the access doors will increase or decrease at different attitudes. For the most outboard access doors in the main fuel tanks fill the tanks to Volumetric Shutoff (VSO). The fuel quantities required to cover these access doors will change due to changes in fuel density and the quantity of expansion space in each main fuel tank.

Table 601/28-11-00-993-813

TABLE 601. Fuel Necessary to Cover the Center Tank Access Doors		
ACCESS DOORS LEFT/RIGHT	FUEL (LBS)	FUEL (KGS)
131AB	3143	1429
531AB/631AB	14845	6748
531BB/631BB	20537	9335

Table 602/28-11-00-993-814

TABLE 602. Fuel Necessary to Cover the No. 1 or No. 2 Tank Access Doors		
ACCESS DOORS LEFT/RIGHT	FUEL (LBS)	FUEL (KGS)
532AB/632AB	60	27
532BB/632BB	699	317
532CB/632CB	1167	529
532DB/632DB	1765	801
532EB/632EB	2583	1172
532FB/632FB	3402	1543
532GB/632GB	4230	1919
532HB/632HB	4940	2241
532JB/632JB	5665	2570
532KB/632KB	6192	2809
532LB/632LB	6710	3044
532MB/632MB	7139	3238
532NB/632NB	7570	3434
532PB/632PB	7966	3613
532QB/632QB	8262	3747
532RB/632RB	8545	3876

SUBTASK 28-11-00-280-012

- (2) Examine the access door for leaks using Find External Leaks with Talcum Powder Procedure.

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SUBTASK 28-11-00-280-013

- (3) Repair or replace the access door as applicable (TASK 28-11-11-400-801, TASK 28-11-11-400-802 or TASK 28-11-11-400-803).

SUBTASK 28-11-00-790-023

- (4) The access doors for the surge tank that contain the vent scoop and pressure relief valve contains a weep hole:

(Figure 608)

Number **Name/Location**

533BB Surge Tank Access Door - Wing Station 679

633BB Surge Tank Access Door - Wing Station 679

- (a) The purpose of the weep hole is to supply venting for the cavity in the door casting at this location.
- (b) If there is leakage in the seals around the vent scoop and the flame arrestor in the vent scoop, fuel can collect in the cavity in the door casting and come out of the weep hole.
- (c) If fuel drips or flows from this weep hole, do these steps:
- 1) For the applicable surge tank access door, do this task: Surge Tank Access Door Removal, TASK 28-11-11-000-802.
 - 2) Examine the seals and sealant around the vent scoop and flame arrestor (TASK 28-13-31-000-801).
 - 3) Re-seal the vent scoop to repair the leakage (TASK 28-11-00-300-803).
 - 4) For the applicable surge tank door, do one of these tasks:
 - Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation, TASK 28-11-11-400-802
 - Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803.

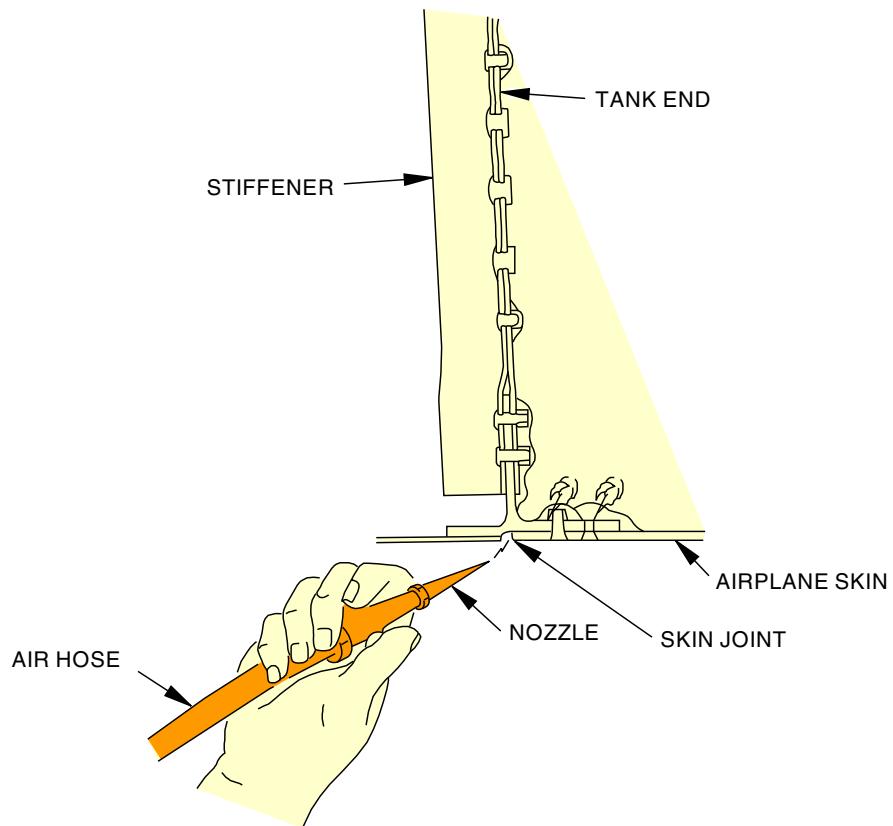
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Backblowing Procedure (Example)
Figure 604/28-11-00-990-809

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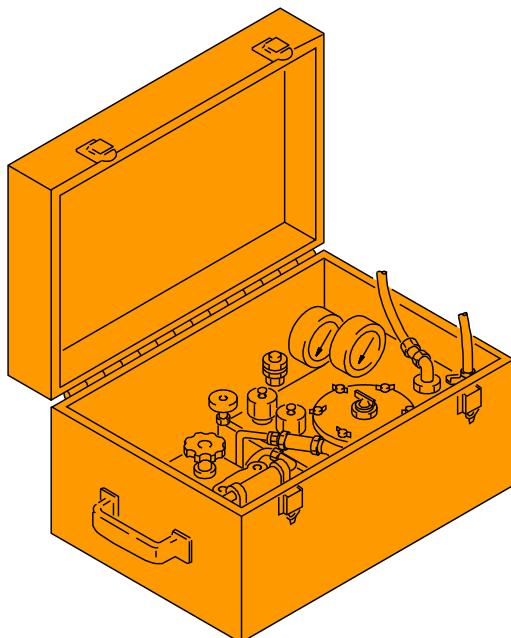
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

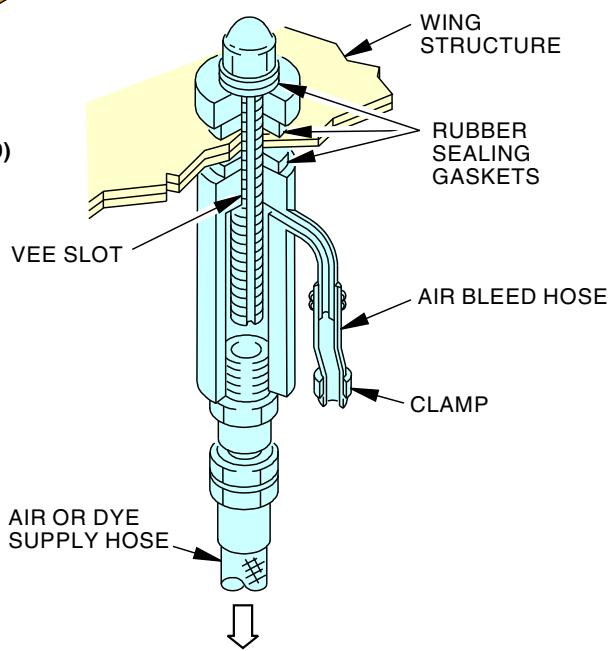
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LEAK TRACING DEVICE (F71329)



ADAPTER ASSEMBLY - FUEL LEAK TRACING HOLLOW BOLT (F70206-1)

- 1 MONITOR THE PRESSURE EQUIPMENT CONSTANTLY TO MAKE SURE THE PRESSURE IS NOT MORE THAN THE MAXIMUM SAFE PRESSURE

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Hollow Bolt for Areas With Complex Structure
Figure 605/28-11-00-990-810

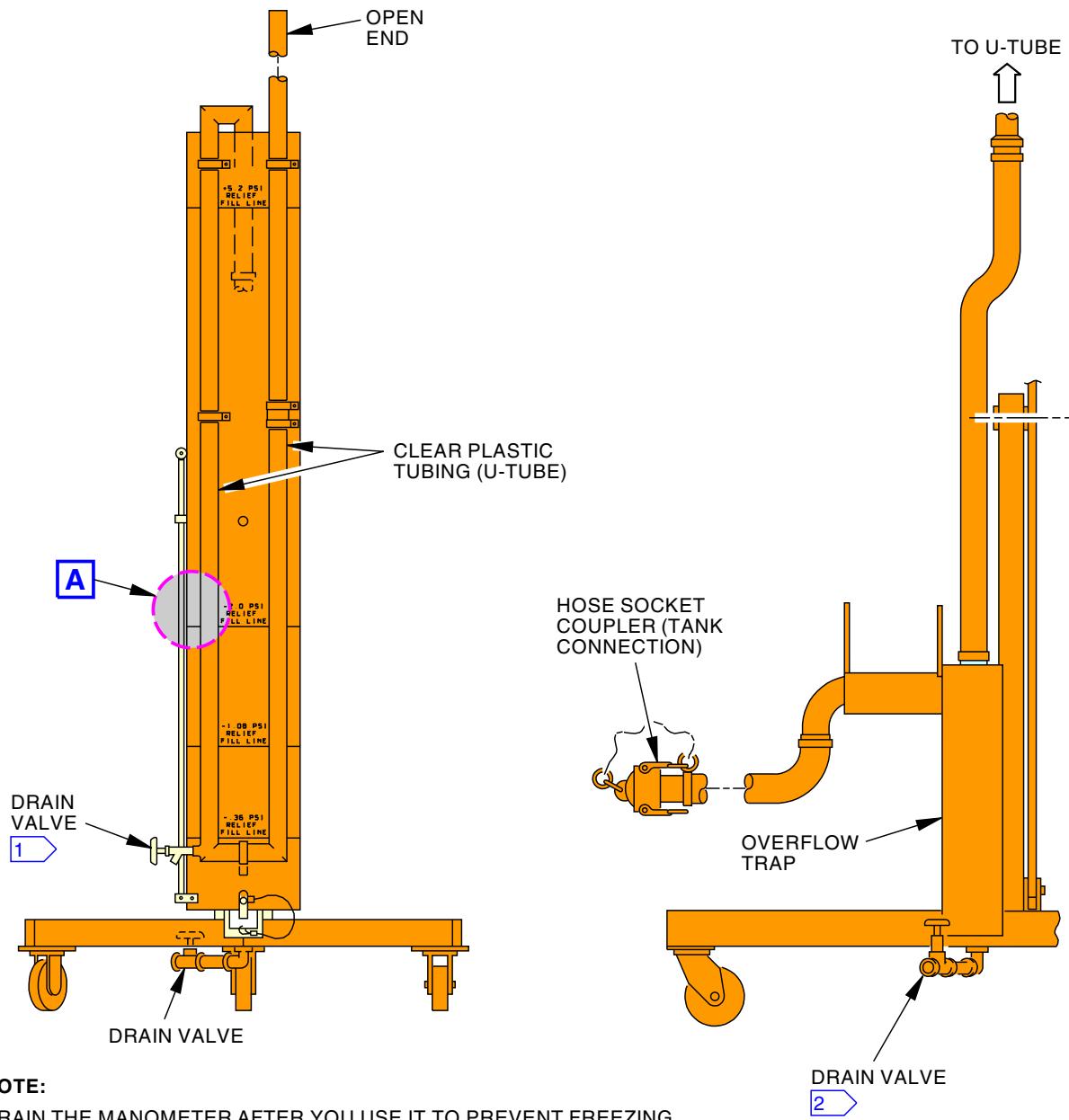
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**NOTE:**

DRAIN THE MANOMETER AFTER YOU USE IT TO PREVENT FREEZING.

- [1]** USE THE VALVE TO ADJUST THE FILL LEVEL AND TO DRAIN THE TUBING
- [2]** USE THE VALVE TO DRAIN THE OVERFLOW TRAP

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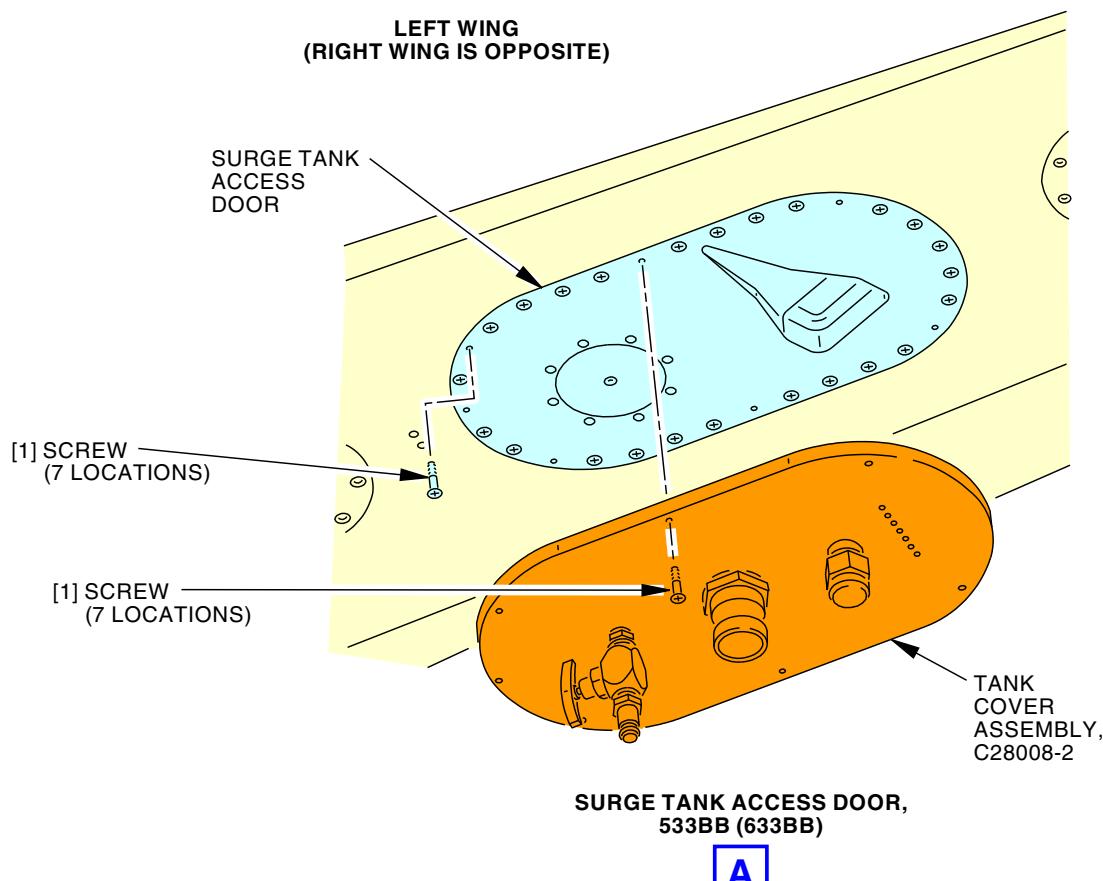
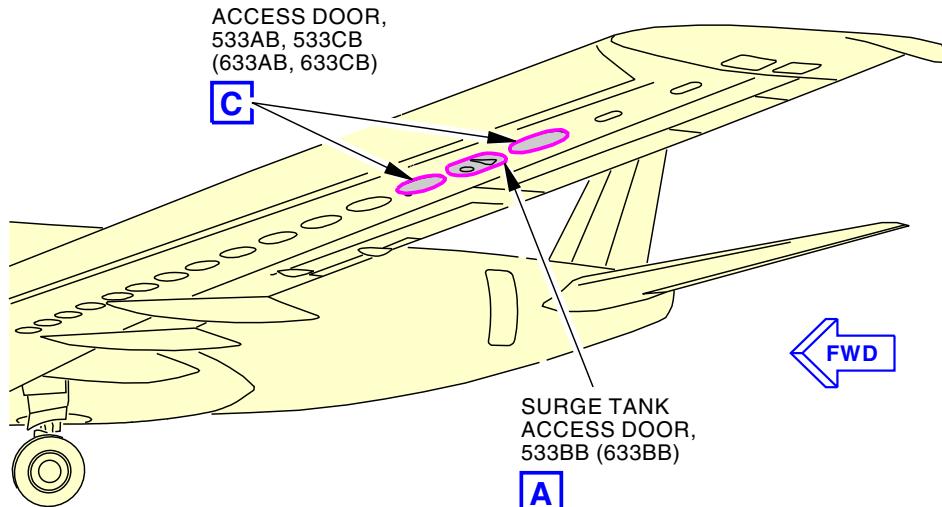
Water Manometer Assembly
Figure 606/28-11-00-990-811

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**Integral Fuel Tanks - Inspection/Check
Figure 607/28-11-00-990-812**

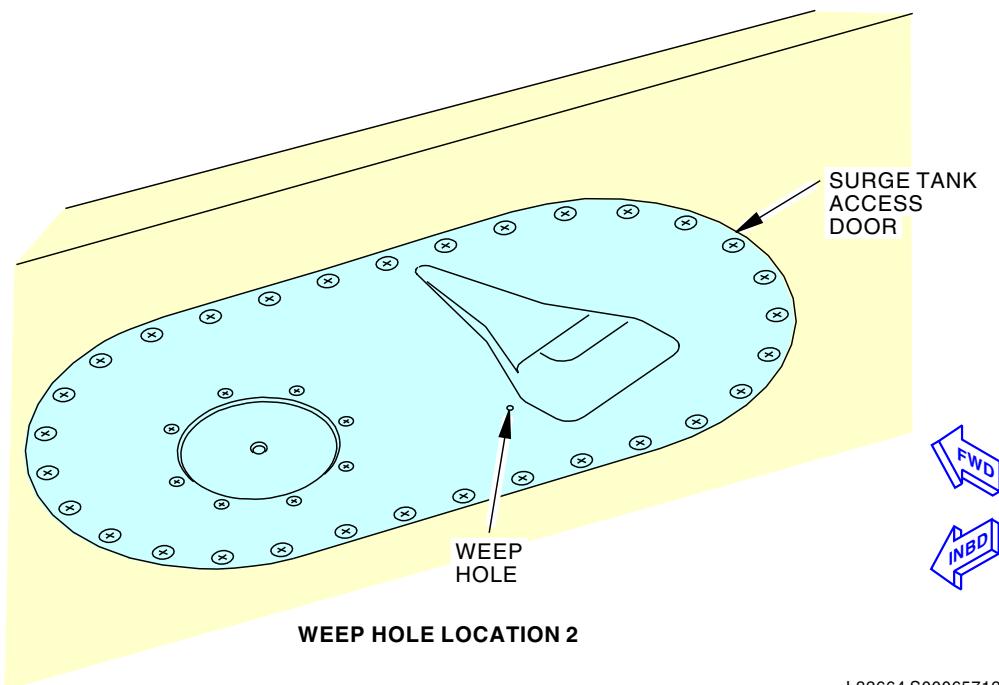
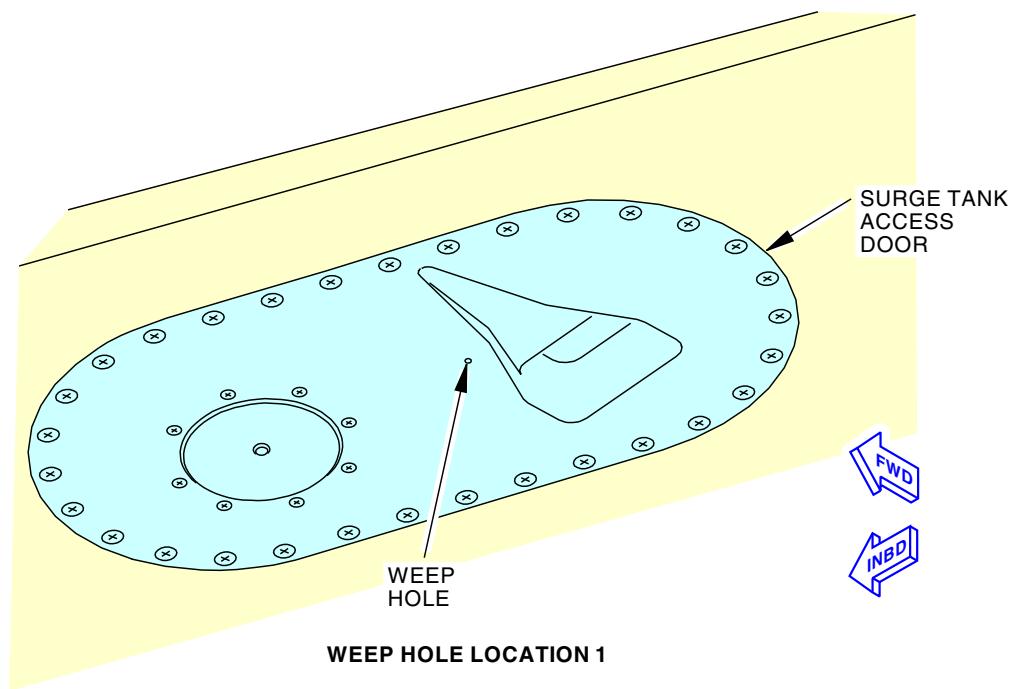
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Surge Tank Weep Hole
Figure 608/28-11-00-990-847

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TASK 28-11-00-790-803

5. Surge Tank Access Door - Leak Test Procedure

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
12-11-00-680-801	Fuel System Sumping (P/B 301)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

B. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

C. Surge Tank Access Door Leak Test Procedure

SUBTASK 28-11-00-650-024

- (1) To do a leak test of the No. 1 surge tank doors, fill the No. 1 tank to its full capacity (to automatic shutoff), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-11-00-650-025

- (2) To do a leak test of the No. 2 surge tank doors, fill the No. 2 tank to its full capacity (to automatic shutoff), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-11-00-860-028

- (3) Open the applicable surge tank drain valve (Fuel System Sumping, TASK 12-11-00-680-801).

SUBTASK 28-11-00-650-032

- (4) With the surge tank sump drain open, slowly fill the main tank until fuel just starts to come out of the surge tank sump drain.

- (a) Push the red Manual Override Button adjacent to the solenoid of the applicable fueling shutoff valve to add fuel beyond the automatic shutoff quantity.

NOTE: The manual override button could be pressed in repeated short intervals to achieve a slow addition of fuel beyond the automatic shutoff quantity.

SUBTASK 28-11-00-860-029

- (5) Close the applicable surge tank drain valve (Fuel System Sumping, TASK 12-11-00-680-801).

SUBTASK 28-11-00-790-024

- (6) Open the applicable refuel valve to slowly add 35 ± 5 gal (132 ± 19 l) of fuel to the applicable main tank (the No. 1 or the No. 2 tank) to cover the surge tank access doors with fuel.

NOTE: At a fuel density of 6.7 pounds/U.S. gallon (0.8029 kilograms/liter), 35 ± 5 gal (132 ± 19 l) is 235 lb (107 kg).

- (a) Make sure you do not exceed the capacity of the surge tank.

- 1) Adjust the fuel quantity if the fuel density is different.



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- (b) Target adding 30 gal (113.6 l) to prevent a fuel spill.

NOTE: Fuel will begin to spill from the surge tank vent at 302 ± 34 lb (137 ± 15 kg) beyond the automatic shutoff quantity. Monitoring of ground uplift system fuel quantity should be observed when fueling.

- (c) Push the red Manual Override Button adjacent to the solenoid of the applicable fueling shutoff valve to add fuel beyond the automatic shutoff quantity.

NOTE: The manual override button could be pressed in repeated short intervals to achieve a slow addition of fuel beyond the automatic shutoff quantity.

SUBTASK 28-11-00-790-026

- (7) Permit the fuel to stay in the surge tank for a minimum of one hour.

SUBTASK 28-11-00-280-017

- (8) Examine the applicable access door for leaks (Fuel Leak Detection Procedures, TASK 28-11-00-790-801).

SUBTASK 28-11-00-790-027

- (9) Make sure that there is no leakage from the applicable surge tank access door.

SUBTASK 28-11-00-650-030

- (10) To remove the fuel from the applicable surge tank, do one of these tasks for the applicable main tank (No. 1 for the No. 1 surge tank, No. 2 for the No. 2 surge tank):

- (a) Transfer sufficient fuel to another tank to let the fuel drain from the surge tank into the main tank, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.
(b) Defuel sufficient fuel from the No. 1 or No. 2 tank to let the fuel drain from the surge tank into the main tank, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-026

- (11) If it is necessary, adjust the fuel quantities in the fuel tanks, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

————— END OF TASK ————

TASK 28-11-00-790-802

6. Helitest Leak Detection Procedure

A. References

Reference	Title
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.





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Reference	Description
COM-6882	Helitest Wing Kit - Fuel Leak (with intrinsically safe probe) Part #: DET-HE-WK Supplier: 3FM31 Opt Part #: 969-4450 Supplier: 3FM31 Opt Part #: DET-HWK Supplier: 3FM31 Opt Part #: DET-W-40052 Supplier: 3FM31
STD-77	Air Source, Regulated - Dry Filtered, 0-50 psig
STD-551	Knife - Razor
STD-1074	Scissors
STD-8422	Helium - Pressure, Regulated, Supply
STD-11112	Equipment - Ventilation, Positive or Negative

C. Consumable Materials

Reference	Description	Specification
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings (AMM 20-30-82) - Series 82	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	
G50004	Tape - Vacuum Bag Sealant, SM 5126 Tacky Tape	
G50464	Talcum Powder (White)	

D. Procedure

SUBTASK 28-11-00-790-011

- (1) Do these steps to find the external leaks and to make a map of them:

NOTE: You must make a precise map of the leaks for this procedure to find the leakage.

- (a) Clean the external wing surface around the area where you think the leak is.
- (b) Use solvent to remove the grease from the area.
- (c) Dry the area.
- (d) Apply a mapping agent to the area.
 - 1) Use Powder - Talc, G50464, or a similar powder for a mapping agent.
- (e) For running leaks, do these steps:
 - 1) Find the origin of the leak.
 - 2) Stop the fuel flow with mastic or tape to make sure that there are no other paths for fuel flow.
- (f) When the leak is found, remove the seal from the leak site and find the origin of the leak precisely within the seal.

SUBTASK 28-11-00-790-012

- (2) Defuel the tank that has the leak (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

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SUBTASK 28-11-00-860-019

- (3) For the tank with the leak, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-00-100-002

- (4) Apply regulated air source, STD-77, to a maximum of 50 psig (345 kPa), to the external leak point to force back the fuel faster and to dry the area.

SUBTASK 28-11-00-100-003

- (5) Completely clean and dry the external leak point with Series 82 solvent, B01002, to give the best adhesion of tape.

NOTE: This step is important for successful leak detection.

SUBTASK 28-11-00-480-040

- (6) Do one of these two steps:

- (a) Build a custom compression chamber around the external leak point with plastic film
(b) If it is possible, install one of the pressure cups supplied in the fuel leak test kit, COM-6882, to contain the pressure of helium on the outer surface of the tank.

SUBTASK 28-11-00-480-041

- (7) Install SM 5126 tacky tape, G50004, around the leak area or the pressure cup.

- (a) Work the tape to stick it to the surface.

SUBTASK 28-11-00-480-042

- (8) If you build a custom chamber, do these steps:

- (a) Use a scissors, STD-1074, to cut a piece of polyethylene film, G00252, to the size of the chamber formed by the SM 5126 tacky tape, G50004.
(b) Set the plastic over the vacuum tape.
(c) Work the plastic to make sure it sticks well to the vacuum tape.
(d) Make sure the chamber is as small as possible.

NOTE: A small chamber can hold more helium pressure than a larger one.

- (e) Trim the plastic with a razor knife, STD-551, to follow the outline of the vacuum tape.

SUBTASK 28-11-00-480-043

- (9) Do these steps to connect the helium supply to the custom chamber:

- (a) Wrap the helium injection tube with vacuum tape to form a 2 in. (5 cm) diameter flange 1.5 ± 0.5 in. (3.8 ± 1.3 cm) from the end of the tube.
(b) Slice a small hole in the plastic chamber and put the helium tube in the hole.
(c) Work the vacuum tape flange on the injection tube so it sticks well and seals the plastic chamber.

SUBTASK 28-11-00-480-044

- (10) If you use a pressure cup, attach the helium injection tube to the cup with the fittings supplied with the kit.

SUBTASK 28-11-00-480-045

- (11) Apply Vibration Damping Tape 434 tape, G02329, or equivalent over the plastic chamber or pressure cup and work it well for the best adhesion.

- (a) Use a sufficiently large quantity of Vibration Damping Tape 434 tape, G02329, to reinforce the plastic helium chamber so it can handle more pressure.

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SUBTASK 28-11-00-480-046

- (12) Set up the fuel leak test kit, COM-6882, and purge the lines with helium, STD-8422, to remove air.

NOTE: Refer to the instructions supplied with the kit.

SUBTASK 28-11-00-790-013

- (13) Carefully and slowly apply approximately 0.2 psig (1.4 kPa) of helium, STD-8422 pressure to the chamber.

NOTE: Start with low pressure and then slowly increase the pressure. Less helium is necessary for larger leaks than for smaller leaks. Too much helium will flood the fuel tank. Inspect the chamber or rubber cup to make sure there is no leakage. If it leaks too much, rebuild the chamber because the helium can interfere with the detector.

SUBTASK 28-11-00-790-014

- (14) Use the ventilation equipment, STD-11112, to draw leaking helium away from the area to make sure it does not interfere with the detector by drifting into the tank.

NOTE: This step is important for successful leak detection. Use positive pressure if negative pressure is not available, but make sure the helium is removed from the area and does not go into the tank where the detector probe is used.

SUBTASK 28-11-00-790-015

- (15) Permit the helium to soak into the leak path for 10 to 15 minutes before you go into the tank.

NOTE: Time is necessary to push the remaining fuel out of the leak path and start the flow of helium from the external leak point to the internal leak point.

SUBTASK 28-11-00-790-016



KEEP THE DETECTOR AND THE PUMP AWAY FROM THE TANK. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING

- (16) Make sure you keep the fuel leak test kit, COM-6882, detector and the auxiliary pump away from the open fuel tank at all times.

SUBTASK 28-11-00-790-017

- (17) Go into the tank with the fuel leak test kit, COM-6882, Visual Probe (intrinsically safe for Class I, Div I areas).

SUBTASK 28-11-00-790-018

- (18) Slowly probe the inside of the tank around the area where you expect to find the leak.

NOTE: Patience is important. With a systematic approach, slowly move away from the area where you expect to find the leak until you find the exact location of the leak.

SUBTASK 28-11-00-790-019



DO NOT LET THE PROBE TOUCH LIQUID FUEL. IT CAN CAUSE DAMAGE TO THE INSTRUMENT.

CAUTION

- (19) If there is a puddle of fuel in the area where you expect to find the leak, use cotton wiper, G00034, and compressed air to dry the area.

- (a) Assemble the cotton wiper, G00034, to soak up the fuel.
(b) Completely dry hidden areas.

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- (c) If fuel is drawn into the fuel leak test kit, COM-6882, visual probe, immediately remove it to a safe area and permit it to operate until all the fuel is vaporized.
- 1) Disconnect the visual probe gas line and permit it to run dry also.
 - 2) Replace the wet filter on the visual probe tip with a dry filter.
 - 3) Do not shut the fuel leak test kit, COM-6882, off while it is contaminated with fuel because permanent damage can occur.

SUBTASK 28-11-00-790-020

- (20) If you do not find the leak, increase the helium, STD-8422, pressure to 0.6 psig (4.1 kPa), and then to 1.2 psig (8.3 kPa).
- (a) Continue to increase the helium, STD-8422, pressure in similar increments until the leak is found.

NOTE: The compression chamber can hold 3.5 ± 1.5 psig (24.1 ± 10.4 kPa) maximum.
The maximum pressure depends on the size of the chamber. A smaller chamber can hold a larger pressure.

SUBTASK 28-11-00-360-008

- (21) When you find the leak, repair it with the applicable repair procedure (TASK 28-11-00-300-803).

SUBTASK 28-11-00-790-021

- (22) After the leak repair, do another test of the leak with the fuel leak test kit, COM-6882, equipment before you remove the helium chamber from the outside of the tank.

NOTE: This procedure makes sure the leak was repaired correctly.

SUBTASK 28-11-00-110-007

- (23) Do these steps to put the area back to its usual condition:
- (a) Remove the pressure chamber or pressure cup and the tape.
 - (b) Clean the area around the leak with Series 82 solvent, B01002.

SUBTASK 28-11-00-790-022

- (24) Do this same procedure with the fuel leak test kit, COM-6882, equipment for other leaks.

———— END OF TASK ————

TASK 28-11-00-400-801

7. Fuel Tank Closure Leak Check

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)

B. Procedure

SUBTASK 28-11-00-700-029

- (1) Do these steps to do a check for fuel leaks after the repairs are finished:
- (a) Remove all materials from the fuel tank and go out of the tank (TASK 28-11-00-410-801).

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- (b) Install the applicable fuel tank access doors (TASK 28-11-11-400-801, TASK 28-11-11-400-802, TASK 28-11-11-400-803).
- (c) To refuel the applicable fuel tank(s), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.
- (d) Examine the external leak area regularly for one hour.
NOTE: You can monitor the leak area for a longer time to make sure the leak repair is OK.
- (e) Make sure there are no leaks in the area of repair.
NOTE: Make sure the leakage area is maintained, at a minimum, to the leakage limits shown in Figure 602 after the 1 hour inspection.

———— END OF TASK ——

TASK 28-11-00-210-801

8. General Visual Inspection of the Fuel Tanks

(Figure 603)

NOTE: This procedure is a scheduled maintenance task.

A. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

B. Procedure

SUBTASK 28-11-00-210-024

- (1) Perform a General Visual Inspection of the main and center fuel tank (wing) lower surfaces for obvious leaks, condition, and security.
 - (a) Make sure you do an inspection of each of these components:
 - 1) Tank vents
 - 2) Sump drain valves
 - 3) Skin lap joints

———— END OF TASK ——

TASK 28-11-00-211-801

9. External Wires Over the Center Fuel Tank Inspection

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-01.

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- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.
NOTE: This is applicable to Airworthiness Limitation 28-AWL-02.
- (3) This task does a detailed inspection of the wire bundles routed over the center fuel tank and under the main deck floor boards.

B. References

Reference	Title
24-22-00 P/B 201	MANUAL CONTROL - MAINTENANCE PRACTICES
24-22-00-860-812	Remove Electrical Power (P/B 201)
25-22-00 P/B 401	PASSENGER SEATS - REMOVAL/INSTALLATION
25-24-15-000-804	Partition Removal (P/B 401)
25-24-15-000-807	Fixed Class Divider - Removal (P/B 401)
25-24-15-400-801	Partition Installation (P/B 401)
25-24-15-400-806	Fixed Class Divider - Installation (P/B 401)
25-27-31-000-804	Raceway - Removal (P/B 401)
25-27-31-400-804	Raceway - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
53-21-00 P/B 401	PASSENGER CABIN FLOORS - REMOVAL/INSTALLATION
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-13	Repair of Electrical Wire and Cable
SWPM 20-10-22	Repair of Seal Fittings

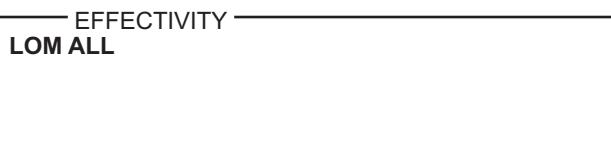
C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Prepare for the Inspection

SUBTASK 28-11-00-010-011

- (1) To get access to the top of the center tank from Station 540 to Station 664 and left and right body buttock line 45.57, do these steps:
- Remove the seats (PAGEBLOCK 25-22-00/401).
 - Remove the partitions (TASK 25-24-15-000-804 or TASK 25-24-15-000-807).
 - Remove the raceway (TASK 25-27-31-000-804).
 - Remove the passenger cabin floors (PAGEBLOCK 53-21-00/401).



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E. External Wires Over the Center Fuel Tank Inspection

SUBTASK 28-11-00-211-001

28-AWL-01: ALI

- (1) Do a detailed inspection of the wire bundles routed over the center fuel tank and under the main deck floor boards.

NOTE: Removal of the wire bundle sleeving is not necessary, unless damage to the sleeving or wiring can be seen.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-01.

- (a) Do the inspection from Station 540 to Station 664 and left and right body buttock line 24.82

NOTE: The actual location of the wire bundles fall within buttock lines 45.57 left and right.

28-AWL-02: CDCCL

- (b) Keep the existing (or newly approved) wire bundle routing, clamping and sleeving.

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

- (c) Look for these items:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

- 1) Damaged wire bundles and clamps,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

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28-AWL-01: ALI

28-AWL-02: CDCCL

- 2) Visible damage to sleeving (if installed)

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

- 3) Wire chafing,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

- 4) Wire bundles that touch (are in contact with) the surface of the center fuel tank.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL- Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

NOTE: This includes the wiring bundle sleeving, which is also not to touch (be in contact with) the surface of the center fuel tank.

SUBTASK 28-11-00-210-041

- (2) If you found a problem, do these steps:

- Remove electrical power from the airplane (TASK 24-22-00-860-812).
- Do the applicable repair (SWPM 20-10-11, SWPM 20-10-13, SWPM 20-10-22).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-00-410-016

- (1) For the area on the top of the center fuel tank, do these steps to install the parts that you removed to do the inspection:
- Install the passenger cabin floors (PAGEBLOCK 53-21-00/401).
 - Install the raceway (TASK 25-27-31-400-804).
 - Install the partitions (TASK 25-24-15-400-801 or TASK 25-24-15-400-806).

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(d) Install the seats (PAGEBLOCK 25-22-00/401).

SUBTASK 28-11-00-860-025

(2) Supply electrical power to the airplane if it is necessary (PAGEBLOCK 24-22-00/201).

———— END OF TASK ————

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FUEL TANKS - CLEANING/PAINTING

1. General

- A. This procedure contains these tasks:
- (1) Apply the Corrosion Resistant Finish (Topcoat)
 - (a) Repair or replace bad sealant in the fuel tank before you apply the topcoat (TASK 28-11-00-300-803).
 - (2) Clean the Fuel Tanks Contaminated with Red Dye

TASK 28-11-00-600-801

2. Apply the Corrosion Resistant Finish (Topcoat)

A. General

- (1) Corrosion resistant finish (topcoat) is applied to prevent corrosion to the internal structural and tubing surfaces, especially the bottom and lower sides, of the fuel tank. BMS 10-20 Type II and MIL-C-27725 are two types of corrosion resistant material which are approved for internal fuel tank use. An advantage of BMS 10-20 Type II finish material is that you can make additional BMS 5-45 sealant repairs, if necessary, after you apply the finish material if it is fully heat cured before sealant is applied. The MIL-C-27725 material can only be used as a topcoat after the sealant installation is complete.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-40-11-910-801	Static Grounding (P/B 201)
28-10-00-100-803	Microbial Growth Removal - Manual Removal Method (P/B 201)
28-10-00-100-804	Microbial Growth Removal - Pressure Washer Method (P/B 201)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1064	Scraper - Phenolic, Hard Resin
STD-1080	Brush - Paint
STD-1119	Blower - Air, Explosion Proof, 90-100 Cubic Feet per Minute, Includes sufficient hose to reach all areas of Fuel Tanks
STD-1120	Fan - Exhaust, Centrifugal, Explosion Proof, 125-150 Cubic Feet per Minute, Includes 75 feet of 3 Inch suction hose and sufficient delivery hose to carry air out of work area



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D. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01001	Solvent - General Cleaning Of All Organic Coatings (AMM 20-30-81) - Series 81	
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings (AMM 20-30-82) - Series 82	
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B50166	Cleaner - Ammonium Hydroxide - Technical Grade	A-A-59370
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C00321	Coating - Corrosion Preventive Coating For Aircraft Integral Fuel Tanks	AMS-C-27725 (Supersedes MIL-C-27725)
C50104	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50358	Surface Treatment - Bonderite M-AD 22 Toner Aero (Formerly ALODINE 22 TONER)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G02088	Abrasive - Silicon Carbide, Waterproof Paper	

E. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75





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F. Prepare to Apply the Corrosion Resistant Finish (Topcoat)

SUBTASK 28-11-00-650-015

- (1) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-016



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-00-480-038



WARNING

GROUND ALL OF THE EQUIPMENT AND HOSES THAT YOU USE IN THE FUEL TANK. IF YOU DO NOT GROUND ALL OF THE EQUIPMENT AND HOSES, AN EXPLOSION CAN OCCUR. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Connect the hoses and nozzles to an electrical ground (TASK 20-40-11-910-801).

SUBTASK 28-11-00-480-039

- (4) Set up the air explosion proof, 90-100 CFM air blower, STD-1119, and the flexible hose to have a good flow of air in the fuel tank.

SUBTASK 28-11-00-160-007



WARNING

MAKE SURE THE CAPACITY OF THE EXHAUST FAN IS MORE THAN THE CAPACITY OF THE AIR BLOWER. THIS WILL MAKE SURE THERE IS A GOOD FLOW OF AIR. THE CORROSION RESISTANT FINISH IS A POISONOUS AND FLAMMABLE COMPOUND WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Use the exhaust explosion proof 125-150 CFM exhaust fan, STD-1120, and hoses to move exhaust air from the fuel tank to an open space away from the work area or hangar.

SUBTASK 28-11-00-210-014

- (6) Examine the internal fuel tank and tubing surfaces for fungus (mildew) and corrosion.

NOTE: A slimy, black layer on the inner surfaces of the fuel tank, soon after defueling, shows fungus contamination. As it dries, the layer becomes solid and turns light brown in color.

- (a) If there is fungus or corrosion, clean the fuel tank (Microbial Growth Removal - Manual Removal Method, TASK 28-10-00-100-803 or Microbial Growth Removal - Pressure Washer Method, TASK 28-10-00-100-804).

SUBTASK 28-11-00-140-003

- (7) Remove all loose finish with a wood or plastic hard resin phenolic scraper, STD-1064 and sand the surface with aluminum oxide abrasive cloth, B00102, paper or disks.

- (a) Do a check for loose finish on the surfaces adjacent to those with loose finish and other areas you are not sure about.
- 1) Apply a strip of pressure sensitive Scotch Flatback Masking Tape 250, G00270, to the applicable surface.
 - 2) Push on the pressure sensitive Scotch Flatback Masking Tape 250, G00270, with constant and hard pressure.

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- 3) Pull the pressure sensitive Scotch Flatback Masking Tape 250, G00270, off the surface with a quick movement, vertical to the surface.
- 4) Examine the surface and the pressure sensitive Scotch Flatback Masking Tape 250, G00270, for signs of loose finish.
 - a) If there are signs of loose finish, remove the loose finish.

SUBTASK 28-11-00-120-002

- (8) Use wet abrasive, G02088, paper to make all finish areas and adjacent areas you will apply a layer to, rough.

SUBTASK 28-11-00-160-008

- (9) Use cotton wiper, G00034, soaked in cleaning Series 81 solvent, B01001, and rub all unwanted materials from the applicable surfaces.

SUBTASK 28-11-00-160-009

- (10) Use a clean cotton wiper, G00034, to make the surfaces dry.

SUBTASK 28-11-00-160-010

- (11) Remove by suction all unwanted materials from the fuel tank.

SUBTASK 28-11-00-370-007

- (12) If chemical conversion coating is worn or damaged, do the "Bonderite M-CR 600 Aero Metal Surface Treatment" procedure before you apply the finish, (SUBTASK 28-11-00-370-008).

SUBTASK 28-11-00-390-014

- (13) If sealant is damaged by removal of corrosion resistant finish, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-803.

SUBTASK 28-11-00-210-015

- (14) Make sure all equipment used to apply the corrosion resistant finish is clean.

- (a) If you are not sure, clean the equipment in solvent, B00148, or Series 81 solvent, B01001, before you apply the corrosion resistant finish.

SUBTASK 28-11-00-210-016

- (15) Make sure that all surfaces of the fuel tank that you apply corrosion resistant finish to are clean.

- (a) If you are not sure, clean the surfaces of the fuel tank with BMS 11-7 solvent, B00184, before you apply the corrosion resistant finish.

SUBTASK 28-11-00-210-017

- (16) Make sure the storage life of the corrosion resistant compounds that are not mixed is not expired.

- (a) The storage life of BMS 10-20 coating, C00307, Type II, Class A is 12 months at 40°F (4°C) to 90°F (32°C) from the date of manufacture.
 - (b) The storage life of MIL-C-27725 corrosion resistant finish coating, C00321, is as follows:
 - 1) For DeSoto 823-011 or 823-730 the storage life is 12 months at 50°F (10°C) to 90°F (32°C) from the date of manufacture.
 - 2) For Products Research Company PR-1560M, PR-1560MC, PR-1560MK the storage life is 6 months at 50°F (10°C) to 90°F (32°C) from the date of manufacture.

SUBTASK 28-11-00-210-018

- (17) Make sure there is sufficient corrosion resistant material to apply the corrosion resistant finish.

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SUBTASK 28-11-00-950-001



CAUTION

MAKE SURE THAT YOU REMOVE ALL MASKING AFTER YOU APPLY THE CORROSION RESISTANT FINISH. MASKING CAN CAUSE A BLOCKAGE OF THE SUCTION INLETS OF THE PUMPS AND PREVENT THE REMOVAL OF THE WATER. WATER CAN CAUSE DAMAGE TO THE SYSTEM.

- (18) Apply Scotch Flatback Masking Tape 250, G00270, to all non structural equipment areas in the fuel tank which are near the surfaces that you apply the corrosion resistant finish (topcoat) to.

NOTE: Do not apply the corrosion resistant finish (topcoat) to electrical bonding surfaces, clamps, O-rings, valves, fuel measuring sticks, tank units, wiring, pumps, filler caps or other non structural equipment.

SUBTASK 28-11-00-220-003

- (19) Make sure you keep the corrosion resistant finish at 50°F (10°C) to 100°F (38°C) with less than 85 percent relative humidity while you apply it.

G. Bonderite M-CR 600 Aero Metal Surface Treatment

SUBTASK 28-11-00-370-008

- (1) If Bonderite M-CR 600 Aero coating, C50315 metal surface treatment is worn or damaged, do the steps that follow before you apply topcoat:



WARNING

DO NOT GET BONDERITE M-CR 600 AERO IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM BONDERITE M-CR 600 AERO. PUT ON GOGGLES AND GLOVES WHEN YOU USE BONDERITE M-CR 600 AERO. KEEP BONDERITE M-CR 600 AERO AWAY FROM SPARKS, FLAME, AND HEAT. BONDERITE M-CR 600 AERO IS POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) To prepare the Bonderite M-CR 600 Aero coating, C50315, do the steps that follow:

NOTE: It is acceptable to use Bonderite M-CR 600RTU Aero, C50356. This is a premixed and ready to use version of Bonderite M-CR 600 Aero.

- 1) Measure 1 gal (4 l) of distilled water, or water with a solids content of less than 50 ppm, into a clean, stainless steel container.
- 2) Add 3 oz (85 g) of Bonderite M-CR 600 Aero coating, C50104.
NOTE: Mix the powder before use.
- 3) Mix the powder in the water until you make a solution.
NOTE: A small quantity of powder may not become a liquid.
- 4) Add up to 2% by volume of Bonderite M-AD 22 Toner Aero surface treatment, C50358 or Ammonium Hydroxide cleaner, B50166 as required to adjust pH to between 1.5 and 2.0.
- 5) Let the Bonderite M-CR 600 Aero coating, C50315 solution stand a minimum of 1 hour before use.

- (b) To apply the Bonderite M-CR 600 Aero coating, C50315, do the steps that follow:

- 1) Remove all burrs or particles from the surface and make nicks or scratches smooth.

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- 2) Clean the surfaces with Series 88 solvent, B01008.
- 3) Apply the Bonderite M-CR 600 Aero coating, C50315, to metal surfaces with a hard resin phenolic scraper, STD-1064, brush, swab, spray gun, or cotton wiper, G00034.
NOTE: If the Bonderite M-CR 600 Aero coating, C50315, does not apply smoothly, the metal surface is not cleaned correctly.
- 4) Keep the surface continuously moist with the Bonderite M-CR 600 Aero coating, C50315, until a layer is made.
NOTE: It can take 1 to 5 minutes to make a layer. The time is related to the temperature.
- 5) Flush with clean water or carefully rub with a soft cotton wiper, G00034, to remove the unwanted Bonderite M-CR 600 Aero coating, C50315.

H. Apply the Corrosion Resistant Finish (Topcoat)



WARNING

MAKE SURE THE CAPACITY OF THE EXHAUST FAN IS MORE THAN THE CAPACITY OF THE AIR BLOWER. THIS WILL MAKE SURE THERE IS A GOOD FLOW OF AIR. THE CORROSION RESISTANT FINISH IS A POISONOUS AND FLAMMABLE COMPOUND WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

SUBTASK 28-11-00-620-002



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- (1) To mix the corrosion resistant finish, do the steps that follow:
 - (a) Make sure the materials are at 60°F (16°C) to 90°F (32°C) before you mix them.
 - (b) Shake the base component for 10 minutes in a shaker.
 - (c) Measure proportional volumes of base and curing solution or activator, and reducer or thinner.
 - 1) If you want to apply the corrosion resistant finish with a spray gun or brush, refer to the table below (Table 701).
 - (d) Mix the base and the curing solution or activator.
 - (e) Add a reducer or thinner if it is necessary.

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Table 701/28-11-00-993-840 Corrosion Resistant Mixing Proportions

Manufacturer	Component	METHOD OF APPLICATION				
		SPRAY			BRUSH	
		Manufacturer Designation	Parts By Volume	Viscosity	Manufacturer Designation	Parts By Volume
AkzoNobel Aerospace Coatings (BMS 10-20 Type II)	Base	454-4-1	3 * ^[1]	12.6 seconds. No.4 Ford Cup 75° ± 5° F	454-4-1	3
	Curing Solution	CA-109	1		CA-109	1
	Thinner	TL-52	0-1		TL-52	0-1
AkzoNobel Aerospace Coatings (BMS 10-20 Type II)	Base	10P30-1	3 * ^[1]	15 seconds. No.4 Ford Cup 75° ± 5° F	10P30-1	3
	Curing Solution	EC-242	1		EC-242	1
	Thinner	TR-114	0-1		TR-114	0-1
AkzoNobel Aerospace Coatings (BMS 10-20 Type II)	Base	454-4-5	3 * ^[1]	21.0 seconds. No.2 Zahn Cup 75° ± 2° F	454-4-5	3
	Curing Solution	X-395	1		X-395	1
	Thinner	TL-132	0-1		TL-132	0-1
Desoto (MIL-C-27725)	Base	823-011	4	31-40 seconds. Zahn No. 1 72° ± 2° F	823-011	4
	Activator	910-099	1		910-099	1
	Reducer	020-037	approx 4		020-037	0-4
	Base	823-730	4	31-40 seconds. Zahn No. 1 72° ± 2° F	823-730	4
	Activator	910-702	1		910-702	1
	Reducer	020-707	approx 4		020-707	0-4
Products Research (MIL-C-27725)	-----	Part A	1	31-40 seconds. Zahn No. 1 72° ± 2° F	Part A	1
	-----	Part B	2		Part B	2

*[1] Mix ratios shall be ± 5.0 percent.

SUBTASK 28-11-00-620-003

- (2) Do not use the corrosion resistant finish until a minimum of 1 hour after you mix it.

NOTE: The maximum usable life of the corrosion resistant finish is 8 hours at 75 ±5°F (24 ±3°C).

- (a) Immediately after you mix the corrosion resistant finish, write the date, the time you mixed the finish, and the usable life expiration on the containers.

- 1) Keep the containers with the corrosion resistant finish tightly closed until you use it or the finish will become thicker.

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SUBTASK 28-11-00-620-004

- (3) To apply the corrosion resistant finish, use the brush procedure or spray gun procedure as follows:

- (a) For the brush procedure (applicable for small areas), do the steps that follow:
- 1) Apply a thin layer of corrosion resistant finish (approximately 0.0005 in. (0.0013 cm)) with a soft bristle paint brush, STD-1080, to apply the finish.
NOTE: Move the brush in one direction as much as possible.
 - a) To prevent air bubbles, spaces and removal of finish already applied, do not move the brush quickly or too many times when you apply the corrosion resistant finish.
 - 2) Let the corrosion resistant finish dry for a minimum of 30 minutes.
 - 3) Apply a second thin layer like the first layer.
 - 4) Make sure the corrosion resistant finish you applied makes an overlap with all adjacent topcoat applied before.
- (b) For the spray gun procedure (recommended for large areas), do the steps that follow:
- 1) Set the spray gun to 40 psi air pressure and 5 to 10 psi fluid pressure.
 - 2) Apply the corrosion resistant finish with a spray gun on the surface.
 - 3) Let the corrosion resistant finish dry for a minimum of 30 minutes.
 - 4) Apply the second layer like the first layer.
 - 5) Make sure the corrosion resistant finish you applied makes an overlap with all adjacent topcoat applied before.

SUBTASK 28-11-00-110-006

- (4) Clean the equipment and tools after you apply the corrosion resistant finish (topcoat).



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- (a) Clean the equipment with Series 81 solvent, B01001, immediately after use.
- (b) Soak the brushes in Series 81 solvent, B01001, immediately after use.

NOTE: Discard the brushes when the bristles become rigid.

SUBTASK 28-11-00-620-005

- (5) Cure the corrosion resistant finish.

- (a) Cure all finish layers, refer to the table below (Table 702).
- (b) The cure time can decrease if you increase the temperatures and, with some finish compounds, increase relative humidity (Figure 701, Figure 702, Figure 703, Figure 704).
- (c) Do the Series 82 solvent, B01002, or fuel resistance check that follows to make sure the cure is complete.
 - 1) Soak a cotton wiper, G00034, with solvent or fuel.
 - 2) Apply the cotton wiper, G00034, to the surface you check and let the solvent or fuel soak the area.

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- 3) Use hard pressure and rub the area 100 strokes.

NOTE: Count each movement in one direction as a stroke.

- 4) Look and see if the corrosion resistant finish is removed.

NOTE: If you can see metal, the corrosion resistant finish is removed.

- a) If you do not see metal, the cure is satisfactory.

Table 702/28-11-00-993-841 Corrosion Resistant Finish Cure Time

CORROSION RESISTANT FINISH (BY MFGR.)	CURE TIME BEFORE FUEL EXPOSURE *[1]	CURE TIME BEFORE TRAFFIC	CURE TIME BEFORE ASSEMBLY *[1]	CURE TIME BEFORE SEALING *[2]
AkzoNobel Aerospace Coatings (BMS 10-20 TYPE II)	Fig. 701. *[3]	6 hours at 65°F (18°C) or higher, or Fig. 701 *[3]	12 hours at 65°F (18°C) or higher, or Fig. 701 *[3]	Fig. 701 *[3]
Desoto (MIL-C-27725)	Fig. 702 *[3]	24 hrs at 65°F (18°C) or higher,	Fig. 703 or 240 Hrs at 65°F (18°C) or higher *[3]	Not Applicable
Products Research (MIL-C-27725)	Fig. 704	24 hours at 65°F (18°C) or higher	240 Hrs at 75°F (24°C) and minimum of 30 percent relative humidity	Not Applicable

*[1] Do the fuel resistance check to make sure the cure is completed.

*[2] Do the solvent resistance check to make sure the cure is completed.

*[3] Let the finish dry a minimum of 30 minutes at the temperature you applied it at, before you cure the finish at a higher temperature.

I. Return the Airplane to Its Usual Configuration

SUBTASK 28-11-00-950-002

- (1) Make sure all the Scotch Flatback Masking Tape 250, G00270, is removed from the fuel tank and tank equipment.

SUBTASK 28-11-00-410-010

- (2) Install all substructure, support brackets, and fuel tank equipment removed for access.

SUBTASK 28-11-00-210-019

- (3) Make sure all tools, cotton wiper, G00034, air movers, hoses, and other equipment are removed from the fuel tank.

SUBTASK 28-11-00-410-011

- (4) To install the applicable access doors:

- (a) Do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.
- (b) Do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801.
- (c) Do this task: Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation, TASK 28-11-11-400-802.
- (d) Do this task: Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803.

SUBTASK 28-11-00-650-017

- (5) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

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SUBTASK 28-11-00-210-020

- (6) Make sure there are no fuel leaks, do this task: Fuel Leak Detection Procedures,
TASK 28-11-00-790-801.

———— END OF TASK ————

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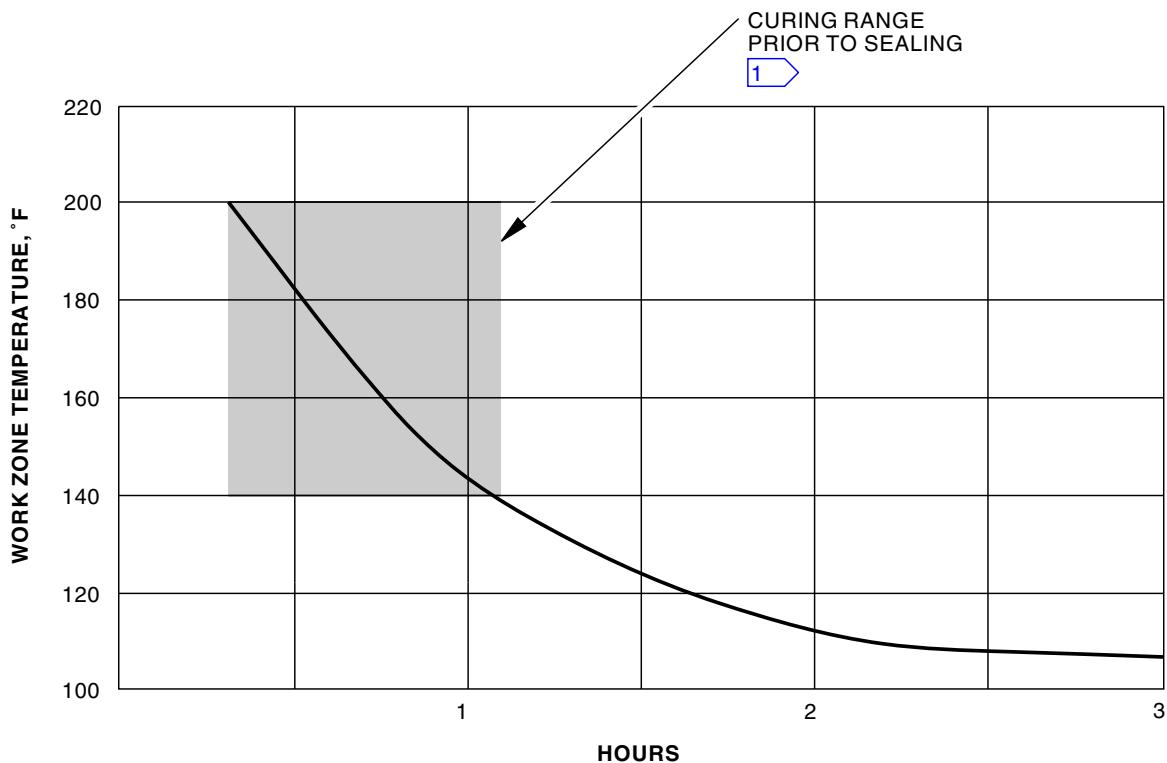
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1 WING ASSEMBLIES THAT HAVE PREVIOUSLY APPLIED FUEL SEALANT MAY BE FORCE DRIED IN AN OVEN WITH A WORK ZONE TEMPERATURE OF NO LESS THAN 110°F (43°C) FOR NO LESS THAN 3 HOURS FOR GRADE A ONLY.

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AkzoNobel Aerospace Coatings (BMS 10-20 Type II) Compound Cure Time Versus Temperature
Figure 701/28-11-00-990-835



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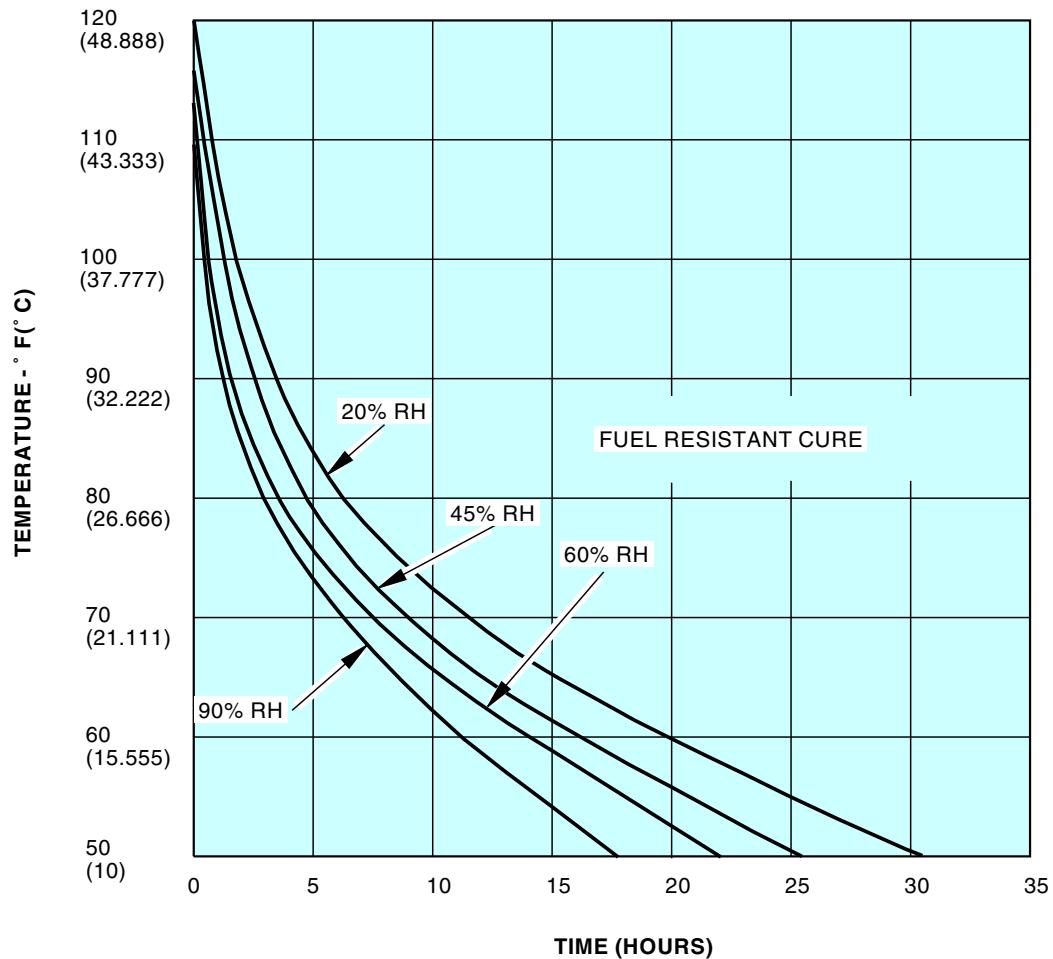
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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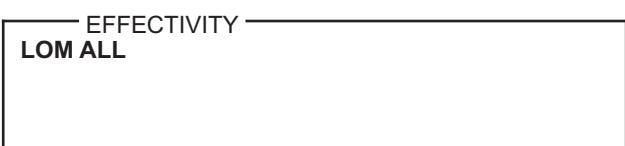


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DeSoto (MIL-C-27725) Compound Fuel Resistant Cure Time Versus Temperature and Relative Humidity (RH)
Figure 702/28-11-00-990-836



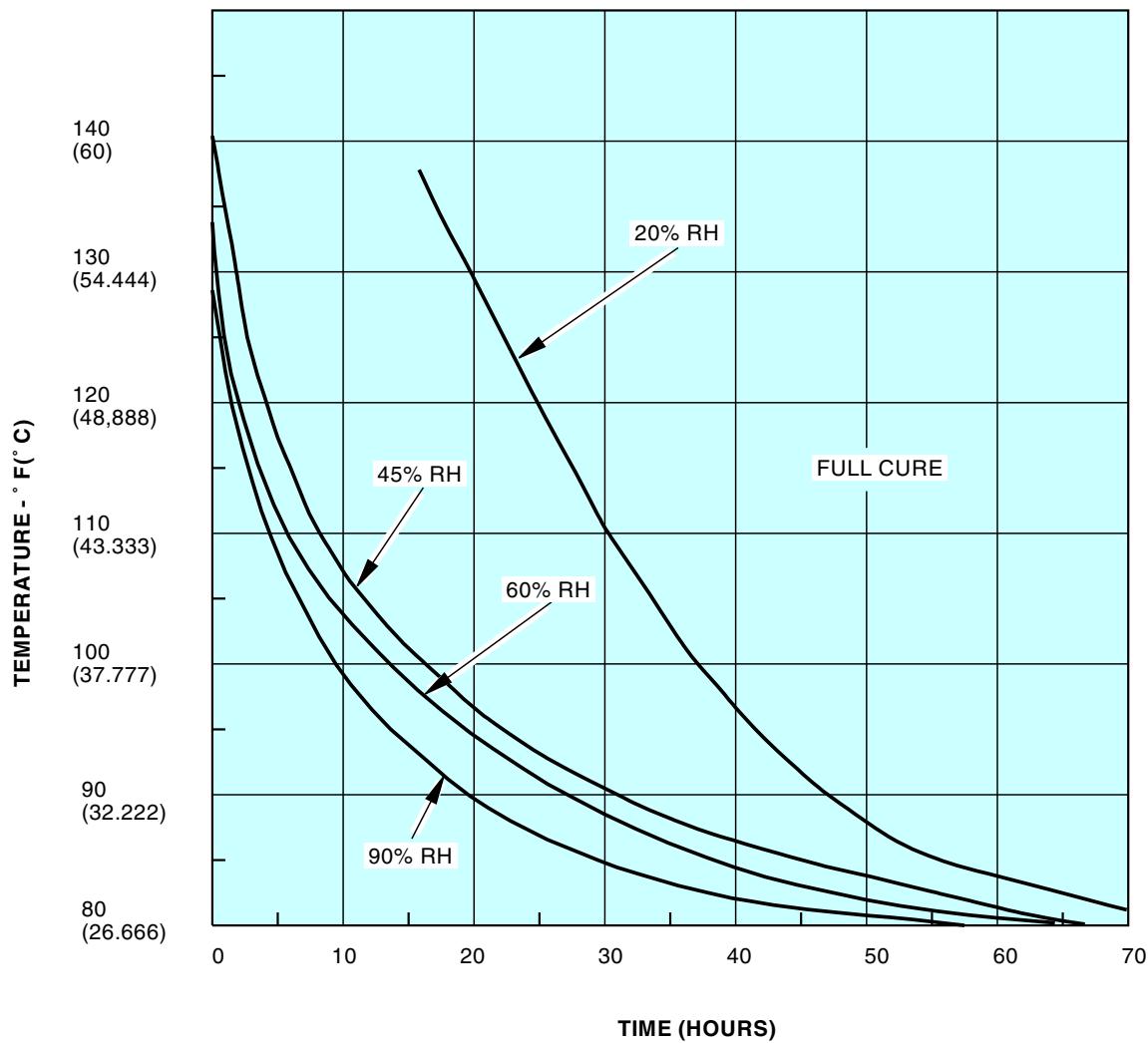
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DeSoto (MIL-C-27725) Compound Full Cure Time Versus Temperature and Relative Humidity (RH)
 Figure 703/28-11-00-990-837



ECCN 9E991 BOEING PROPRIETARY - See title page for details

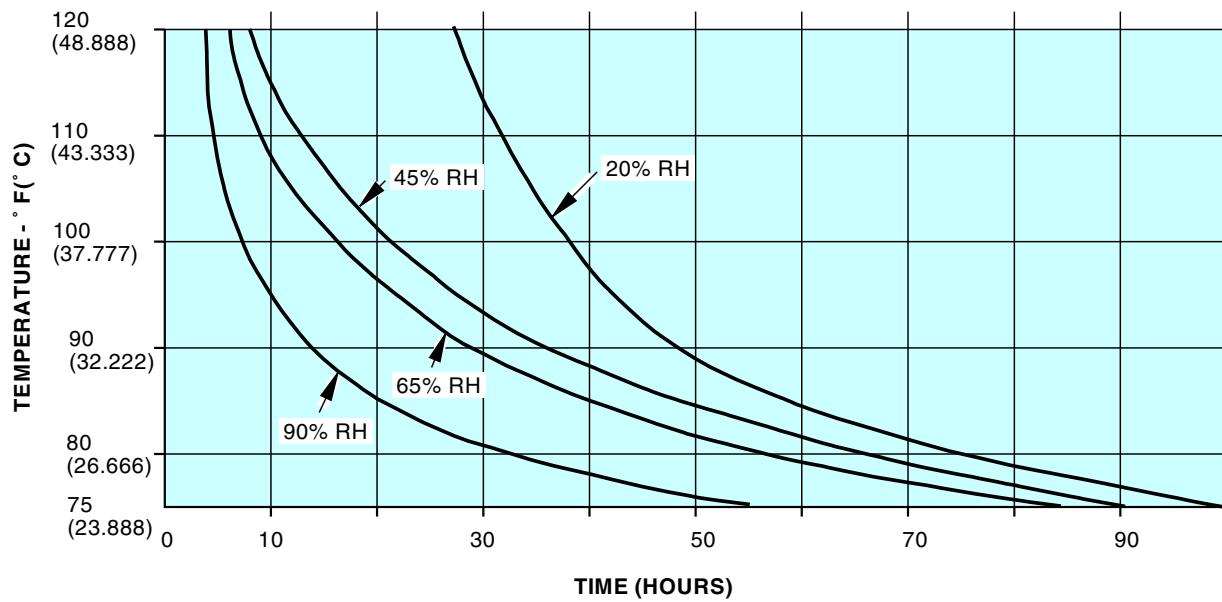
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% RELATIVE HUMIDITY (RH)	TEMPERATURE - ° F (° C)	
	65 (18.333)	70 (21.111)
20	392	228
45	376	212
65	344	184
90	240	124



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Products Research (MIL-C-27725) Compound Cure Time Versus Temperature and Relative Humidity (RH)
Figure 704/28-11-00-990-838

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TASK 28-11-00-100-802

3. Clean the Fuel Tanks Contaminated with Red Dye

A. General

- (1) Do the procedure that follows if either of these conditions are true:
 - (a) The dye concentration of red dye is more than 0.41 milligrams per liter fuel per ASTM D7058 or equivalent.
 - (b) The concentration of red dye is more than 0.28 milligrams per liter as indicated by the JT-100S analyzer or equivalent.

NOTE: Scale on JT-100S or equivalent instruments is calibrated to a solid dye standard. To obtain liquid dye equivalent value, multiply the meter reading by 1.446 (1.446 X 0.28=0.41 mg/l).

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)
73-11-02-000-801-F00	Fuel Filter - Removal (P/B 401)
73-11-02-400-801-F00	Fuel Filter - Installation (P/B 401)

C. Procedure

SUBTASK 28-11-00-860-016

- (1) Do not start or operate the engines or the APU.

SUBTASK 28-11-00-650-020

- (2) Defuel the fuel tanks to the fuel tank sump levels. To defuel them, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-021

- (3) Drain the fuel tank sumps and leave only trapped fuel.

NOTE: To drain them, do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.

SUBTASK 28-11-00-020-005

- (4) Remove the fuel filter, do this task: Fuel Filter - Removal, TASK 73-11-02-000-801-F00.

SUBTASK 28-11-00-020-006

- (5) Do a check of the engine fuel filter and the fuel filter bowl for signs of contamination of the fuel.
 - (a) Replace the filter if you think that there is contamination. To replace it, do this task: Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
 - (b) If there is no contamination, install the same filter. To install it, do this task: Fuel Filter - Installation, TASK 73-11-02-400-801-F00.

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SUBTASK 28-11-00-650-022

- (6) Refuel the fuel tanks with new clean fuel. To refuel them, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

NOTE: For most airplane fuel tanks, this will give a dilution ratio of new fuel to trapped fuel in the range of 1,000:1 to 10,000:1.

SUBTASK 28-11-00-210-025

- (7) Take a sample of the fuel from the tank sumps.

NOTE: To take a sample, do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.

- (a) If you see signs of continued contamination, repeat the defueling and refueling steps above.
- 1) If the contamination continues, remove all fuel from the tank, including trapped fuel. To remove the trapped fuel from the tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.
- (b) If the samples from the fuel tank sumps do not show signs of contamination, do the subsequent steps:
- 1) Start the engines, do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.
 - 2) Start the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 3) Let them operate until the dirty fuel is flushed from the fuel system.
 - 4) Make sure that the engine and its controls operate correctly in all standard power settings.
 - 5) Stop the engines, do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00.
 - 6) Stop the APU, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 7) Speak to the engine and APU manufacturers about more inspections or tests.

SUBTASK 28-11-00-020-007

- (8) After you operate the engine and the APU, remove the fuel filter. To remove it, do this task: Fuel Filter - Removal, TASK 73-11-02-000-801-F00.

SUBTASK 28-11-00-210-027

- (9) Do a check of the engine fuel filter and the fuel filter bowl for signs of contamination of the fuel.
- (a) If you do not see signs of contamination, do these steps:
- 1) Install the filter, do this task: Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
 - 2) Operate the airplane as usual.
- (b) If you see signs of contamination, do these steps:
- 1) Clean the filter bowl.
 - 2) Replace the filter, do this task: Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
 - 3) Apply the full procedure described above again.

SUBTASK 28-11-00-860-018

- (10) If the engines do not operate correctly, or if contamination continues, you will possibly have to do more engine inspections and tests.

NOTE: Speak to the engine and APU manufacturer for more procedures for their equipment.

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SUBTASK 28-11-00-280-016

- (11) If you operated the engines for a long time with contaminated fuel, you must fully examine the engine fuel system, its components, and the turbine blades.

NOTE: Speak to the engine and APU manufacturer for the procedures for their equipment.

———— END OF TASK ————

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FUEL TANKS - REPAIRS

1. General

A. This procedure contains three tasks as follows:

- (1) Repair of Fuel Tank Corrosion
 - (a) This procedure contains the task to do small corrosion repairs. Corrosion can make the structure weak. Before you do a corrosion repair, refer to the Structural Repair Manual to calculate if the structure is weak.
- (2) Repair of Sealant Leaks in the Fuel Tank Structure
 - (a) Before you repair a leak, make an analysis of the source and cause of the leak with the Fuel Leak Detection procedure (TASK 28-11-00-790-801).
 - (b) If the cause of the fuel leak is a result of structural damage, do the structural repair. Refer to the Structural Repair Manual before you apply sealant (TASK 28-11-00-300-803).
- (3) Repair of the Secondary Fuel Barrier Sealant.



CAUTION MAKE SURE THAT THE SEALANT AND SURFACE FINISH THAT YOU USE IN THE FUEL TANK ARE RECOMMENDED MATERIALS. IF THE MATERIALS DO NOT HAVE APPROVAL TO BE USED WITH EACH OTHER, DAMAGE TO THE FUEL TANK COULD OCCUR.

B. This procedure also contains information on how to prepare, use and cure the sealant materials.

- (1) The sealant and finish materials recommended for use in this procedure and in FUEL TANKS - CLEANING/PAINTING, PAGEBLOCK 28-11-00/701 can be used with each other (mutually compatible). For example, you can apply sealant on fully cured corrosion resistant finish for fuel tanks (coating, C00307) or you can apply corrosion resistant finish for fuel tanks (coating, C00307) on sealant with a spray gun or brush.
- (2) Remove the old corrosion resistant finish in the area of sealant repair, unless you know the old finish can be used with the new sealant. If you need to remove the finish, remove it to the bare metal.

TASK 28-11-00-300-802

2. Repair of Fuel Tank Corrosion

A. General



WARNING

MAKE SURE THAT THERE IS A GOOD FLOW OF AIR WHEN YOU ARE IN THE FUEL TANK. DO NOT REMOVE THE RESPIRATOR WHILE YOU ARE IN THE FUEL TANK. DO NOT DO MAINTENANCE IN THE FUEL TANK UNTIL YOU REMOVE ALL FUEL FROM THE AREA. FUEL FUMES CAN KILL YOU.

- (1) To repair fuel tank corrosion, the areas of repair in the fuel tank must be cleaned and treated with etchant and chemical conversion coating. Corrosion resistant finish for fuel tanks (coating, C00307) is then applied to the surfaces to prevent more corrosion. Be careful to clean and treat all corners, crevices and other limited access areas.

B. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)

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Reference	Title
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B50154	solution - chromium nitrate etchant	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3

D. Prepare for the Fuel Tank Repair

SUBTASK 28-11-00-650-009

- (1) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-010



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

E. Fuel Tank Corrosion Repair

SUBTASK 28-11-00-140-001

- (1) Look for corrosion on all structural surfaces of the fuel tank and do the subsequent steps to remove the corrosion:
 - (a) If there is light surface corrosion, rub the surface with fine abrasive paper or cloth to remove the corrosion.
 - (b) If you cannot fully remove the corrosion with the abrasive paper or cloth, refer to the Structural Repair Manual.

SUBTASK 28-11-00-110-001

- (2) Clean the fuel tank surfaces in the area of repair with solvent, B00184 (Figure 801, Figure 802).

SUBTASK 28-11-00-150-007

- (3) Apply etchant (solution, B50154) over the cleaned fuel tank surfaces in the area of the repair.

SUBTASK 28-11-00-150-008

- (4) Keep the etchant on the fuel tank surfaces for 3 to 5 minutes.

SUBTASK 28-11-00-170-001

- (5) Flush the fuel tank surface with water to remove the etchant.

SUBTASK 28-11-00-370-001

- (6) To apply the chemical conversion coating treatment, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Refer to the Bonderite M-CR 600 Aero coating, C50315 Metal Surface Treatment procedure.

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SUBTASK 28-11-00-390-001

- (7) To repair all sealant damaged or removed during corrosion repair, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-803.

SUBTASK 28-11-00-370-002

- (8) To apply the corrosion resistant finish for fuel tanks (coating, C00307), do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

F. Put the Airplane Back to Its Usual Condition

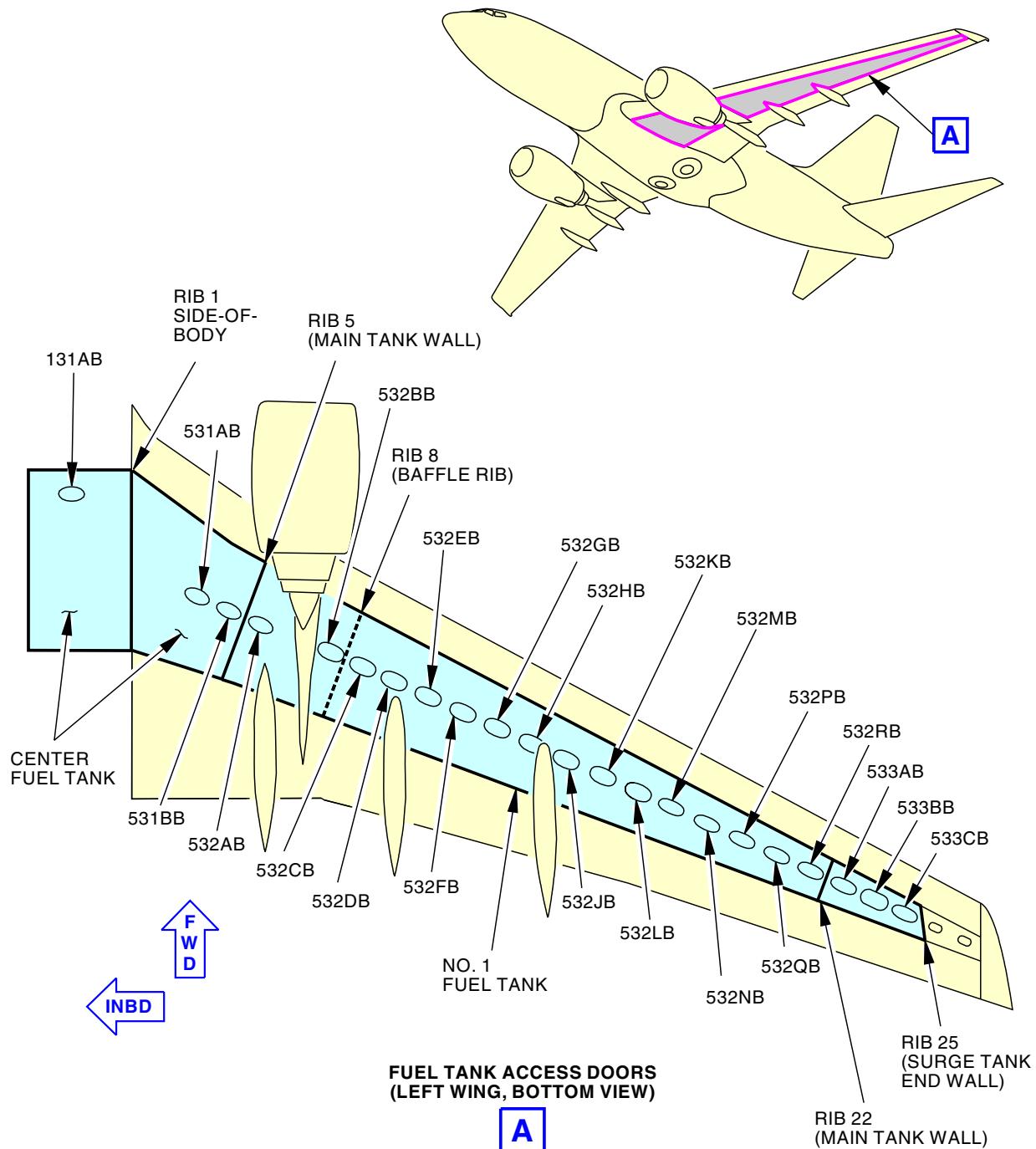
SUBTASK 28-11-00-410-006

- (1) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

———— END OF TASK ————

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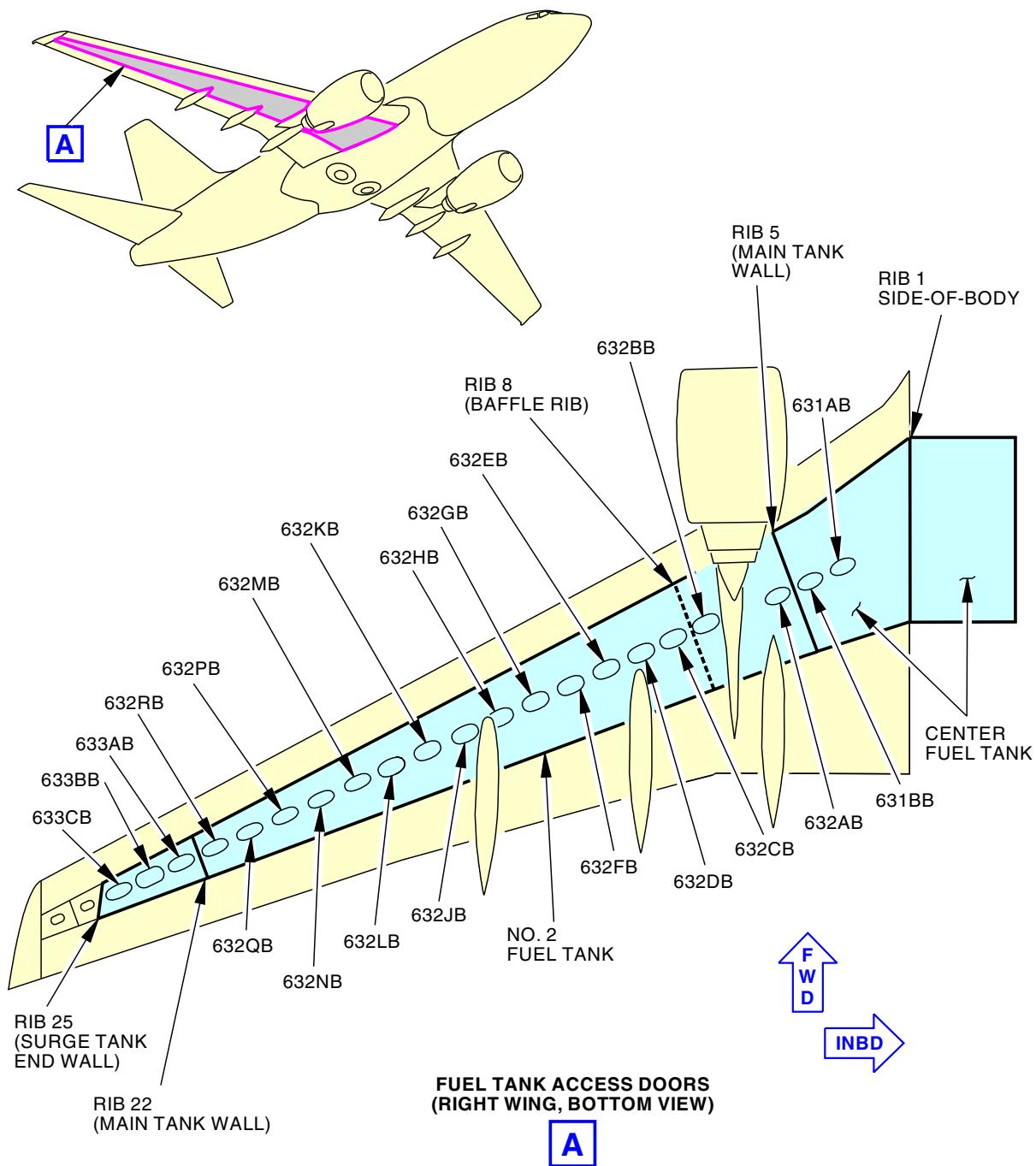
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Fuel Tank - Left Wing
Figure 801/28-11-00-990-815

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Fuel Tank - Right Wing
Figure 802/28-11-00-990-816

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TASK 28-11-00-300-803

3. Repair of Sealant Leaks in the Fuel Tank Structure

A. General

- (1) It is necessary to use materials that are poisonous and flammable when you repair the sealant. You must have a good flow of air in the area. You must obey all fire safety precautions.
- (2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B non-faying seal applications:
NOTE: BMS5-168 sealant, A50303 is not approved for faying surface seals.
(a) The sealant, A50110 and sealant, A50153, are also acceptable sealants.

B. References

Reference	Title
20-30-93-910-801	Final Cleaning Prior to Fuel Tank Sealing (Series 93) (P/B 201)
28-11-00-300-801	Analysis of the Fuel Leak Type (P/B 601)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
51-31-00-100-802	Excess Sealant Removal (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-768	Sealant Removal Tool, Non-Metallic Part #: ST982L-9 Supplier: 81205 Part #: ST982LF-9 Supplier: 81205 Part #: ST982LH-A-1 Supplier: 81205
SPL-1762	Temporary Repair Tool - Self-Sealing Rivets, Fuel System Part #: F70230-1 Supplier: 81205 Part #: J28006-1 Supplier: 81205
STD-124	Brush - Stiff Bristle, Non-Metallic
STD-449	Gun - Sealant
STD-809	Spatula
STD-1182	Tool - Seal Cutting, Hardwood or Plastic
STD-9933	Gun, Rivet

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50052	Sealant - PR-1826 Class B Rapid Curing Fuel Tank Sealant	SAE AMS3277 Class B
A50084	Sealant - P/S 860 Class B-1/6 Quick Repair Fuel Tank Sealant	AMS-S-83318 Class B
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2

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Reference	Description	Specification
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50303	Sealant - Fast Cure Fuel Tank Sealant (use until stock depleted)	BMS5-168
A50337	Sealant - Fuel Tank	BMS5-45 Class B
A50408	Promoter - Adhesion, PR-148, Conductive Filler	BAC5010 Type 118
A50518	Sealant - Fuel Tank	BMS5-45 Class C-24
A50530	Sealant - PR-1826 Class B-1/2 Rapid Curing Fuel Tank	SAE AMS3277 Class B-1/2
A50574	Promoter - Adhesion, PR-1826AP	
A50582	Sealant - Fuel Tank	BMS5-45 Class C-48
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01013	Solvent - Final Cleaning Prior To Fuel Tank Sealing (AMM 20-30-93) - Series 93	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50381	Abrasive - Aluminum Oxide Paper, 180 Grit	
G50653	Kit - Semco Click-Patch Kit, Sealant Type (Patch Kit Assembly P/N 231255, 231231, 231230)	
G50654	Kit - Semco Click-Patch Kit, Fast Set Epoxy Type (Patch Kit Assembly P/N 231256, 231232, 231265)	

E. Prepare for Fuel Tank Repair

SUBTASK 28-11-00-650-023

- (1) For the applicable fuel tank, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-860-020



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-00-810-001

- (3) To find the leak source, do this task: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

SUBTASK 28-11-00-150-004

- (4) Use the sealant cutting tools (Figure 803) to remove the bad sealant.



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- (a) To cut sealant away from a fillet seal, refer to Figure 805.
 - 1) Cut the ends of the bad sealant at a slope such that the new sealant makes an overlap with the remaining sealant.
 - 2) Make sure you cut the sealant smoothly.
 - 3) When you remove the sealant, be careful so you do not damage the bare metal.
- (b) If the fillet seal bond to the finish is good and the finish bond to the tank surface is good, it is not necessary to cut the sealant to the bare metal (Figure 805).
 - 1) Make sure you remove all sealant that is loose.
- (c) If the bad sealant includes fasteners with fillet seals, do the steps that follow:
 - 1) Cut around the bottom of the fastener with a sealant cutting tool (Figure 803).
 - 2) Use pliers and pull the sealant from the fastener.
NOTE: It is not necessary to remove small quantities of the sealant that bond to the fastener.
- (d) If there is a bad injection seal, do the steps that follow:
 - 1) Remove the bad sealant from short injection channels with hooked wire and small cutting tools.
NOTE: You must disassemble long injection channels (refer to the Structural Repair Manual). You can repair bad injection seals if you raise the new seal plane above the old seal plane to isolate the bad seal from the fuel.
 - 2) Make sure the injection channel is clean.
NOTE: If air is caught in the injection channel when you apply the sealant, the new sealant cannot fully fill the channel.
 - 3) Be careful not to cause damage to the tank structure when you remove sealant or disassemble parts.
- (e) To remove excess sealant, do this task: Excess Sealant Removal, TASK 51-31-00-100-802.

SUBTASK 28-11-00-360-002

- (5) For a bad prepack or faying surface seal, do the steps these steps:
 - (a) Disassemble the structure around the bad sealant (refer to the Structural Repair Manual).
 - 1) If you do not want to disassemble the structure, you can repair the leak if you lift the new seal plane above the old seal plane to isolate the bad sealant from the fuel.
NOTE: The area of bad sealant must be small to use this method.
 - (b) Remove the bad sealant with seal cutting tools, STD-1182, and sealant removal tools, SPL-768.

SUBTASK 28-11-00-150-005

- (6) If there is corrosion resistant finish on the surface, remove all the corrosion resistant finish from the sealant repair area unless you know it is coating, C00307, (BMS 10-20, Type II corrosion resistant finish).
 - (a) Use 180 grit abrasive paper, G50381, and remove the used corrosion resistant finish until either bare metal or sealant shows (in good condition).

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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Use clean cotton wipers, G00034, soaked with Series 93 solvent, B01013, (TASK 20-30-93-910-801) to clean all removed corrosion resistant finish surfaces and sealant.
- (c) Rub the surface with clean cotton wipers, G00034, until the solvent is dry.
- (d) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-150-006

- (7) Remove all sealant precoat from the repair area unless it is known that precoat is BMS5-45 sealant, A00767 (or equivalent), material in good condition.



WARNING

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- (a) Remove the used sealant precoat with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).
- (b) Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).
NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.
- (c) Rub dry with a clean, dry cotton wiper, G00034.
- (d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-210-008

- (8) Make sure that all fasteners in the sealant repair area are installed and tightened, unless you must install the fastener after you apply the faying surface sealant.

NOTE: You cannot install and tighten most fasteners after you apply the sealant.

SUBTASK 28-11-00-110-002

- (9) If the chemical conversion coating metal surface treatment is worn or damaged, you must apply Bonderite M-CR 600 Aero coating, C50315, to the metal surface before you apply the new sealant or finish material.

SUBTASK 28-11-00-110-003

- (10) Refer to the Bonderite M-CR 600 Aero Metal Surfaces procedure to apply Bonderite M-CR 600 Aero coating, C50315 to the surfaces that are worn, damaged or where metal shows (TASK 28-11-00-600-801).

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SUBTASK 28-11-00-110-004

- (11) Immediately before you apply the sealant, clean the surface with solvent, B00184, and rub dry with clean cotton wipers, G00034.

NOTE: Do not let the solvent dry on the surface. Do not touch the area with your fingers.

F. Prepare, Apply, and Cure Sealants

NOTE: It is very important to mix, use and keep sealants correctly. You must follow approved procedures to prevent damage or injury. Fully mix all components, refer to the manufacturer's instructions. Do not mix sealants that you apply with a brush until you use them. Do not put thinners in the sealant. Keep the sealants covered when not in use.

SUBTASK 28-11-00-390-002



DISCARD ALL SEALANT THAT DOES NOT APPLY SMOOTHLY. IF YOU APPLY THE SEALANT INCORRECTLY, IT CAN CAUSE LEAKAGE.

CAUTION

- (1) Storage of Sealant Compound that is not Mixed

NOTE: You should keep sealant at temperatures between $65 \pm 15^{\circ}\text{F}$ ($18 \pm 9^{\circ}\text{C}$).

- (a) Keep the sealant for 6 months or less from the manufacturer's date of packaging.
(b) Do a test of sealant that is kept for 6 months or more from the manufacturer's date of packaging.

- 1) Mix a sample of the sealant base compound and the curing compound in a container, at room temperature.
 - a) Use an entire 2-part kit or make a 2-part kit.
 - <1> To make a 2-part kit, use the correct ratio of base compound and curing compound.
 - <2> Weigh the components to calculate the ratio.
 - <3> If you use a Semkit, mix the entire Semkit.
- 2) Apply a fillet seal (Class B) or brush a thick coating of sealant (Class A) to a sample piece of structure or scrap metal to find the time necessary before a sample of the sealant is not tacky.
 - a) Use the plastic film in the applicable sealant specification to find the time when the sealant is not tacky (tack-free time).
- 3) Compare this time with maximum permitted tack-free time given in the applicable sealant specification.
- 4) If this time is more than the maximum permitted time, discard the sealant.
- 5) The storage life may be extended only once by a maximum of 3 months.

SUBTASK 28-11-00-390-003

- (2) Mix the Sealant Compound

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WARNING

MAKE SURE THAT THERE IS A GOOD FLOW OF CLEAN AIR WHEN YOU MIX THE SEALANTS. DO NOT MIX THE SEALANTS IN A CLOSED SPACE IN THE AIRPLANE. DO NOT LET THE SEALANTS TOUCH YOUR SKIN OR EYES. WEAR RUBBER GLOVES AND EYE PROTECTION WHEN YOU MIX THESE MATERIALS. THEY ARE POISONOUS AND CAN CAUSE INJURY TO PERSONS.

- (a) Mix only the quantity of sealant necessary for the job to be done.

NOTE: Identify the necessary sealant for the repair before you mix it. The use of premeasured Semkits (purchased from the vendor) is recommended for small repairs.

- (b) Make sure all equipment used to mix the sealant is clean.

- (c) Mix the sealant compounds as shown in the manufacturer's instructions.

NOTE: Always use the curing compound with the base compound from the same repair kit. Do not mix the contents of one repair kit with that of a different kit. Do not mix the sealant too much or the time you can apply the sealant will decrease.



CAUTION

MAKE SURE THAT THERE ARE NO AIR BUBBLES IN THE SEALANT WHEN YOU MIX IT. IF THERE ARE AIR BUBBLES IN THE SEALANT, IT WILL NOT BOND CORRECTLY.

- (d) For small repair kits (less than 0.5 lb (0.2 kg)), mix the curing compound and base compound until the sealant is of a constant, equal color with a clean spatula, STD-809, or other applicable tool.

- 1) Put the sealant in a container cleaned with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

- 2) Use immediately after you mix it.

- (e) Sealant may be machine-mixed and stored frozen to extend the storage life.

- 1) Thoroughly mix the accelerator with a machine mixer.

- 2) Use an entire kit or weigh out the base and accelerator in the correct proportion for mixing.

- a) Use the ratio recommended by the manufacturer.

- 3) Mix the base and accelerator together with a machine mixer.

NOTE: Use either a batch or a continuous mixer recommended by the manufacturer of the sealant.

- 4) Make sure the sealant is mixed correctly.

NOTE: The sealant is mixed correctly if it is uniform in color and free from streaks.

- 5) Immediately after the sealant is mixed, do these steps:

- a) Put the mixed BMS5-45 sealant, A00767 (or equivalent), into cartridges.

- b) Install caps on both ends of the cartridges.

- c) Write the date you mix the sealant, the sealant type, class, supplier, and the expiration date on the cartridges.

- d) Put the cartridges in a freezer at a temperature of -40°F (-40°C) or colder.

- e) Discard the sealant if it is kept more than 21 days at -40°F (-40°C).

- f) Discard the sealant if it is kept more than 7 days at -20°F (-29°C).

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SUBTASK 28-11-00-390-004

- (3) Sealant application time at 77°F (25°C) and 50% relative humidity (Figure 806)

NOTE: Sealant application time is the maximum length of time you can apply the sealant to the part. Application time starts when mixing or thawing (for frozen sealant) is complete.

- (a) BMS5-45 Class B-½ sealant, A00767 - ½ hour
- (b) BMS 5-45 Class B-2 sealant, A50110 - 2 hours
- (c) BMS5-45 Class C-24 sealant, A50518 - 8 hours
- (d) BMS5-45 Class C-48 sealant, A50582 - 12 hours
- (e) BMS5-45 Class C-168 sealant, A50155 - 48 hours
- (f) P/S 860 B-1/6 sealant, A50084 - 10 minutes
- (g) PR-1826 sealant, A50052 Class B-½ - ½ hour

SUBTASK 28-11-00-390-015

- (4) Maximum temperature to apply fay surface sealant.

- (a) For BMS5-45 Class B-2 sealant, A50110 - 95°F (35°C) maximum
- (b) For BMS5-45 Class C sealant, A50155 - 100°F (38°C) maximum

SUBTASK 28-11-00-390-005

- (5) Sealant squeeze-out life:

- (a) Squeeze-out life is the length of time you can assemble parts with faying surface sealant.
- (b) Squeeze-out life starts when mixing or thawing (for frozen sealant) is complete.
- (c) You must apply the sealant within the application time and finish the assembly within the squeeze-out life.
- (d) The squeeze-out life when measured at 77°F (25°C) and 50% relative humidity is shown in Figure 806 for BMS5-45 sealant, A00767.

SUBTASK 28-11-00-390-006

- (6) Sealant cure time

- (a) You must let the BMS 5-45 sealant, A00767 (or equivalent), cure until it is at least tack-free (Figure 806) before you continue maintenance operations in the fuel tank or refuel the fuel tank.
- (b) P/S 860 B-1/6 sealant, A50084 can touch fuel after 2 hours and has a cure time of 4 hours.
- (c) PR-1826 sealant, A50530 can touch fuel after 2–1/2 hours and has a cure time of 3 hours.



DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)



DO NOT APPLY SEALANT WHEN THE TEMPERATURE OF THE FUEL TANK STRUCTURE IS TOO HOT OR TOO COLD. THE SEALANT WILL NOT CURE CORRECTLY IF THE STRUCTURE TEMPERATURE IS OUT OF RANGE. INCORRECTLY CURED SEALANT CAN CAUSE A FUEL LEAK.

- (d) The cure times in (Figure 806) are at a temperature of $77 \pm 5^{\circ}\text{F}$ ($25 \pm 3^{\circ}\text{C}$) and a relative humidity of $50\% \pm 5\%$.
- 1) The best condition would be with a good flow of air in the area.
 - 2) Make sure the tank and component surfaces are dry.
NOTE: Sealant will not adhere to wet surfaces.
 - 3) If you increase the temperature of the tank structure, the curing time decreases.
 - a) You can increase the temperature of all the tank structure up to 140°F (60°C).
 - b) Tack-free and cure times are approximately one-half as long for each 20°F (11°C) increase in temperature.
 - 4) If you increase the humidity of the tank structure, the curing time decreases.
 - a) Tack-free and cure times decrease between 33%-50% for every 15% increase in relative humidity.
NOTE: Humidity affects polysulfide sealants more than polythioether sealants.
 - b) You must know the relative humidity at all times during the sealant operations.
 - <1> If the relative humidity is less than 40%, the cure of the sealant is slower.
 - <2> For faying and non-faying surface seals, to increase the relative humidity, put or flow warm, moist air above the repair area or over the sealant.
 - <a> Make sure the water added to the air contains less than 100 parts per million of total solids and less than 10 parts per million of chlorides.
NOTE: In hot dry climates, if you put a pan of water in the fuel tank near the repair area, it could add the necessary humidity.

SUBTASK 28-11-00-360-003

- (7) To apply a new fillet seal, do the steps that follow:
- (a) BMS 5-45 Class B sealant, A00767 (or equivalent), is used to apply all fillet seals after a precoat of BMS 5-45 Class A sealant, A00767 (or equivalent).
 - (b) Examine the seal area to make sure you have the correct selection of tools for the job.
 - (c) Apply a precoat of correctly mixed BMS 5-45 Class A sealant, A00767 (or equivalent), to the surface with a stiff bristle non-metallic brush, STD-124 (Figure 807).
 - 1) Use a vigorous motion to apply the precoat.
 - 2) Make sure you apply precoat into all crevices and the full length of the area that you will apply sealant to.
 - 3) Apply the precoat at a width of 0.5 in. (12.7 mm) on each side of seams.

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- (d) If you let the precoat become tack-free, clean with Series 93 solvent, B01013, before you apply the fillet seal (TASK 20-30-93-910-801).

NOTE: It is not necessary to let the precoat cure. A minimum of 15 to 20 minutes, after you apply the precoat, is recommended before you apply the fillet seal.

- (e) If you use PR-1826 sealant, A50052, let the PR-1826AP adhesion promoter, A50574 dry for a minimum 30 minutes before you apply the fillet seal.

- 1) If the PR-1826AP adhesion promoter, A50574 becomes contaminated or sealant is not applied within 24 hours, it is necessary to remove and re-apply the PR-1826AP adhesion promoter, A50574.



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- a) Remove the old or contaminated PR-1826AP adhesion promoter, A50574 with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).
b) Clean the surface with a stiff bristle non-metallic brush, STD-124, and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

- c) Rub dry with a clean, dry cotton wiper, G00034.
d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
e) Re-apply the PR-1826AP adhesion promoter, A50574 to the surface.

- (f) If you use P/S 860 B-1/6 sealant, A50084, let the PR-148 adhesion promoter, A50408 dry for a minimum 30 minutes before you apply the fillet seal.



WARNING

DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES AND GLOVES WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 1) Remove the old or contaminated PR-148 adhesion promoter, A50408 with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).
2) Clean the surface with a stiff bristle non-metallic brush, STD-124, and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

- 3) Rub dry with a clean, dry cotton wiper, G00034.

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- 4) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
 - 5) Re-apply the PR-148 adhesion promoter, A50408 to the surface.
- (g) Apply a small first fillet seal of BMS 5-45 Class B sealant, A00767, or equivalent, with the sealant gun, STD-449 (Figure 808).
- 1) Make sure there are no air bubbles in the sealant.
NOTE: Air bubbles in the sealant make a path for fuel to leak.
 - 2) When you use a nozzle tip, point the nozzle tip into the seam, almost perpendicular to the direction of travel.
 - 3) Keep a bead of sealant in front of the nozzle tip.
 - 4) If the seal has a bad bond or air bubbles, do the procedure again.
- (h) Use a sealant fairing tool and push the first fillet seals tightly into position (Figure 809, Figure 810).
- 1) Apply all the first fillet seals.
 - 2) Make sure all sealant fairing tools are clean.
 - 3) Do not use solutions or lubricants to help the fairing tools move over the sealant.
 - 4) Clean the fairing tools frequently with a clean cotton wiper, G00034.
- (i) If the first fillet seal is tack-free or cured, but is not clean, then it must be cleaned before you apply the second fillet seal.
- (j) Apply BMS 5-45 Class B sealant, A00767 (or equivalent), a second time to make a full bodied fillet seal.
NOTE: Use a larger nozzle for the second fillet seal.
- 1) If you use are extruding sealant with a nozzle, do the steps that follow to apply the second fillet seal:
 - a) Cut the nozzle to get the dimensions shown in Figure 810.
 - b) Put the nozzle at the seam, and push the sealant bead ahead of the nozzle while you move along the seam.
NOTE: Keep the nozzle of the sealing gun near the surface to prevent air bubbles.
 - c) Make sure the second fillet seal stays at the seam.
 - 2) Remove all air bubbles and fair out re-entrant edges.
- (k) Apply corrosion resistant finish (topcoat) if it is necessary.
NOTE: You must apply Bonderite M-CR 600 Aero coating, C50315 and coating, C00307, if bare metal is open to fuel after the repair.
Follow the procedure in this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-390-007

(8) Repair of fastener seals

(a) Repair self-sealing rivets.

- 1) Self-sealing rivets are used in skin panels in the fuel tank area. If you find a fuel leak at a rivet, you must replace the rivet to make a permanent repair. You can make a temporary repair if you make a permanent repair the next time you go into the fuel tank, refer to the Structural Repair Manual.

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- 2) To make a temporary repair of a self-sealing rivet, use one of the procedures that follows:

- a) Apply sealant to a self-sealing rivet with a sealing tool (Figure 804, Figure 811).

NOTE: Use this procedure for fuel leaks at mechanically sealed rivets only.

<1> Clean the surface of the adapter with emery cloth if it is necessary.

<2> Remove the paint from around the rivet that leaks.



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<3> Clean the surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: Do not touch the surface with your fingers after you clean it.



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DO NOT GET THE ADHESIVE IN YOUR EYES OR ON YOUR SKIN. WEAR SAFETY GLASSES TO PROTECT YOUR EYES. WEAR POLYETHYLENE GLOVES TO PROTECT YOUR HANDS. INJURIES TO PERSONNEL COULD OCCUR.

- <4> Use a cotton-tipped stick to apply a thin layer of Eastman 910 adhesive to the surface of the adapter, Step 1, (Figure 811).
- <5> Put the adapter over the center of the rivet and tightly push against the wing surface for 10 seconds, Step 2, (Figure 811).
- <6> Release your hold on the adapter.
- <7> Do not touch the adapter for 15 minutes.
- <8> Remove the screw from the sealant loading port (Figure 804).
- <9> Turn the screw in the sealant bleed port until only one more turn will remove it.
- <10> Remove the pressure bolt.
- <11> Drain all collected fuel.
- <12> Install the pressure bolts (approximately 12 turns or 0.5 in. (12.7 mm)).
- <13> Put BMS 5-45 Class A sealant, A00767, in the sealant loading port until it comes out of the sealant bleed port, Step 3, (Figure 811).
- <14> Install the screw in the sealant loading port.
- <15> Tighten the screw in the sealant bleed port.
- <16> Torque the pressure bolt to 5 in-lb (0.565 N·m) and hold for 5 minutes.
- <17> Hit the sides of the adapter lightly with a small hammer or mallet, Step 4, (Figure 811), to remove the adapter.

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- <18> Examine the repair for fuel leaks.
 - <19> If the fuel leak continues, do the procedure again.
 - <20> If you must replace the self-sealing rivet, refer to the structural repair manual.
 - <21> Clean the sealant from the wing surface and the adapter with Series 93 solvent, B01013 (TASK 20-30-93-910-801).
 - <22> Do not try to clean the adhesive from the wing surface.
NOTE: The adhesive wears off in 1 to 2 weeks.
- b) Apply sealant to a self-sealing rivet with a temporary repair tool (Figure 812).
- <1> Remove paint from around the rivet that leaks with an approved emery cloth.



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- <2> Clean the temporary repair tool and the wing surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).
NOTE: Do not touch the wing surface with your fingers after you clean it.
- <3> Make a mark on the wing surface to show the position of the temporary repair tool while it is in use (Figure 812).
- <4> Fill the temporary repair rivet sealing tool, SPL-1762, with mixed BMS 5-45 Class A sealant, A00767.
- <5> Put the temporary repair tool into a small rivet gun, STD-9933.
- <6> Put the O-ring of the temporary repair tool on the wing surface at the marked location.



CAUTION

ALWAYS KEEP THE TEMPORARY REPAIR TOOL PERPENDICULAR TO THE WING SURFACE. IF YOU DO NOT KEEP THE TEMPORARY REPAIR TOOL PERPENDICULAR TO THE WING SURFACE, DAMAGE TO THE WING SURFACE COULD OCCUR.

- <7> Operate the rivet gun, STD-9933, until sealant is applied around the rivet that leaks.
- <8> Examine the repair for fuel leaks.
- <9> If the fuel leak continues, do the procedure again.
- <10> If you must replace the self-sealing rivet, refer to the structural repair manual.

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- <11> Clean the sealant from the temporary repair tool and the wing surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: Make sure you do not touch the area with the new sealant.

- c) Install a Click-Patch.

- <1> You can use either a, Semco sealant click-patch kit, G50653, or Semco fast-set epoxy click-patch kit, G50654, to repair fuel leaks through Class C (Heavy Seep) Fuel Leak - Isolation procedure (TASK 28-11-00-300-801).
- <2> Click-Patch kits contain flat disks for fasteners that do not come out of the surface and hatted disks for rivets or bolts that are above the wing surface. The disks are put on the fasteners that leak.
- <3> The subsequent limits apply to Click-Patch repairs:
- <4> You can install a Click-Patch only after you make sure there are no structural crack in the applicable area of the fuel leak.
- <5> The maximum size of a Click-Patch is 1.25 in. (31.75 mm).
- <6> A Click-Patch is a temporary repair and you must make a permanent repair when possible.

- (b) Apply a fillet seal to a sealed fastener.

NOTE: You can use BMS5-45 sealant, A00767, PR-1826 PR-1826 sealant, A50052 or P/S 860 B-1/6 sealant, A50084.

- 1) If you use BMS5-45 sealant, apply a precoat of BMS 5-45 Class A sealant, A00767 (or equivalent) to the fastener and the area 0.5 in. (12.7 mm) in width in all directions from the fastener.

NOTE: PR-148 adhesion promoter, A50408 is required before the use of P/S 860 B-1/6 sealant, A50084, on all surfaces. Adhesion promoter is required before the use of PR-1826 sealant, A50052, on all surfaces. A precoat of BMS5-45, Class A sealant, A00767 is optional before the use of PR-148 adhesion promoter, A50408 and P/S 860 B-1/6 sealant, A50084 or PR-1826AP adhesion promoter, A50574 and sealant.

- a) Use a stiff, bristled brush to vigorously apply the precoat on the surfaces and into crevices.
- b) Let the precoat dry until it is not tacky.
- 2) If you use PR-1826 sealant, A50052, apply PR-1826AP adhesion promoter, A50574 and wait 30 minutes before you apply the sealant.
 - a) If the PR-1826AP adhesion promoter, A50574 becomes contaminated or the sealant is not applied within 24 hours, it is necessary to remove and re-apply the PR-1826AP adhesion promoter, A50574.

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- <1> Remove the old or contaminated PR-1826AP adhesion promoter, A50574 with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).
 - <2> Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).
NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.
 - <3> Rub dry with a clean, dry cotton wiper, G00034.
 - <4> Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
 - <5> Re-apply PR-1826AP adhesion promoter, A50574 on the surface.
- 3) If you use P/S 860 B-1/6 sealant, A50084, apply PR-148 adhesion promoter, A50408 and wait 30 minutes before you apply the sealant.



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- a) Remove the old or contaminated PR-148 adhesion promoter, A50408 with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).
 - b) Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).
NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.
 - c) Rub dry with a clean, dry cotton wiper, G00034.
 - d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
 - e) Re-apply PR-148 adhesion promoter, A50408 on the surface.
- 4) Use a sealing gun or spatula and apply a layer of BMS 5-45 Class B sealant, A00767, P/S 860 B-1/6 sealant, A50084, or PR-1826 sealant, A50530 around and on the fastener.
- 5) Move the sealant with a sealant fairing tool until you get the dimensions shown in (Figure 813) for the fillet seal.

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- 6) Examine the sealant for holes, bubbles, or spaces.
 - a) If there are holes, bubbles or spaces, use the fairing tool to move the sealant and remove these..
 - 7) Apply corrosion resistant finish (topcoat) (TASK 28-11-00-600-801).
- (c) Repair fasteners with metal seal covers.
- NOTE: BACC50H and BACC50AJ are the specifications for acceptable metal seal covers.
- 1) Use a sealant cutting tool to cut around and below the metal seal cover and to move apart the sealant from the structure.
 - 2) Hold the metal seal cover with pliers and pull away from the fastener.

NOTE: This will remove most of the sealant.
 - 3) Cut and remove the remaining sealant.

NOTE: You do not have to remove small quantities of the sealant that bond tightly to the fastener.
 - 4) Clean the metal seal covers, fastener ends, and structure with cleaning solvent.
 - 5) Vigorously apply precoat BMS 5-45 Class A sealant, A00767 (or equivalent), to the area with a stiff, bristle brush.
- NOTE: Precoat BMS 5-45 Class A sealant, A00767 is necessary when you use BMS 5-45 Class B sealant, A50337. Precoat is optional when you use P/S 860 B-1/6 sealant, A50084. PR-148 adhesion promoter, A50408 is required before the use of P/S 860 B-1/6 sealant, A50084. PR-1826AP adhesion promoter, A50574 is used with PR-1826 sealant, A50052. Obey the manufacturers instructions.
- a) Apply (brush) the precoat smoothly and equally into all the crevices.
 - 6) Fill a metal seal cover, of the correct size and shape, two-thirds full of BMS 5-45 Class B sealant, A50337, or P/S 860 B-1/6 sealant, A50084, with a sealing gun or a clean spatula (Figure 814).
 - 7) Make sure there is sufficient sealant to be extruded around the base and through the hole in the top of the metal seal cover.
 - 8) Push the sealant in the metal seal cover to make sure there are no holes.
 - 9) Push the metal seal cover on the fastener until the metal seal cover touches the structure (Figure 814).
 - 10) Move the extruded sealant around the top of the metal seal cover and remove the unwanted sealant.

NOTE: Use clean cotton wiper, G00034, to rub the sealant fairing tool.
 - 11) Hold the metal seal cover in its position and move the extruded sealant around the base.
 - a) Keep the metal seal cover on the center of the bolt.
 - b) Do not let the metal seal cover move.
 - c) If there is not sufficient clearance with adjacent metal seal covers, structures, or fillet seal, you can remove 25% or less of the area of the metal seal cover.
 - d) Make sure the metal seal cover has the dimensions shown in (Figure 815)
 - 12) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

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SUBTASK 28-11-00-390-008

(9) Apply an injection seal.

NOTE: You could lift the seal plane of the new sealant to isolate the bad seal from the fuel as an alternative to a new injection seal.

- (a) Make sure you have these tools: pipe cleaners, a sealant fairing tool, and a sealing gun with an injection nozzle attached.
- (b) Make sure the channel to be injected is clean.
- (c) Apply a precoat of BMS 5-45 Class A sealant, A00767 (or equivalent,) to the channel surfaces with pipe cleaners or a long, bristled pencil brush.

NOTE: If the channel cross-section is 0.07 in. (1.78 mm) or less, it is not necessary to apply precoat.

- 1) Make sure you do not seal the channel with the precoat of BMS 5-45 Class A sealant, A00767 (or equivalent).

NOTE: If you seal the channel, it will prevent the flow of the sealant into the channel.

- (d) Put BMS 5-45 Class B sealant, A50337 (or equivalent), into one end of the channel and fill until sealant comes out of all other openings (Figure 816).

- 1) Make sure there is sufficient sealant in the sealing gun for a full seal.

NOTE: If you stop and start when you apply the seal, air bubbles can get into the seal.

- (e) Fill all slots, joggles and channels where continuity of a seal or a block-off seal is necessary.

- (f) Fair the ends of the sealant to make a smooth transition to and adjacent fillet seal or the component surface, as applicable.

- (g) Remove excess sealant with the sealant fairing tool.

- (h) Examine the seal for a bad bond or air bubbles.

- 1) If the seal has a bad bond or air bubbles, do the procedure again.

- 2) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat),
TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-004

(10) Apply a prepack seal.

- (a) Apply a bead of BMS 5-45 Class B sealant, A50337 (or equivalent), along each corner of the part cavity (Figure 817).

- 1) Fill all of the cavity with an excess of sealant.

- (b) Make sure you apply sufficient sealant to completely fill the parts.

- (c) Assemble the parts in the sealant squeeze-out life (Figure 806).

- 1) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat),
TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-005

(11) Apply a faying surface seal.

NOTE: The maximum temperature for application of a faying seal is 95°F (35°C) for sealant, A50110, and 100°F (38°C) for sealant, A50155.

EFFECTIVITY
LOM ALL

28-11-00



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- (a) Apply a layer of sealant, A50110, Class B-2 or sealant, A50155, Class C to one faying surface with a sealing gun or spatula (Figure 818).
- (b) Make sure the sealant covers the surface and is approximately 0.03 in. (0.76 mm) thick (Figure 818).
- (c) Assemble the parts in the sealant squeeze-out life (Figure 806).
- (d) Use a sealant fairing tool to smooth the sealant along the joint.

NOTE: You must apply sufficient sealant to make sure there is continuous extruded sealant on the along the entire length of the joint.

- 1) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat),
TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-006

- (12) Increase the seal plane above the initial seal plane (Figure 819).

- (a) You can replace an injection, prepack, or faying surface seal, or you can increase the seal plane to isolate a bad seal from the fuel.

NOTE: Because you add a large quantity of sealant when you increase the seal plane above the initial seal plane, it is better to replace the bad seal.

- 1) Examine the structure around the bad seal to find where to increase the seal plane.
- 2) Apply a new fillet seal around the structure with the applicable seals and fasteners to increase the seal plane (Figure 819).
- 3) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat),
TASK 28-11-00-600-801.

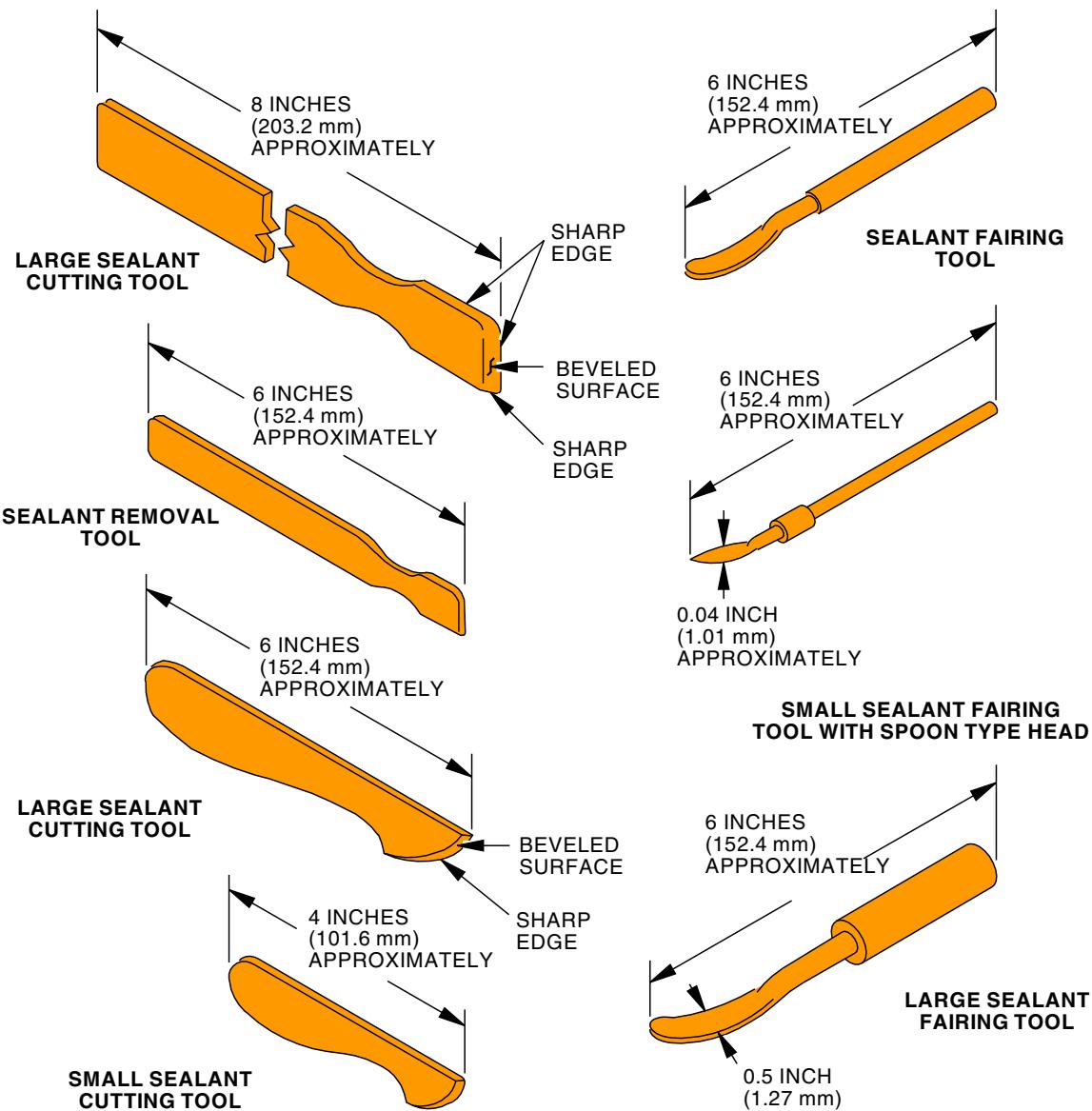
— END OF TASK —

EFFECTIVITY
LOM ALL

28-11-00



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NOTE:

THESE TOOLS SHOULD BE MADE OF PLASTIC, HARDWOOD, OR METAL NO HARDER THAN 2024-T3 ALUMINUM TO REDUCE THE POSSIBILITY OF DAMAGE TO THE STRUCTURE (PLASTIC AND HARDWOOD TOOLS ARE RECOMMENDED).

SEALANT REMOVAL AND CUTTING TOOLS

NOTE:

THESE TOOLS CAN BE MADE OF 0.25 INCH (6.35 mm) DIA BRONZE OR STEEL WELDING ROD AND CAN BE PLATED TO IMPROVE THE SMOOTHNESS

SEALANT FAIRING TOOLS

F57605 S0006571265_V2

Sealant Removal, Cutting and Fairing Tools
Figure 803/28-11-00-990-817 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

D633A101-LOM

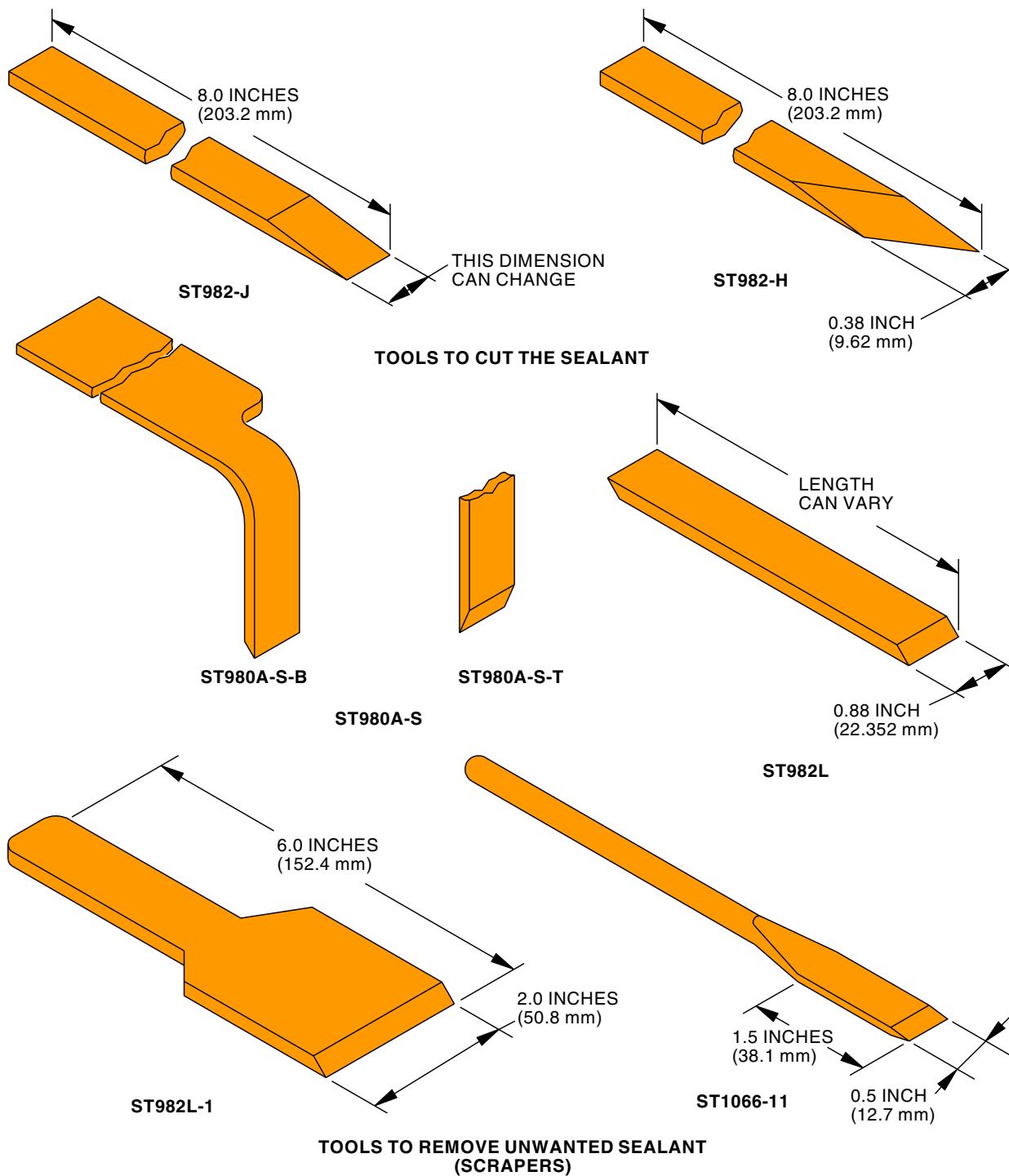
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F57609 S0006571266_V2

Sealant Removal, Cutting and Fairing Tools
Figure 803/28-11-00-990-817 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-11-00

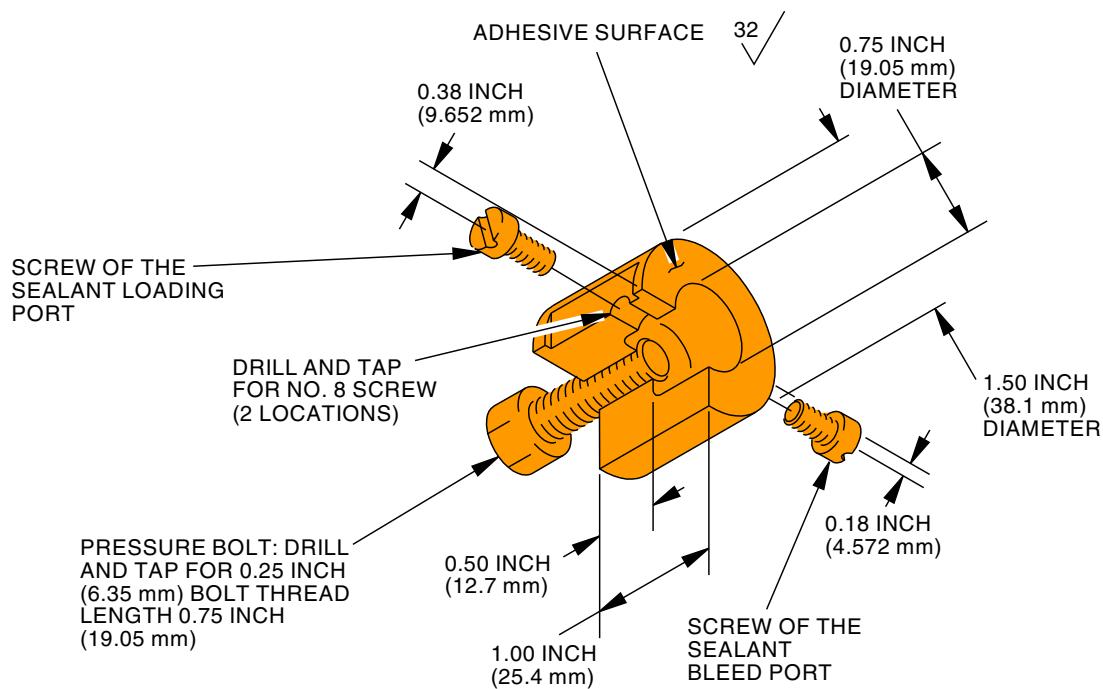
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MATERIAL: MILD STEEL CADMIUM PLATED

F57612 S0006571267_V3

Sealing Tool for Rivets that Leak
Figure 804/28-11-00-990-818

EFFECTIVITY
LOM ALL

28-11-00

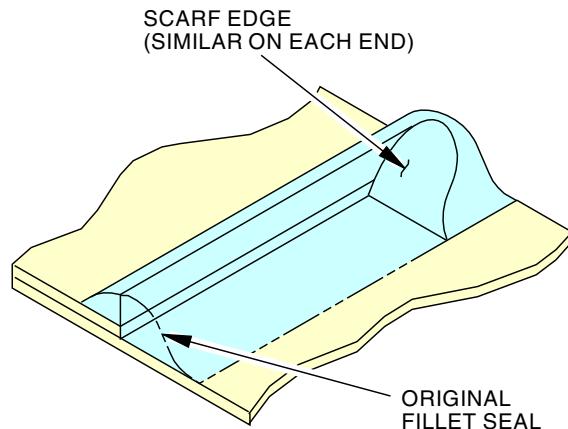
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F57614 S0006571268_V2

Fillet Seal Removal
Figure 805/28-11-00-990-819

EFFECTIVITY
LOM ALL

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SEALANT	CLASS	APPLICATION TIME (MINIMUM) HOURS ¹	TACK-FREE TIME (MINIMUM) HOURS ¹	SQUEEZE-OUT LIFE (MINIMUM) HOURS ¹	CURING TIME (MINIMUM) HOURS ¹
Proseal 860 ³	B-1/6	1/6	1.5 ²	--	4
PR-1826 ⁴ ⁶	B-1/2	1/2	2.5	--	3
BMS 5-45	A-2 (Grade 1)	2	36	--	72
	A-2 (Grade 2)	2	24	--	48
	A-2 (GRADE 3)	2	8	--	8
	B-2 ⁷	1/2	--	--	6
	B-1/2	1/2	10	--	12
	B-2	2	12	6	24
	C-24 ⁵	8	--	24	168
	C-48 ⁵	12	--	48	336
BMS 5-168	C-168 ⁵	48	--	168	1,344
	A-2	2	8	--	8
	B-2	2	8	4	8

- ¹ AT 77°F (25°C) AND 50% RELATIVE HUMIDITY AMBIENT CONDITIONS. OTHER TEMPERATURE AND RELATIVE HUMIDITY CONDITIONS WILL CHANGE THE TIMES.
- ² DO NOT LET FUEL TOUCH THE SEALANT UNTIL IT IS NOT TACKY FOR A MINIMUM OF 2 HOURS.
- ³ WHEN YOU USE PROSEAL 860, NO PRECOAT IS NECESSARY. PROSEAL 860 IS RECOMMENDED FOR SMALL REPAIRS ONLY, DUE TO ITS SHORT APPLICATION TIME. AVAILABLE FROM PPG AEROSPACE, MOJAVE, CALIFORNIA.
- ⁴ USED TO REPAIR FILLET SEALS OF BMS 5-45. AVAILABLE FROM PPG AEROSPACE, MOJAVE, CALIFORNIA.
- ⁵ USED WITH FAYING SURFACE SEALS THAT HAVE A LONG SQUEEZE-OUT LIFE.
- ⁶ PR-1826 PRIMER IS REQUIRED BEFORE THE USE OF PR-1826 SEALANT.
- ⁷ MIX BMS 5-45, CLASS B-2 SEALANT WITH A 20:100 ACCELERATOR/BASE RATIO BY WEIGHT OR GET THIS SEALANT PRE-MIXED.

2240185 S0000501175_V4

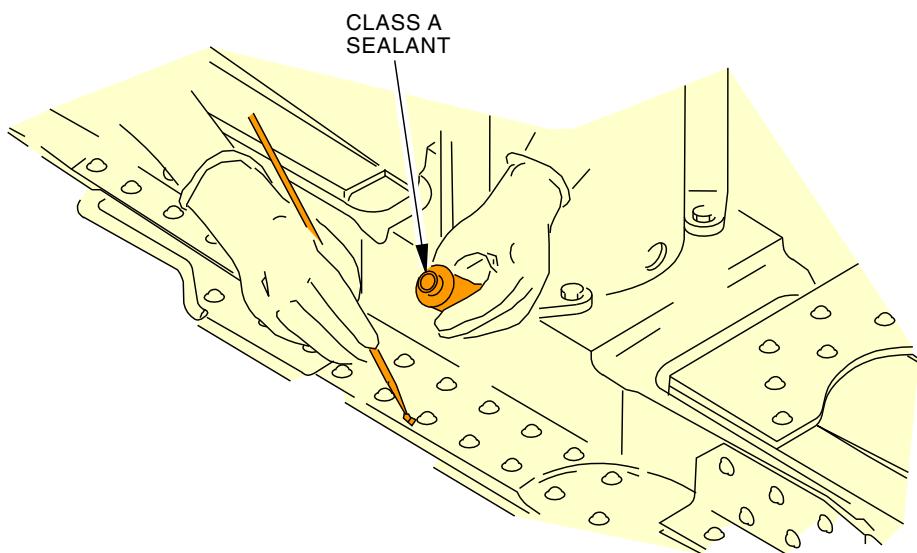
Sealant Usable Time
Figure 806/28-11-00-990-820

EFFECTIVITY	
LOM ALL	

28-11-00



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F57619 S0006571270_V3

Apply the Precoat
Figure 807/28-11-00-990-821

EFFECTIVITY
LOM ALL

28-11-00

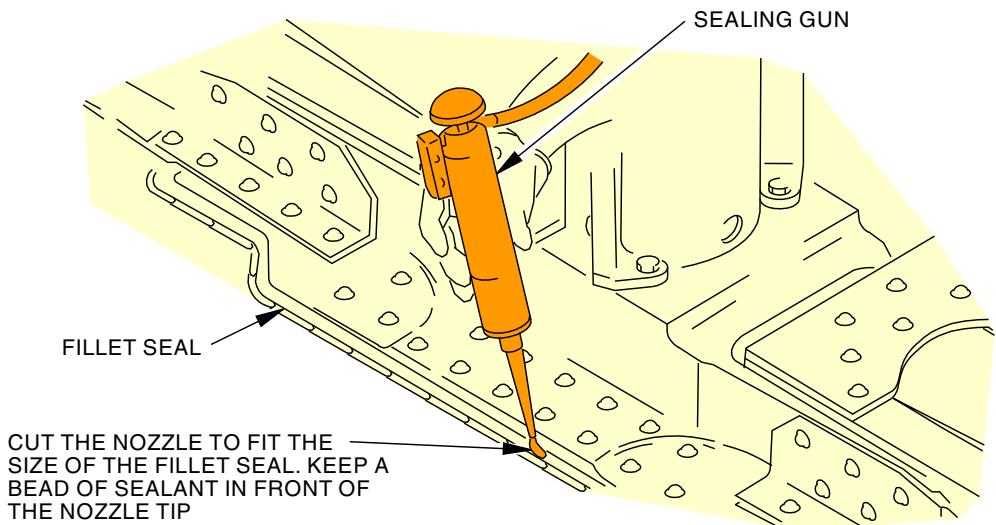
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F57620 S0006571271_V2

Apply a Fillet Seal
Figure 808/28-11-00-990-822

EFFECTIVITY
LOM ALL

28-11-00

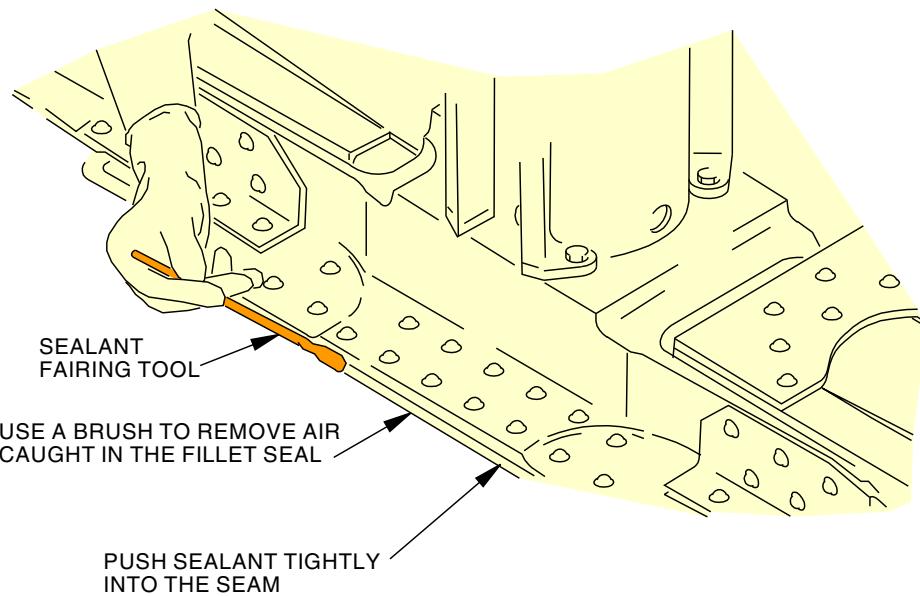
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F57621 S0006571272_V2

Push the First Fillet Seal into the Seam
Figure 809/28-11-00-990-823

EFFECTIVITY
LOM ALL

28-11-00

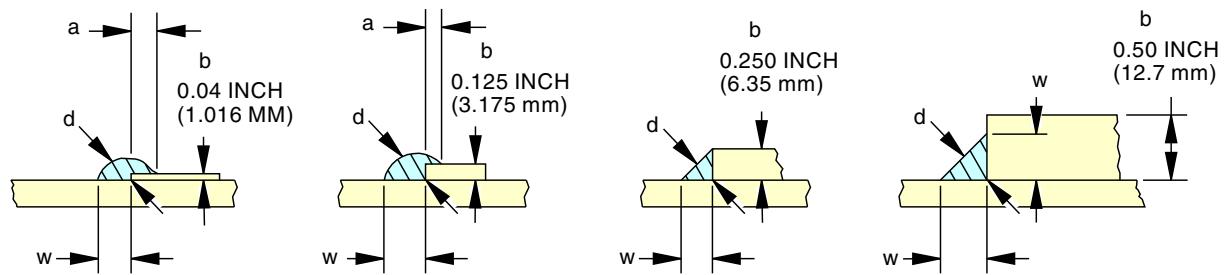
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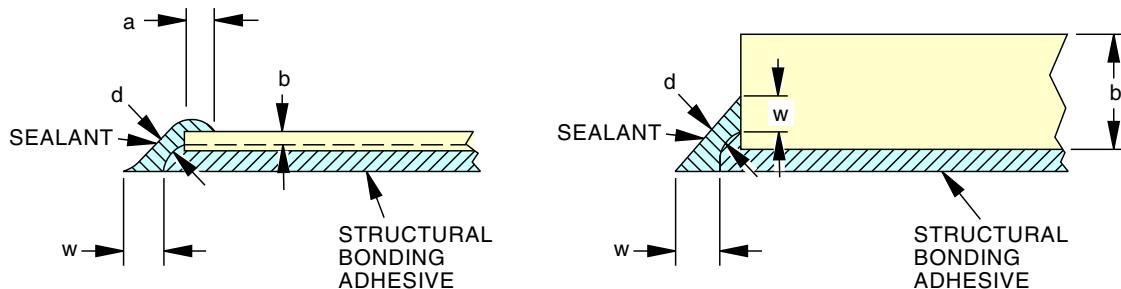
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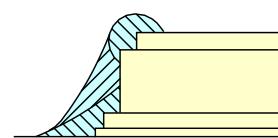
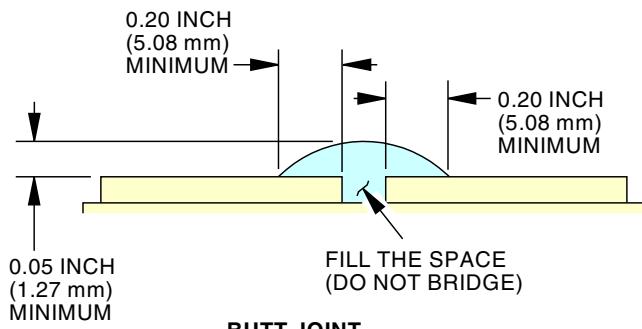


NON-BONDED SURFACES



BONDED SURFACES

$d = 0.15$ INCH (3.83 mm) MINIMUM
 $w = 0.25\text{--}0.50$ INCH (6.35-12.7 mm)
 $a+b = w$, EXCEPT $a = \text{ZERO WHEN } b = 0.25$ INCH (6.35 mm) OR MORE



F57629 S0006571273_V2

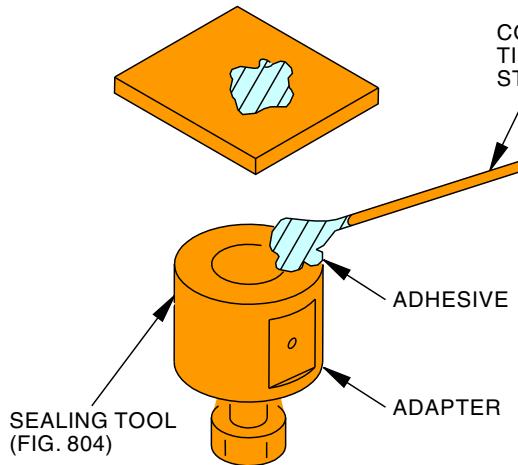
Fillet Seal and Dimensions of Full Bodied Fillet Seals
Figure 810/28-11-00-990-824

EFFECTIVITY
LOM ALL

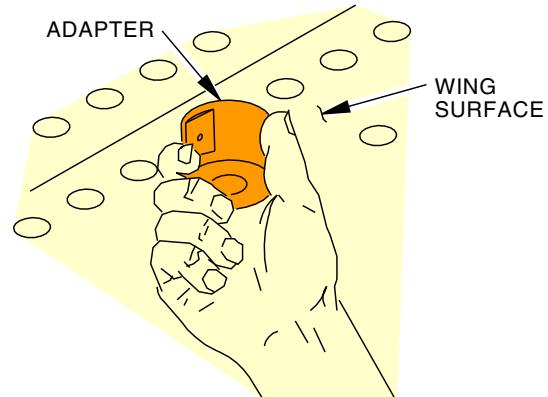
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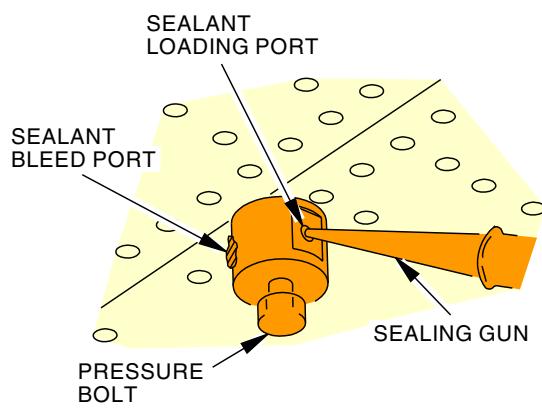
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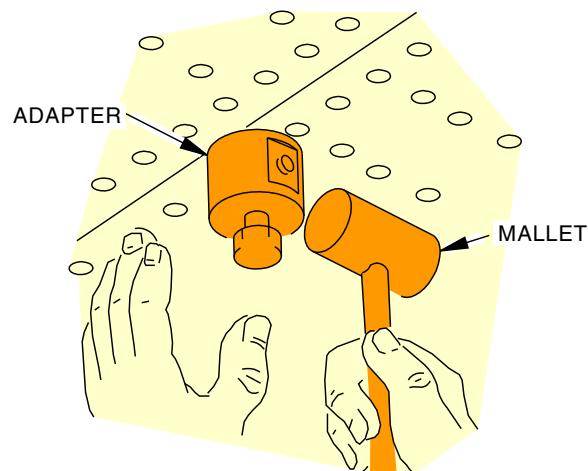
STEP 1



STEP 2



STEP 3



STEP 4

F57631 S0006571274_V2

Temporary Repair of Self-Sealing Rivets
Figure 811/28-11-00-990-825

EFFECTIVITY
LOM ALL

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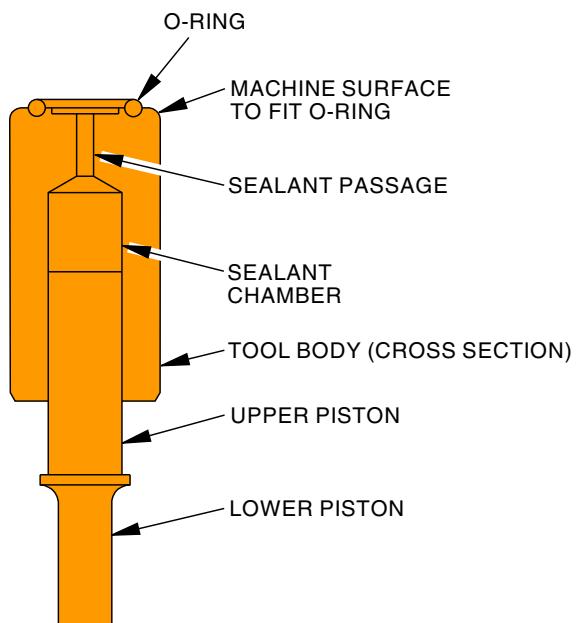
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F57632 S0006571275_V2

Temporary Repair Tool (F70230) for Self-Sealing Rivets
Figure 812/28-11-00-990-826

EFFECTIVITY
LOM ALL

28-11-00

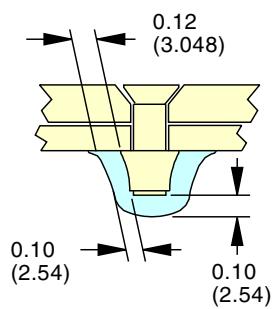
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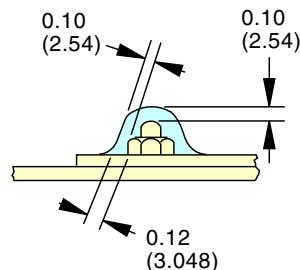
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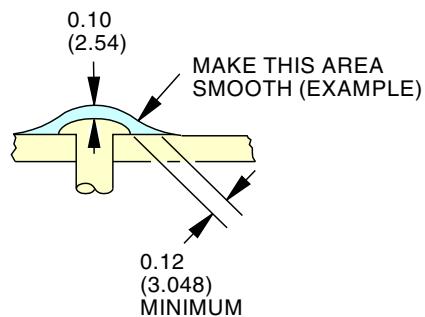
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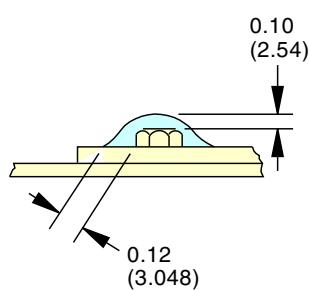
RIVET



BOLT



RIVET



BOLT

NOTE:

ALL DIMENSIONS ARE IN INCHES (MILLIMETERS ARE IN PARENTHESES).

F57634 S0006571276_V2

Dimensions of Fillet Seals (Inches) for Fasteners
Figure 813/28-11-00-990-827

EFFECTIVITY
LOM ALL

28-11-00

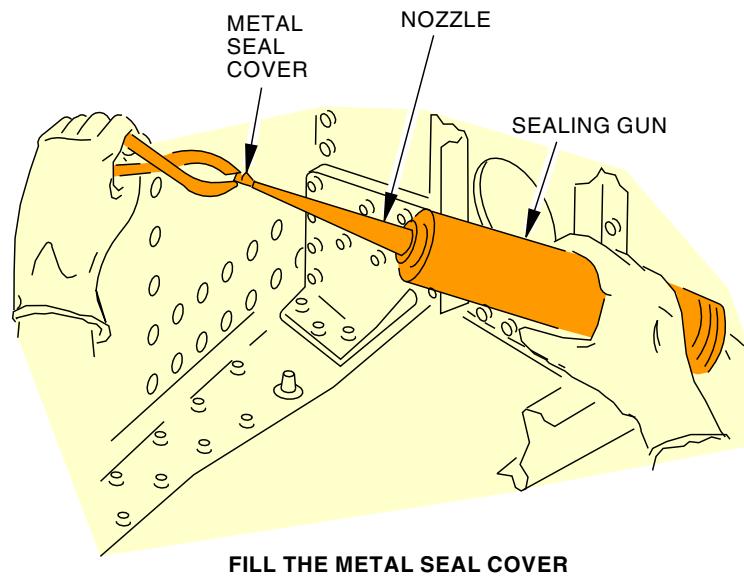
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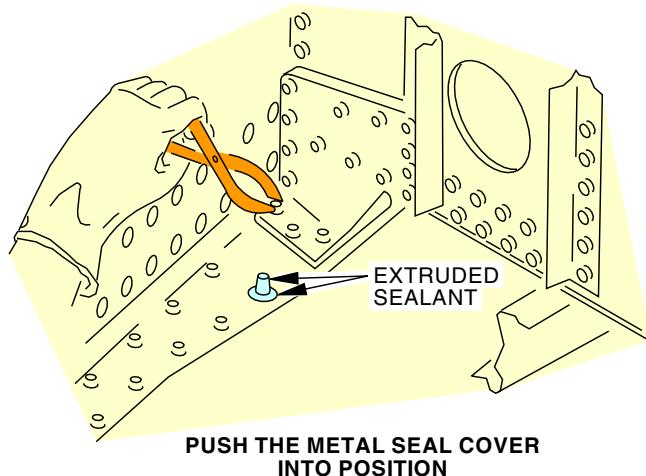


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NOTE:

THE NOZZLE SIZE DEPENDS ON THE
SIZE OF THE METAL SEAL COVER.



F57636 S0006571277_V2

Metal Seal Cover Installation
Figure 814/28-11-00-990-828

EFFECTIVITY
LOM ALL

28-11-00

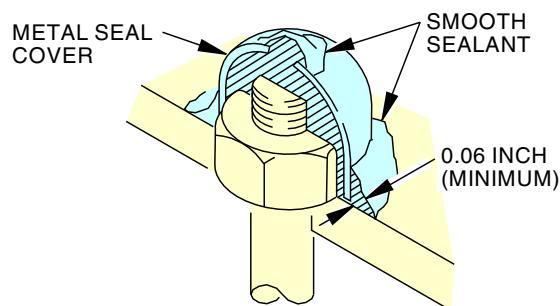
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F57637 S0006571278_V2

Installed Metal Seal Cover
Figure 815/28-11-00-990-829

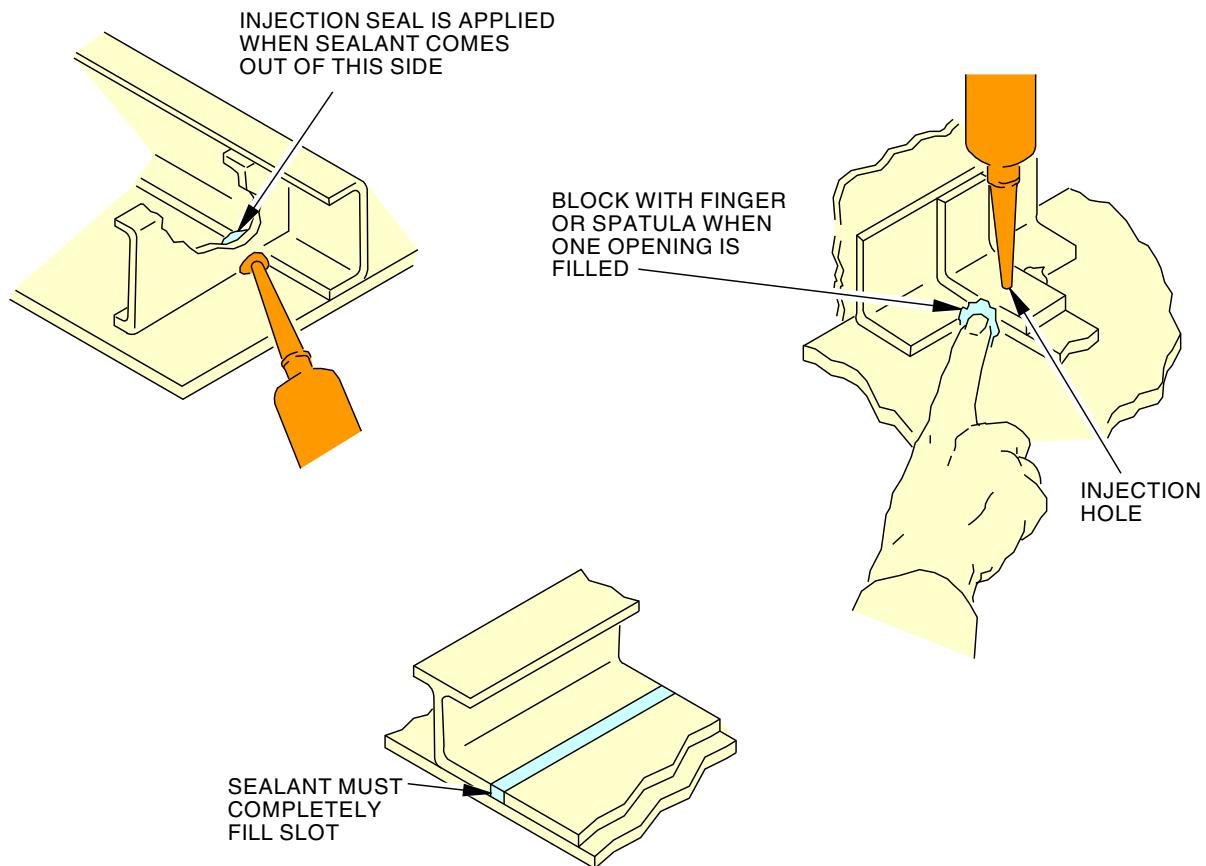
EFFECTIVITY
LOM ALL

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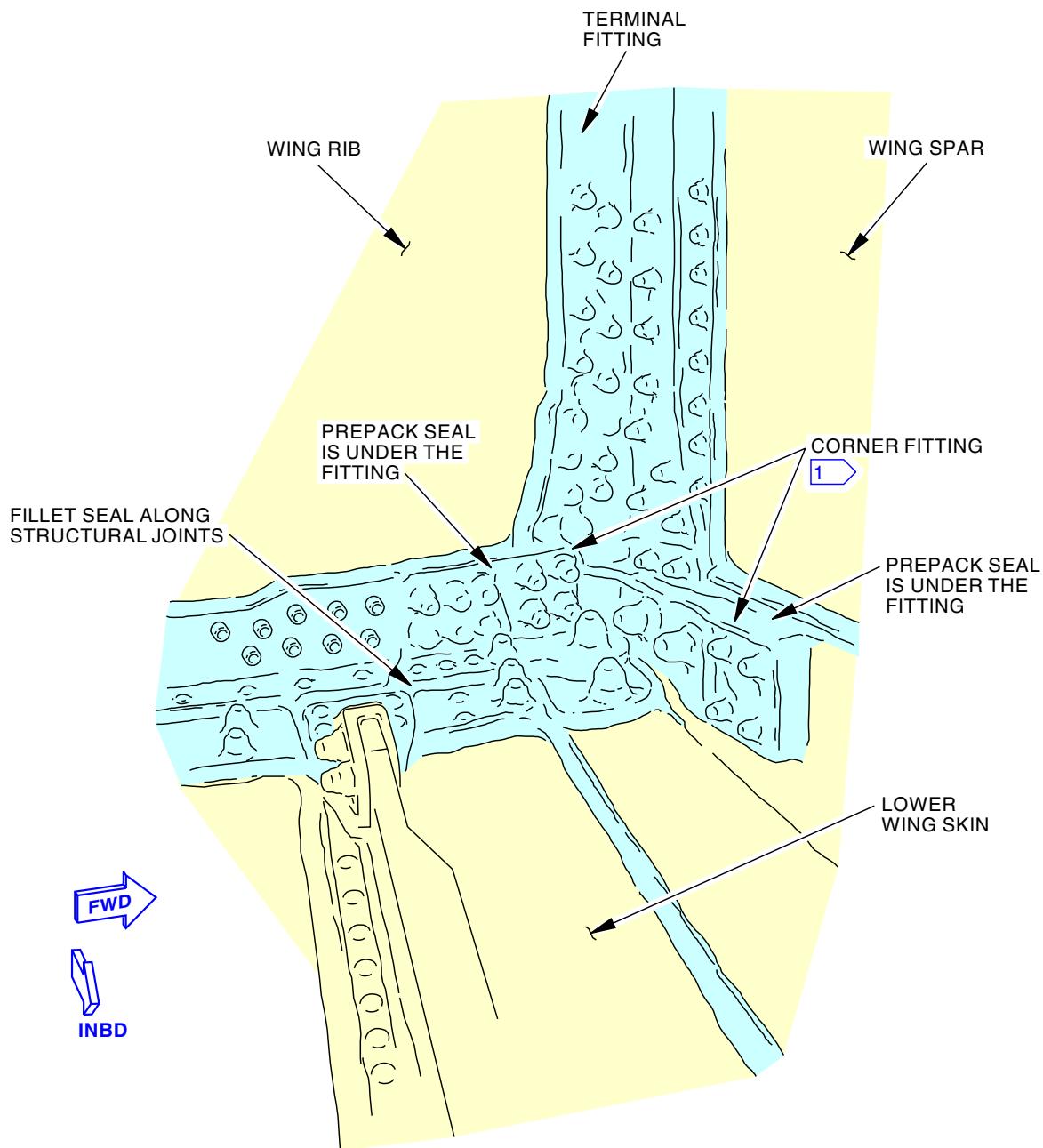


F57642 S0006571279_V2

Apply an Injection Seal
Figure 816/28-11-00-990-830EFFECTIVITY
LOM ALL**28-11-00**

D633A101-LOM

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1 THE FITTING MUST BE TEMPORARILY REMOVED AND
CLEANED OF USED SEALANT BEFORE YOU APPLY A
NEW PREPACK SEAL

F57645 S0006571280_V2

Example of a Combination of Prepack Seal and Fillet Seals
Figure 817/28-11-00-990-831

EFFECTIVITY	LOM ALL
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D633A101-LOM

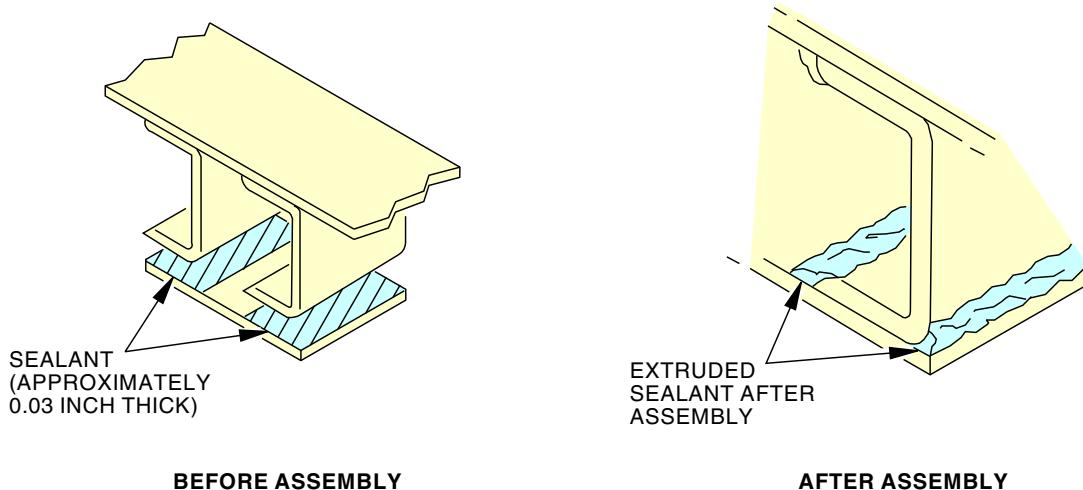
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Faying Surface Seal
Figure 818/28-11-00-990-832

F57647 S0006571281_V2

EFFECTIVITY
LOM ALL

28-11-00

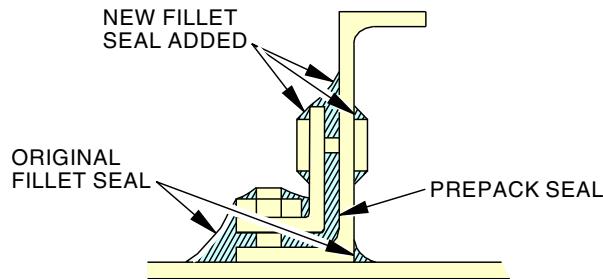
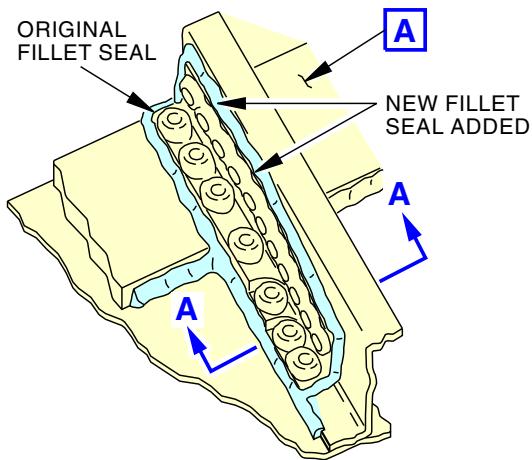
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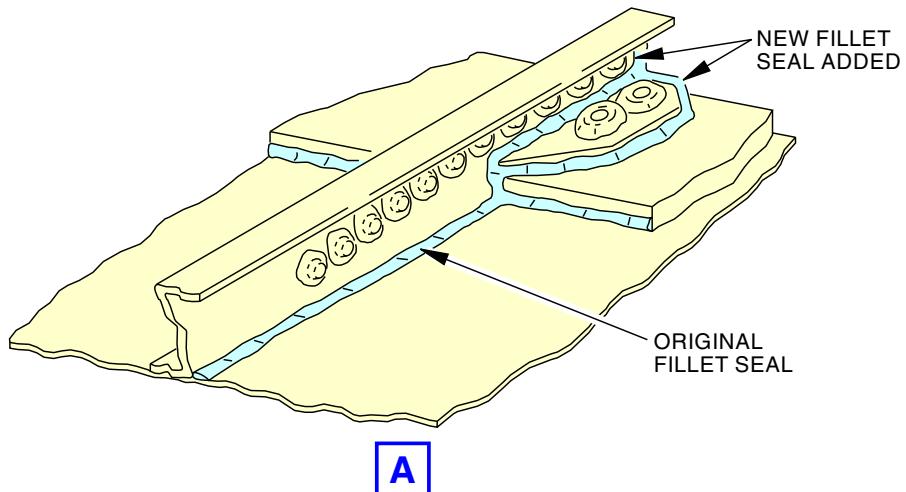
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A-A



F57649 S0006571282_V2

Prepack Seal Repair
Figure 819/28-11-00-990-833

EFFECTIVITY
LOM ALL

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TASK 28-11-00-300-804

4. Repair of the Secondary Fuel Barrier Sealant

(Figure 820)

A. General

- (1) Secondary fuel barrier sealant is a polyurethane (Type II) material applied to the front spar and top exterior surface of the center fuel tank.

B. References

Reference	Title
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
51-21-21-370-801	Prepare the Surface to be Painted (P/B 701)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
51-31-00-390-805	Fastener Seal Application (P/B 201)
51-31-00-390-812	Fillet Seals Repair (P/B 201)
51-31-00-390-815	Transition Seal Repair (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1595	Instrument - Thickness Measurement, Eddy Current Test Method Part #: 1007330 Supplier: 61325 Opt Part #: 602-814 Supplier: 61325 Opt Part #: 602-816 Supplier: 61325 Opt Part #: 603-693 Supplier: 61325 Opt Part #: 603-694 Supplier: 61325 Opt Part #: 604-285 Supplier: 61325 Opt Part #: 604-299 Supplier: 61325 Opt Part #: 605-023 Supplier: 61325
COM-1596	Probe - Thickness Measurement, Pencil-Type, Model FTA3.3H Part #: 604-142 Supplier: 61325 Opt Part #: 602-128 Supplier: 61325

EFFECTIVITY
LOM ALL

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(Continued)

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
STD-1080	Brush - Paint

D. Consumable Materials

Reference	Description	Specification
A00015	Sealant - Secondary Fuel Barrier, 2 Part Polyurethane	BMS5-81 Type II
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G50077	Abrasive - Aluminum Oxide Paper, 240 grit or finer	
G50078	Abrasive - Aluminum Oxide Paper, 320 grit or finer	

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

EFFECTIVITY
LOM ALL

28-11-00



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F. Prepare the Surface Area

(Figure 821)

SUBTASK 28-11-00-200-004



CAUTION

DO NOT APPLY SEALANT WHEN THE TEMPERATURE OF THE FUEL TANK STRUCTURE IS TOO HOT OR TOO COLD. THE SEALANT WILL NOT CURE CORRECTLY IF THE STRUCTURE TEMPERATURE IS OUT OF RANGE. INCORRECTLY CURED SEALANT CAN CAUSE A FUEL LEAK.

- (1) Make sure the following conditions are met in the repair area when you apply sealant, A00015, and primer, C00259:
 - (a) The air temperature is between 65°F (18°C) and 95°F (35°C).
 - (b) The relative humidity is below 95 percent.

SUBTASK 28-11-00-150-009

- (2) Remove any disbonded or damaged secondary fuel tank barrier sealant, A00015, and primer, C00259 (yellow), with sealant removal tools, COM-2481 (Figure 803).

NOTE: Removal of disbonded material is necessary to make sure new secondary fuel tank barrier sealant, A00015, adheres to existing secondary fuel tank barrier sealant, A00015.

SUBTASK 28-11-00-110-008

- (3) Clean a minimum of 1.5 in. (38.1 mm) or more from the edge of the existing secondary fuel barrier sealant, A00015.
 - (a) Use a clean cotton wiper, G00034, wet with solvent, B00184.
 - (b) Rub the area dry with a clean, dry cotton wiper, G00034.

SUBTASK 28-11-00-120-003

- (4) Lightly sand the existing secondary fuel barrier sealant, A00015, with 240 grit or finer abrasive paper, G50077.

NOTE: Be careful not to sand through the primer to bare metal. If you sand into the bare metal it can damage metal surface treatments that affect structural performance.

- (a) If it is necessary, break the edge of the existing secondary fuel barrier sealant, A00015.
- (b) Lightly sand the area 0.50 in. (12.70 mm) or more from the edge of the existing secondary fuel barrier sealant, A00015.

SUBTASK 28-11-00-300-001



CAUTION

MAKE SURE THAT THE TRANSITION, FILLET AND FASTENER SEALS ARE SMOOTH WITH NO VOIDS OR CRACKS. IF YOU DO NOT OBEY, THE SECONDARY FUEL BARRIER (SFB) SEALANT WILL NOT BOND CORRECTLY AND FUEL LEAKS CAN OCCUR.

- (5) If the surface of the seal is not smooth, or if voids or cracks are found, do these tasks to repair the seals:
 - (a) To repair the fillet seals, do this task: Fillet Seals Repair, TASK 51-31-00-390-812.
 - (b) To repair the transition seals, do this task: Transition Seal Repair, TASK 51-31-00-390-815.
 - (c) To repair the fastener seals, do this task: Fastener Seal Application, TASK 51-31-00-390-805.

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SUBTASK 28-11-00-120-004

- (6) If it is necessary, do these steps to reactivate surfaces coated with primer, C00259 (yellow):
 - (a) Use a clean cotton wiper, G00034, soaked with solvent, B00184
 - (b) Rub the area dry with a clean, dry cotton wiper, G00034.
 - (c) Lightly sand the surface with 320 grit or finer abrasive paper, G50078.

NOTE: Be careful not to sand through the primer to bare metal. If you sand into the bare metal it can damage metal surface treatments that affect structural performance.

SUBTASK 28-11-00-370-009

- (7) If it is necessary, do these tasks to refinish bare metal surfaces:
 - (a) Prepare the Surface to be Painted, TASK 51-21-21-370-801.
 - (b) Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process, TASK 51-21-41-370-802.

SUBTASK 28-11-00-110-009

- (8) Do these steps to final clean the repair area:
 - (a) Use a clean cotton wiper, G00034, soaked with solvent, B00184
 - (b) Rub the area dry with a clean, dry cotton wiper, G00034.
 - (c) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-370-010

- (9) Apply the primer, C00259 (yellow), with a paint brush, STD-1080, up to the edge of the existing secondary fuel barrier sealant, A00015, with the tolerances shown in Figure 821.
 - (a) Spray application of primer, C00259, can be used for large areas (TASK 28-11-00-600-801).

SUBTASK 28-11-00-390-016

- (10) Let the primer, C00259, dry for 30 minutes to 3.5 hours.

G. Repair of the Secondary Fuel Barrier Sealant

SUBTASK 28-11-00-360-007

- (1) Prepare the secondary fuel barrier sealant, A00015, as follows:
 - (a) Make sure the base resin and catalyst are each homogeneous, free from lumps or jelled particles.
 - (b) Make sure the base resin is clear. If the base resin is cloudy, do these steps:
 - 1) Heat the base resin in an oven at a temperature between 120°F (49°C) and 130°F (54°C) for 60 to 70 minutes.
 - 2) Let the base resin cool to a temperature between 60°F (16°C) and 80°F (27°C) before use.
 - 3) Discard the base resin if it is still cloudy.
 - (c) At any time when a base container is opened, and the base material will not be used, discard the container.
 - (d) Before you combine the necessary quantities of base resin and accelerator, stir the base resin and the accelerator, each in its container, to make sure each is homogeneous.

NOTE: Heating can cause the accelerator to form particulates (seeding) and become unstable.

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- 1) After you stir the base resin and the accelerator, let them rest for 10 minutes to help remove trapped nitrogen or air.

- 2) Make sure the accelerator has no lumps or particulate matter after you stir it.

NOTE: Particulate matter is a result of seeding and cannot be corrected.

- a) Discard the accelerator if there is particulate matter in it.

- (e) Slowly mix the accelerator into the base resin in a ratio of 100 parts of base resin to 90 parts of accelerator by weight or by volume.

NOTE: The material is normally supplied in premeasured kits to give the correct ratio.

SUBTASK 28-11-00-390-011



WARNING

DO NOT GET PRIMER AND SEALANT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM PRIMER AND SEALANT. PUT ON GOGGLES, AND GLOVES WHEN YOU USE PRIMER AND SEALANT. KEEP PRIMER AND SEALANT AWAY FROM SPARKS, FLAME, AND HEAT. PRIMER AND SEALANT IS POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to apply sealant, A00015:

- (a) If it is necessary to make the sealant, A00015, thinner, add solvent, B00148.

NOTE: Do not add thinner other than Methyl Ethyl Ketone.

- 1) Do not add solvent, B00148, in a quantity more than 40 percent by volume of the mixed unthinned sealant.

- (b) Do not apply sealant, A00015, when the air temperature or temperature of the structure to be sealed is less than 65°F (18°C).

- (c) Make sure that sealant, A00015, that has not been cured does not get colder than 60°F (16°C) until the cured dry-through time (Table 801).

- (d) Apply a minimum of two layers of sealant, A00015, with a flat, bristle brush.

NOTE: At $77 \pm 5^{\circ}\text{F}$ ($25 \pm 2.8^{\circ}\text{C}$) and 50 ± 5 percent relative humidity, the approximate application time of sealant, A00015, Class 1 is 120 minutes. The approximate application time of sealant, A00015, Class 2 is 30 minutes. Higher temperatures make the application time shorter. Lower temperatures make the application time longer.

- 1) Apply the sealant, A00015, to overlap the existing secondary fuel barrier sealant by a minimum of 1.0 in. (25.4 mm) as shown in (Figure 821).

- 2) For large areas, sealant, A00015, can also be applied with a spray application.

- a) If multiple coats are applied, permit a flash-off time of 15-45 minutes between coats to prevent solvent entrapment and bubble formation.

- b) In difficult spray areas or where fade-out of the sealant is necessary, you can apply one coat with a flat bristle brush to get smooth coverage over the area. Wait for a flash-off time of 15-45 minutes before you apply the subsequent coat with a spray application.

- 3) Let the sealant dry (flash-off) a minimum of 15 minutes between layers.

- 4) Make sure the second layer is applied before it reaches the sealant dry hard time (Table 801)

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KEEP THE THICKNESS OF THE APPLIED SEALANT AND THE PRIMER LAYER IN THE LIMITS. IF IT IS TOO THICK, DAMAGE TO EQUIPMENT CAN OCCUR.

- 5) Make sure the total thickness of the applied sealant and the primer layer is 0.012 in. (0.30 mm) to 0.017 in. (0.43 mm). (These dimensions include a 0.002 in. (0.05 mm) layer of primer.)

NOTE: In some cases, dry sealant thickness of more than 0.015 in. (0.38 mm) or less than 0.010 in. (0.25 mm) can occur. These conditions are acceptable, but the thickness must not be less than 0.007 in. (0.18 mm) or more than 0.022 in. (0.56 mm). (These dimensions include a 0.002 in. (0.05 mm) layer of primer.)

- 6) Use a thickness measurement instrument, COM-1595, and thickness measurement probe, COM-1596, to make sure the sealant has the correct thickness.

NOTE: It is not possible to measure the thickness of the sealant layer without the primer layer.

SUBTASK 28-11-00-390-012

- (3) Let the sealant dry.

- (a) The cure rates of the sealant are shown in the table below (Table 801):

NOTE: A cure temperature of more than 80°F (26.7°C) is recommended for the best results.

- 1) Let the sealant cure to the dry-through condition shown in the table.

Table 801/28-11-00-993-846

CURE TEMPERATURE	CURE CONDITIONS			
	DRY HARD (HOURS) *[1]		DRY THROUGH (HOURS) *[2]	
	TYPE II, CLASS 1	TYPE II, CLASS 2	TYPE II, CLASS 1	TYPE II, CLASS 2
75 ± 5 deg. F 23.8 ± 2.8 deg. C	50	8	96	24
100 ± 5 deg. F 37.8 ± 2.8 deg. C	18	2.5	36	3.5
125 ± 5 deg. F 51.7 ± 2.8 deg. C	7.5	1.5	15	2.5
150 ± 5 deg. F 65.6 ± 2.8 deg. C	2.5	1.5	5	2

*[1] Condition where metal particles do not bond to the sealant.

*[2] Condition where sealant is sufficiently hard to prevent damage when walked on with boot socks.

SUBTASK 28-11-00-750-001

- (4) Do these steps to do a test to make sure the secondary fuel barrier is in dry-through condition:

- (a) On a horizontal section of structure, put your thumb horizontally on the newly applied secondary fuel barrier with your arm in a vertical straight line from the wrist to the shoulder.
- (b) While you put as much pressure on your thumb as possible with your arm, turn your thumb through an angle of 90 degrees in the plane of the barrier.

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- (c) If there is no loosening, detachment, wrinkling or other distortion of the barrier, then the film is in dry-through condition.

— END OF TASK —

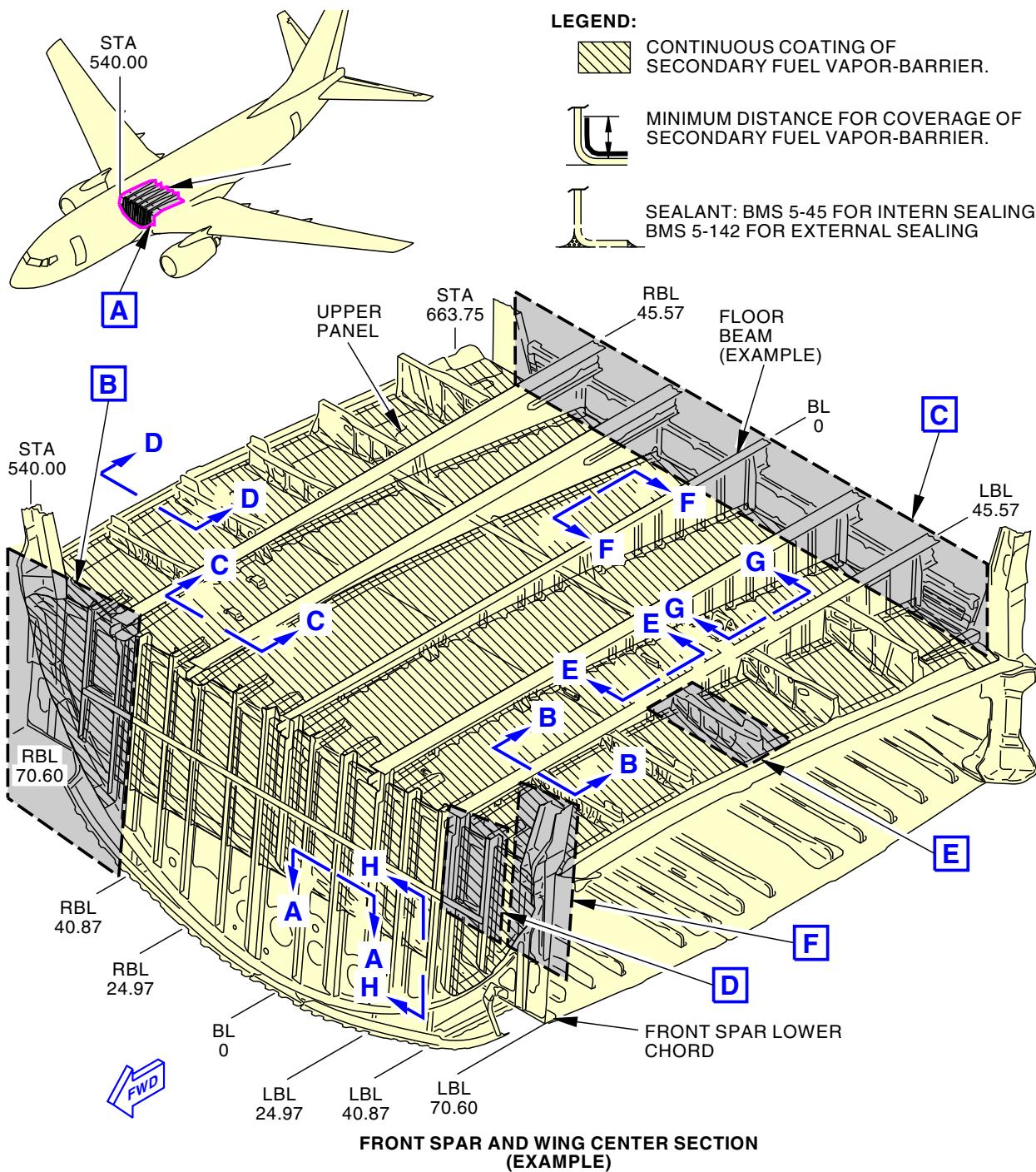
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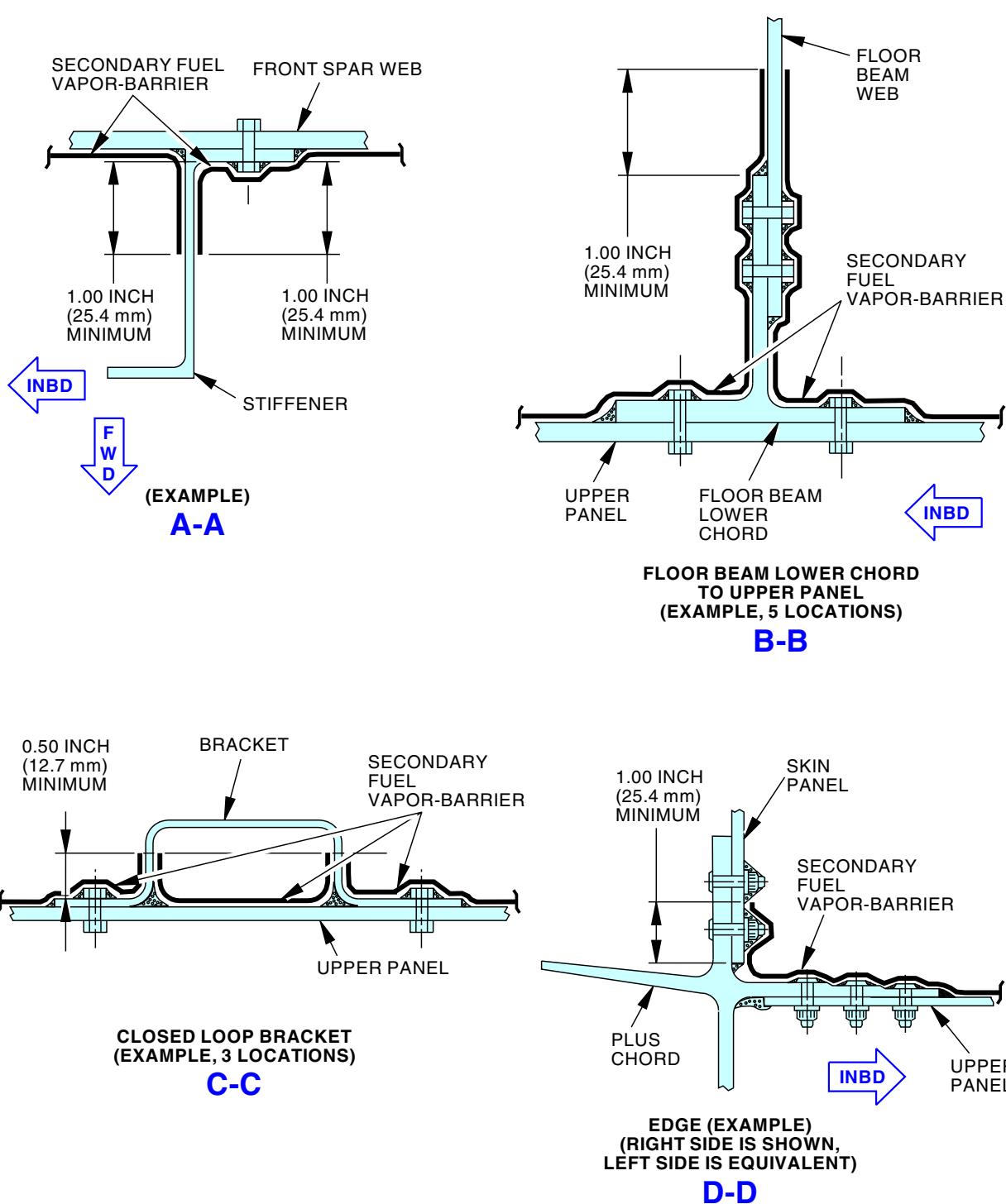
Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 1 of 10)

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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 2 of 10)

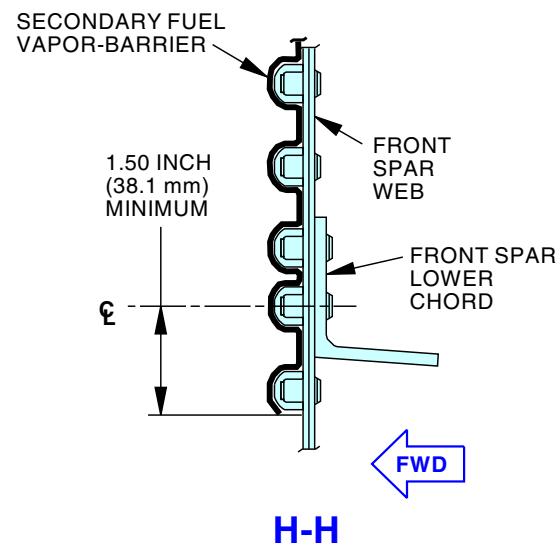
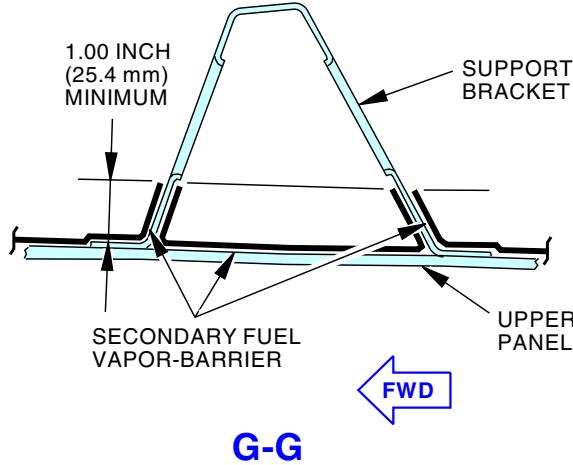
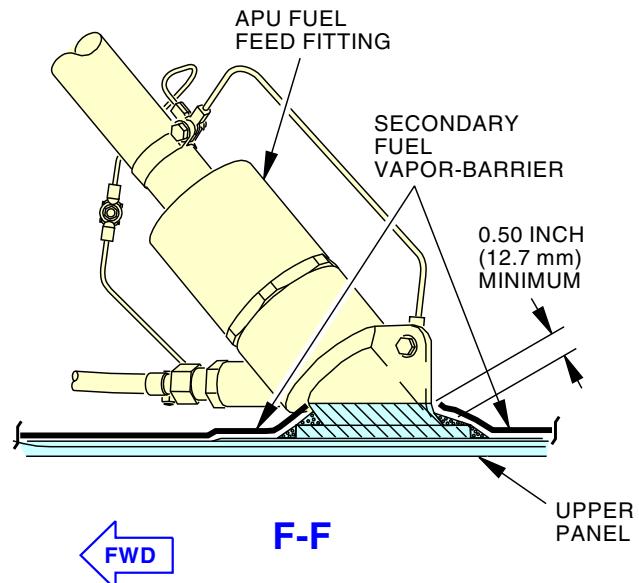
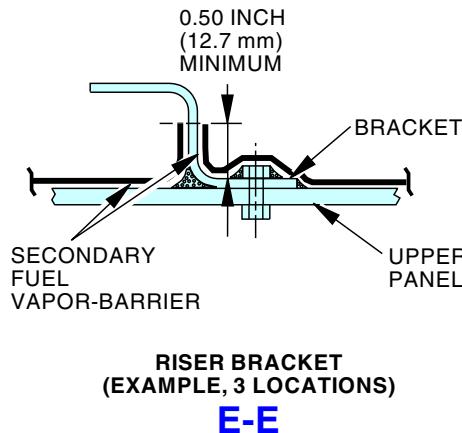
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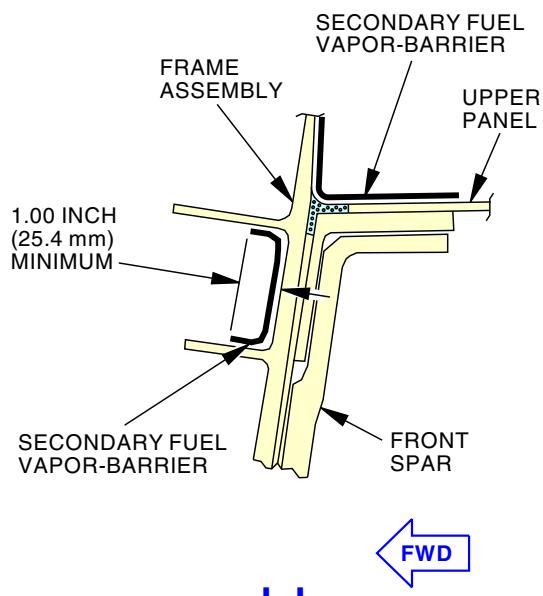
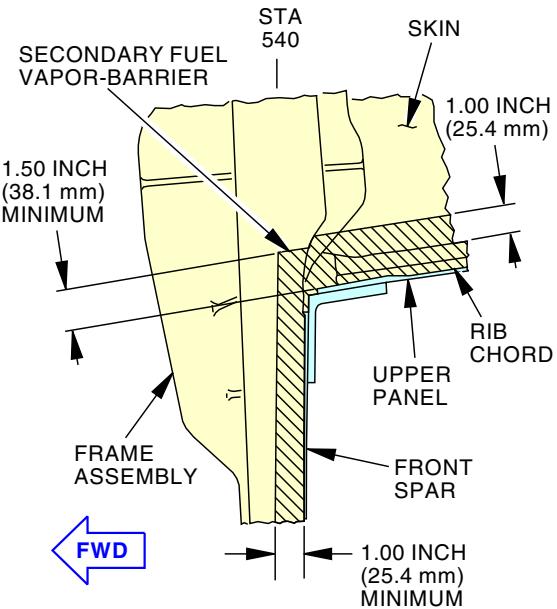
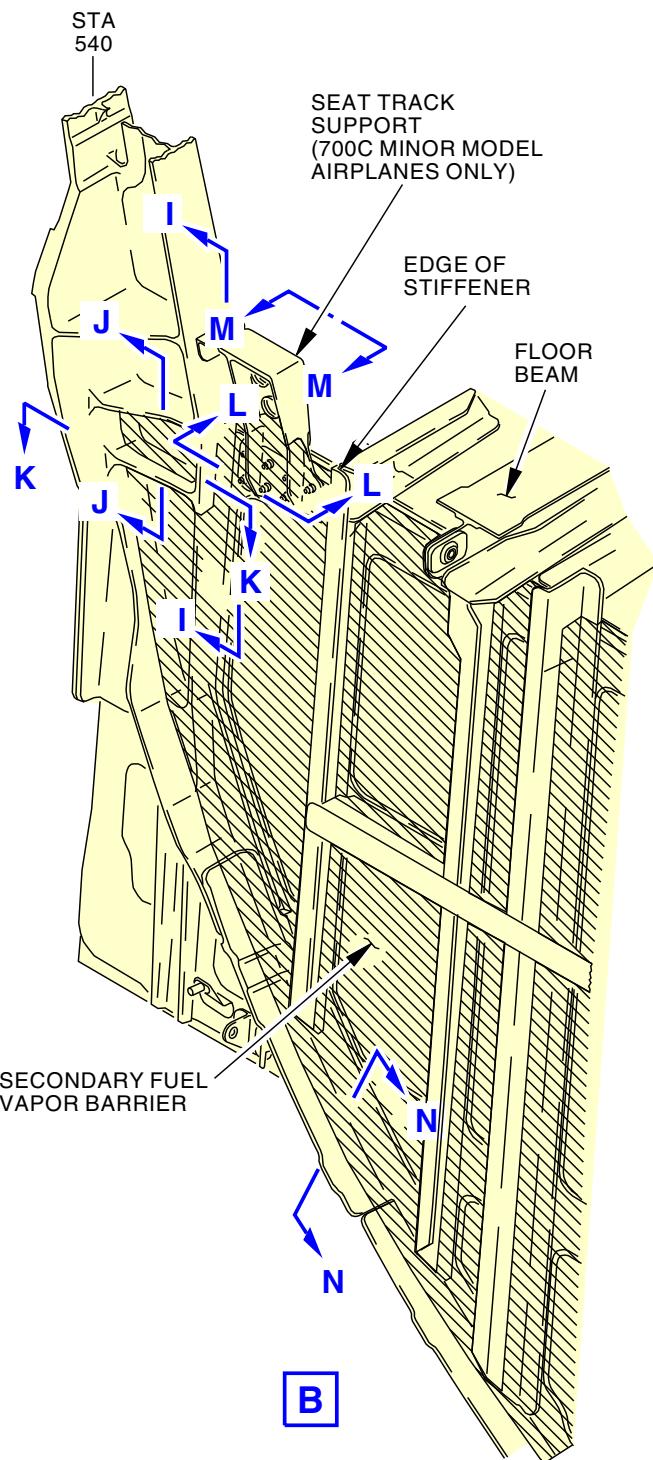


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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 3 of 10)

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M25850 S0006571289_V3

Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 4 of 10)

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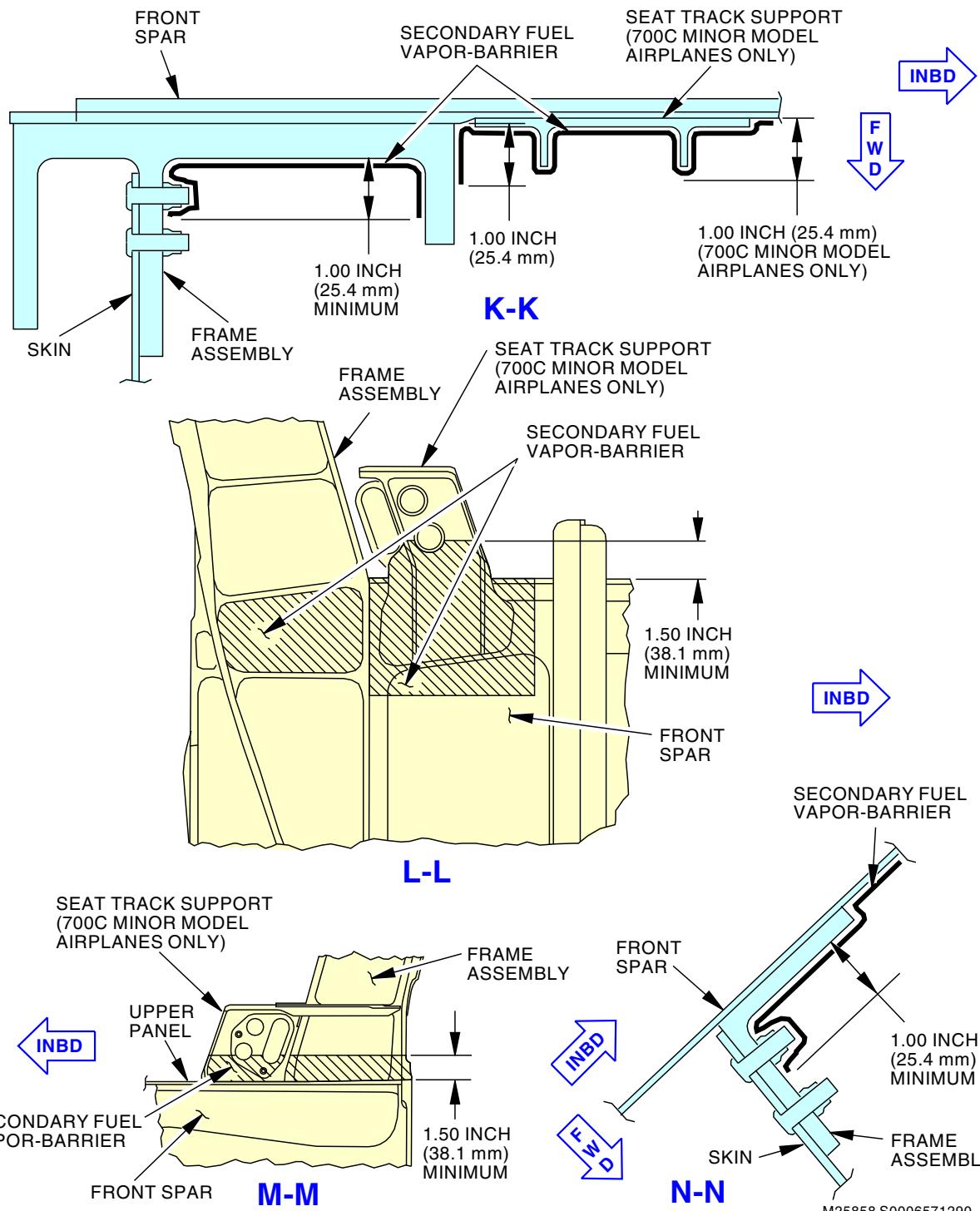
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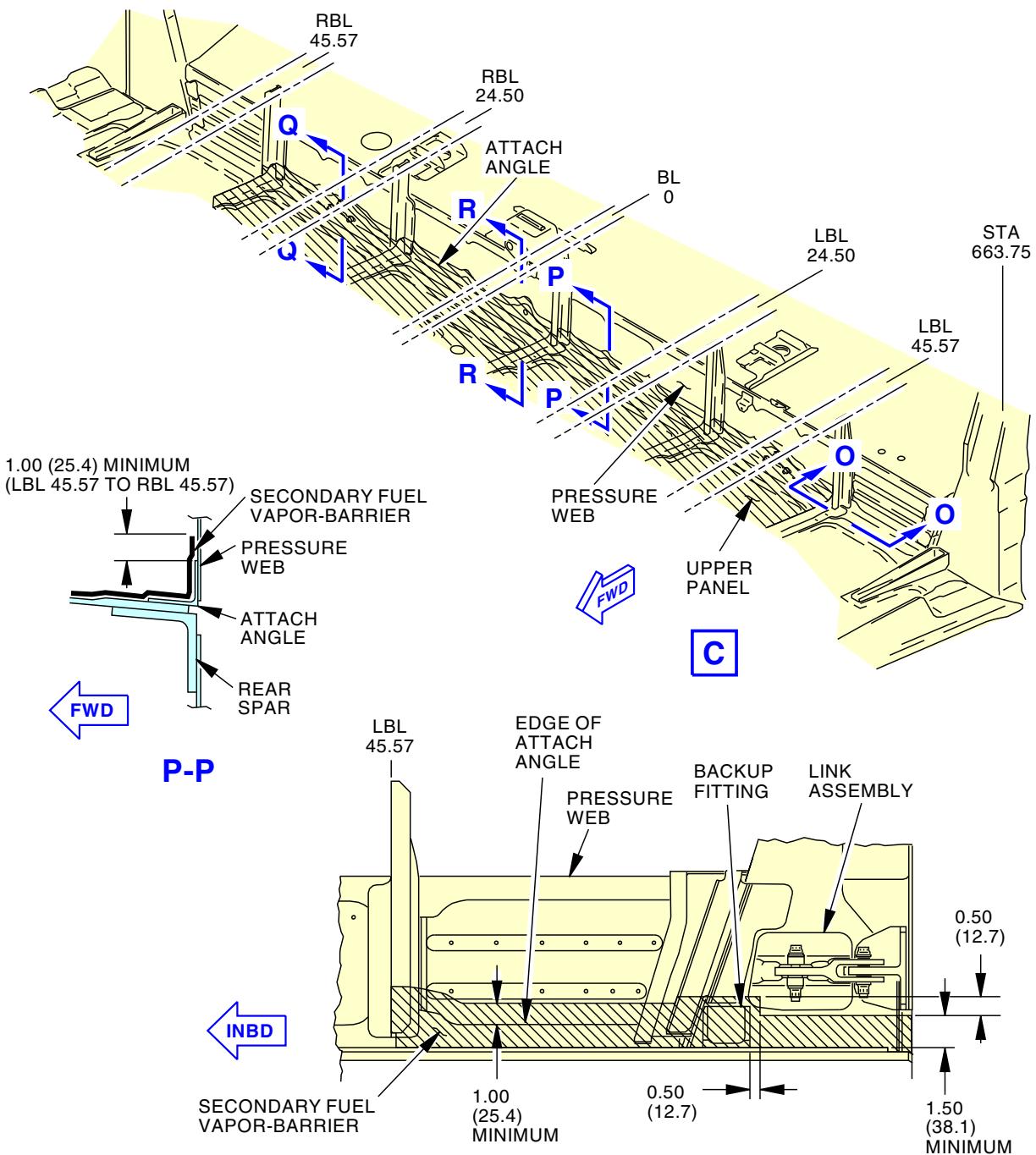
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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 5 of 10)

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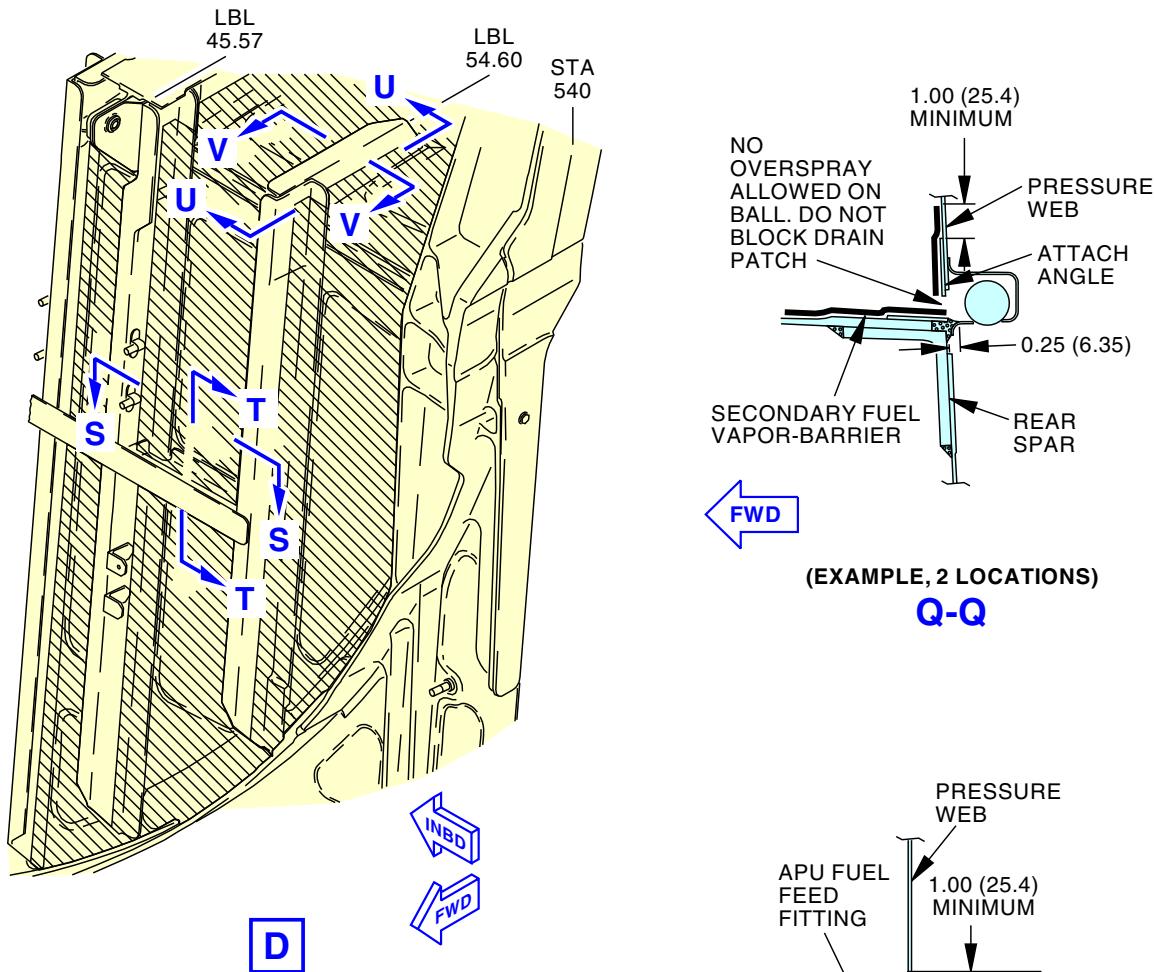
Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 6 of 10)

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NOTE:

ALL DIMENSIONS ARE IN INCHES
(MILLIMETERS ARE IN PARENTHESIS).

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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 7 of 10)

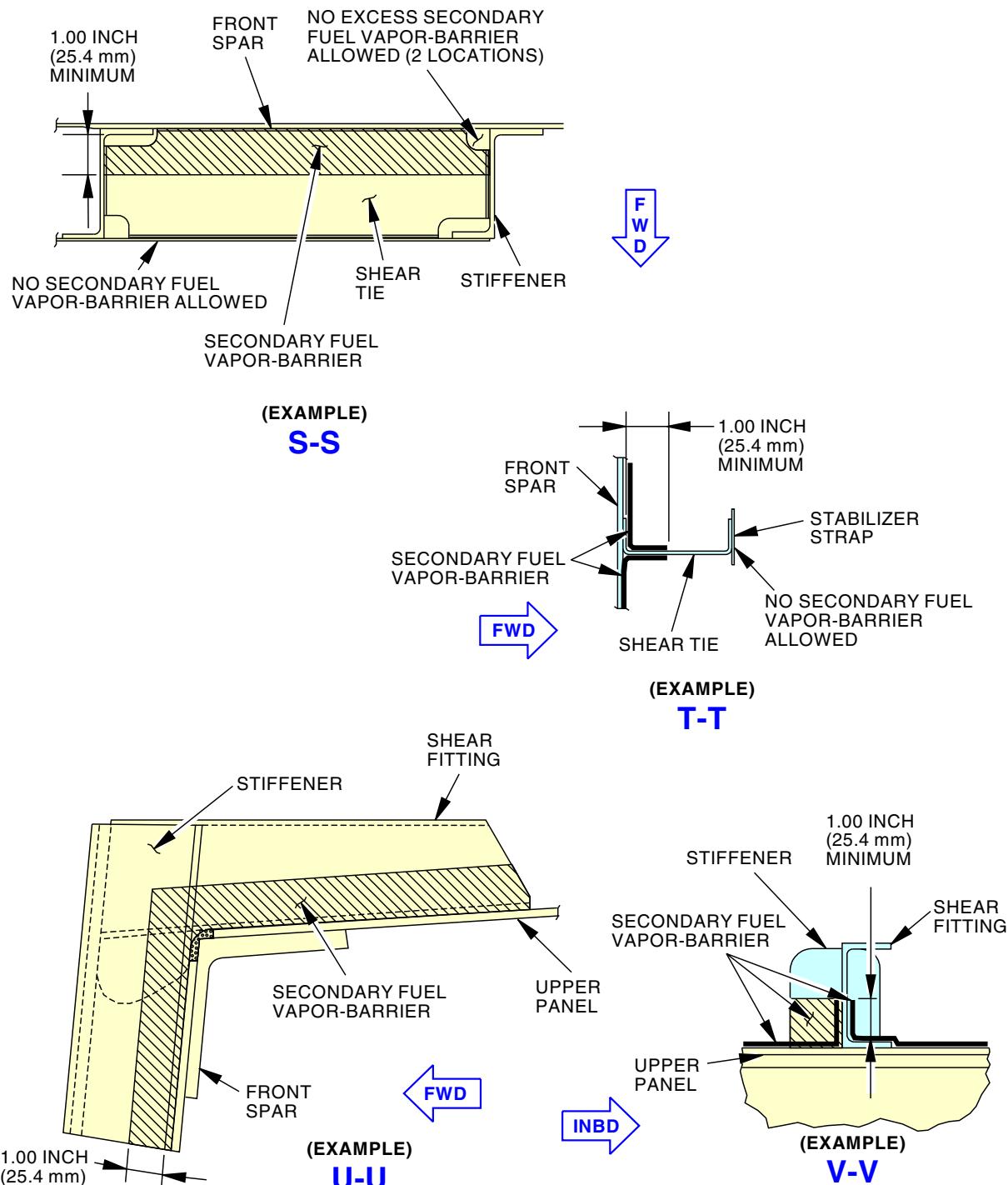
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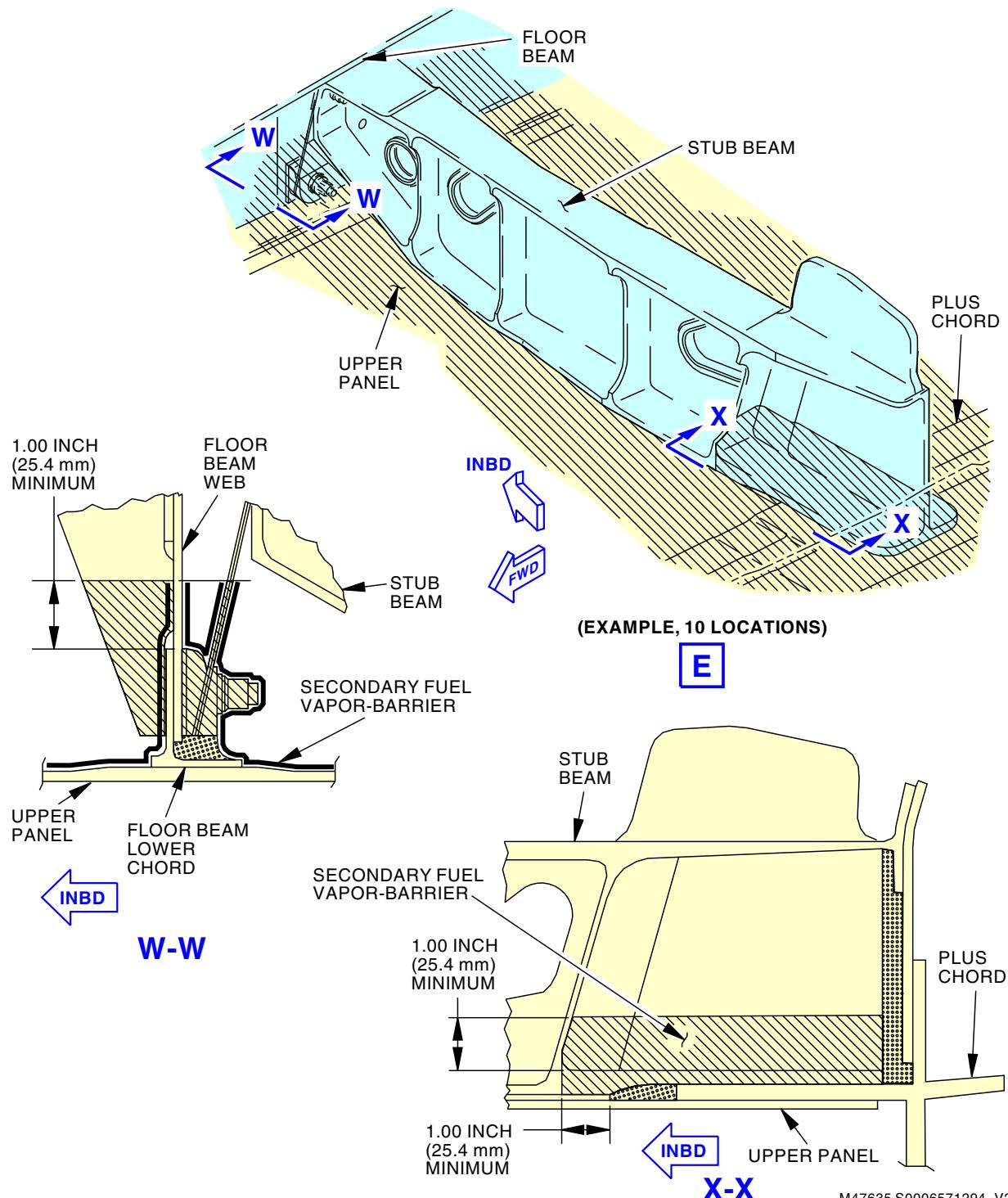
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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 8 of 10)

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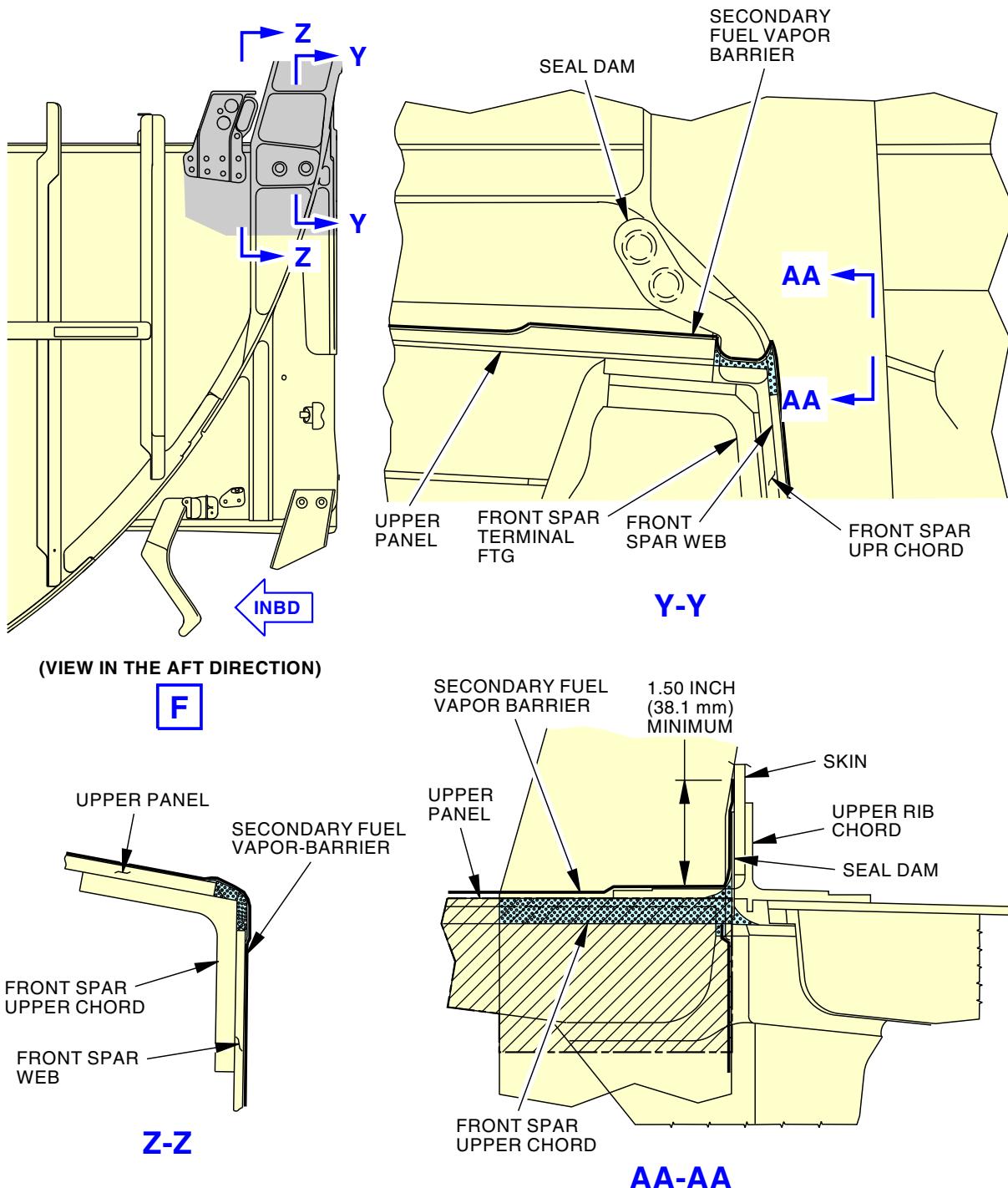
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Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 9 of 10)

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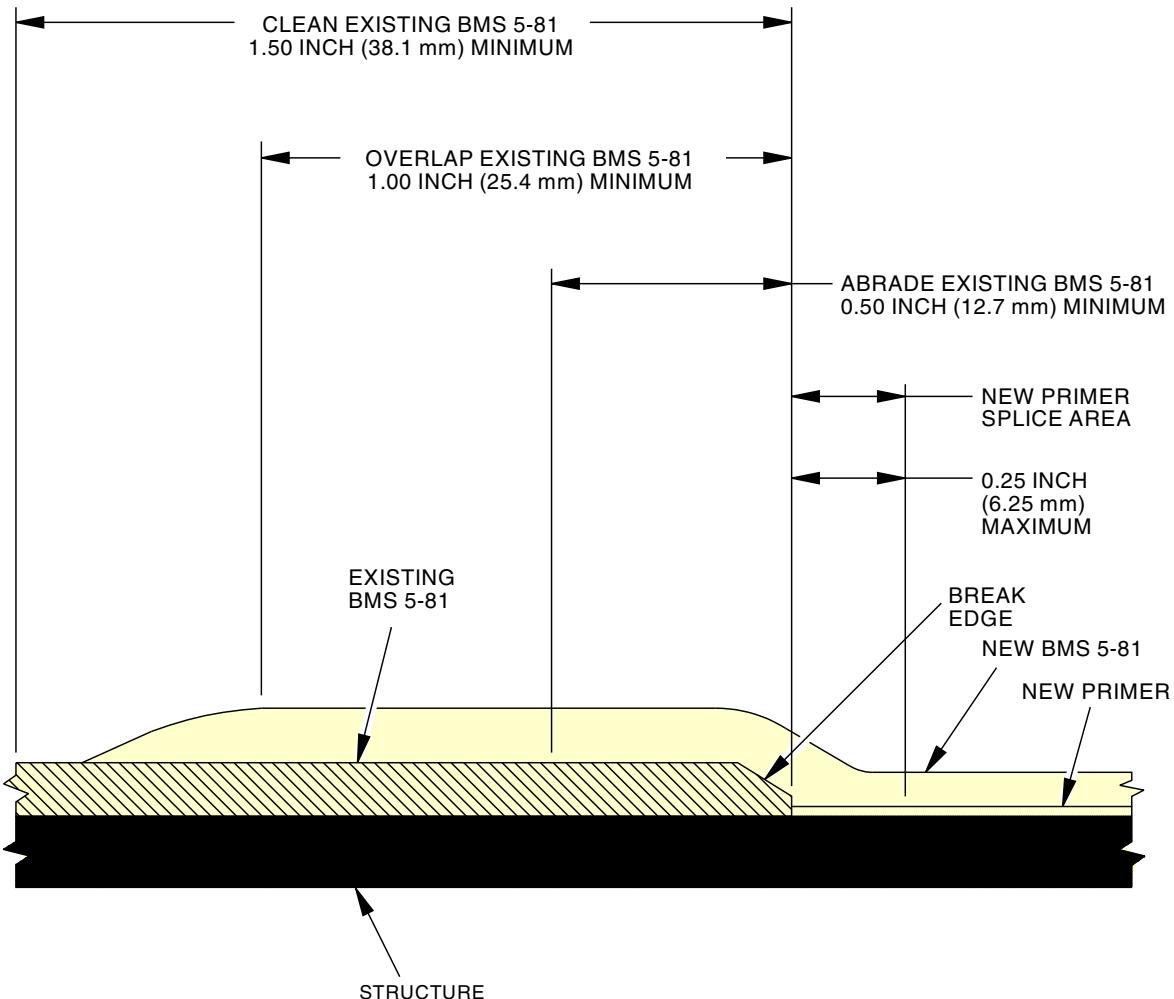
Secondary Fuel Vapor-Barrier
Figure 820/28-11-00-990-845 (Sheet 10 of 10)

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Splice Surface Area Preparation for Secondary Fuel Barrier
Figure 821/28-11-00-990-848

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WING FUEL TANK ACCESS PANELS - REMOVAL/INSTALLATION

1. General

- A. Each main fuel tank has 16 elliptical shaped access doors installed in the lower wing surface. The access doors let you go into the main fuel tanks.
- B. Each surge tank has three access doors installed in the lower wing surface. A pressure relief valve and a vent scoop and flame arrestor are installed on the surge tank access doors 533BB and 633BB.
- C. This procedure contains five tasks:
 - (1) Main tank access door removal
 - (2) Main tank access door installation
 - (3) Surge tank access door removal
 - (4) Surge tank access door 533AB, 533CB, 633AB, 633CB installation
 - (5) Surge tank access door 533BB, 633BB installation

TASK 28-11-11-000-801

2. Main Tank Access Door Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the main tank access door.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
27-51-28-000-801	Outboard Flap Outboard Support Forward Fairing Removal (P/B 401)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8436	Protective Ring - Access Door Opening, Wing Lower Panel Part #: C28013-3 Supplier: 81205
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III

E. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing

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(Continued)

Zone Area

532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number Name/Location

532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602
632RB	Main Tank Access Door - Wing Station 629

G. Prepare for the Removal

SUBTASK 28-11-11-650-001

- (1) Defuel the applicable fuel tank, do one of these tasks: Fuel Tank Defueling, TASK 28-26-00-650-801, or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

SUBTASK 28-11-11-010-003

- (2) Get access to the applicable main tank access door(s):

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- (a) Get access to the applicable No. 1 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629

- (b) Get access to the applicable No. 2 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602
632RB	Main Tank Access Door - Wing Station 629

SUBTASK 28-11-11-940-001



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

H. Main Tank Access Door Removal

SUBTASK 28-11-11-010-001

- (1) For access doors 532BB and 632BB, remove the applicable aft fairing panel on the strut, 434CL or 444CR, to get full access to the access door [1] (TASK 06-43-00-800-801).



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SUBTASK 28-11-11-010-007

- (2) For access doors 532HB or 632HB, remove the applicable flap support fairing panel 544AB or 644AB, to get full access to the access door [1] (TASK 27-51-28-000-801).

SUBTASK 28-11-11-020-010

- (3) Hold the clamp ring [5] and remove the mounting bolt [4] for the applicable access door [1], access door [6], or access door [8].
(a) Keep the removed mounting bolts [4] with the applicable access door [1], access door [6], or access door [8] and/or check grip length before installing new mounting bolts [4].

SUBTASK 28-11-11-020-011

- (4) Remove the clamp ring [5] and aluminum gasket [3].

- (a) Discard the aluminum gasket [3].

NOTE: It is not recommended, but if it is necessary, you may be able to re-use the aluminum gasket [3].

SUBTASK 28-11-11-420-004



DO NOT USE A TOOL TO LIFT THE EDGES OF THE ACCESS DOOR TO THE FUEL TANK. THE LOWER SURFACE OF THE ACCESS DOOR FLANGE AND THE TOP SURFACE OF THE WING SKIN AROUND THE ACCESS DOORS ARE SEAL SURFACES. YOU CAN CAUSE SCRATCHES OR OTHER DAMAGE TO THE SEAL SURFACE.



BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

- (5) On the main tank access doors [1] and access doors [8] without the fuel measuring sticks, push up on the access door.
(a) If the main tank access door [1] or access door [8] does not move freely, use a rubber mallet, STD-3906 and lightly hit around the main tank access door [1] or access door [8].

SUBTASK 28-11-11-020-002

- (6) On the main tank access doors [6] with the fuel measuring sticks, push up and put the access doors at an angle so the fuel measuring sticks do not touch the stringers at the top of the fuel tank.
(a) If the main tank access door [6] does not move freely, use a rubber mallet rubber mallet, STD-3906 and lightly hit around the main tank access door [6].

SUBTASK 28-11-11-020-003



BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

- (7) Remove the main tank access door [1], access door [6], or access door [8] from the fuel tank.
(a) These access doors have fuel measuring stick assemblies that attach to the inner surface of the door:

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Table 401/28-11-11-993-801

NO. 1 TANK	NO. 2 TANK
532CB	632CB
532FB	632FB
532JB	632JB
532LB	632LB
532NB	632NB
532QB	632QB

SUBTASK 28-11-11-110-001

- (8) Clean the inner side and the outer side of the access opening with solvent, B00083.

SUBTASK 28-11-11-410-001

- (9) Install a protective ring, SPL-8436, in the access door opening.

NOTE: This step is not necessary if you will replace the access door immediately.

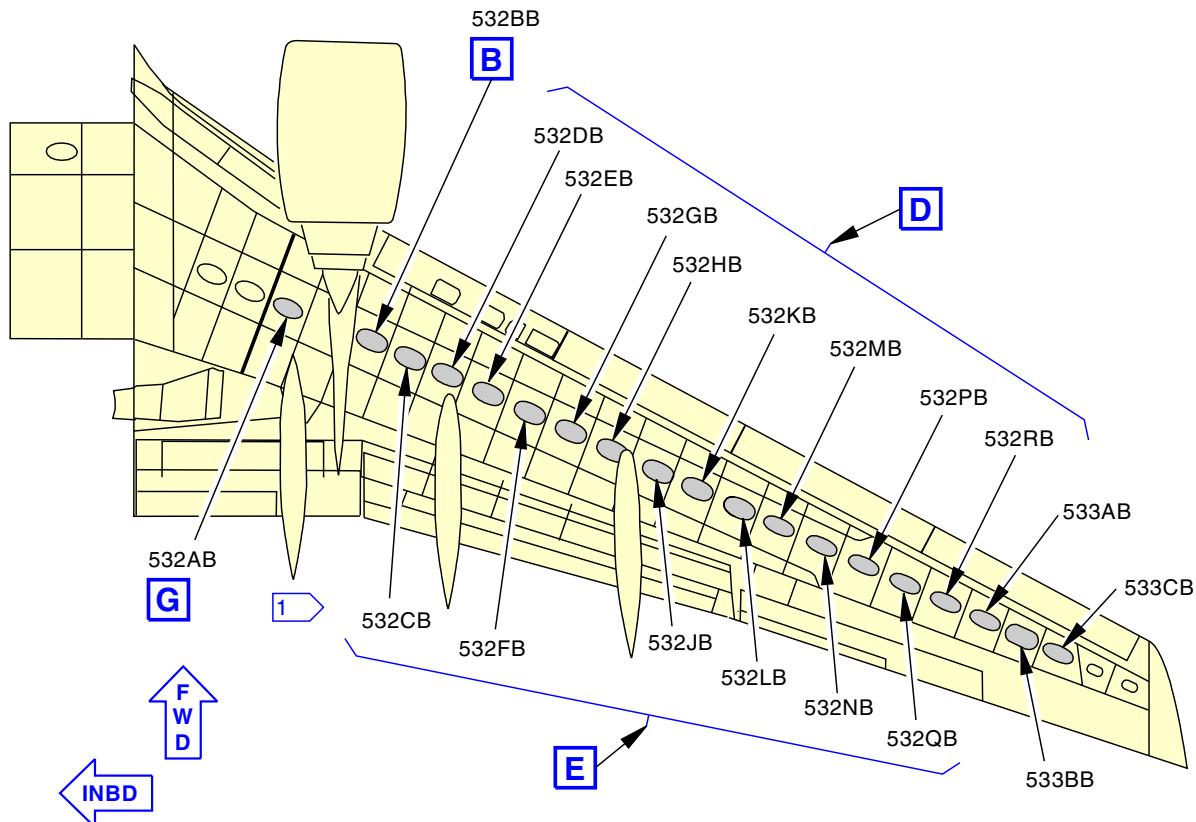
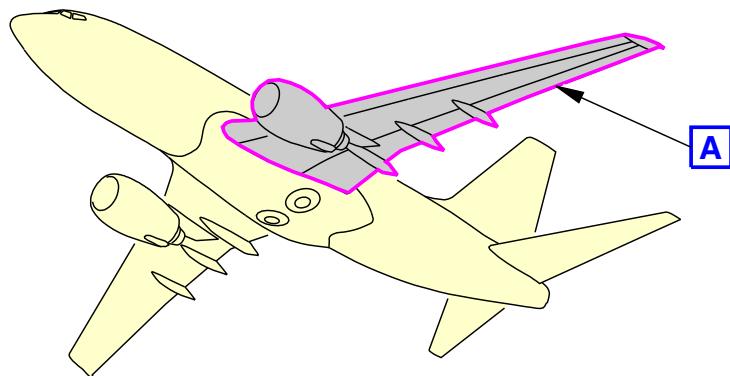
———— END OF TASK ————

EFFECTIVITY
LOM ALL

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FUEL TANK ACCESS DOORS
(LEFT WING, BOTTOM VIEW,
RIGHT WING IS OPPOSITE)

1 HIGH IMPACT RESISTANT
ACCESS DOOR



F60162 S0006571301_V4

Main Tank Access Door Installation
Figure 401/28-11-11-990-802 (Sheet 1 of 5)



D633A101-LOM

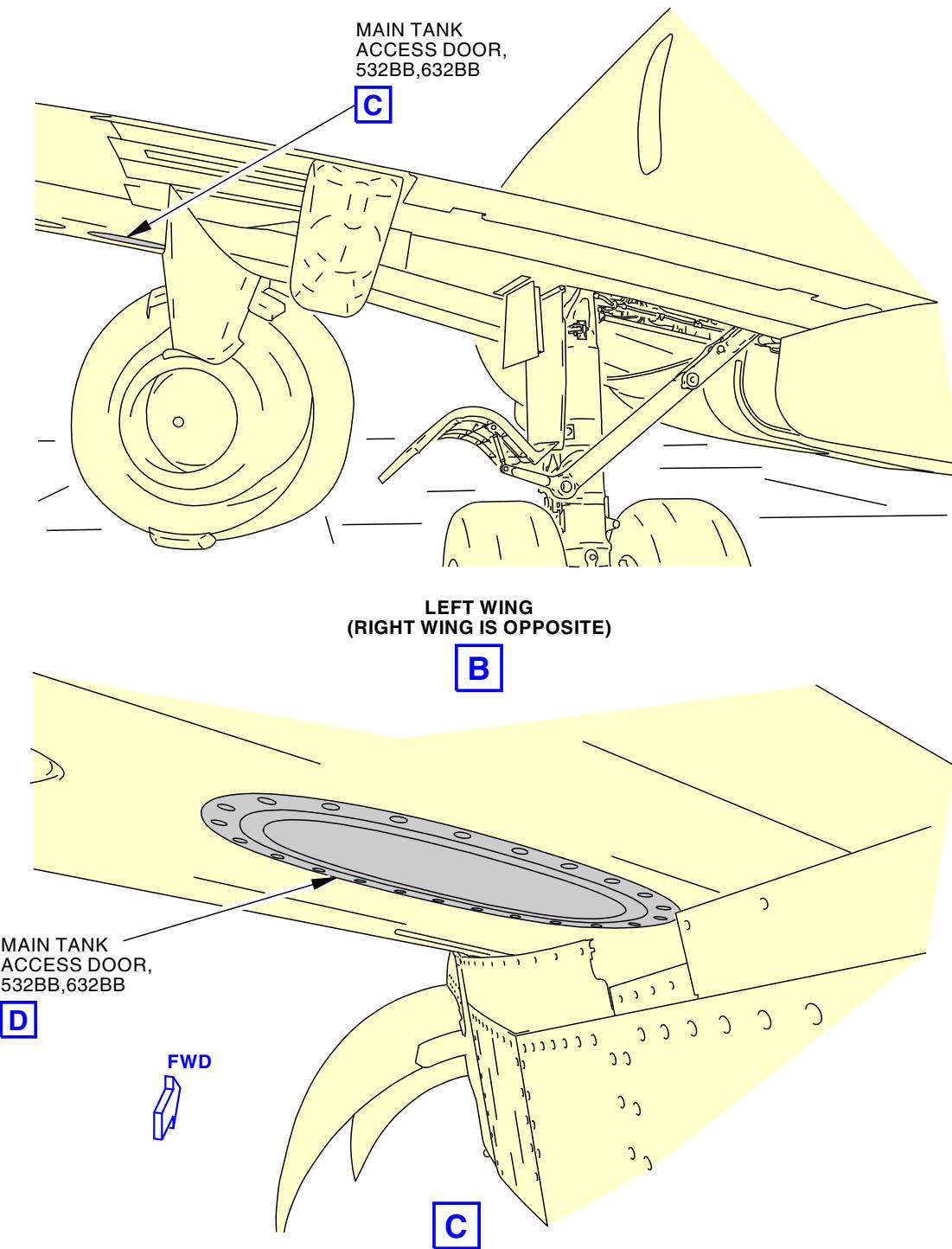
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F99612 S0006571302_V2

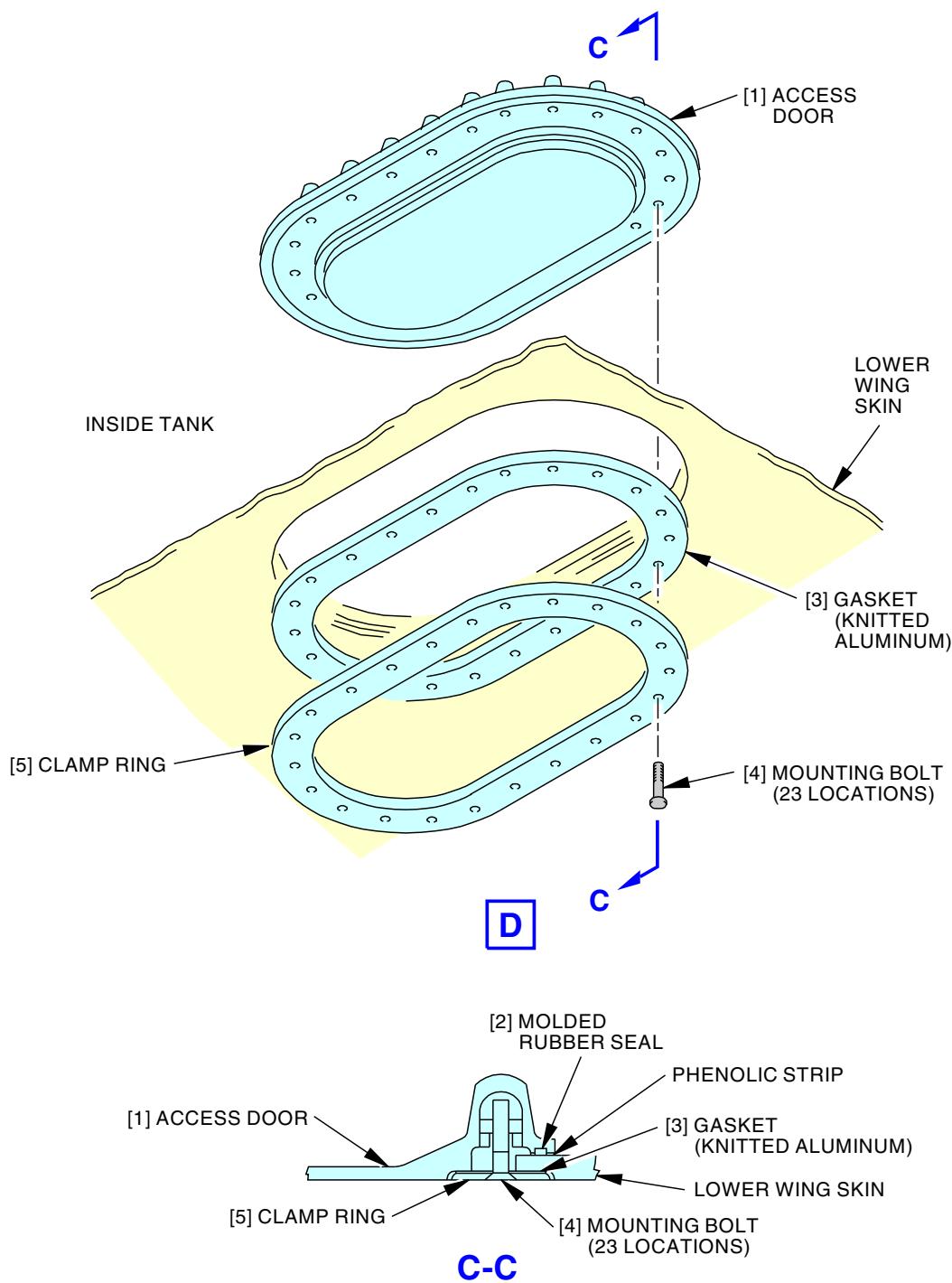
Main Tank Access Door Installation
Figure 401/28-11-11-990-802 (Sheet 2 of 5)

EFFECTIVITY	LOM ALL
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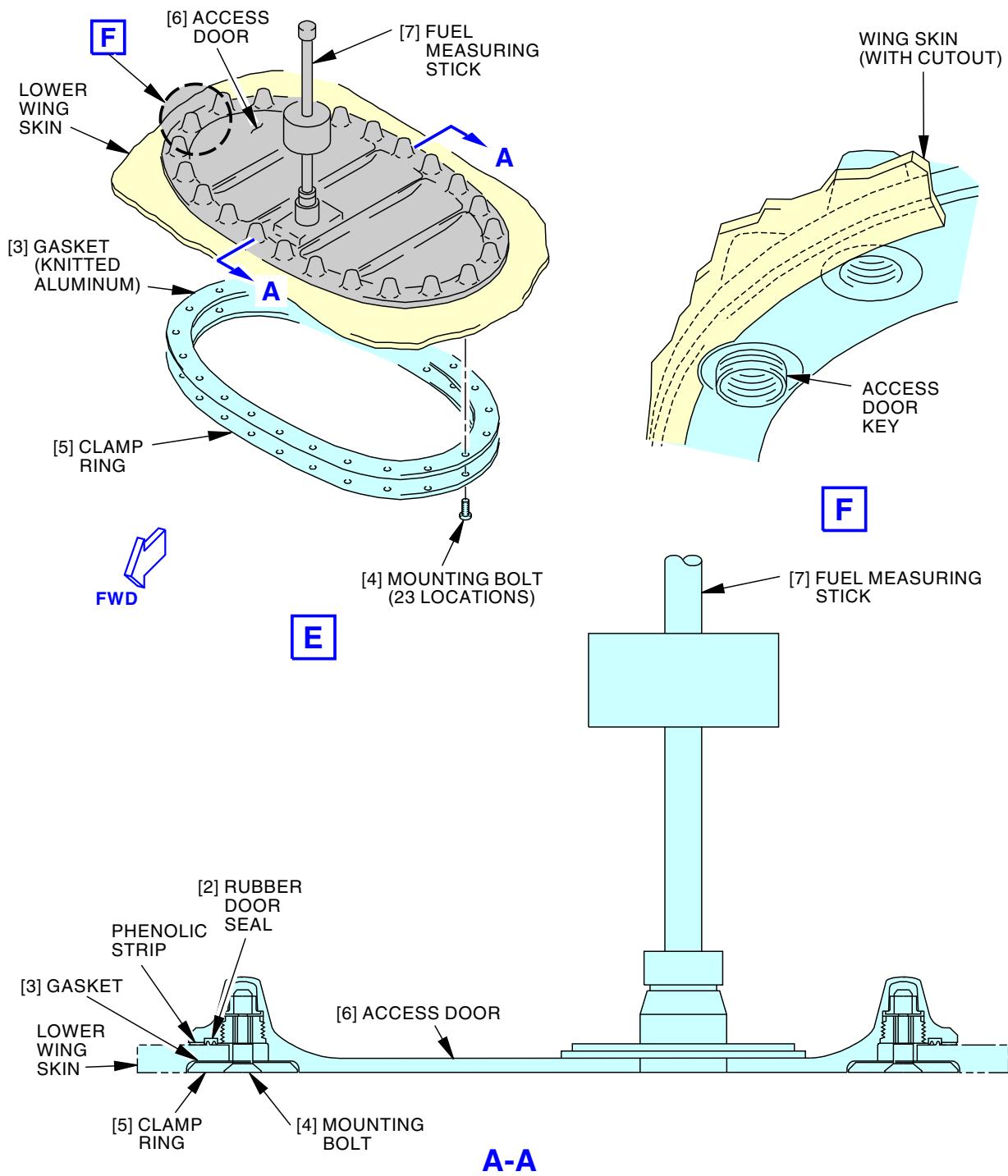


F99615 S0006571303_V6

Main Tank Access Door Installation
Figure 401/28-11-11-990-802 (Sheet 3 of 5)

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LOM ALL

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F99619 S0006571304_V5

Main Tank Access Door Installation
Figure 401/28-11-11-990-802 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

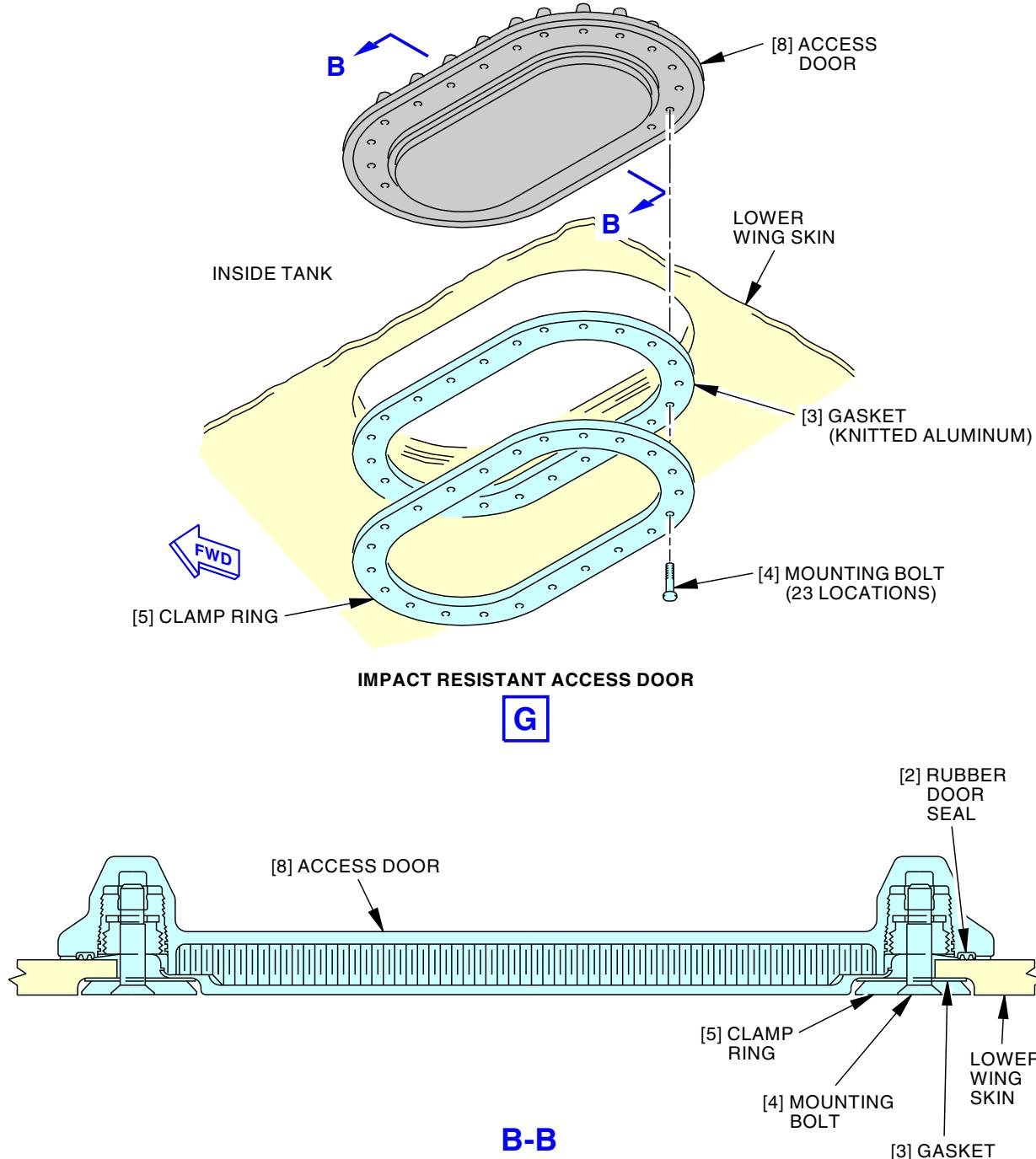
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1889564 S0000342524_V2

Main Tank Access Door Installation
Figure 401/28-11-11-990-802 (Sheet 5 of 5)

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D633A101-LOM

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TASK 28-11-11-400-801

3. Main Tank Access Door Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.
- (2) Mobilgrease 33, D50306, is the recommended material for access door gasket installations. The Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, can still be used for access door gaskets.
- (3) Do not mix the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and the Cor-Ban 27L Compound, G50237. If you replaced a gasket filled with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, with a gasket filled with Mobilgrease 33, D50306, remove all Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the clamp ring and access door structure of the airplane. If you replaced a gasket filled with Mobilgrease 33, D50306, with a gasket filled with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, remove all Mobilgrease 33, D50306, from the clamp ring and the access door structure on the airplane.
- (4) These main tank access doors are high impact resistant doors and they must not be replaced with a standard door:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216
632AB Main Tank Access Door - Wing Station 216

- (5) It is recommended that a new aluminum gasket [3] be used every time you install the main tank access doors.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
27-51-28-400-801	Outboard Flap Outboard Support Forward Fairing Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-400-801	Fuel Tank Closure Leak Check (P/B 601)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-11-900-801	Rubber Door Seal - Replacement (P/B 801)
28-22-41-420-801	Fuel Boost Pump and Override Pump Priming (P/B 401)
51-21-72-370-801	BMS10-79 Primer - Application (P/B 701)

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C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8436	Protective Ring - Access Door Opening, Wing Lower Panel Part #: C28013-3 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
A50473	Sealant - Brush (See BAC5000 8.5.3b(1) for instructions to prepare BMS5-95 Type I Class A-2)	BAC5000 Section 8.5.3
A50479	Sealant - P/S 870 Class B-2 Corrosion Inhibitive Sealant	BMS5-95 Class B-2
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
C00175	Primer - Urethane Compatible, Corrosion Resistant	BMS10-79 Type III
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Access door	28-11-11-02A-140	LOM ALL
		28-11-11-02A-145	LOM ALL
		28-11-11-02A-180	LOM ALL
		28-11-11-02A-200	LOM ALL
		28-11-11-02A-205	LOM ALL
3	Aluminum gasket	28-11-11-02A-260	LOM ALL
		28-11-11-02A-300	LOM ALL
		28-11-11-02A-305	LOM ALL
6	Access door	28-11-11-02A-090	LOM ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
6 (cont.)		28-11-11-02A-145	LOM ALL
		28-11-11-02A-190	LOM ALL
		28-11-11-02A-205	LOM ALL
8	Access door	28-11-11-02A-210	LOM ALL
		28-11-11-02A-215	LOM ALL

F. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629
544AB	Flap Support No. 1 Access Panel, Forward Assembly
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443

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Number	Name/Location
632KB	Main Tank Access Door - Wing Station 470
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602
632RB	Main Tank Access Door - Wing Station 629
644AB	Flap Support No. 8, Forward Assembly Access Panel

H. Prepare for Access Door Installation

SUBTASK 28-11-11-210-015

- (1) Examine the open tank for unwanted objects or material.

SUBTASK 28-11-11-160-001

- (2) If it is necessary, clean the opened tank.

SUBTASK 28-11-11-020-004

- (3) Remove the protective ring, SPL-8436, from the access door opening.

SUBTASK 28-11-11-210-012

- (4) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-11-210-002

28-AWL-16: CDCCL

- (5) Make sure the areas on the access door [1], access door [6], or access door [8], clamp ring [5] and the lower wing skin electrical faying surfaces are clean and have no visible corrosion.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- (a) Use solvent, B00083, to clean the surface if it is necessary.

NOTE: This step makes sure there is good electrical contact between the door and the wing skin.

SUBTASK 28-11-11-210-003

- (6) Make sure that the molded rubber seal [2] is in good condition and secured.

- (a) Clean the rubber seal with a clean cotton wiper, G00034, moist with solvent, B00316.

- (b) Look for areas of deterioration on the rubber seal.

- (c) If it is necessary, replace the molded rubber seal [2] (TASK 28-11-11-900-801).

- (d) Apply a thin layer of grease, D00504, to the molded rubber door seal.

NOTE: This will prevent damage to the rubber seal during subsequent access panel removal.
It will also be easier to remove the access panel.

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SUBTASK 28-11-11-211-001

- (7) If rub strip has installed on the 532BB and 632BB or 532HB and 632HB access door [1], make sure that the edge of the rub strip aligns with and does not extend over the edge of the fuel access door.

NOTE: Clearance between the edge of the rub strip and the edge of the fuel door may vary to a maximum of 0.06 in. (1.52 mm).

SUBTASK 28-11-11-840-003

- (8) If you use a new clamp ring [5] for installation on the access door 532BB and 632BB or 532HB and 632HB without installed rub strip on the clamp ring [5], do these steps to install the provided rub strip:

NOTE: If a new clamp ring is provided with a rub strip installed, it is not necessary to do these steps.

- Use polysulfide sealant, A50473, or P/S 870 Class B-2 sealant, A50479, to bond the rub strip to the clamp ring [5].
- Trim the rub strip locally as necessary to keep a minimum of 0.00 in. (0.00 mm) clearance to the edge of the clamp ring [5].
- Apply one layer of primer, C00175 (TASK 51-21-72-370-801).

I. Prepare the Knitted Aluminum Gasket for Installation

SUBTASK 28-11-11-840-001

- (1) To prepare a new knitted aluminum gasket [3] for installation (recommended procedure), do these steps:

- Clean the clamp ring [5] surface with solvent, B00083.

NOTE: To remove dried corrosion inhibiting compound, use abrasive mat, G00251.

28-AWL-16: CDCCL

- Make sure both sides of the new knitted aluminum gasket [3] are filled with the correct Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- Do a check of the manufacturing date (shelf-life) information on the replacement gasket container.

28-AWL-16: CDCCL

- If the aluminum gasket [3] is more than five years old from the manufacturing date, do these steps:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- a) Remove (Vapor de-grease) the old Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the aluminum gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- b) Refill (Re-impregnate) the aluminum gasket [3] with 0.5 fl-oz (15 ml) to 1 fl-oz (30 ml) of new Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to make sure both sides of the aluminum gasket [3] are filled before installation.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: If you do not fill the aluminum mesh with the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the spaces with no grease or anti-corrosion compound can collect water. Do not apply too much grease or anti-corrosion compound or it can move out to the wing surface.

- 2) If the aluminum gasket [3] is less than five years old, do these steps:

► 28-AWL-16: CDCCL

- a) Vapor de-grease the aluminum gasket [3] if you switch from the original grease or anti-corrosion compound to a different gasket filling material.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- b) If you do not switch from the original grease or anti-corrosion compound to a different gasket filling material, then it is not necessary to remove the old grease or anti-corrosion compound.

- (d) Put a new aluminum gasket carrier tray package face up on a flat surface.
(e) Remove the paper cover from the carrier tray.
(f) Carefully put the clamp ring [5] on the aluminum gasket [3] (with the countersunk end of the holes face up) so that the clamp ring and aluminum gasket [3] holes align.
(g) Push the clamp ring [5] on the aluminum gasket [3] until the clamp ring [5] is tightly against the aluminum gasket [3].
(h) Remove the clamp ring [5], aluminum gasket [3], and release strip from the carrier tray as a unit.
(i) Put the unit, with the aluminum gasket [3] side turned up, on a flat surface.
(j) Remove the release strip from the aluminum gasket [3].

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SUBTASK 28-11-11-840-002

- (2) To prepare a used knitted aluminum gasket [3] for installation (alternate procedure), do these steps:

- (a) Clean the clamp ring [5] surface and aluminum gasket [3] with a cotton wiper, G00034, that is moist with solvent, B00083.

NOTE: To remove dried corrosion inhibiting compound, use abrasive mat, G00251.

28-AWL-16: CDCCL

- (b) A used aluminum gasket [3] that meets the criteria that follows can be installed:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 1) No fastener holes are torn.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 2) Gasket is not elongated or out of shape.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 3) Gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 4) No more than 10% of strands in the layer(s) are broken through in any one area.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- (c) Apply 0.5 fl-oz (15 ml) to 1 fl-oz (30 ml) of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to both sides of the aluminum gasket [3] to make sure both sides of the aluminum gasket [3] are filled before installation.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- 1) Vapor de-grease the aluminum gasket [3] if you switch from the original grease or anti-corrosion compound to a different gasket filling material.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- 2) Make sure that the layer is continuous on the aluminum gasket [3].

J. Inspect the Access Door

► 28-AWL-16: CDCCL

SUBTASK 28-11-11-210-010

- (1) For the access doors installed at door position numbers other than 532AB and 632AB, make sure there is a phenolic strip positioned around the outermost periphery of the door that mates with the wing skin inside the tank (for honeycomb-style impact-resistant doors installed at door position numbers 532AB and 632AB, a phenolic strip is not used).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-11-210-013

- (2) Make sure that there are no cracks in the nut domes of the access door [1], access door [6], or access door [8].

NOTE: Paint flaking or bulging can show cracks in the nut domes of the access door.

SUBTASK 28-11-11-370-001

- (3) If there are no cracks and paint is flaked or bulged, repair the finish paint.

NOTE: A paint flaking can potentially cause a fuel leak.

SUBTASK 28-11-11-210-019

- (4) Make sure that the nut domes of the access door [1], access door [6], or access door [8] are free of unwanted contamination.

K. Install the Access Door

SUBTASK 28-11-11-420-005

- (1) On the main tank access doors [1] and access doors [8] without fuel measuring sticks, put the access door [1] or access door [8] in the fuel tank and set the door in the opening.

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- (a) These are the applicable No. 1 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532KB	Main Tank Access Door - Wing Station 470
532MB	Main Tank Access Door - Wing Station 523
532PB	Main Tank Access Door - Wing Station 576
532RB	Main Tank Access Door - Wing Station 629

- (b) These are the applicable No. 2 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632KB	Main Tank Access Door - Wing Station 470
632MB	Main Tank Access Door - Wing Station 523
632PB	Main Tank Access Door - Wing Station 576
632RB	Main Tank Access Door - Wing Station 629

SUBTASK 28-11-11-420-006



CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

- (2) Put the access door [6] in the fuel tank at an angle so the fuel measuring stick [7] does not touch the stringers at the top of the fuel tank and set the door in the opening.

NOTE: Access doors with fuel measuring sticks have a door key (View F, Figure 401).

- (a) These are the applicable No. 1 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
532CB	Main Tank Access Door - Wing Station 290
532FB	Main Tank Access Door - Wing Station 367
532JB	Main Tank Access Door - Wing Station 443
532LB	Main Tank Access Door - Wing Station 496
532NB	Main Tank Access Door - Wing Station 549
532QB	Main Tank Access Door - Wing Station 602

- (b) These are the applicable No. 2 tank access door(s):

<u>Number</u>	<u>Name/Location</u>
632CB	Main Tank Access Door - Wing Station 290
632FB	Main Tank Access Door - Wing Station 367
632JB	Main Tank Access Door - Wing Station 443

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(Continued)

Number Name/Location

632LB	Main Tank Access Door - Wing Station 496
632NB	Main Tank Access Door - Wing Station 549
632QB	Main Tank Access Door - Wing Station 602

- (c) Make sure that the door key is installed correctly in the lower wing skin.

NOTE: Access doors with fuel measuring sticks have a door key (View F, Figure 401).

SUBTASK 28-11-11-100-002

- (3) Clean the clamp ring [5] surface with solvent, B00083.

SUBTASK 28-11-11-210-016

- (4) Make sure that the clamp ring [5] and aluminum gasket [3] holes align.

NOTE: The holes are not symmetrical.

NOTE: Align the holes to prevent the fuel tank access door nut dome from cracking. Do not use excessive Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

SUBTASK 28-11-11-640-001



CAUTION

DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

► 28-AWL-16: CDCCL

- (5) Apply a thin layer of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [3] for the access door [1], access door [6], or access door [8].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- (a) Make sure you use the same grease or anti-corrosion material that is on the aluminum gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-11-420-009

- (6) Set and hold the aluminum gasket [3] and clamp ring [5] in the opening between the outside face of the access door and the wing skin while you install the mounting bolts [4] for the access door [1], access door [6], or access door [8].

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SUBTASK 28-11-11-420-027

- (7) Apply a thin layer of Cor-Ban 27L Compound, G50237 (preferred), or compound, C00528 (alternate), to the threads and shank of the mounting bolts [4].

LOM ALL

SUBTASK 28-11-11-420-010



DO NOT USE MOUNTING BOLTS WITH A LONGER GRIP LENGTH. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR.

► 28-AWL-16: CDCCL

- (8) Torque the mounting bolts [4] on the access door [1] and access door [6] to 35 ± 5 in-lb (4 ± 1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: It is allowed to use mounting bolts with one grip length shorter to meet the flushness and tightness requirements.

NOTE: It is recommended to re-torque the access door mounting bolts within 60 days and again at 12 months after installation of gaskets if Cor-Ban 27L compound was applied. This is to reduce clamp-up loss on the access door.

- Start at the centerline and tighten the mounting bolts [4] equally in each direction (Figure 403).
- Make sure that the heads of the mounting bolts [4] are flush to the adjacent surface within -0.010 in. (-0.254 mm) to 0.002 in. (0.051 mm) and are not loose.

SUBTASK 28-11-11-420-013



DO NOT USE MOUNTING BOLTS WITH A LONGER GRIP LENGTH. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR.

► 28-AWL-16: CDCCL

- (9) Torque the mounting bolts [4] on the access door [8] to 35 ± 5 in-lb (4 ± 1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: It is allowed to use mounting bolts with one grip length shorter to meet the flushness and tightness requirements.

NOTE: It is recommended to re-torque the access door mounting bolts within 60 days and again at 12 months after installation of gaskets if Cor-Ban 27L compound was applied. This is to reduce clamp-up loss on the access door.

- Start at the centerline and tighten the mounting bolts [4] equally in each direction (Figure 403).

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- (b) Make sure that the heads of the mounting bolts [4] are flush to the adjacent surface within -0.010 in. (-0.254 mm) to 0.002 in. (0.051 mm) and are not loose.

SUBTASK 28-11-11-650-002

- (10) Refuel the applicable fuel tank (TASK 12-11-00-650-802).

SUBTASK 28-11-11-210-007

- (11) To make sure that there are no leaks from the applicable access door [1], access door [6], or access door [8], do one of these tasks:
- Fuel Tank Closure Leak Check, TASK 28-11-00-400-801
 - Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

SUBTASK 28-11-11-650-004

- (12) After you refuel the applicable tank and do the leak check, do this task: Fuel Boost Pump and Override Pump Priming, TASK 28-22-41-420-801.

SUBTASK 28-11-11-410-002

- (13) For access door [1], 532BB or 632BB, do this step (TASK 06-43-00-800-801):
(a) Install the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2

SUBTASK 28-11-11-410-007

- (14) For access door [1], 532HB or 632HB, do this step (TASK 27-51-28-400-801):
(a) Install the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
544AB	Flap Support No. 1 Access Panel, Forward Assembly
644AB	Flap Support No. 8, Forward Assembly Access Panel

— END OF TASK —

TASK 28-11-11-000-802

4. Surge Tank Access Door Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the Surge Tank Access Door.

B. References

<u>Reference</u>	<u>Title</u>
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.



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Reference

Description

SPL-8436	Protective Ring - Access Door Opening, Wing Lower Panel Part #: C28013-3 Supplier: 81205
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference

Description

Specification

B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
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E. Location Zones

Zone

Area

533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Access Panels

Number

Name/Location

533AB	Surge Tank Access Door - Wing Station 655
533BB	Surge Tank Access Door - Wing Station 679
533CB	Surge Tank Access Door - Wing Station 703
633AB	Surge Tank Access Door - Wing Station 655
633BB	Surge Tank Access Door - Wing Station 679
633CB	Surge Tank Access Door - Wing Station 703

G. Surge Tank Access Precautions



WARNING DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.



WARNING DO NOT BREATHE THE AIR FROM THE FUEL TANK UNTIL YOU MAKE IT SAFE. THE NITROGEN GENERATION SYSTEM DECREASES THE OXYGEN IN THE AIR. IF YOU BREATHE AIR THAT DOES NOT HAVE SUFFICIENT OXYGEN, DANGEROUS HEALTH CONDITIONS CAN QUICKLY OCCUR.

DANGEROUS HEALTH CONDITIONS INCLUDE NAUSEA, UNCONSCIOUSNESS, AND CONVULSIONS. IF THE OXYGEN LEVEL OF THE AIR THAT YOU BREATHE IS VERY LOW, IT CAN KILL YOU.

SUBTASK 28-11-11-910-004



WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU

DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) For the applicable surge tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-11-700-001

- (2) Before you access the applicable surge tank, make sure that the fuel level in the adjacent main wing tank is below 6000 lb (2722 kg) (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

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SUBTASK 28-11-11-700-002

- (3) Make sure that all unwanted sources of ignition have been removed from an area within 25 ft (8 m) of the surge tank access panel.

NOTE: Unwanted sources of ignition include: open flames, electrical equipment, frictional hot spots, electromagnetic energy (radio transmitters or radars), static electricity, and lightning.

SUBTASK 28-11-11-480-001

- (4) Put a rope barrier around a 25 ft (8 m) area of the surge tank access panel.

NOTE: The rope barrier must include signs or placards that say: DANGER - OPEN FUEL TANKS.

SUBTASK 28-11-11-700-003

- (5) Make sure that the airplane is correctly grounded to an approved ground before you defuel the surge tank or open the access door.

SUBTASK 28-11-11-700-004



WARNING

DO NOT USE AIRPLANE ELECTRICAL POWER WHEN SURGE-TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL FUMES AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE EQUIPMENT.

- (6) Before the surge tank access doors are opened, make sure that all electrical power to and from the airplane is removed.

- (a) Put placards that say that power can not be restored to the airplane until the surge tanks are closed on all power inlets.

SUBTASK 28-11-11-700-005

- (7) Make sure that the main and AUX batteries are disconnected.

- (a) Put placards that say not to connect batteries until the surge tanks are closed in all disconnected batteries.

SUBTASK 28-11-11-700-006

- (8) Make sure that all equipment or materials used in fuel tanks or roped off area is non-sparking, non-ferrous and non-static generating or is explosion-proof approved (Class I, Division 1).

H. Surge Tank Access Door Removal

SUBTASK 28-11-11-650-003

- (1) Drain the surge tank at the sump drain valve (TASK 12-11-00-650-804).

SUBTASK 28-11-11-020-012

- (2) Do these steps to remove the applicable access doors [21]:

Number Name/Location

533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703

- (a) Hold the clamp ring [5] and remove the mounting bolts [4].
(b) Remove the clamp ring [5] and the aluminum gasket [3].



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- 1) Discard the aluminum gasket [3].

NOTE: It is not recommended, but if it is necessary, you may be able to re-use the aluminum gasket [3].



CAUTION

DO NOT USE A LEVER (PRY BAR) ON THE ACCESS DOOR. THE LOWER SURFACE OF THE ACCESS DOOR FLANGE AND THE TOP SURFACE OF THE WING SKIN AROUND THE ACCESS DOORS ARE SEAL SURFACES. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

- (c) Push up on the access door [21].
1) If the access door [21] does not move freely, use a rubber mallet, STD-3906 and lightly hit around the access door [21].
(d) Clean the inner side and the outer side of the access opening with solvent, B00083.
(e) Install a protective ring, SPL-8436, in the access door opening.

NOTE: This step is not necessary if you will replace the access door immediately.

SUBTASK 28-11-11-020-005

- (3) Do these steps to remove the applicable access door(s):

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679
633BB Surge Tank Access Door - Wing Station 679



CAUTION

THE MOUNTING BOLTS HOLD THIS ACCESS DOOR IN ITS POSITION. THE DOOR CAN FALL OUT OF THE OPENING WHEN YOU REMOVE ALL OF THE MOUNTING BOLTS. THIS CAN CAUSE DAMAGE TO THE DOOR.

- (a) Loosen and remove the mounting bolts [24].



WARNING

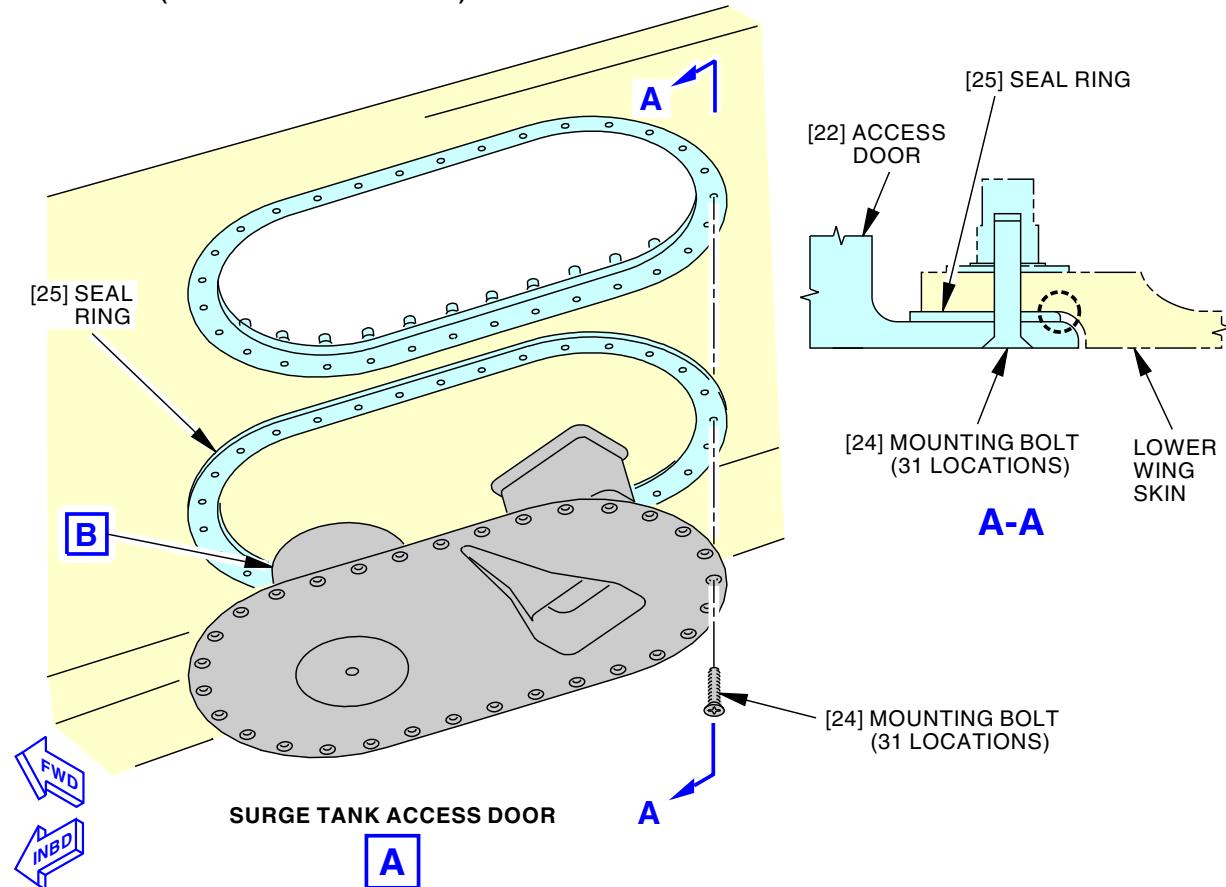
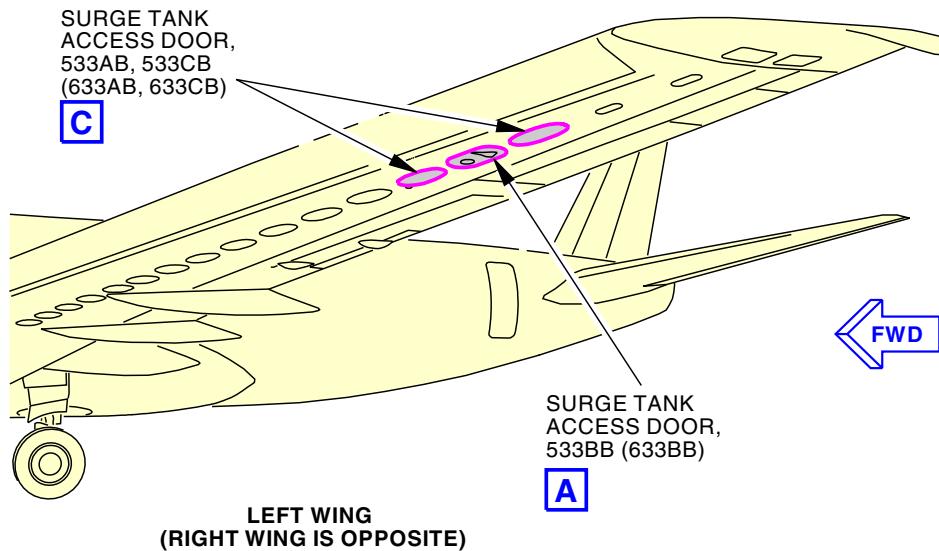
DO NOT TOUCH THE PRESSURE RELIEF VALVE WHEN YOU REMOVE THE ACCESS PANEL. IF THE PRESSURE RELIEF VALVE OPENS ACCIDENTALLY, INJURIES TO PERSONNEL CAN OCCUR.

- (b) Remove the access door [22] and the molded rubber seal from the surge tank.

———— END OF TASK ————

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Surge Tank Access Door Installation
Figure 402/28-11-11-990-803 (Sheet 1 of 3)

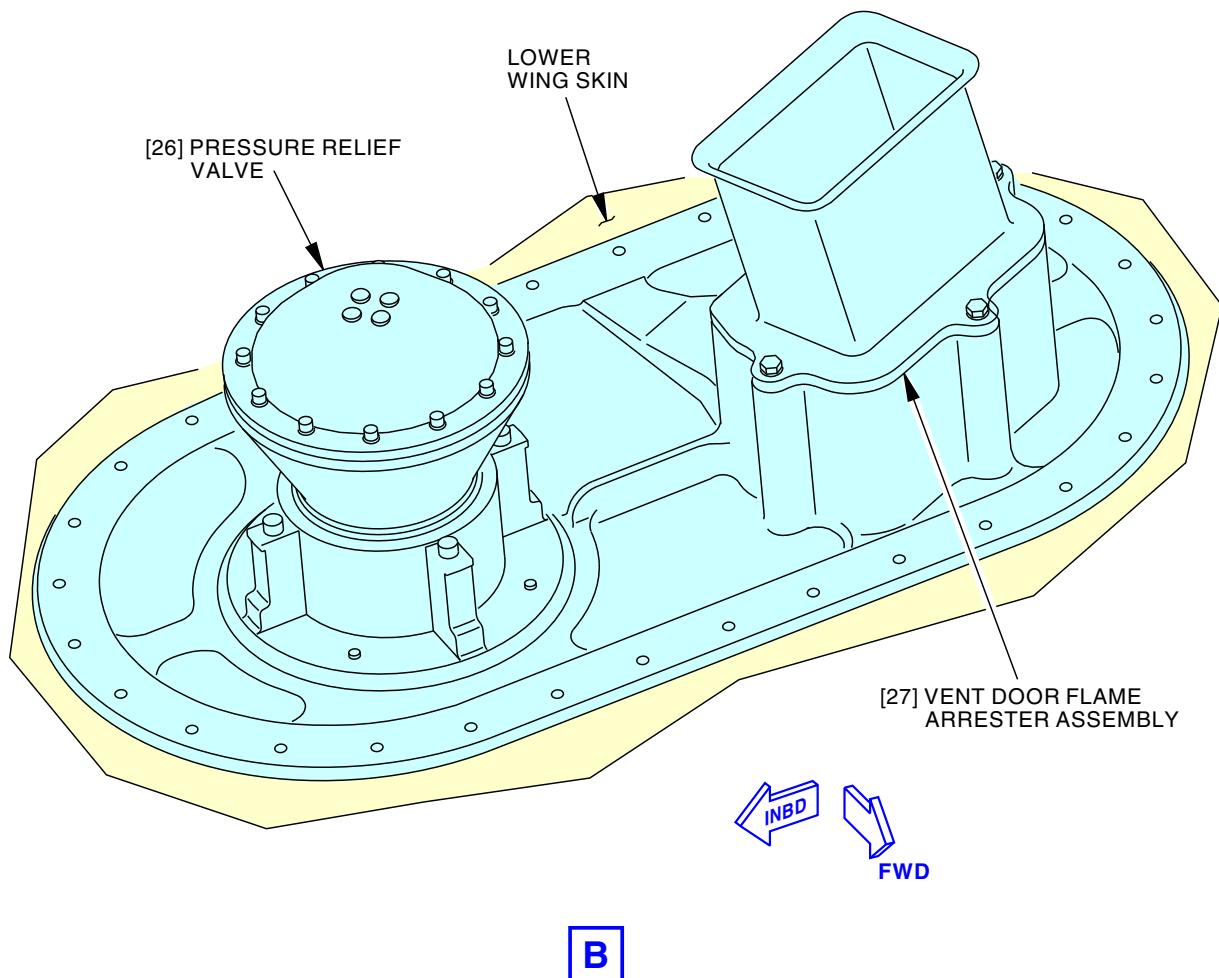
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2187530 S0000485116_V4

Surge Tank Access Door Installation
Figure 402/28-11-11-990-803 (Sheet 2 of 3)

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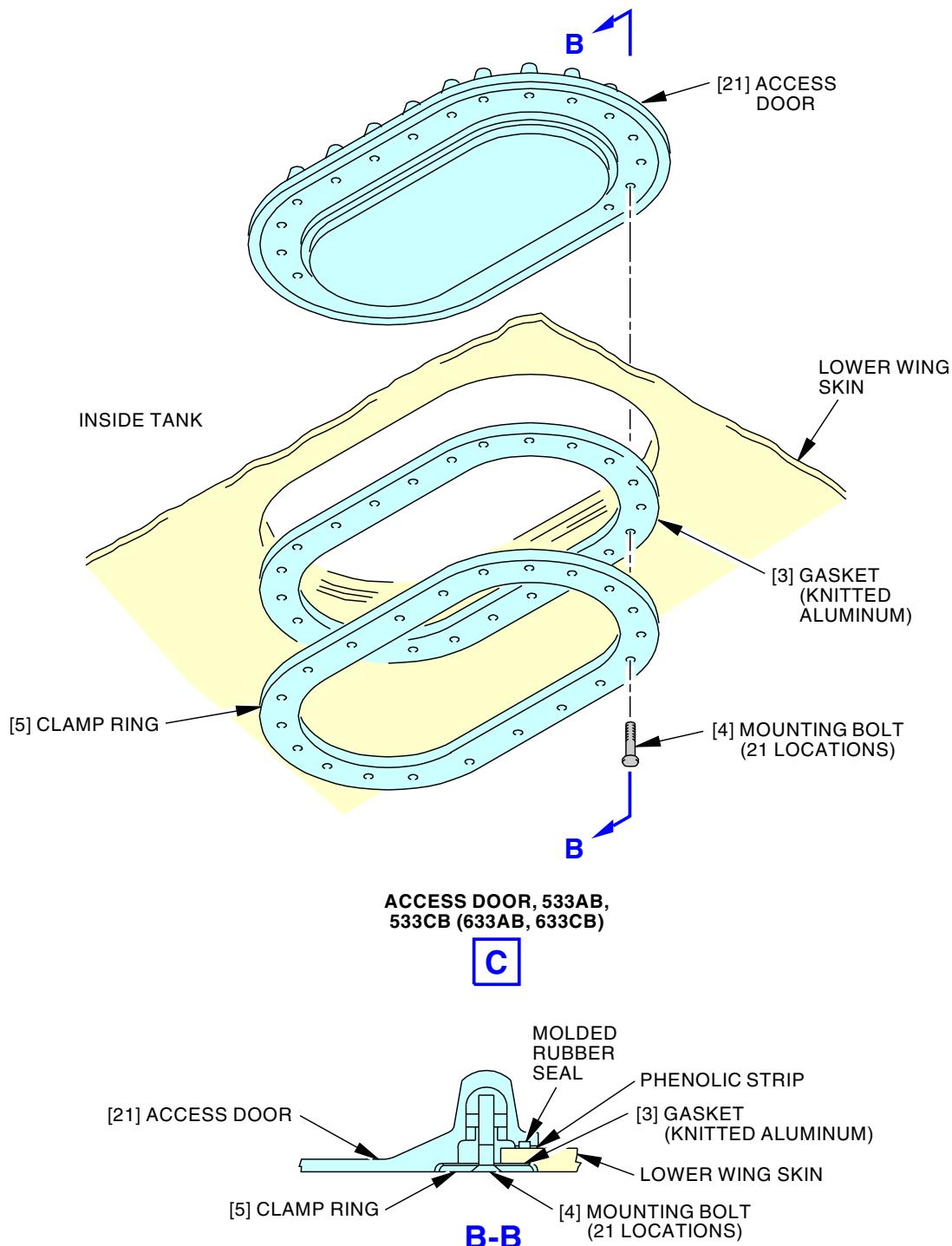
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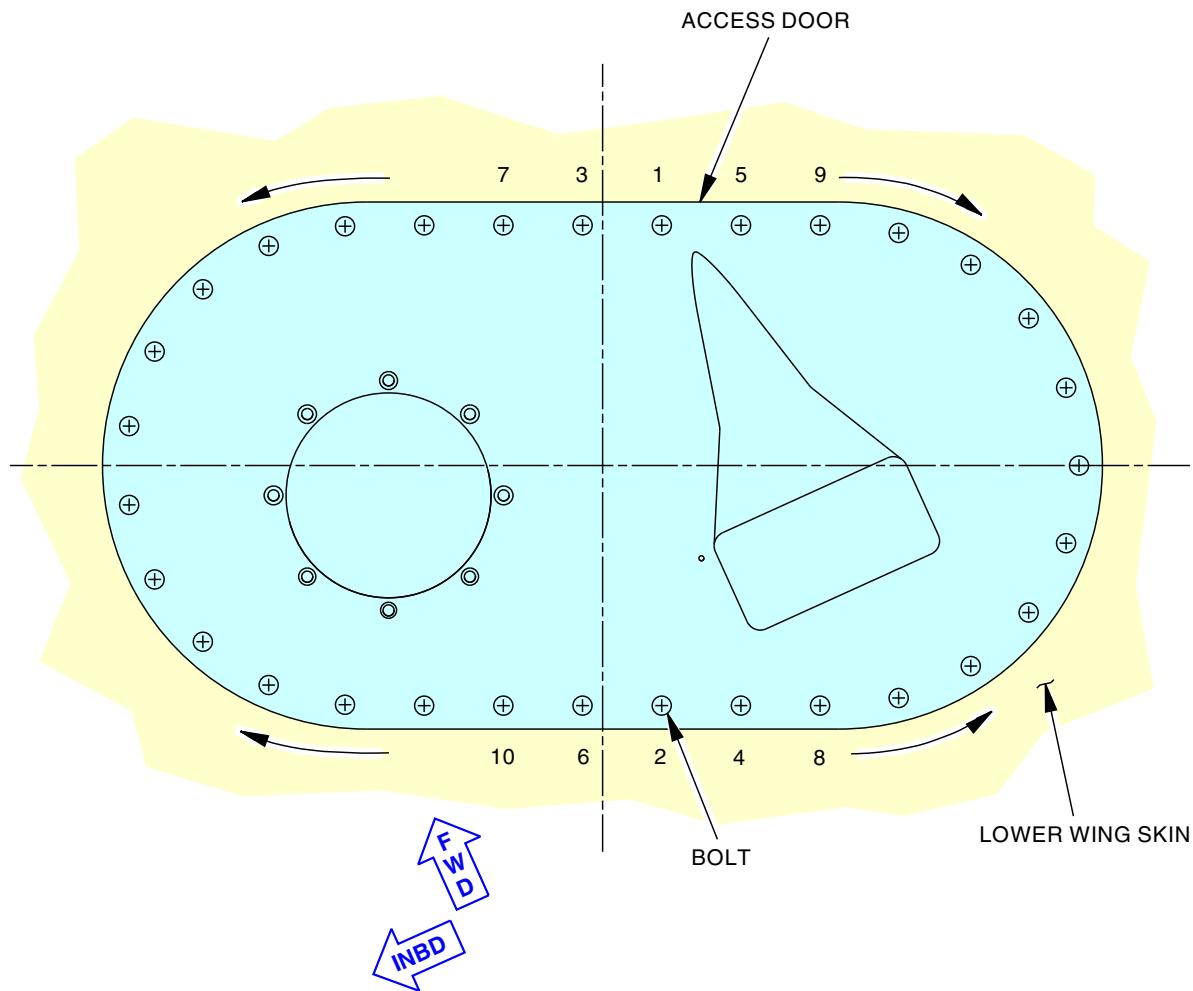


F99817 S0006571310_V1

Surge Tank Access Door Installation
Figure 402/28-11-11-990-803 (Sheet 3 of 3)

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NOTE:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS. THIS WILL MAKE SURE THAT FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

PAY CAREFUL ATTENTION TO THE PROPER ORIENTATION OF THE MOLDED RUBBER SEAL. THE SEAL WILL LAY FLAT ON THE DOOR WHEN PROPERLY ALIGNED WITH THE FASTENER HOLES.

L45920 S0006571311_V6

Access Panel Mount Bolt Torque Pattern
Figure 403/28-11-11-990-804

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TASK 28-11-11-400-802

5. Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation

(Figure 402, Figure 403)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-16.

- (2) This task gives the instruction to install the following surge tank access doors:

Number	Name/Location
---------------	----------------------

533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703

- (3) Mobilgrease 33, D50306, is the recommended material for access door gasket installations. The Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, can be used for access door gaskets.
- (4) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237. If you replaced a gasket filled with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, with a gasket filled with Mobilgrease 33, D50306, remove all Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the clamp ring and the access door structure on the airplane.
- (5) It is recommended that a new aluminum gasket [3] be used every time you install the surge tank access door [21].

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-00-790-803	Surge Tank Access Door - Leak Test Procedure (P/B 601)
28-11-11-900-801	Rubber Door Seal - Replacement (P/B 801)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8436	Protective Ring - Access Door Opening, Wing Lower Panel Part #: C28013-3 Supplier: 81205



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D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

E. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Access Panels

Number	Name/Location
533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703

G. Prepare for Surge Tank Access Door Installation

SUBTASK 28-11-11-010-005

- (1) Remove the protective ring, SPL-8436, from the access door [21] opening.

SUBTASK 28-11-11-100-003

- (2) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-11-210-017

► 28-AWL-16: CDCCL

- (3) Make sure the areas on the access door [21], clamp ring [5], and the lower wing skin electrical faying surfaces are clean and have no visible corrosion.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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- (a) Clean the surface with solvent, B00083, if it is necessary.

SUBTASK 28-11-11-100-004

- (4) Make sure that the molded rubber seal is in good condition.
- (a) Clean the rubber seal with a clean cotton wiper, G00034, moist with solvent, B00316.
 - (b) Look for areas of deterioration on the rubber seal.
 - (c) To replace the molded rubber seal if it is necessary, do this task: Rubber Door Seal - Replacement, TASK 28-11-11-900-801.
 - (d) Apply a thin layer of grease, D00504, to the molded rubber seal.

NOTE: This will prevent damage to the rubber seal during subsequent access panel removal. It will also be easier to remove the access panel.

SUBTASK 28-11-11-410-005

► 28-AWL-16: CDCCL

- (5) Use a new knitted aluminum gasket [3] (recommended procedure).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: It is recommended to use a new aluminum gasket every time you install the access door.

► 28-AWL-16: CDCCL

- (a) If a new aluminum gasket [3] is not available, a used aluminum gasket [3] that meets the certain criteria may be installed (alternate procedure).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

H. Prepare New Knitted Aluminum Gasket for Installation (Recommended Procedure)

SUBTASK 28-11-11-100-005

- (1) Clean the clamp ring [5] surface with solvent, B00083.

NOTE: To remove dried corrosion inhibiting compound, use abrasive mat, G00251.

SUBTASK 28-11-11-640-003

► 28-AWL-16: CDCCL

- (2) Make sure both sides of the new knitted aluminum gasket [3] are filled with the correct Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- (a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-11-200-003

- (3) Do a check of the manufacturing date (shelf-life) information on the replacement gasket container.

► 28-AWL-16: CDCCL

- (a) If the aluminum gasket [3] is more than five years old from the manufacturing date, do these steps:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- 1) Remove (De-grease) the old Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the aluminum gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- a) Vapor degrease the aluminum gasket [3] if you switch from the original grease or anti-corrosion compound to a different gasket filling material.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- 2) Refill (Re-impregnate) the aluminum gasket [3] with 0.5 fl-oz (15 ml) to 1 fl-oz (30 ml) of new Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to make sure both sides of the aluminum gasket [3] are filled before installation.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: If you do not fill the aluminum mesh with the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the spaces with no grease or anti-corrosion compound can collect water. Do not apply too much grease or anti-corrosion compound or it can move out to the wing surface.

► 28-AWL-16: CDCCL

- a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- (b) If the aluminum gasket [3] is less than five years old, then it is not necessary to remove the old grease or anti-corrosion compound.

SUBTASK 28-11-11-410-006

- (4) Put a new aluminum gasket carrier tray package face up on a flat surface.

SUBTASK 28-11-11-010-006

- (5) Remove the paper cover from the carrier tray.

SUBTASK 28-11-11-210-018

- (6) Since the hole locations are symmetrical, carefully put the clamp ring [5] on the aluminum gasket [3] (with the countersunk end of the holes face up) so that the clamp ring and aluminum gasket [3] holes align.

SUBTASK 28-11-11-420-018

- (7) Push the clamp ring [5] on the aluminum gasket [3] until the clamp ring [5] is tightly against the aluminum gasket [3].

SUBTASK 28-11-11-020-013

- (8) Remove the clamp ring [5], aluminum gasket [3], and release strip from the carrier tray as a unit.

SUBTASK 28-11-11-420-019

- (9) Put the unit, with the aluminum gasket [3] side turned up, on a flat surface.

SUBTASK 28-11-11-020-014

- (10) Remove the release strip from the aluminum gasket [3].

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I. Prepare Used Knitted Aluminum Gasket for Installation (Alternate Procedure)

SUBTASK 28-11-11-100-006

- (1) Clean the clamp ring [5] surface and aluminum gasket [3] with a cotton wiper, G00034, that is moist with solvent, B00083.

NOTE: To remove dried corrosion inhibiting compound, use abrasive mat, G00251.

SUBTASK 28-11-11-420-021

28-AWL-16: CDCCL

- (2) A used aluminum gasket [3] that meets the criteria that follows can be installed:

NOTE: A gasket that meets Items (2)(d) but does not meet Items (2)(a) through (2)(c) criteria may be used for a maximum duration of 30 days and then must be replaced with a gasket that meets all the criteria listed below.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- (a) No fastener holes are torn.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- (b) Gasket is not elongated or out of shape.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- (c) Gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- (d) No more than 10% of strands in the layer(s) are broken through in any one area.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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SUBTASK 28-11-11-640-004

► **28-AWL-16: CDCCL**

- (3) Apply 0.5 fl-oz (15 ml) to 1 fl-oz (30 ml) of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to both sides of the aluminum gasket [3] to make sure that both sides of the aluminum gasket [3] are filled before installation.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► **28-AWL-16: CDCCL**

- (a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► **28-AWL-16: CDCCL**

- (b) Vapor degrease the aluminum gasket [3] if you switch from the original grease or anti-corrosion compound to a different gasket filling material.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- (c) Make sure the layer is continuous on the aluminum gasket [3].

J. Inspect the Surge Tank Access Door

SUBTASK 28-11-11-100-008

► **28-AWL-16: CDCCL**

- (1) Make sure that there is a phenolic strip around the outermost periphery of the access door [21] that mates with the wing skin inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-11-210-020

- (2) Make sure that there are no cracks in the nut domes of the access door [21].

NOTE: Paint flaking or bulging can show cracks in the nut domes of the access door.

SUBTASK 28-11-11-370-002

- (3) If there are no cracks and paint is flaked or bulged, repair the finish paint.

NOTE: A paint flaking can potentially cause a fuel leak.

SUBTASK 28-11-11-200-004

- (4) Make sure that the nut domes of the access door [21] are free of unwanted contamination.

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K. Surge Tank Access Door Installation

SUBTASK 28-11-11-420-020

- (1) Put the access door [21] in the fuel tank and set the door in the opening.

SUBTASK 28-11-11-100-007

- (2) Clean the clamp ring [5] surface with solvent, B00083.

SUBTASK 28-11-11-100-009

- (3) Make sure that the clamp ring [5] and aluminum gasket [3] holes align.

NOTE: The holes are not symmetrical.

NOTE: Align the holes to prevent the fuel tank access door nut dome from cracking. Do not use excessive Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

SUBTASK 28-11-11-640-005



CAUTION DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

► 28-AWL-16: CDCCL

- (4) Apply a thin layer of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [3] for the access door [21].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- (a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- (b) Make sure that you use the same grease or anti-corrosion material that is on the aluminum gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitation (CDCCL).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-11-420-022

- (5) Set and hold the aluminum gasket [3] and the clamp ring [5] in the opening between the outside face of the access door [21] and the wing skin while you install the mounting bolts [4] for the access door [21].

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LOM ALL; ALL AIRPLANES EXCEPT 737-900ER

SUBTASK 28-11-11-420-026

- (6) Apply a thin layer of Cor-Ban 27L Compound, G50237 (preferred), or compound, C00528 (alternate), to the threads and shank of the mounting bolts [4].

LOM ALL

SUBTASK 28-11-11-420-023



DO NOT USE MOUNTING BOLTS WITH A LONGER GRIP LENGTH. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR.

► 28-AWL-16: CDCCL

- (7) Torque the mounting bolts [4] on the access door [21] to a torque of 35 ± 5 in-lb (4 ± 1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCL.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: It is allowed to use mounting bolts with one grip length shorter to meet the flushness and tightness requirements.

NOTE: It is recommended to re-torque the access door mounting bolts within 60 days and again at 12 months after installation of gaskets if Cor-Ban 27L compound was applied. This is to reduce clamp-up loss on the access door.

- (a) Start at the centerline and tighten the mounting bolts [4] to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m), equally in each direction. Then tighten again to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m), until reaching the final torque of 35 ± 5 in-lb (4 ± 1 N·m) (Figure 403).
- (b) Make sure that the heads of the mounting bolts [4] are flush to the adjacent surface within -0.010 in. (-0.254 mm) to 0.002 in. (0.051 mm) and are not loose.

SUBTASK 28-11-11-790-001

- (8) To do a leak test for one of the surge tank access doors, do one of these tasks:

- (a) Surge Tank Access Door - Leak Test Procedure, TASK 28-11-00-790-803.
- (b) Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

———— END OF TASK ————

TASK 28-11-11-400-803

6. Surge Tank Access Door (533BB, 633BB) - Installation

(Figure 402, Figure 403)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-17.

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- (2) This task gives the instruction to install the following surge tank access doors:

<u>Number</u>	<u>Name/Location</u>
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

B. References

<u>Reference</u>	<u>Title</u>
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-00-790-803	Surge Tank Access Door - Leak Test Procedure (P/B 601)
28-13-31-400-801	Flame Arrestor Installation (P/B 401)
28-13-41-400-801	Pressure Relief Valve Installation (P/B 401)

C. Consumable Materials

<u>Reference</u>	<u>Description</u>	<u>Specification</u>
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

<u>Zone</u>	<u>Area</u>
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

E. Access Panels

<u>Number</u>	<u>Name/Location</u>
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

F. Prepare for the Installation

SUBTASK 28-11-11-940-009

- (1) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

G. Surge Tank Access Door Installation

SUBTASK 28-11-11-800-001

- (1) Make sure that the areas on the access door [22] and the wing skin, that the seal ring [25] touches, are clean.
- (a) Use solvent, B00083, to clean the surfaces if it is necessary.

SUBTASK 28-11-11-800-002

- (2) Make sure that the seal ring [25] is in good condition.
- (a) Replace the seal ring [25] if it is necessary.



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SUBTASK 28-11-11-400-002

LOM ALL; AIRPLANES WITH RING SEAL P/N 110A0114-1



CAUTION

MAKE SURE THAT THE MOLDED RUBBER SEAL IS IN ITS CORRECT POSITION ON THE ACCESS DOOR WITH THE HOLES ALIGNED CORRECTLY. IF YOU INSTALL THE MOLDED RUBBER SEAL INCORRECTLY, FUEL CAN SPILL.

LOM ALL

- (3) Put the flat surface of the seal ring [25] on the access door with the holes aligned correctly.
 - (a) Do not apply grease to the seal ring [25].

NOTE: Access doors 533BB and 633BB are installed dry.

SUBTASK 28-11-11-800-003

► 28-AWL-17: CDCCL

- (4) Make sure that there is no visible corrosion on the countersinks on the access door fasteners.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-11-11-400-003

- (5) Install the pressure relief valve [26] on the access door [22], if it was removed (Pressure Relief Valve Installation, TASK 28-13-41-400-801).

SUBTASK 28-11-11-400-004

- (6) Install the flame arrestor assembly [27] on the access door [22], if it was removed (Flame Arrestor Installation, TASK 28-13-31-400-801).

SUBTASK 28-11-11-400-005



CAUTION

MAKE SURE THAT THE ACCESS PANEL IS INSTALLED CORRECTLY. IF YOU INSTALL THE ACCESS PANEL INCORRECTLY, FUEL CAN SPILL.

- (7) Put the access door [22] in the opening of the surge tank.

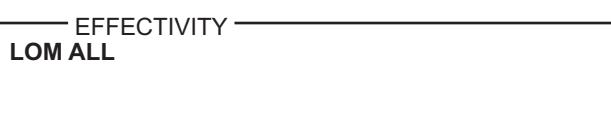
- (a) Make sure that the access door [22] is in the correct orientation (View A, Figure 402).

LOM ALL; ALL AIRPLANES EXCEPT 737-900ER

SUBTASK 28-11-11-420-025

- (8) Apply a thin layer of Cor-Ban 27L Compound, G50237 (preferred), or compound, C00528 (alternate), to the threads and shank of the mounting bolts [24].

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SUBTASK 28-11-11-420-014

28-AWL-17: CDCCL

- (9) Install the mounting bolts [24] (conductive fasteners - part number BACB30LH3-10) on the access door [22].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

28-AWL-17: CDCCL

- (a) No substitution of fastener part number is permitted.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-11-11-420-024

28-AWL-17: CDCCL

- (10) Tighten the mounting bolts [24] (conductive fasteners) on the access door [22] to a torque of 35 ± 5 in-lb (4 ± 1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Start at the centerline and tighten the mounting bolts [24] (conductive fasteners) to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m), equally in each direction. Then tighten again to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m), until reaching the final torque of 35 ± 5 in-lb (4 ± 1 N·m)(Figure 403).

- (b) Make sure that the heads of the mounting bolts [24] are flush to the adjacent surface within -0.010 in. (-0.254 mm) to 0.002 in. (0.051 mm).

SUBTASK 28-11-11-790-002

- (11) To do a leak test for one of the surge tank access doors, do one of these tasks:

- (a) Surge Tank Access Door - Leak Test Procedure, TASK 28-11-00-790-803.
(b) Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

———— END OF TASK ————

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WING FUEL TANK ACCESS DOORS - REPAIRS

1. General

- A. This procedure has one task. This task replaces the rubber door seal for each of the fuel tank access doors.
- B. Do not use this procedure to replace the rubber door seal on Surge Tank Access Door - Wing Station 679, 533BB or Surge Tank Access Door - Wing Station 679, 633BB. No adhesive or sealant are necessary for the rubber seal ring on these panels.

TASK 28-11-11-900-801

2. Rubber Door Seal - Replacement

(Figure 801)

A. References

Reference	Title
20-30-11-910-801	Adhesives, Cements, and Sealants (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
STD-124	Brush - Stiff Bristle, Non-Metallic
STD-197	Container - Plastic, Polyethylene or Polypropylene

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50052	Sealant - PR-1826 Class B Rapid Curing Fuel Tank Sealant	SAE AMS3277 Class B
A50084	Sealant - P/S 860 Class B-1/6 Quick Repair Fuel Tank Sealant	AMS-S-83318 Class B
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G00624	Bag - Plastic, General Purpose	
G50078	Abrasive - Aluminum Oxide Paper, 320 grit or finer	
G50140	Gloves - Protective, Latex or Nitrile	

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left

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Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

E. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629
533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470



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<u>Number</u>	<u>Name/Location</u>
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602
632RB	Main Tank Access Door - Wing Station 629
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703

F. Prepare for the Replacement of the Rubber Door Seal

SUBTASK 28-11-11-010-002

- (1) Open the applicable access doors:

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629
533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470

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<u>Number</u>	<u>Name/Location</u>
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602
632RB	Main Tank Access Door - Wing Station 629
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703

SUBTASK 28-11-11-020-001

- (2) Remove the rubber door seal [1] from the access door fully.

SUBTASK 28-11-11-140-001



BE CAREFUL WHEN YOU REMOVE THE SEAL WITH THE SEALANT REMOVAL TOOL. DAMAGE TO THE PAINT OR PRIMER CAN OCCUR.

CAUTION

- (3) Remove the remaining sealant, with a sealant removal tool, COM-2481, from the seal groove in the access door.

G. Prepare the New Rubber Door Seal

SUBTASK 28-11-11-913-001

- (1) Put on protective gloves, G50140.

NOTE: Wear gloves during this procedure to prevent contamination to the rubber seal.

SUBTASK 28-11-11-120-002

- (2) Abrade the bottom surface of the rubber door seal [1] with a 320 grit or finer abrasive paper, G50078, to remove the parting agent.

SUBTASK 28-11-11-860-001

- (3) Obey all safety precautions when using solvents, special cleaning compounds, paint strippers (strong alkalies or acids), etchants (corrosion removers that contain acids) or conversion coating chemicals.

SUBTASK 28-11-11-110-002



DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN.
DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES AND GLOVES
WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT
IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO
PERSONNEL, AND DAMAGE TO EQUIPMENT.



DENATURED ETHYL ALCOHOL IS FLAMMABLE AND TOXIC. AVOID
PROLONGED BREATHING OF VAPOR AND PROLONGED OR REPEATED
CONTACT WITH SKIN. AVOID CONTACT WITH EYES. CLEAN PARTS IN
WELL-VENTILATED AREA AND USE APPROVED SAFETY EQUIPMENT.

- (4) Remove the unwanted material from the rubber door seal [1] with a clean cotton wiper, G00034, moist with denatured alcohol, B00068.

NOTE: Do not handle cleaned seal with bare hands or allow to come into contact with potential contaminated surfaces.

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SUBTASK 28-11-11-550-001

- (5) Keep the rubber door seal [1] in a clean plastic bag, G00624, or a clean sealed plastic container, STD-197, to prevent contamination of the rubber seal.

SUBTASK 28-11-11-420-011

- (6) Install the rubber door seal [1] in 60 minutes or less
- (7) Do the alcohol cleaning procedure if the rubber door seal [1] is not installed in 1 hour.

H. Prepare the Seal Groove on the Door

SUBTASK 28-11-11-110-003

- (1) Clean the surface of the door groove with a clean, dry cotton wiper to remove wax, dirt, grease, oil or unwanted material.

SUBTASK 28-11-11-110-004



WARNING

DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES AND GLOVES WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



WARNING

DENATURED ETHYL ALCOHOL IS FLAMMABLE AND TOXIC. AVOID PROLONGED BREATHING OF VAPOR AND PROLONGED OR REPEATED CONTACT WITH SKIN. AVOID CONTACT WITH EYES. CLEAN PARTS IN WELL-VENTILATED AREA AND USE APPROVED SAFETY EQUIPMENT.

- (2) Clean the seal groove with a clean cotton wiper, G00034, moist with denatured alcohol, B00068.
 - (a) Continue to clean the groove until the cotton wiper, G00034, shows no contamination.
 - (b) Let the denatured alcohol, B00068, dry.

I. Rubber Door Seal Replacement

SUBTASK 28-11-11-640-002

- (1) Apply the sealant, A50153, to the full width of the seal groove with a stiff bristle non-metallic brush, STD-124.

NOTE: Alternative to sealant, A50153, are sealant, A00767, P/S 860 B-1/6 sealant, A50084, and PR-1826 sealant, A50052. Refer to Adhesives, Cements, and Sealants, TASK 20-30-11-910-801.

SUBTASK 28-11-11-420-012

- (2) Install the rubber door seal [1] into the door groove.
 - (a) Make sure that the rubber door seal [1] is tight against the seal groove.

SUBTASK 28-11-11-110-005

- (3) Clean off the unwanted sealant with a clean cotton wiper, G00034, and denatured alcohol, B00068.

SUBTASK 28-11-11-490-001

- (4) Apply sufficient clamp pressure to make sure that the rubber door seal [1] is fully installed in the seal groove.

SUBTASK 28-11-11-490-002

- (5) Continue to apply clamp pressure for a minimum of 2 hours at room temperature or 1 hour at 120°F (48.9°C).

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SUBTASK 28-11-11-780-001

- (6) Do not stress the bond line until the sealant is fully cured.

NOTE: BMS 5-45 sealant, A50153, is fully cured at a minimum of 72 hours at $75 \pm 5^{\circ}\text{F}$ ($23.9 \pm 2.8^{\circ}\text{C}$) and 50±5 percent relative humidity.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-11-410-004

- (1) Do the applicable installation procedure:

To install the applicable access doors:

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
532AB	Main Tank Access Door - Wing Station 216
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602
532RB	Main Tank Access Door - Wing Station 629
533AB	Surge Tank Access Door - Wing Station 655
533CB	Surge Tank Access Door - Wing Station 703
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192
632AB	Main Tank Access Door - Wing Station 216
632BB	Main Tank Access Door - Wing Station 265
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602

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(Continued)

<u>Number</u>	<u>Name/Location</u>
632RB	Main Tank Access Door - Wing Station 629
633AB	Surge Tank Access Door - Wing Station 655
633CB	Surge Tank Access Door - Wing Station 703
(a)	Main Tank Access Door Installation, TASK 28-11-11-400-801.
(b)	Center Tank Access Door - Installation, TASK 28-11-31-400-801.
(c)	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation, TASK 28-11-11-400-802.
(d)	Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803.

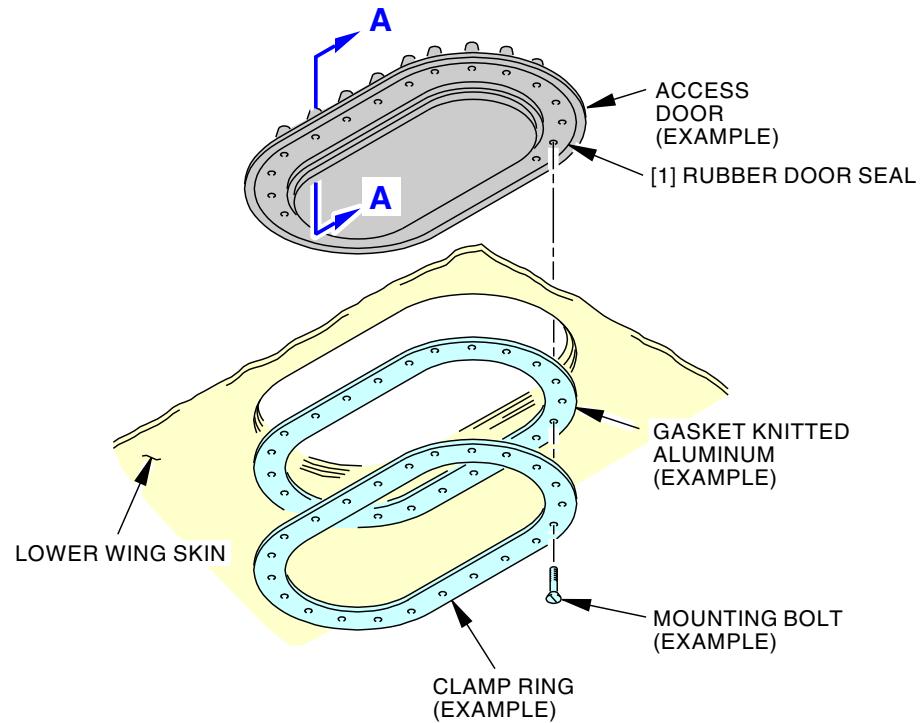
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EFFECTIVITY
LOM ALL

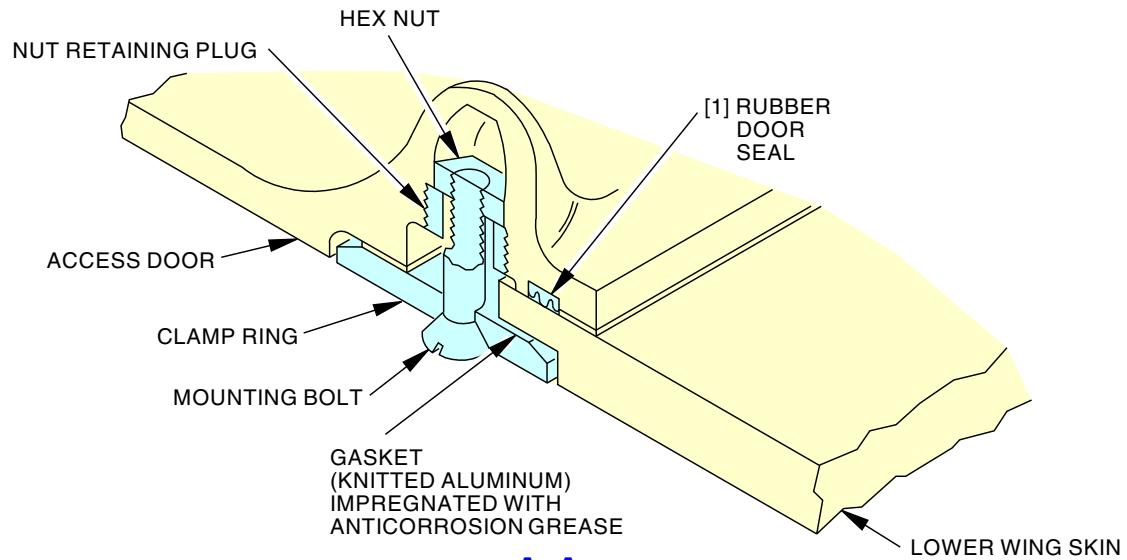
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FUEL TANK ACCESS PANEL
(EXAMPLE)



A-A

F74111 S0006571315_V2

Fuel Tank Access Door Repair
Figure 801/28-11-11-990-801

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SURGE TANK FUEL SUMP DRAIN VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the sump drain valve for the surge tank
 - (2) An installation of the sump drain valve for the surge tank
 - (3) A removal of the sump flapper valve for the surge tank
 - (4) An installation of the sump flapper valve for the surge tank.
- B. The sump drain valves for the surge tank are installed in shrink-fit bushings. These bushings are installed in the skin on the bottom of each wing. If you remove or install the valve, you must be careful not to cause damage to the threads.
- C. The sump flapper valves are installed over the drain valve bushings inside the surge tanks.

TASK 28-11-21-000-801

2. Surge Tank Fuel Sump Drain Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Surge Tank Fuel Sump Drain Valve.

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1764	Adapter - Removal/Installation, Sump Drain Valve
	Part #: B28001-13 Supplier: 81205
	Part #: B28001-18 Supplier: 81205
	Opt Part #: SE28-1103 Supplier: 81205

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Surge Tank Fuel Sump Drain Valve Removal

SUBTASK 28-11-21-480-001

- (1) Put the adapter, SPL-1764, into the drain valve assembly [1].
 - (a) Make sure the hexagonal surfaces of the tool touch the valve body correctly.

SUBTASK 28-11-21-020-001

- (2) Remove the drain valve assembly [1] from the valve bushing.
 - (a) Push the tool up to prevent fuel leakage during this procedure.
 - (b) Loosen and remove the drain valve assembly [1] from the valve bushing.
 - (c) Discard the O-ring [2].

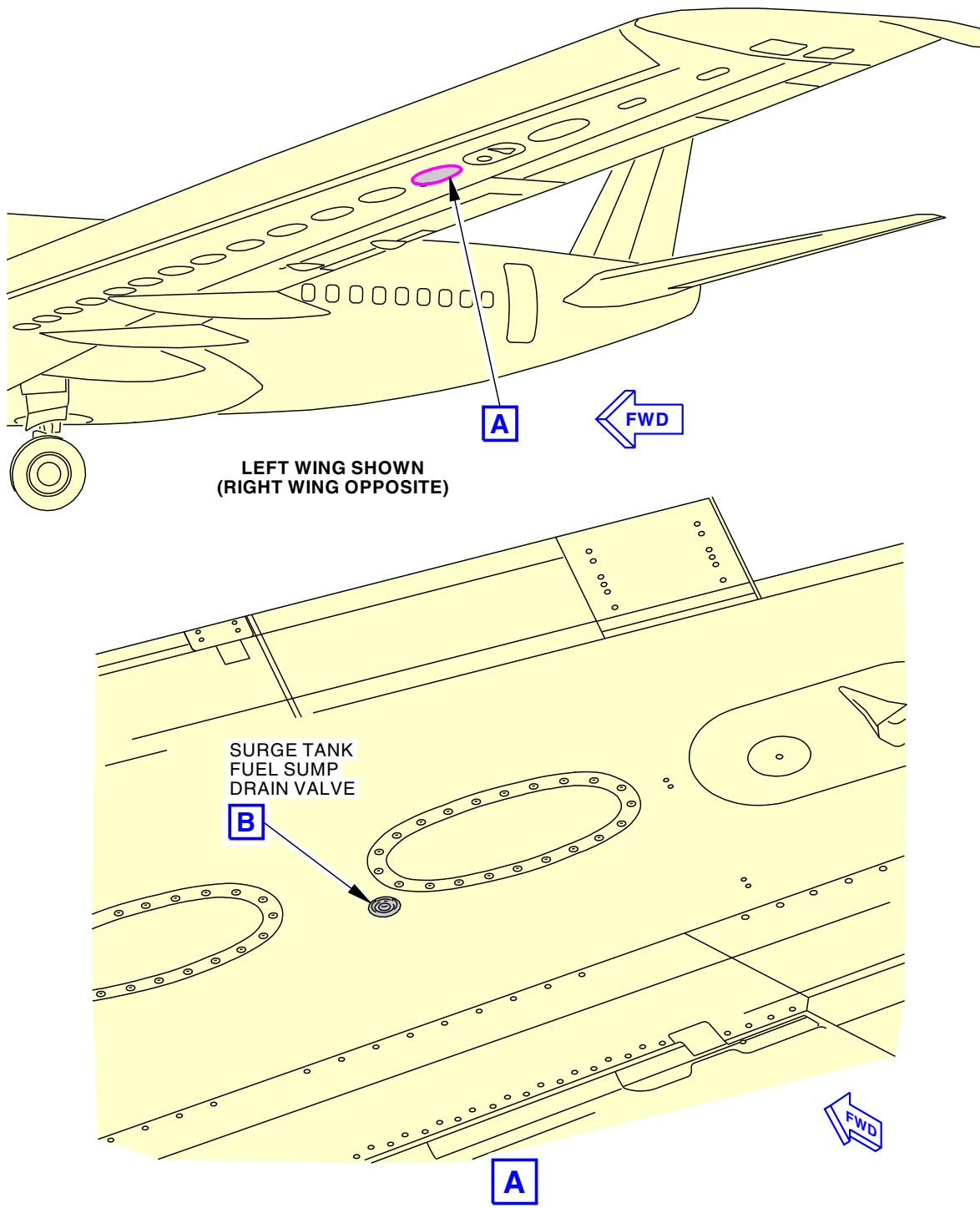
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LOM ALL

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F50045 S0006571319_V2

Surge Tank Fuel Sump Drain Valve Installation
Figure 401/28-11-21-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

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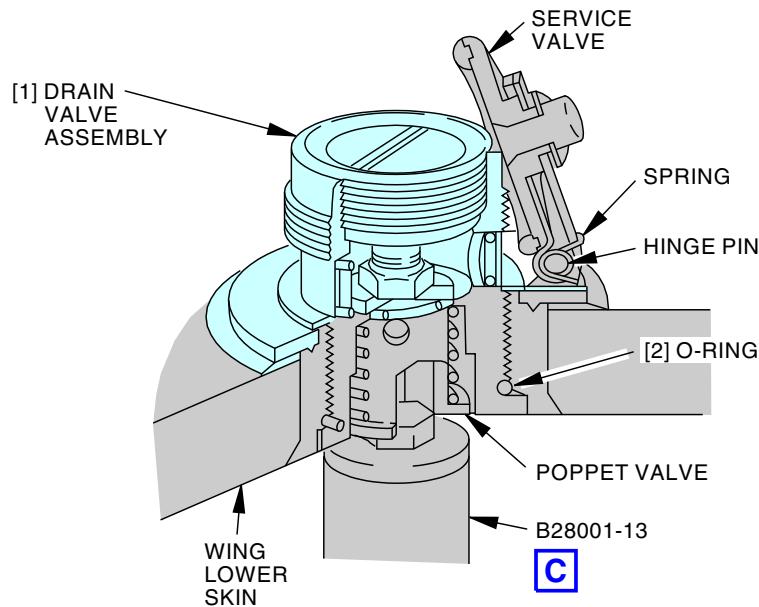
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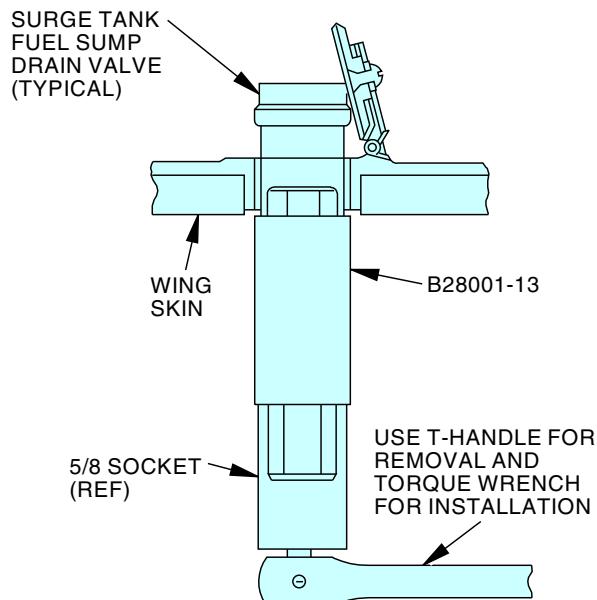


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SURGE TANK FUEL SUMP DRAIN VALVE

B



C

F58307 S0006571320_V2

Surge Tank Fuel Sump Drain Valve Installation
Figure 401/28-11-21-990-801 (Sheet 2 of 2)

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TASK 28-11-21-400-801

3. Surge Tank Fuel Sump Drain Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install Surge Tank Fuel Sump Drain Valve.

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1764	Adapter - Removal/Installation, Sump Drain Valve
	Part #: B28001-13 Supplier: 81205
	Part #: B28001-18 Supplier: 81205
	Opt Part #: SE28-1103 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Drain valve assembly	28-11-61-02-040	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-060	LOM 447, 450-999
2	O-ring	28-11-61-02-045	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-065	LOM 447, 450-999

E. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Surge Tank Fuel Sump Drain Valve Installation

SUBTASK 28-11-21-160-001

- (1) Clean the drain valve in the solvent, B00083, until the screen and the drain valve are free of all unwanted material.

SUBTASK 28-11-21-640-001

- (2) Lightly lubricate the new O-ring seal with some fuel.

SUBTASK 28-11-21-420-001

- (3) Put the O-ring [2] in the correct position on the drain valve assembly [1].

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SUBTASK 28-11-21-420-002



CAUTION

MAKE SURE THAT YOU PUT THE THREADS OF THE VALVE AND THREADS OF THE BUSHING TOGETHER CORRECTLY. DAMAGE TO THE THREADS CAN OCCUR.

- (4) Carefully install the valve in the bushing and tighten it with your hand.

SUBTASK 28-11-21-480-002

- (5) Put the adapter, SPL-1764, into the drain valve assembly [1].
 - (a) Make sure the hexagonal surfaces of the tool touch the mating valve surfaces correctly.

SUBTASK 28-11-21-420-003

- (6) Tighten the drain valve assembly [1] into the valve bushing.
 - (a) Push the tool up to prevent fuel leakage during this procedure.
 - (b) Tighten the drain valve assembly [1] into the valve bushing with the drain valve tool.
 - (c) Continue to tighten the valve assembly to a torque of 200 in-lb (23 N·m) - 220 in-lb (25 N·m).

———— END OF TASK ————

TASK 28-11-21-000-802

4. Surge Tank Fuel Sump Flapper Valve Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the surge tank fuel sump flapper valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Access Panels

Number	Name/Location
533AB	Surge Tank Access Door - Wing Station 655
633AB	Surge Tank Access Door - Wing Station 655

E. Prepare for the Removal

SUBTASK 28-11-21-650-001



WARNING

DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Defuel the applicable tank and prepare to go into it (TASK 28-11-00-910-802).

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SUBTASK 28-11-21-010-001

- (2) Remove the applicable access doors from the surge tank:
(TASK 28-11-11-000-802)

Number Name/Location

533AB Surge Tank Access Door - Wing Station 655
633AB Surge Tank Access Door - Wing Station 655

F. Surge Tank Fuel Sump Flapper Valve Removal

SUBTASK 28-11-21-020-002

- (1) Remove the flapper valve assembly [21].
(a) Remove the bolt [22].
(b) Unfold half-links and remove the flapper valve assembly [21] from the drain valve bushing.

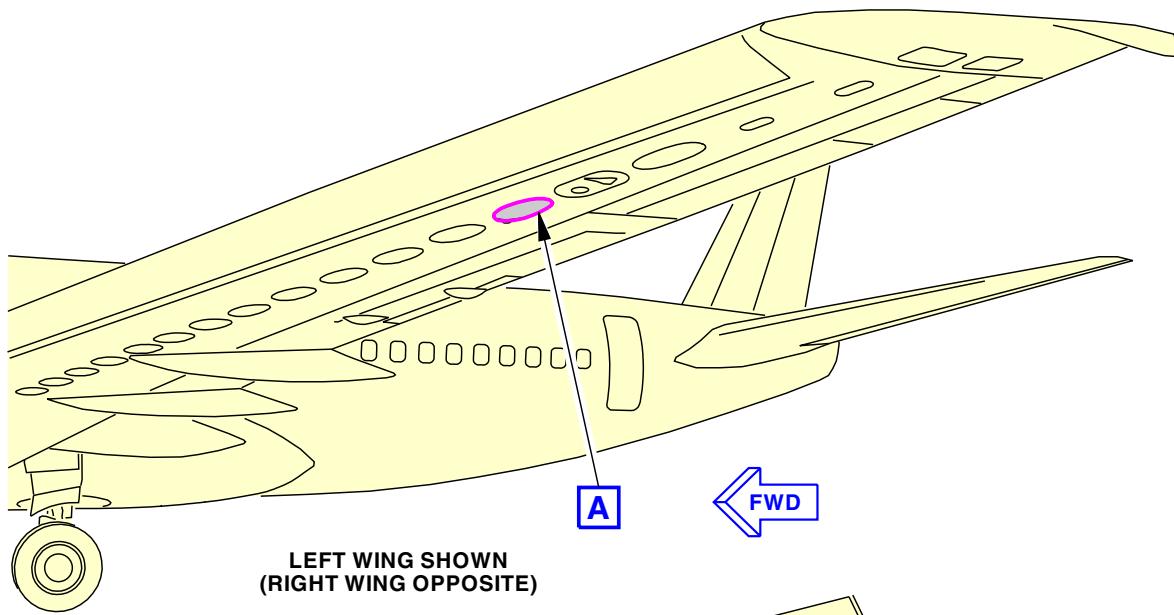
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EFFECTIVITY
LOM ALL

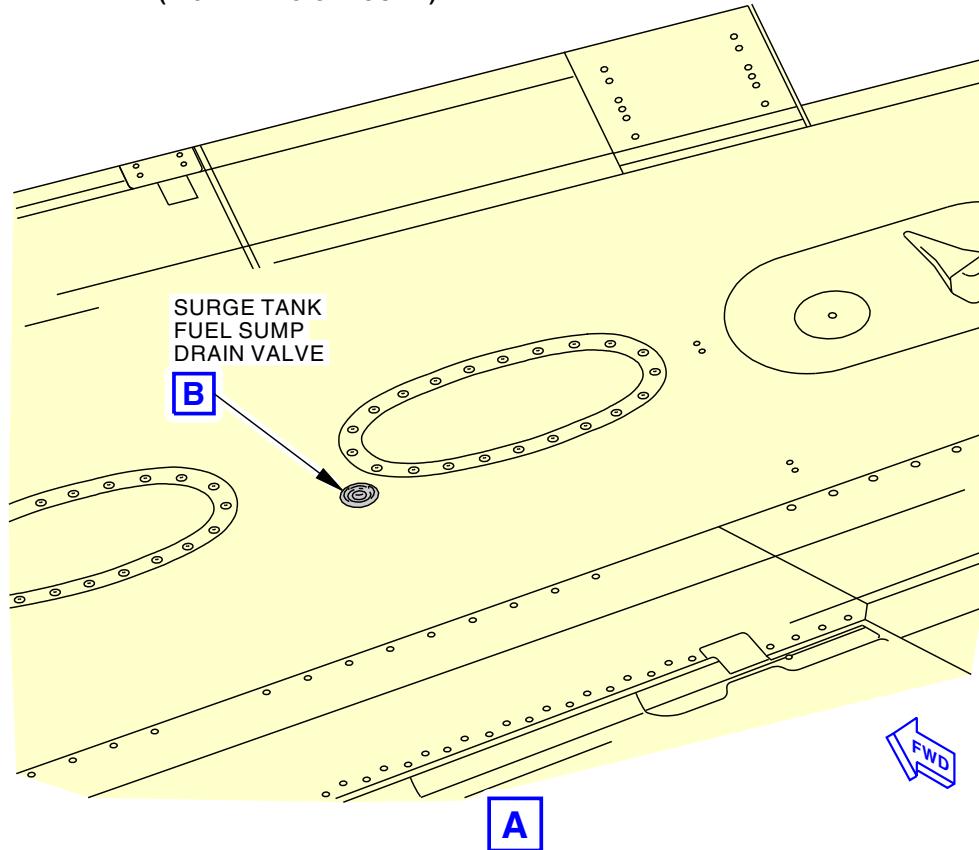
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LEFT WING SHOWN
(RIGHT WING OPPOSITE)



SURGE TANK
FUEL SUMP
DRAIN VALVE

F50045 S0006571319_V2

Surge Tank Fuel Sump Flapper Valve Installation
Figure 402/28-11-21-990-802 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

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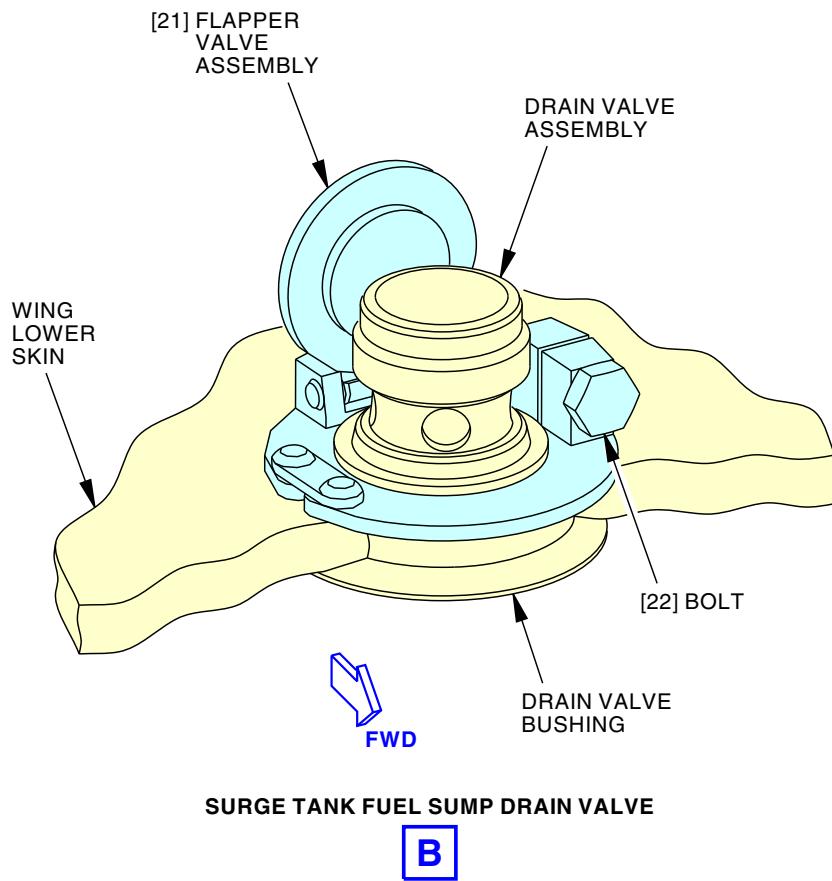
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2984112 S0000761477_V1

Surge Tank Fuel Sump Flapper Valve Installation
Figure 402/28-11-21-990-802 (Sheet 2 of 2)

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LOM ALL

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TASK 28-11-21-400-802

5. Surge Tank Fuel Sump Flapper Valve Installation

(Figure 402)

A. General

- (1) This task gives instructions to install the surge tank fuel sump flapper valve.

B. References

Reference	Title
28-11-11-400-802	Surge Tank Access Door (533AB, 533CB, 633AB, 633CB) - Installation (P/B 401)

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Access Panels

Number	Name/Location
533AB	Surge Tank Access Door - Wing Station 655
633AB	Surge Tank Access Door - Wing Station 655

E. Prepare for the Installation

SUBTASK 28-11-21-210-001

- (1) Make sure that the seal surfaces of the flapper valve assembly [21] and bushing are clean and in a good condition.

F. Surge Tank Fuel Sump Flapper Valve Installation

SUBTASK 28-11-21-420-004

- (1) Install the flapper valve assembly [21].
- Put the flapper valve assembly [21] in its position by opening at hinge.
 - Fit the flapper valve assembly [21] over undercut in the bushing.
NOTE: Orientation of flapper valve is optional.
 - Fold half-links and instal the bolt [22].
- 1) Tighten the bolt [22] to 16 in-lb (1.8 N·m) - 18 in-lb (2.0 N·m).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-21-410-001

- (1) Install the applicable surge tank access doors:
(TASK 28-11-11-400-802)

Number	Name/Location
533AB	Surge Tank Access Door - Wing Station 655
633AB	Surge Tank Access Door - Wing Station 655

— END OF TASK —



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CENTER TANK ACCESS DOOR - REMOVAL/INSTALLATION

1. General

- A. There are five access doors for the center wing fuel tank. Two access doors are on the lower left wing surface (531AB, 531BB from inboard to outboard respectively). Two access doors are on the lower right wing surface (631AB, 631BB from inboard to outboard respectively). There is one access door (131AB) in the center wing section.
- B. This procedure contains two tasks. The first task removes a center tank access door. The second task installs a center tank access door.

TASK 28-11-31-000-801

2. Center Tank Access Door Removal

(Figure 401, Figure 402, Figure 403)

A. General

- (1) This task gives instructions to remove the Center Tank Access Door.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
21-51-07-000-802-002	Conditioned Air Check Valve Removal (P/B 401)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
36-13-01-000-804	Crossover Duct Removal (P/B 401)
47-32-01-000-801	NGS Shutoff Valve Removal (P/B 401)
47-32-02-000-801	Ozone Converter - Removal (P/B 401)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Access Panels

Number	Name/Location
131AB	Center Tank Access
192CL	ECS Access Door
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

E. Center Tank Access Door Removal

SUBTASK 28-11-31-650-001

- (1) Defuel the center fuel tank (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).



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SUBTASK 28-11-31-010-001

- (2) Find the applicable access door [1] or access door [6] on the lower wing surface.

NOTE: There is no access between the center wing section and the left center fuel tank or the right center fuel tank.

- (a) Make sure that the applicable access door is opened for the scheduled task.

- 1) The access doors for the left center fuel tank are:

Number Name/Location

531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192

- 2) The access doors for the right center fuel tank are:

Number Name/Location

631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

- 3) The access door for the center wing section is:

Number Name/Location

131AB	Center Tank Access
-------	--------------------

SUBTASK 28-11-31-010-002

- (3) To remove the access door [8], do these steps:

- (a) Open this access door:

(TASK 06-41-00-800-801)

Number Name/Location

192CL	ECS Access Door
-------	-----------------

- (b) If it is necessary, remove the conditioned air check valve and sense line
(TASK 21-51-07-000-802-002).

- (c) If it is necessary, remove the crossover manifold duct (TASK 36-13-01-000-804).

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

- (d) If it is necessary, do this task: NGS Shutoff Valve Removal, TASK 47-32-01-000-801.
(e) If it is necessary, do this task: Ozone Converter - Removal, TASK 47-32-02-000-801.

LOM ALL

SUBTASK 28-11-31-940-001



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU
IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL,
CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (4) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-11-31-020-005

- (5) Hold the clamp ring [4] on the access door [1], access door [6], or access door [8] and remove the mounting bolts [3].

- (a) Keep the removed mounting bolts [3] with the applicable access door [1], access door [6], or access door [8] and/or check grip length before installing new mounting bolts [3].

EFFECTIVITY
LOM ALL

28-11-31



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SUBTASK 28-11-31-020-006

- (6) Remove the clamp ring [4] and the aluminum gasket [2].
 - (a) Discard the aluminum gasket [2].

NOTE: It is not recommended, but if it is necessary, re-use the aluminum gasket.

SUBTASK 28-11-31-020-001



CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.



CAUTION

DO NOT USE A TOOL TO LIFT THE EDGES OF THE ACCESS DOOR TO THE FUEL TANK. THE LOWER SURFACE OF THE ACCESS DOOR FLANGE AND THE TOP SURFACE OF THE WING SKIN AROUND THE ACCESS DOORS ARE SEAL SURFACES. YOU CAN CAUSE SCRATCHES OR OTHER DAMAGE TO THE SEAL SURFACE.

- (7) Push up on the access door [1], access door [6], or access door [8].
 - (a) If the access door [1], access door [6], or access door [8] does not move freely, use a rubber mallet and hit lightly around the access door.

SUBTASK 28-11-31-020-002

- (8) Remove the access door.

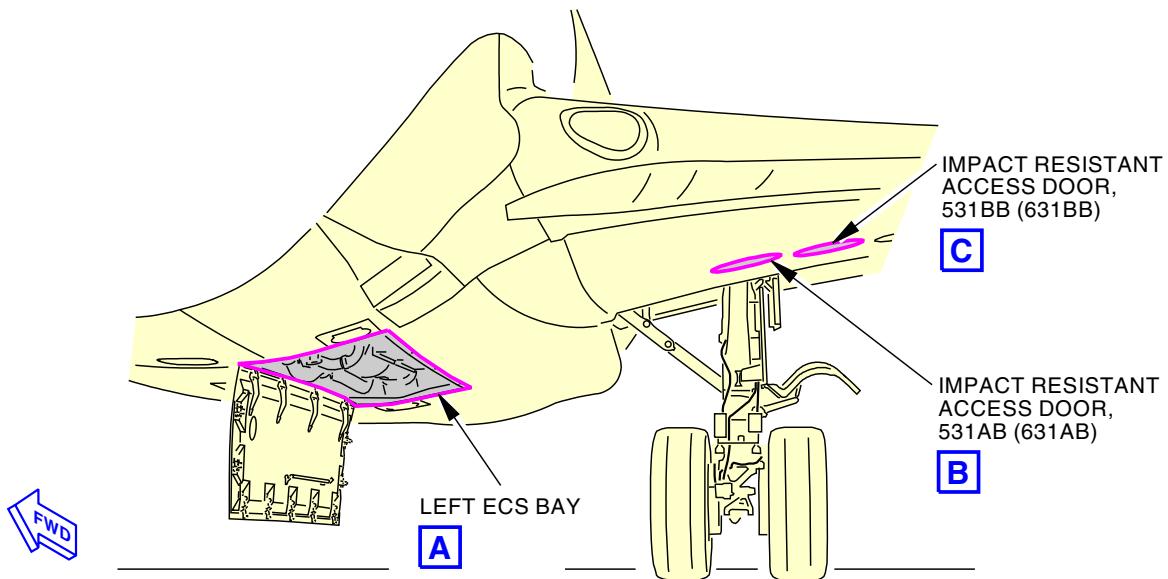
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EFFECTIVITY
LOM ALL

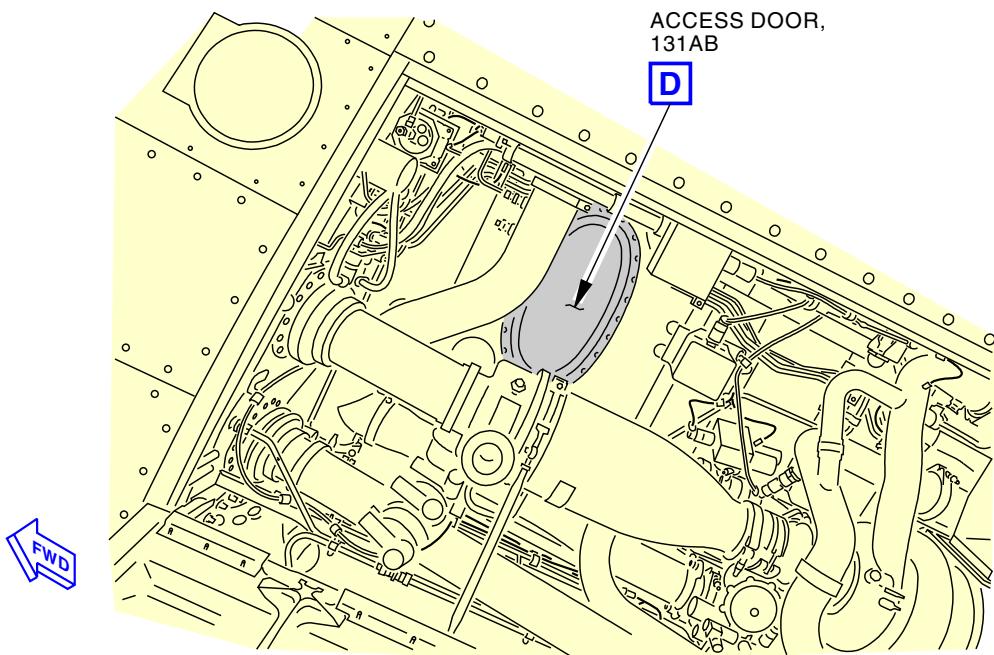
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LEFT WING
(RIGHT WING IS OPPOSITE)



LEFT ECS BAY



F70155 S0006571325_V2

Center Tank Access Door Installation
Figure 401/28-11-31-990-801 (Sheet 1 of 4)

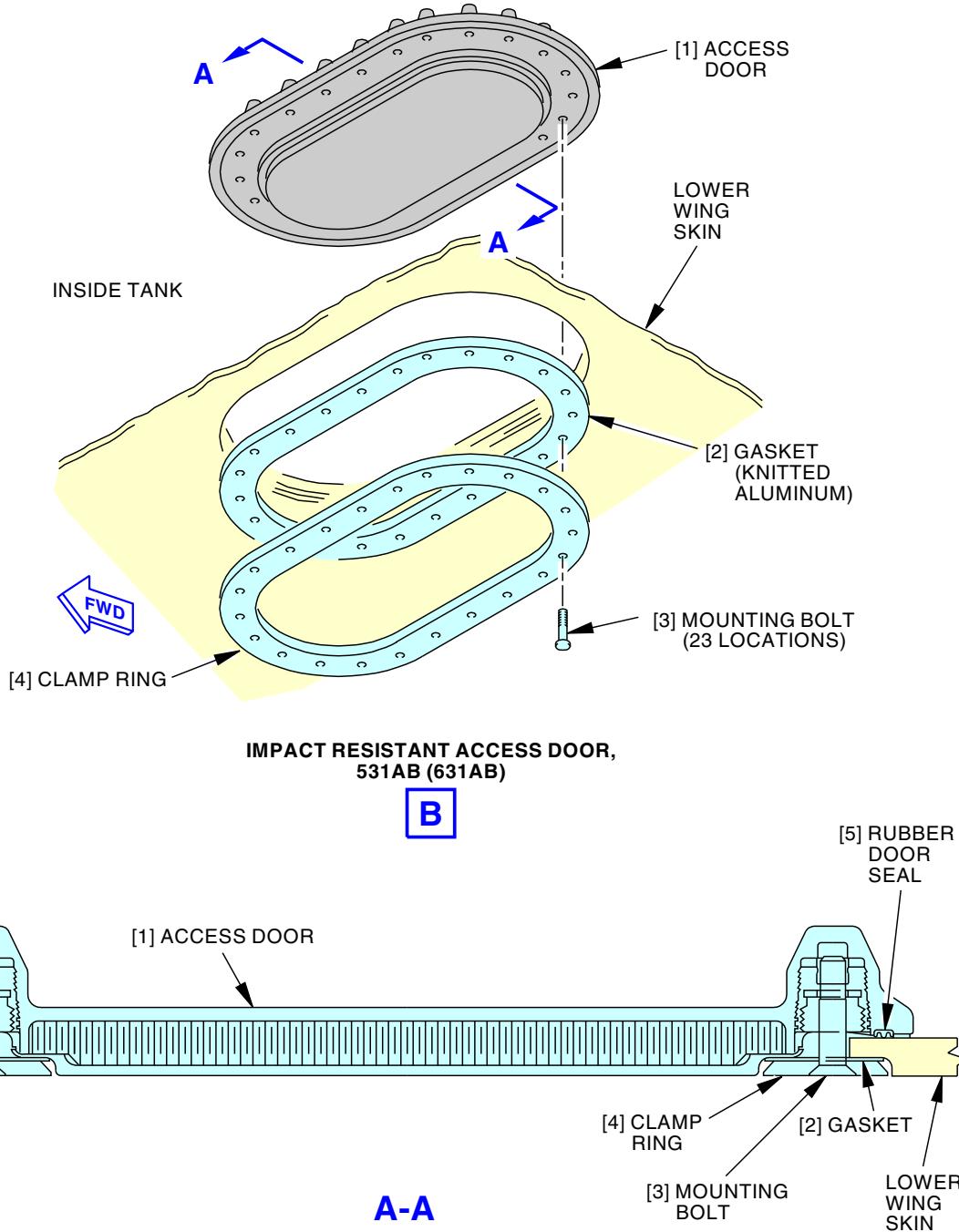
EFFECTIVITY
LOM ALL

28-11-31

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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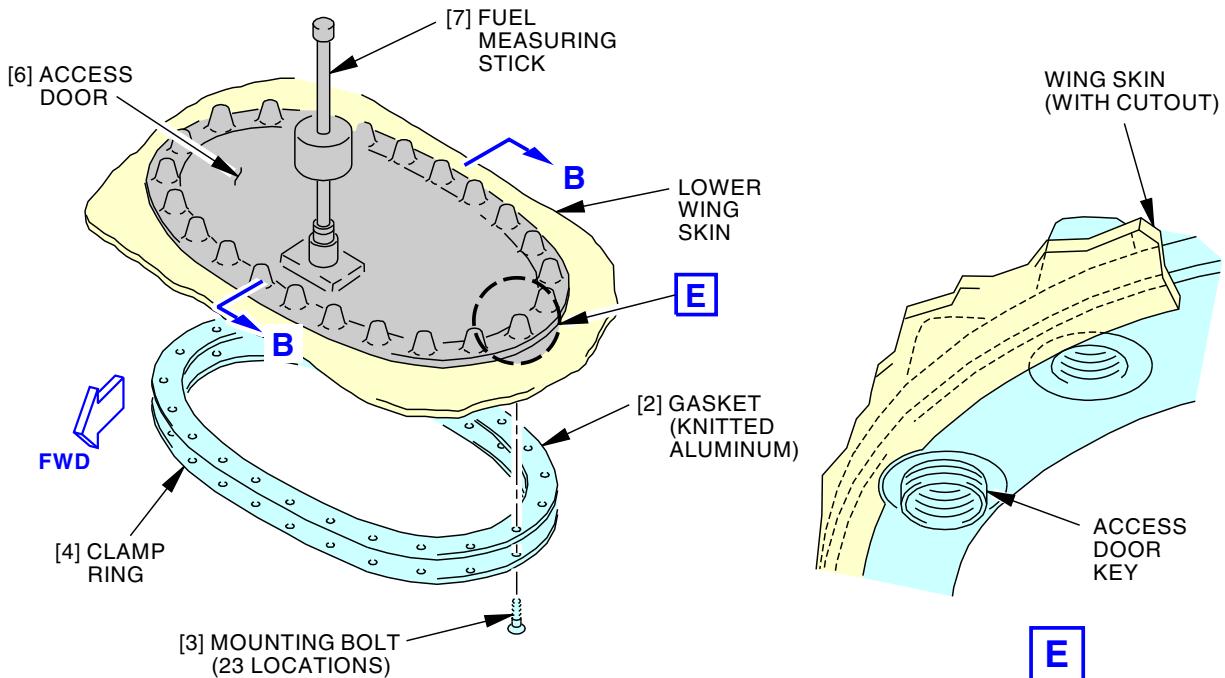
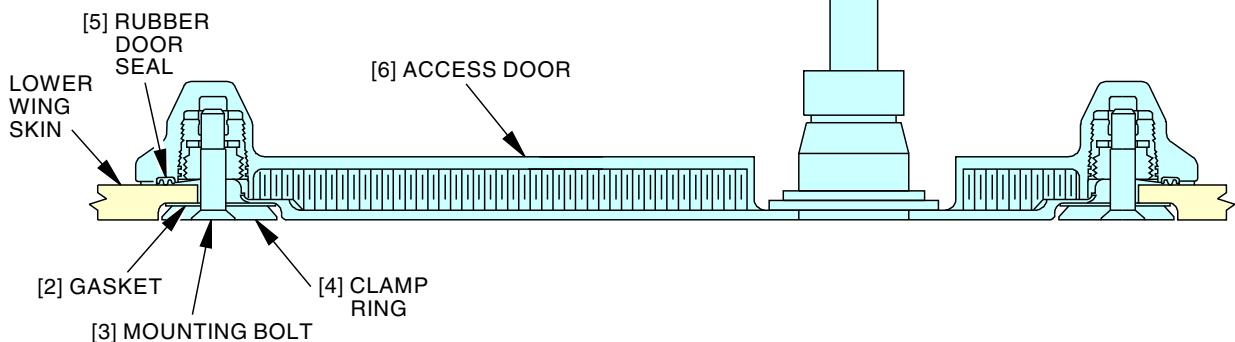
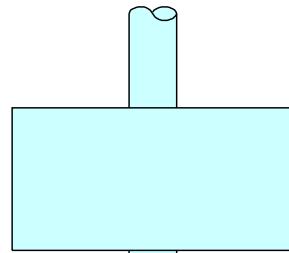


1889602 S0000342840_V2

**Center Tank Access Door Installation
Figure 401/28-11-31-990-801 (Sheet 2 of 4)**

EFFECTIVITY
LOM ALL

28-11-31

**737-600/700/800/900
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**IMPACT RESISTANT ACCESS DOOR,
531BB (631BB)**
C

B-B

1889603 S0000342843_V3

**Center Tank Access Door Installation
Figure 401/28-11-31-990-801 (Sheet 3 of 4)**

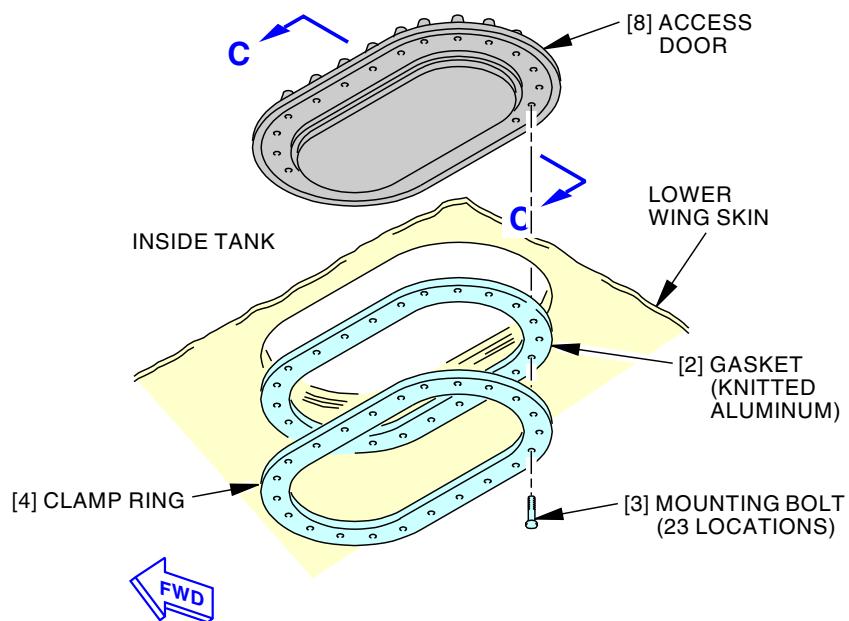
 EFFECTIVITY
LOM ALL

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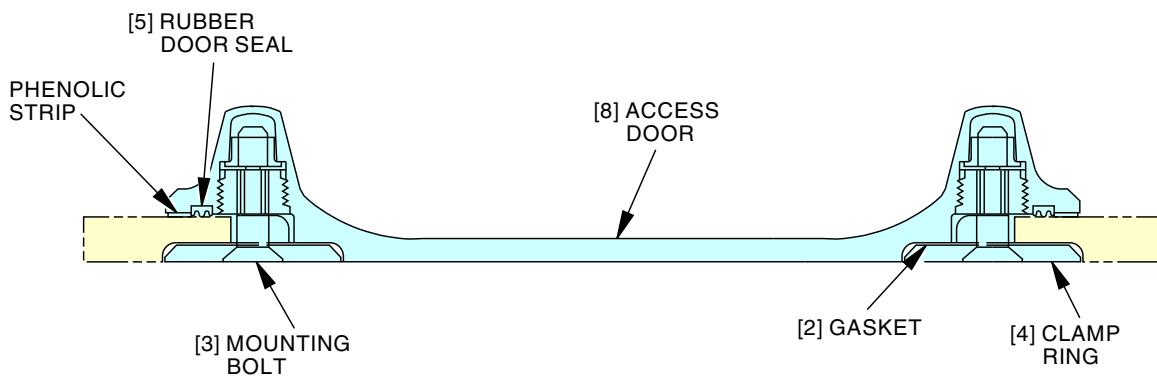


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AIRCRAFT MAINTENANCE MANUAL



CENTER TANK ACCESS DOOR, 131AB

D



F70308 S0006571328_V3

Center Tank Access Door Installation
Figure 401/28-11-31-990-801 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

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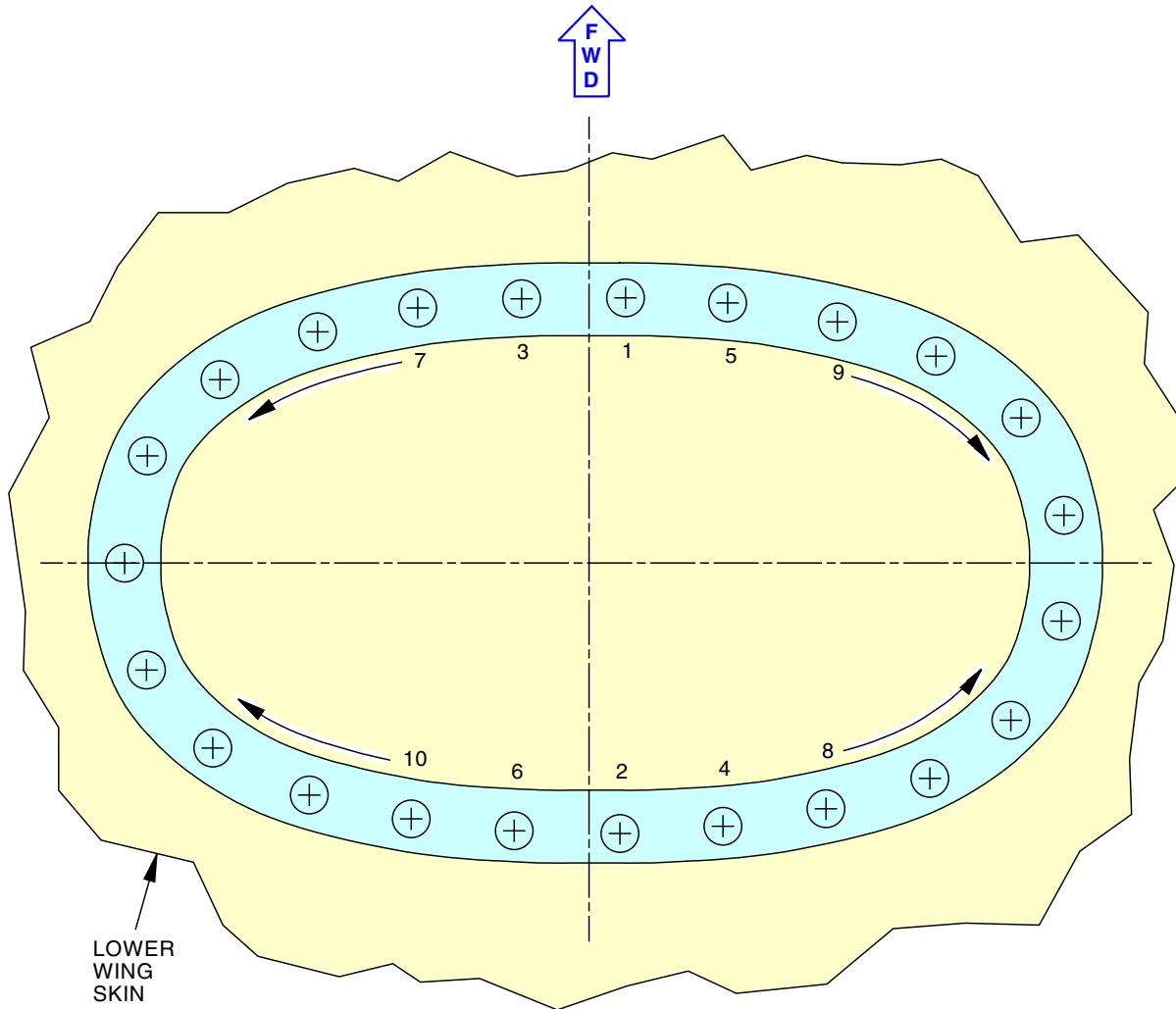
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NOTE:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS. THIS WILL MAKE SURE FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

L45921 S0006571329_V2

Access Panel Mount Bolt Torque Pattern
Figure 402/28-11-31-990-802

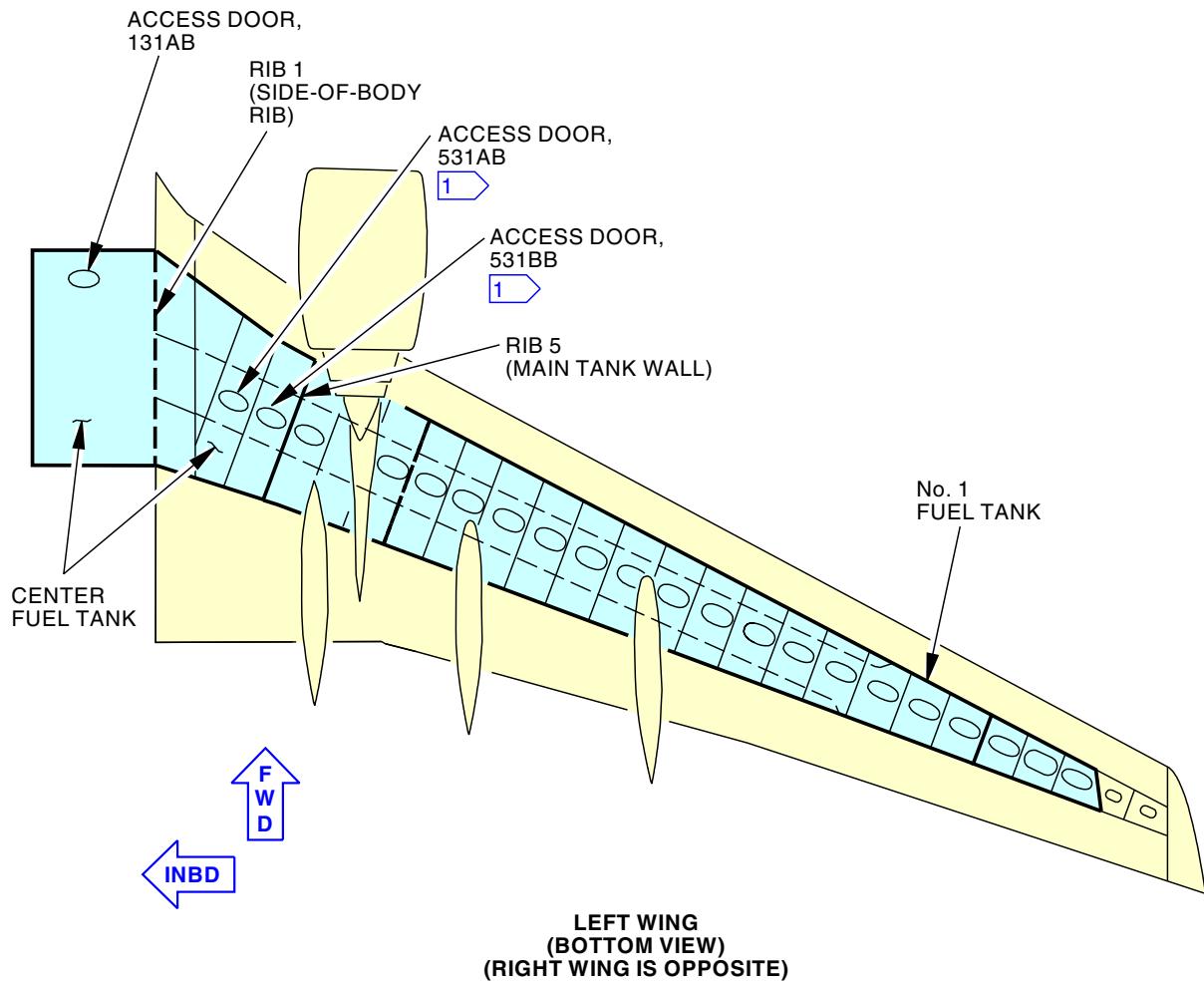
EFFECTIVITY
LOM ALL

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D633A101-LOM

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1 HIGH IMPACT RESISTANT ACCESS DOOR

M05328 S0006571330_V4

Center Tank Access Doors - Plan View
Figure 403/28-11-31-990-803

EFFECTIVITY
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D633A101-LOM

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TASK 28-11-31-400-801

3. Center Tank Access Door - Installation

(Figure 401, Figure 402)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.
- (2) Mobilgrease 33, D50306, is the recommended material for access door gasket installations. The Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237 (BMS 3-38), can be used for access door gaskets.
- (3) Do not mix the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237. If a gasket filled with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, is replaced with a gasket filled with Mobilgrease 33, D50306, remove all Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the clamp ring and access door structure on the airplane. If a gasket filled with Mobilgrease 33, D50306, is replaced with a gasket filled with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, remove all Mobilgrease 33, D50306, from the clamp ring and the access door structure on the airplane.
- (4) These center tank access doors are high impact resistant doors and they must not be replaced with a standard door:

Number Name/Location

531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

- (5) It is recommended, that a new aluminum gasket [2] be used every time the center tank access doors are installed.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
21-51-07-400-802-002	Conditioned Air Check Valve Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-11-900-801	Rubber Door Seal - Replacement (P/B 801)
28-22-41-420-801	Fuel Boost Pump and Override Pump Priming (P/B 401)
36-13-01-000-805	Crossover Duct Installation (P/B 401)
47-32-01-400-801	NGS Shutoff Valve Installation (P/B 401)
47-32-02-400-801	Ozone Converter - Installation (P/B 401)

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C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Access door	28-11-11-02A-230 28-11-11-02A-235	LOM ALL
6	Access door	28-11-11-02A-220 28-11-11-02A-225	LOM ALL
8	Access door	28-11-11-02A-240	LOM ALL

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Access Panels

Number	Name/Location
131AB	Center Tank Access
192CL	ECS Access Door
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

G. Prepare for Access Door Installation

SUBTASK 28-11-31-410-002

- (1) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

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SUBTASK 28-11-31-210-001

28-AWL-16: CDCCL

- (2) Make sure that the areas on the access door [1], access door [6], or access door [8], clamp ring [4] and the lower wing skin electrical faying surfaces are clean and have no visible corrosion.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- (a) If it is necessary, use solvent, B00083, to clean the surfaces.

SUBTASK 28-11-31-210-003

- (3) Make sure that the rubber door seal [5] is in good condition and secure.

- (a) Clean the rubber seal with a clean cotton wiper, G00034, moist with solvent, B00316.
(b) Look for areas of deterioration on the rubber seal.
(c) If it is necessary, replace the rubber door seal [5] (TASK 28-11-11-900-801).
(d) Apply a thin layer of grease, D00504, to the rubber door seal [5].

NOTE: This will prevent damage to the rubber seal during subsequent access panel removal. It will also be easier to remove the access panel.

H. Prepare the Knitted Aluminum Gasket for Installation

SUBTASK 28-11-31-840-001

- (1) To prepare a new knitted aluminum gasket [2] for installation (recommended procedure), do these steps:
(a) Clean the clamp ring [4] surface with solvent, B00083.
(b) Use abrasive mat, G00251, to remove dried corrosion inhibiting compound.

28-AWL-16: CDCCL

- (c) Make sure that both sides of the new knitted aluminum gasket [2] are filled with the correct Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

- (d) Do a check of the manufacturing date (shelf-life) information on the replacement gasket container.

28-AWL-16: CDCCL

- 1) If the aluminum gasket [2] is more than five years old from the manufacturing date, do these steps:

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- a) Vapor degrease the old Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the aluminum gasket [2].

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- <1> Vapor degrease the aluminum gasket [2] if the original grease or anti-corrosion compound is switched to a different gasket filling material.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- b) Refill (re-impregnate) the aluminum gasket [2] with 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of new Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to make sure that both sides of the aluminum gasket [2] are filled before installation.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: If the aluminum mesh isn't filled with the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the spaces with no grease or anti-corrosion compound can collect water. Do not apply too much grease or anti-corrosion compound or it can move out to the wing surface.

- 2) If the aluminum gasket [2] is less than five years old from the manufacturing date, then it is not necessary to remove the old Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

- (e) Put a new aluminum gasket carrier tray package face up on a flat surface.
(f) Remove the paper cover from the carrier tray.
(g) Since the hole locations are symmetrical, carefully put the clamp ring [4] on the aluminum gasket [2] (with the countersunk end of the holes face up) so that the clamp ring [4] and aluminum gasket [2] holes align.
(h) Push the clamp ring [4] on the aluminum gasket [2] until the clamp ring [4] is tightly against the aluminum gasket [2].
(i) Remove the clamp ring [4], aluminum gasket [2], and release strip from the carrier tray as a unit.
(j) Put the unit, with the aluminum gasket [2] side turned up, on a flat surface.
(k) Remove the release strip from the aluminum gasket [2].

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SUBTASK 28-11-31-840-002

- (2) To prepare a used knitted aluminum gasket [2] for installation (alternate procedure), do these steps:

- (a) Clean the clamp ring [4] surface and aluminum gasket [2] with a cotton wiper, G00034, that is moist with solvent, B00083.
- (b) Use abrasive mat, G00251, to remove dried corrosion inhibiting compound.

28-AWL-16: CDCCL

- (c) A used aluminum gasket [2] that meets the criteria that follows can be installed:

NOTE: A gasket that meets 4) but does not meet 1) through 3) criteria may be used for a maximum duration of 30 days and then must be replaced with a gasket that meets all the criteria listed below.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 1) No fastener holes are torn.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 2) Gasket is not elongated or out of shape.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 3) Gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

- 4) No more than 10% of strands in the layer(s) are broken through in any one area.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- (d) Apply a layer of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237 to both sides of the aluminum gasket [2] to make sure that both sides of the aluminum gasket [2] are filled before installation.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- 1) Vapor degrease the aluminum gasket [2] if the original grease or anti-corrosion compound is switched to a different gasket filling material.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

► 28-AWL-16: CDCCL

- 2) Refill (re-impregnate) the aluminum gasket [2] with 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of new Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to make sure that both sides of the aluminum gasket [2] are filled before installation.

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: If the aluminum mesh isn't filled with the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the spaces with no grease or anti-corrosion compound can collect water. Do not apply too much grease or anti-corrosion compound or it can move out to the wing surface.

- (e) Make sure that the grease or anti-corrosion compound layer is continuous on the aluminum gasket [2].

I. Inspect the Access Door

► 28-AWL-16: CDCCL

SUBTASK 28-11-31-210-009

- (1) Make sure that there is a phenolic strip around the outermost periphery of the center tank access door, 131AB, that mates with the wing skin inside the tank.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-31-210-012

- (2) Make sure that there are no cracks in the nut domes of the access door [1], access door [6], or access door [8].

NOTE: Paint flaking or bulging can show cracks in the nut domes of the access door.

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- (a) Make sure that the clamp ring [4] and aluminum gasket [2] holes align to prevent a fuel tank access door nut dome from cracking.
 - 1) Do not use excessive Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

SUBTASK 28-11-31-370-001

- (3) If there are no cracks and paint is flaked or bulged, repair the finish paint.

NOTE: A paint flaking can potentially cause a fuel leak.

SUBTASK 28-11-31-200-001

- (4) Make sure that the nut domes of the access door [1], access door [6], or access door [8] are free of unwanted contamination.

J. Install the Access Door

SUBTASK 28-11-31-420-008

- (1) Put the access door [1] and access door [8] without fuel measuring sticks in the fuel tank and set the door in the opening.

SUBTASK 28-11-31-420-001



CAUTION BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

- (2) Put the access door [6] in the fuel tank at an angle so the fuel measuring stick [7] does not touch the stringers at the top of the fuel tank and set the door in the opening.

NOTE: Access doors with fuel measuring sticks have a door key (Figure 401, View E).

- (a) Make sure that the door key is installed correctly in the lower wing skin.

SUBTASK 28-11-31-100-001

- (3) Clean the clamp ring [4] surface with solvent, B00083.

SUBTASK 28-11-31-210-006

- (4) Make sure that the clamp ring [4] and aluminum gasket [2] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-31-640-001



CAUTION DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

► 28-AWL-16: CDCCL

- (5) Apply a thin layer of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [2] for the access door [1], access door [6], or access door [8].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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► 28-AWL-16: CDCCL

- (a) Make sure that the same grease or anti-corrosion material is used that is on the aluminum gasket [2].

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-31-420-005

- (6) Set and hold the aluminum gasket [2] and the clamp ring [4] in the opening between the outside face of access door [1], access door [6] or access door [8] and the wing skin while the mounting bolts [3] are installed for the access door [1], access door [6], or access door [8].

SUBTASK 28-11-31-640-003

- (7) Apply a thin layer of Cor-Ban 27L Compound, G50237 (preferred), or compound, C00528 (alternate), to the threads and shank of the mounting bolts [3].

SUBTASK 28-11-31-420-007



DO NOT USE MOUNTING BOLTS WITH A LONGER GRIP LENGTH. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR.

CAUTION

► 28-AWL-16: CDCCL

- (8) Tighten the mounting bolts [3] to 35 ± 5 in-lb (4 ± 1 N·m).

NOTE: CDCCL - refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: It is allowed to use the mounting bolts with one grip length shorter to meet the flushness and tightness requirements.

NOTE: It is recommended to re-torque the access door mounting bolts within 60 days and again at 12 months after installation of gaskets if Cor-Ban 27L compound was applied. This is to reduce clamp-up loss on the access door.

- (a) Start at the centerline and tighten the mounting bolts [3] equally in both directions (Figure 402).
- (b) Make sure that the heads of the mounting bolts [3] are flush to the adjacent surface within -0.010 in. (-0.254 mm) to 0.002 in. (0.051 mm) and are not loose.

K. Post-Installation Test

SUBTASK 28-11-31-650-002

- (1) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-11-31-210-007

- (2) To make sure that there is no fuel leakage at the applicable access door, do this task: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-31-650-003

- (1) After the applicable tank is refueled and a check for leaks is done, do this task: Fuel Boost Pump and Override Pump Priming, TASK 28-22-41-420-801.

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SUBTASK 28-11-31-010-003

- (2) Examine the applicable access door [1], access door [6], or access door [8] on the lower wing surface.

- (a) The access doors for the left center fuel tank are:

<u>Number</u>	<u>Name/Location</u>
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192

- (b) The access doors for the right center fuel tank are:

<u>Number</u>	<u>Name/Location</u>
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

- (c) The access door for the part of the center fuel tank in the wing center section is:

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access

SUBTASK 28-11-31-410-001

- (3) If the access door [8] was removed, do these steps:

**LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB
737-47-1003**

- (a) If the ozone converter is removed, reinstall it (TASK 47-32-02-400-801).
(b) If the Nitrogen Generation System (NGS) Shutoff Valve (SOV) is removed, reinstall it (TASK 47-32-01-400-801).

LOM ALL

- (c) If the crossover manifold duct is removed, reinstall it (TASK 36-13-01-000-805).
(d) If the conditioned air check valve and sense line are removed, reinstall them (TASK 21-51-07-400-802-002).
(e) Close this access door:
(TASK 06-41-00-800-801)

<u>Number</u>	<u>Name/Location</u>
192CL	ECS Access Door

———— END OF TASK ————

EFFECTIVITY
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CENTER TANK SUMP DRAIN VALVE - REMOVAL/INSTALLATION

1. General

- A. The sump drain valve is a poppet type of check valve operated with a spring. It is installed in the center tank at the bottom of the second bay in the center of the bay.
- B. You operate the sump drain valve with a rod attached to the valve. The sump drain valve has a thread which attaches it to the valve bushing on the bottom surface of the center fuel tank. When the sump drain valve is removed, the flapper type service valve closes to prevent the fuel from draining. Thus, it is not necessary to drain the center tank to remove the sump drain valve. Access to the sump drain valve is through the wing to body fairing through the sump drain access door and the access hole in the left ECS bay.

TASK 28-11-41-000-801

2. Sump Drain Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Sump Drain Valve.

B. References

Reference	Title
20-10-17-000-801	O-Rings Removal (P/B 401)
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Access Panels

Number	Name/Location
192CL	ECS Access Door
192G	Sump Drain Access Door

E. Sump Drain Valve Removal

SUBTASK 28-11-41-010-001

- (1) To get access to the bonding jumper [4] on the sump drain valve [1], do this step:

Open this access panel:

Number	Name/Location
192CL	ECS Access Door

SUBTASK 28-11-41-010-002

- (2) To get access to the keel beam access holes, remove the air condition duct section in the left and right ECS bays.

SUBTASK 28-11-41-010-003

- (3) Look through the access hole to find the parts that attach the bonding jumper [4] to the sump drain valve [1].

SUBTASK 28-11-41-020-001

- (4) Remove the bolt [6], washers [7], and nut [8] that attach the bonding jumper to the sump drain valve.

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SUBTASK 28-11-41-010-004

- (5) Open this access panel:

Number Name/Location

192G Sump Drain Access Door

NOTE: The is in the wing to body fairing between the two ECS access doors.

SUBTASK 28-11-41-020-002

- (6) Remove the bolts [10] that hold the cover plate [9] to the drain well structure.

SUBTASK 28-11-41-020-003

- (7) Remove the lockwire that attaches the hexagonal fitting on the sump drain valve [1] to the cover plate [9] (TASK 20-10-44-000-801).

SUBTASK 28-11-41-020-004

- (8) Remove the cover plate [9] from the sump drain valve [1].

SUBTASK 28-11-41-020-005

- (9) Do these steps to remove the sump drain valve:

- (a) Turn the sump drain valve counterclockwise to remove it from the bushing [3].

NOTE: You can use a deep socket wrench to turn the drain valve by a hex fitting on the bottom of the sump drain valve [1].

- (b) Lower the sump drain valve [1] down in a straight line through the valve door opening to remove it.

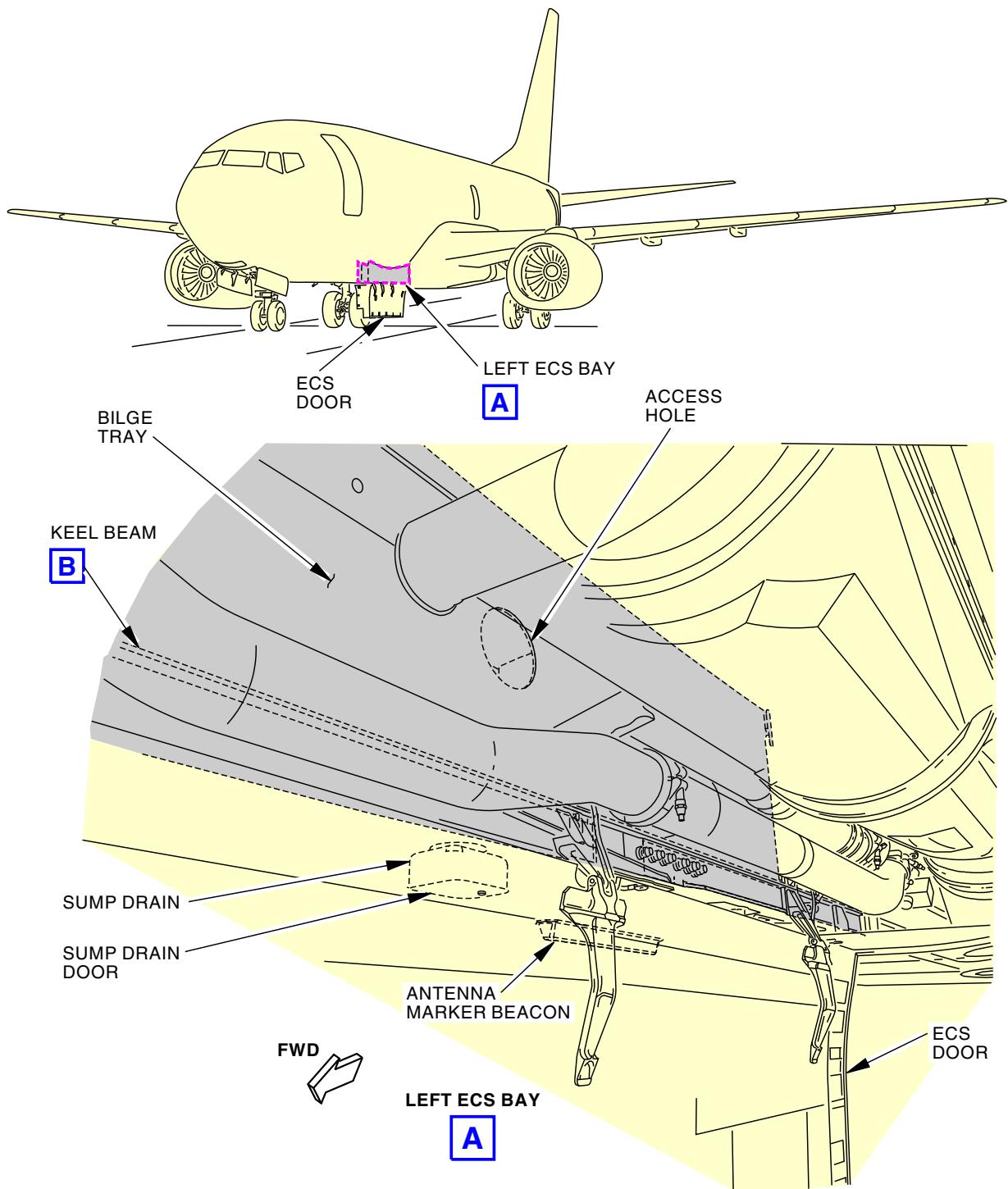
NOTE: You can use one hand through the access hole to help to guide the valve.

- (c) Remove and discard the O-ring [2] from the sump drain valve [1] (TASK 20-10-17-000-801).

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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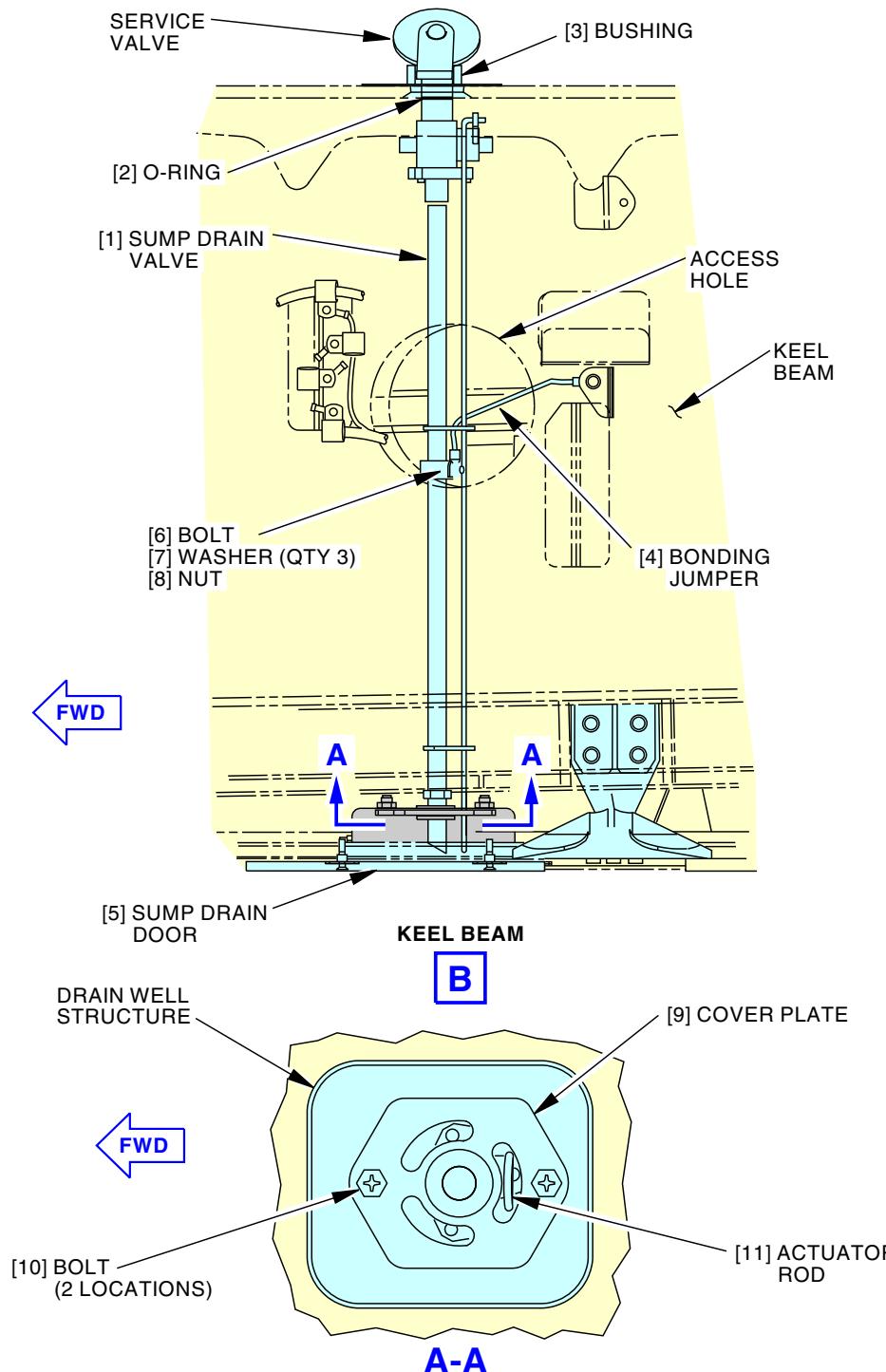
Center Tank Sump Drain Valve installation
Figure 401/28-11-41-990-802 (Sheet 1 of 2)

EFFECTIVITY	LOM ALL
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**Center Tank Sump Drain Valve installation
Figure 401/28-11-41-990-802 (Sheet 2 of 2)**

EFFECTIVITY
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TASK 28-11-41-400-801

3. Sump Drain Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Sump Drain Valve.

B. References

Reference	Title
20-10-17-400-801	O-Rings Installation (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-40-11-760-801	Electrical Bonding (P/B 201)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Access Panels

Number	Name/Location
192CL	ECS Access Door
192G	Sump Drain Access Door

E. Sump Drain Valve Installation

SUBTASK 28-11-41-420-001

- (1) Install a new O-ring [2], lightly lubricated with fuel, on the sump drain valve (TASK 20-10-17-400-801).

SUBTASK 28-11-41-420-002

- (2) Do these steps to install the sump drain valve in the bushing [3].

- (a) Open this access panel:

Number	Name/Location
192CL	ECS Access Door

- (b) Open this access panel:

Number	Name/Location
192G	Sump Drain Access Door

- (c) Move the drain valve up through the access door opening for the sump drain.

NOTE: You can use one hand through the access hole to help to guide the valve. You will feel the valve bushing when it touches the sump drain valve.

NOTE: The final lockwire procedure will be easier if you attach the lockwire to the hexagonal fitting before you put the valve assembly into the keel beam.

- (d) Turn the sump drain valve clockwise until it is against the bushing [3].

- (e) Use a deep socket wrench on the hexagonal fitting at the end of the sump drain valve to tighten the sump drain valve to 60 in-lb (7 N·m) - 75 in-lb (8 N·m).

- (f) Make sure the actuator rod [11] can go through one of the three slots on the cover plate when the assembly is tight.

NOTE: The cover plate can be turned 180 degrees if necessary to make the actuator rod fit.

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SUBTASK 28-11-41-420-003

- (3) Attach the bonding jumper [4] to the sump drain valve [1] with the bolt [6], washer [7], and nut [8] that you removed before.

SUBTASK 28-11-41-420-004

- (4) Attach the hexagonal fitting on the sump drain valve to the cover plate [9] with a lockwire (TASK 20-10-44-400-801).

SUBTASK 28-11-41-420-005

- (5) Do these steps to install the cover plate on the drain well structure:
- (a) Make sure the grommet in the center hole of the cover plate is correctly seated
 - (b) Attach the cover plate [9] to the drain well structure with the bolts [10] that you removed before.
 - (c) Make sure the grommet in the center hole of the cover plate stays correctly seated after installation.
 - (d) Make sure the actuator rod [11] goes through one of the three slots in the cover plate [9].
- NOTE: The cover plate can be turned 180 degrees to make it possible for the actuator rod to go through the cover plate.

SUBTASK 28-11-41-280-001

- (6) Do a check of the electrical bond between the sump drain valve and the structure (TASK 20-40-11-760-801).
- (a) The resistance must not be more than 0.010 ohms.

SUBTASK 28-11-41-410-001

- (7) Install the air conditioning duct sections that were removed from the left and right ECS bays for access to the keel beam access hole.

SUBTASK 28-11-41-410-002

- (8) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CL	ECS Access Door

SUBTASK 28-11-41-710-001

- (9) Make sure the valve operates correctly.
- (a) Pull the actuator rod [11] to open the sump drain valve.
 - (b) Make sure the rod moves freely when you pull with a maximum force of five to ten pounds.
 - (c) If the tank contains some fuel, catch the fuel that flows from the sump drain valve in a container.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-41-410-003

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192G	Sump Drain Access Door

———— END OF TASK ————

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MAIN TANK FUEL SUMP DRAIN VALVE - MAINTENANCE PRACTICES

1. General

- A. This procedure has three tasks:
 - (1) The removal of the sump drain valve for the main tank
 - (2) The installation of the sump drain valve for the main tank
 - (3) A task to replace the O-ring for the primary drain seal on the sump drain valve for the main tank.
- B. The sump drain valves for the main tanks are installed in shrink-fit bushings in the skin on the bottom of the wing. When you remove the jam nut and washer from inside the tank, make sure you catch the valve body so that it is not damaged.

TASK 28-11-61-000-801

2. Main Tank Fuel Sump Drain Valve Removal

A. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)

B. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

D. Prepare for the Removal

SUBTASK 28-11-61-650-001



DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Prepare to go into the applicable fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-11-61-010-001

- (2) Remove these access doors:

(TASK 28-11-11-000-801)

Number Name/Location

532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

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E. Removal Procedure

(Figure 201)

SUBTASK 28-11-61-020-001



CAUTION
HOLD THE VALVE DURING THE REMOVAL (OR USE A SUPPORT TO HOLD THE VALVE). IF YOU LET THE VALVE FALL, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Do these steps to remove the drain valve:

- (a) Remove the lockwire between the valve body [4] and the jamnut [1].
- (b) Remove the jamnut [1] and the washer [2] that attach the valve body to the bushing [5].
- (c) Remove the valve body [4].
- (d) Discard the O-ring [3].

— END OF TASK —

TASK 28-11-61-400-801

3. Main Tank Fuel Sump Drain Valve Installation

(Figure 201)

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-11-61-02-170	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
4	Valve body	28-11-61-03-190 28-11-61-02-085	LOM 447, 450-999 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-105	LOM 447, 450-999

C. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

E. Installation Procedure

(Figure 201)



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SUBTASK 28-11-61-210-001

- (1) Make sure the seal surfaces of the valve body [4] and the bushing [5] are clean and in a good condition.

SUBTASK 28-11-61-420-001

- (2) Install new O-ring [3] on the valve body [4].

SUBTASK 28-11-61-420-002

- (3) Put the valve body [4] into the bushing [5] and make sure it is held up until you install it.

SUBTASK 28-11-61-420-003

- (4) Install the parts that attach the drain valve.
 - (a) Go into the fuel tank.
 - (b) Install the washer [2] and the jamnut [1].
 - (c) Tighten the jamnut [1] to 50 in-lb (5.6 N·m).
 - (d) Install lockwire between the valve body [4] and the jamnut [1].

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-61-410-001

- (1) To close these access panels:

(TASK 28-11-11-400-801)

Number Name/Location

532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

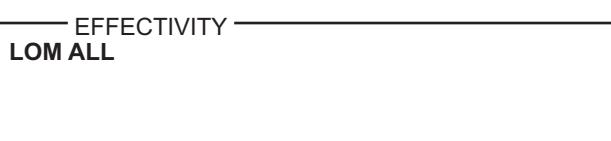
SUBTASK 28-11-61-650-002

- (2) Fill the applicable tank with fuel and do a check for leaks (TASK 12-11-00-650-802).

SUBTASK 28-11-61-650-003

- (3) Drain a small quantity of fuel from the tank to make sure the valve operates correctly.

———— END OF TASK ————



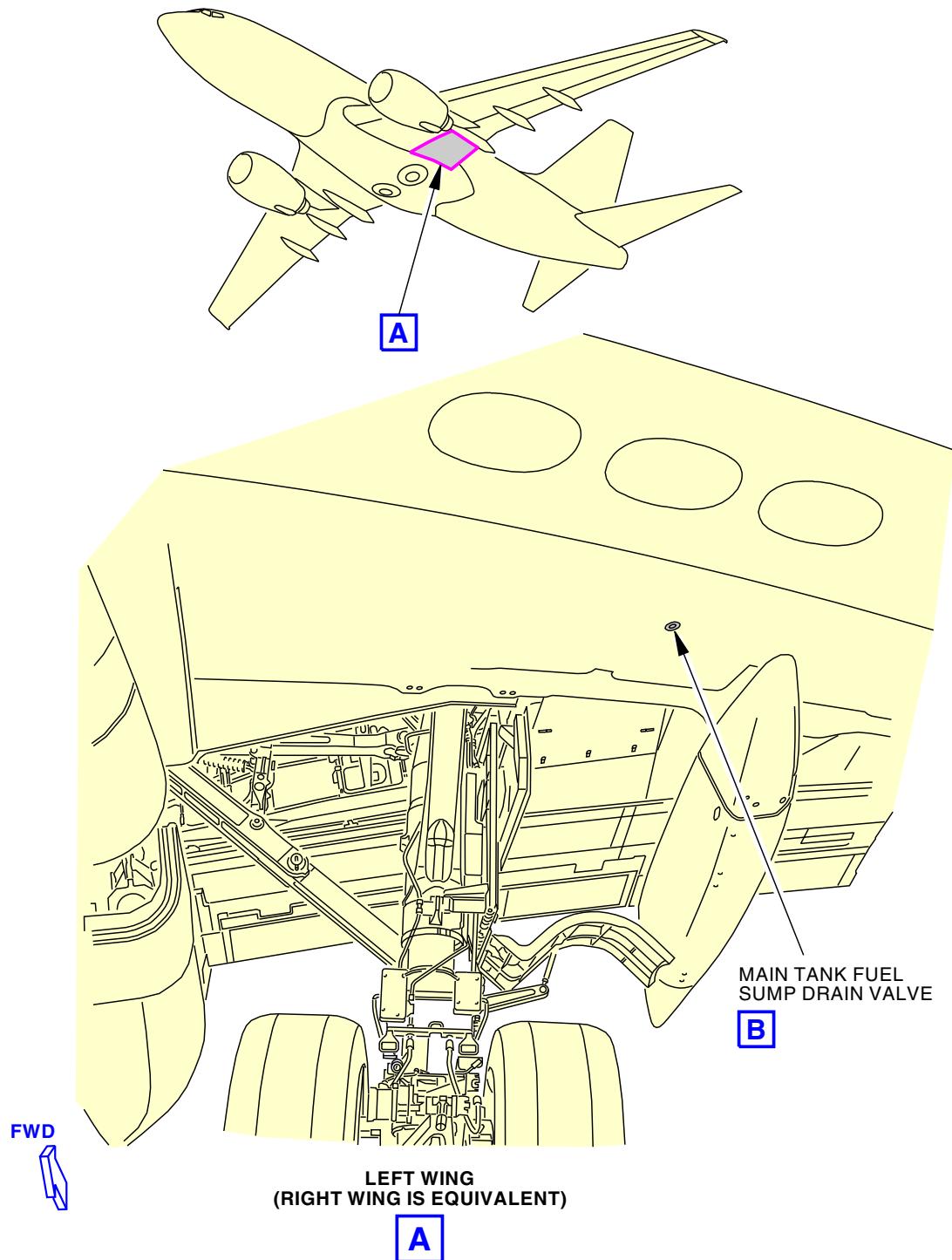
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Main Tank Fuel Sump Drain Valve Installation
Figure 201/28-11-61-990-801 (Sheet 1 of 2)

EFFECTIVITY
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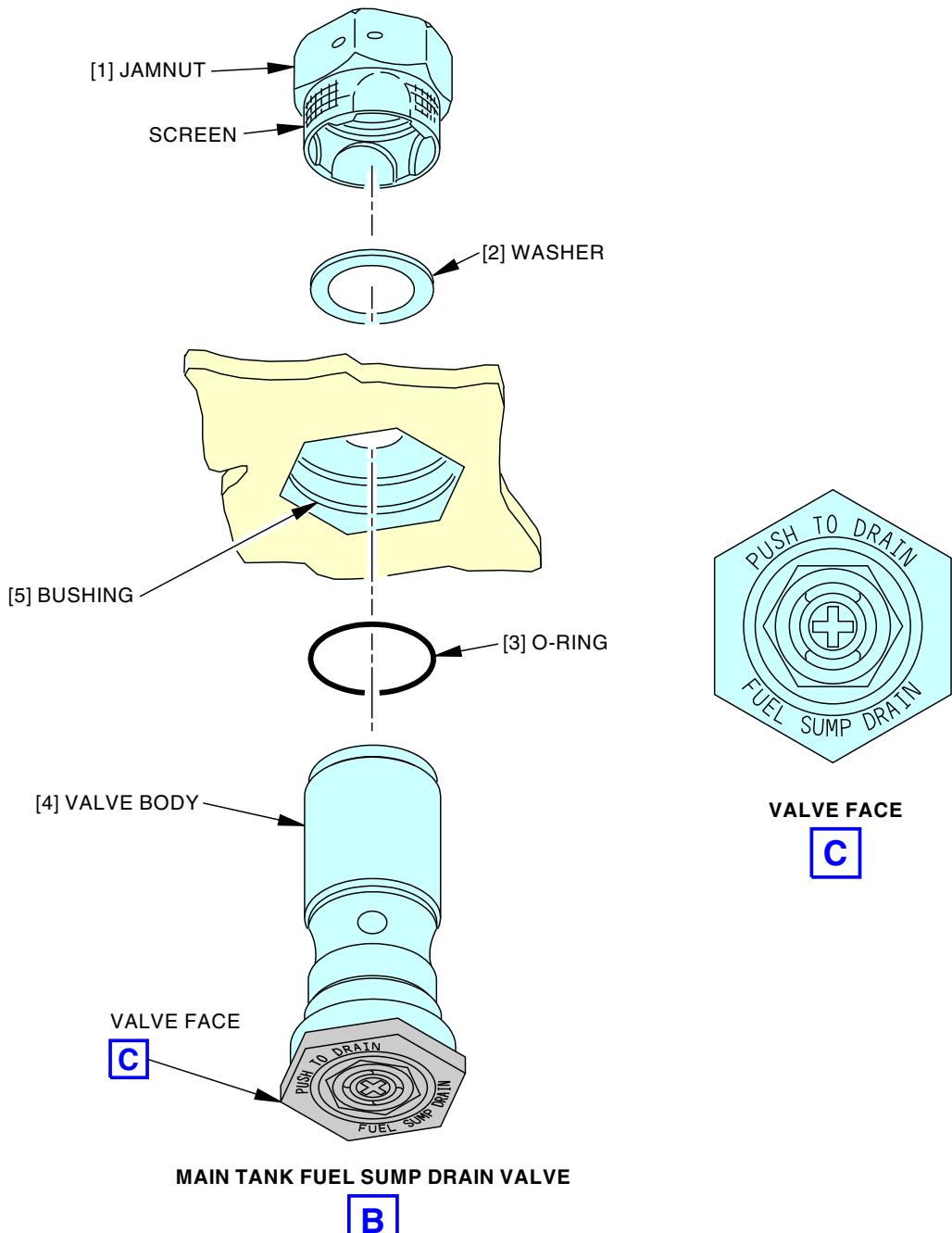
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Main Tank Fuel Sump Drain Valve Installation
Figure 201/28-11-61-990-801 (Sheet 2 of 2)

EFFECTIVITY
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TASK 28-11-61-600-801

4. Primary Drain Seal O-ring Replacement

(Figure 202)

A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
23	O-ring	28-11-61-02-125	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-145	LOM 447, 450-999
24	O-ring	28-11-61-02-135	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-155	LOM 447, 450-999

B. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Procedure

(Figure 202)

SUBTASK 28-11-61-020-002

- (1) Loosen and remove the valve core plug [22] and the valve poppet [21] with a socket wrench.

SUBTASK 28-11-61-020-003

- (2) Remove and discard the valve core O-ring [23] and primary O-ring [24] on the valve poppet [21].

SUBTASK 28-11-61-420-004

- (3) Install a new valve core O-ring [23] and a new primary O-ring [24].

SUBTASK 28-11-61-420-005

- (4) Install the valve poppet [21] and the valve core plug [22].

- (a) With the socket wrench, tighten the valve core plug [22] to a maximum torque of 60 in-lb (6.8 N·m) - 66 in-lb (7.5 N·m).

SUBTASK 28-11-61-650-004

- (5) Drain a small quantity of fuel from the tank to make sure the valve operates correctly and has a good seal.

———— END OF TASK ————

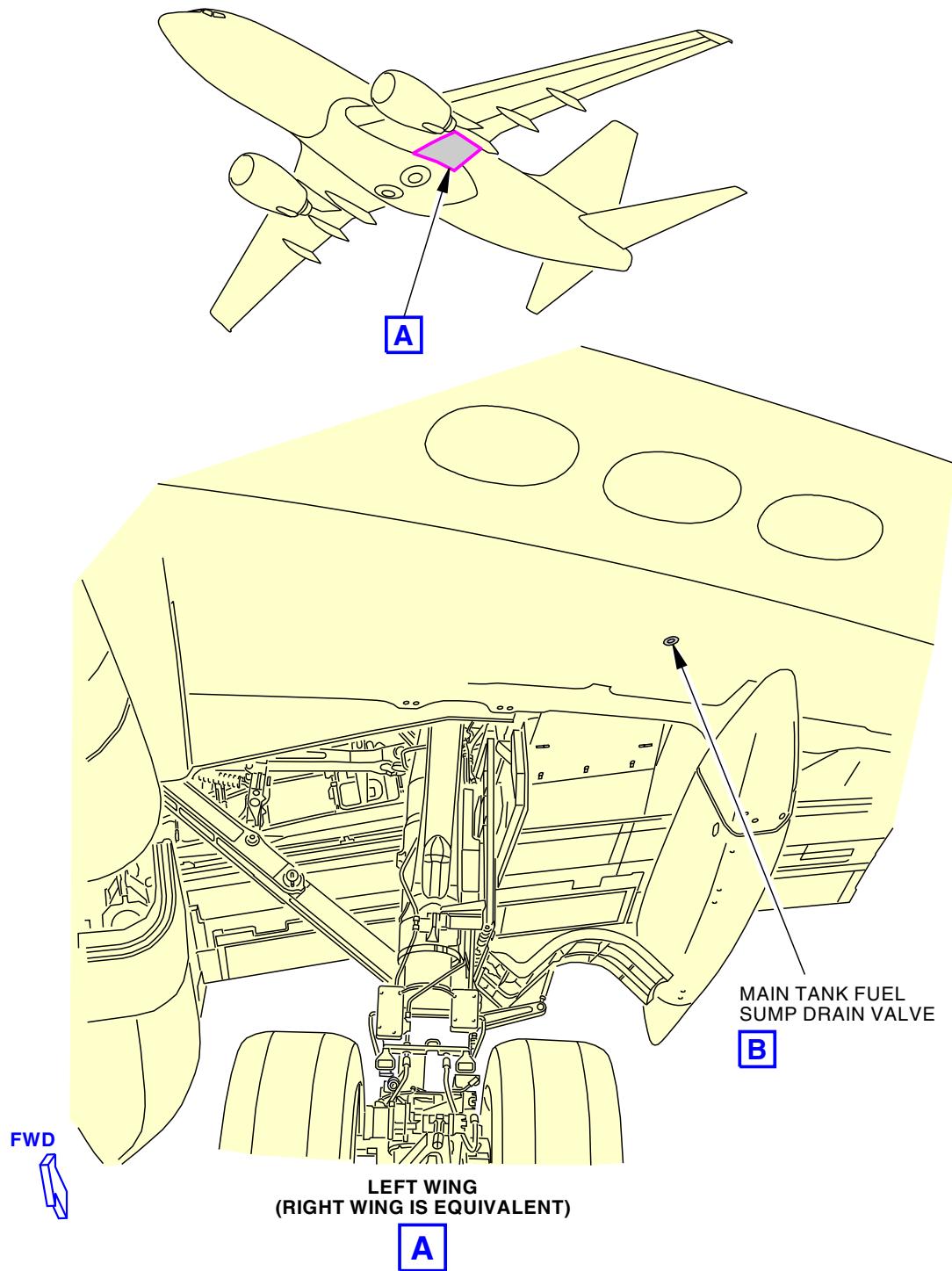
EFFECTIVITY
LOM ALL

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Main Tank Fuel Sump Drain Valve Primary Drain Seal Replacement
Figure 202/28-11-61-990-802 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

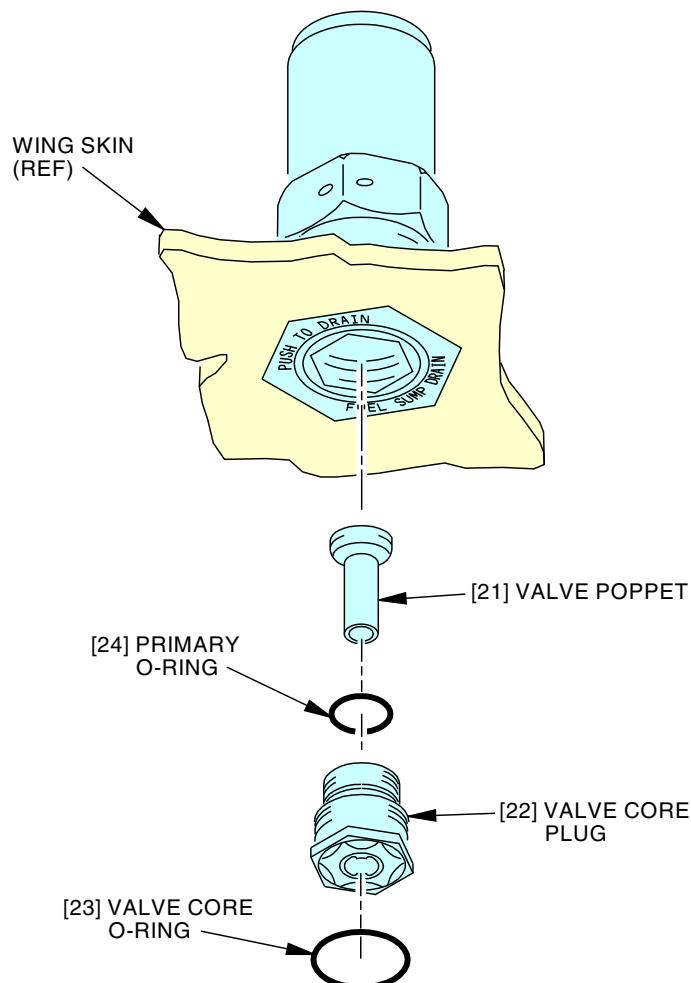
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MAIN TANK FUEL SUMP DRAIN VALVE

B

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Main Tank Fuel Sump Drain Valve Primary Drain Seal Replacement
Figure 202/28-11-61-990-802 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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FUEL VENT FLOAT VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A task to remove the float valve for the fuel vent system
 - (2) A task to install the float valve for the fuel vent system.

TASK 28-13-11-000-801

2. Fuel Vent Float Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Vent Float Valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)

C. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
532RB	Main Tank Access Door - Wing Station 629
632RB	Main Tank Access Door - Wing Station 629

E. Prepare for the Removal

SUBTASK 28-13-11-650-001



WARNING

DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Prepare the applicable fuel tank for entry (TASK 28-11-00-910-802).

SUBTASK 28-13-11-010-001

- (2) Open these access panels:

Number Name/Location

532RB	Main Tank Access Door - Wing Station 629
632RB	Main Tank Access Door - Wing Station 629

(TASK 28-11-11-000-801).

F. Fuel Vent Float Valve Removal

SUBTASK 28-13-11-020-001

- (1) Remove the bolts [2] that attach the float valve [1] to the structure.



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SUBTASK 28-13-11-020-002

- (2) Remove the float valve [1].

———— END OF TASK ————

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LOM ALL

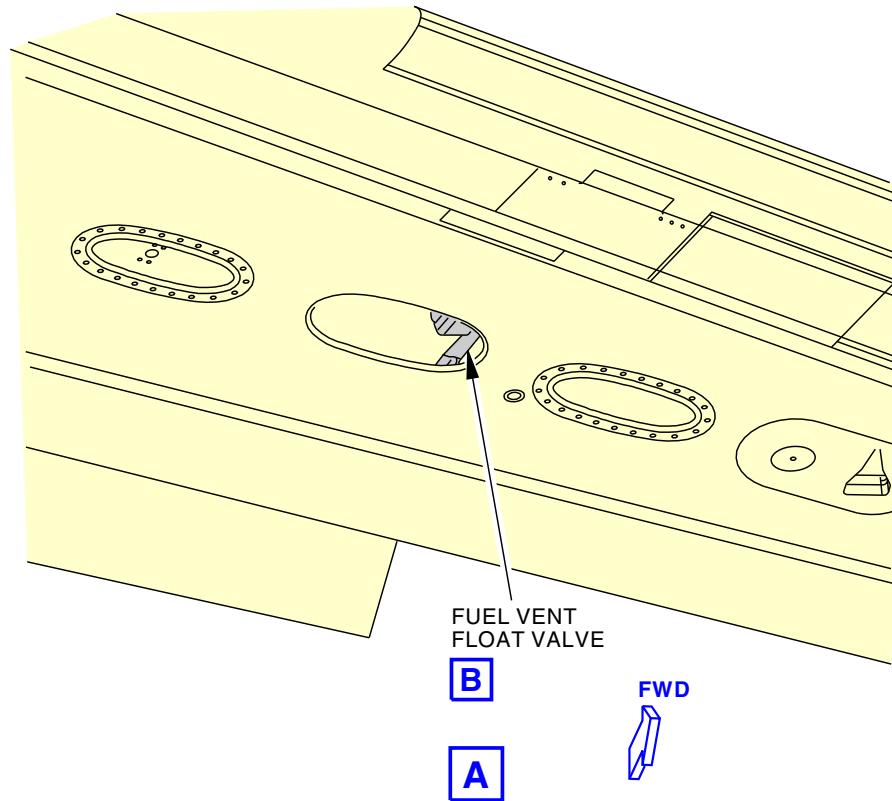
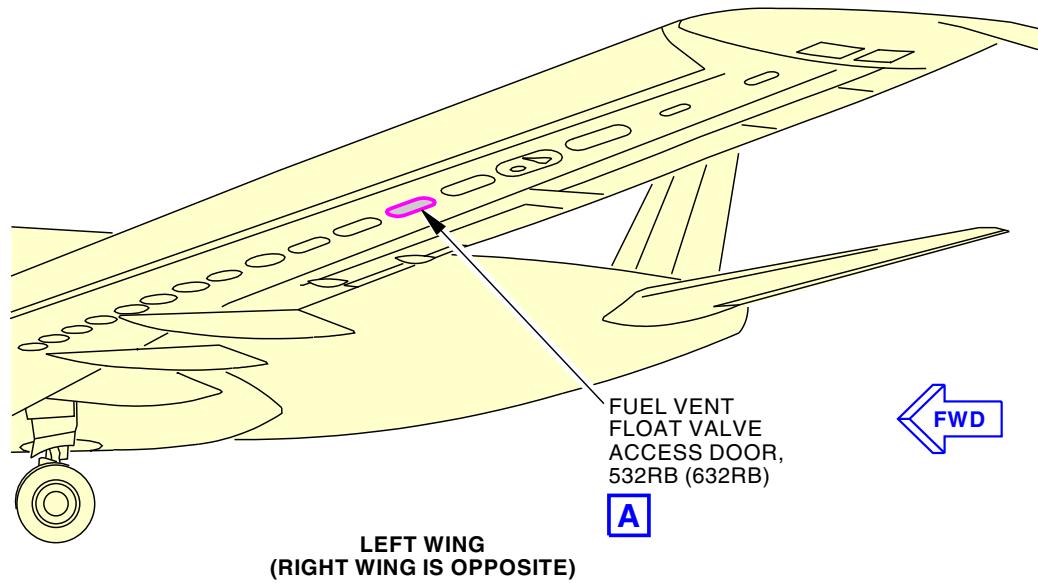
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Fuel Vent Float Valve Installation
Figure 401/28-13-11-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-13-11

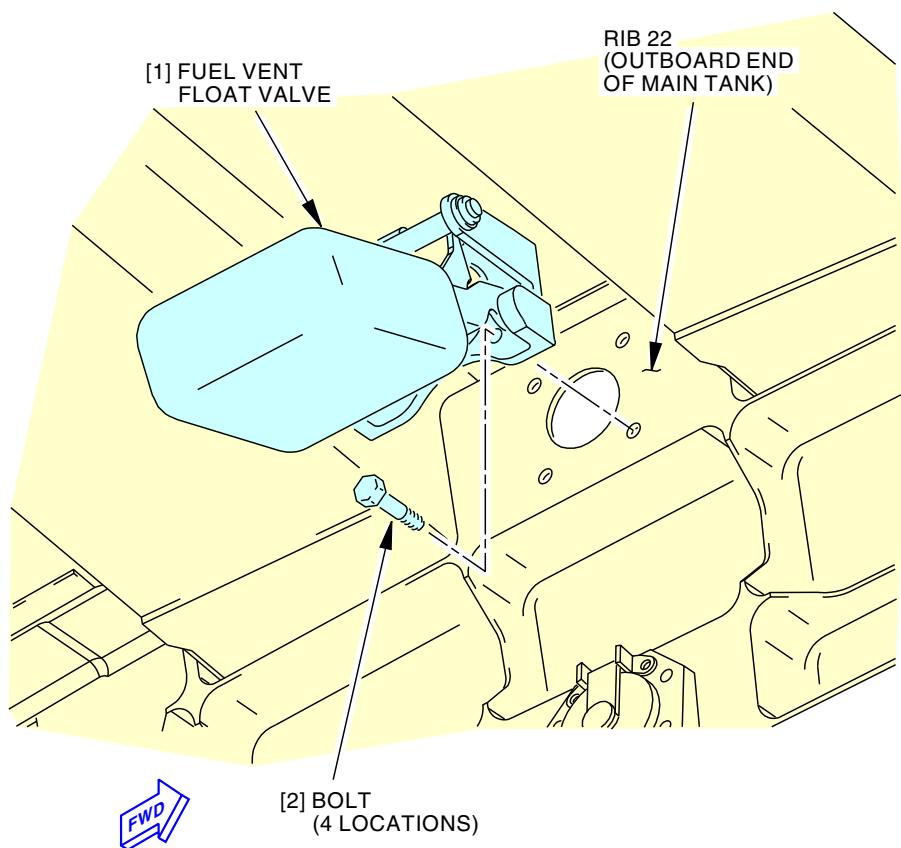
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FUEL VENT FLOAT VALVE

B

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Fuel Vent Float Valve Installation
Figure 401/28-13-11-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-13-11

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TASK 28-13-11-400-801

3. Fuel Vent Float Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel Vent Float Valve.

B. References

Reference	Title
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Float valve	28-13-11-01A-015	LOM ALL

F. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
532RB	Main Tank Access Door - Wing Station 629
632RB	Main Tank Access Door - Wing Station 629

EFFECTIVITY
LOM ALL

28-13-11



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H. Fuel Vent Float Valve Installation

SUBTASK 28-13-11-110-002



WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Clean the fay surfaces of the float valve [1] and the rib (SWPM 20-20-00).

SUBTASK 28-13-11-390-001

- (2) Apply a fay sealed fay surface bond to the mating surfaces between the float valve [1] and the rib (SWPM 20-20-00).

SUBTASK 28-13-11-420-002

- (3) Hold the float valve [1] in the correct position and install the bolts [2].

SUBTASK 28-13-11-280-002

- (4) Use an intrinsically safe approved bonding meter, COM-1550, to measure the electrical bonding resistance between the float valve [1] base and the rib (SWPM 20-20-00).
 - (a) Make sure that the electrical bonding resistance is 0.0005 ohms (0.5 milliohms) or less.

SUBTASK 28-13-11-210-003

- (5) Manually apply Bonderite M-CR 600 Aero coating, C50315, to the bare metal areas (TASK 28-11-00-600-801).

SUBTASK 28-13-11-210-004

- (6) Apply a coat of coating, C00307, to the bare metal areas (TASK 28-11-00-600-801).

I. Put the Airplane Back to its Usual Condition

SUBTASK 28-13-11-410-002

- (1) Close the applicable access panel(s):

(TASK 28-11-11-000-801)

Number Name/Location

532RB Main Tank Access Door - Wing Station 629
632RB Main Tank Access Door - Wing Station 629

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-13-11



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AIR VENT SCOOP FLAME ARRESTOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) The removal of the flame arrestor for the air vent scoop
 - (2) The installation of the flame arrestor for the air vent scoop.
- B. If the flame arrestor cells are blocked with particles, you can clean the flame arrestor (TASK 28-13-31-100-801).
- C. If it is necessary to remove the flame arrestor, you must seal the mounting flange again when you install the flame arrestor.

TASK 28-13-31-000-801

2. Flame Arrestor Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Flame Arrestor.

B. References

Reference	Title
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

D. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

E. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

F. Prepare for the Removal

SUBTASK 28-13-31-860-001

- (1) Make sure the airplane is correctly grounded to an approved and identified ground.

SUBTASK 28-13-31-860-002

- (2) Unless the fuel tank is defueled and prepared for entry, do these safety checks:
 - (a) Remove the electrical power from the airplane.
 - 1) Do not connect the power again until the fuel tank is closed and safe.
 - (b) Disconnect the battery and attach a sign that shows OPEN FUEL TANKS - DO NOT CONNECT.
 - (c) Put a rope around the outboard section of the wing and attach signs that you can see clearly that show DANGER - OPEN FUEL TANKS.
 - (d) Make sure there is no remaining fuel in the surge tank.



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- 1) Put a 10 gallon (38 l) fuel resistant container, STD-200 below the sump drain valve for the surge tank.
- 2) Open the sump drain valve for the surge tank.
- 3) Let the remaining fuel flow into the 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-31-010-002

- (3) Remove or open the applicable access panels:

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

To do this, do this task: Surge Tank Access Door Removal, TASK 28-11-11-000-802.

G. Flame Arrestor Removal

SUBTASK 28-13-31-150-001

- (1) With sealant removal tools, remove the sealant from the area around the mounting flange for the flame arrestor [2].

SUBTASK 28-13-31-020-004

- (2) Remove the screws [6] and washers [5] that attach the flame arrestor [2].

SUBTASK 28-13-31-020-003

- (3) Remove the flame arrestor [2] from the lower air vent stack [3].

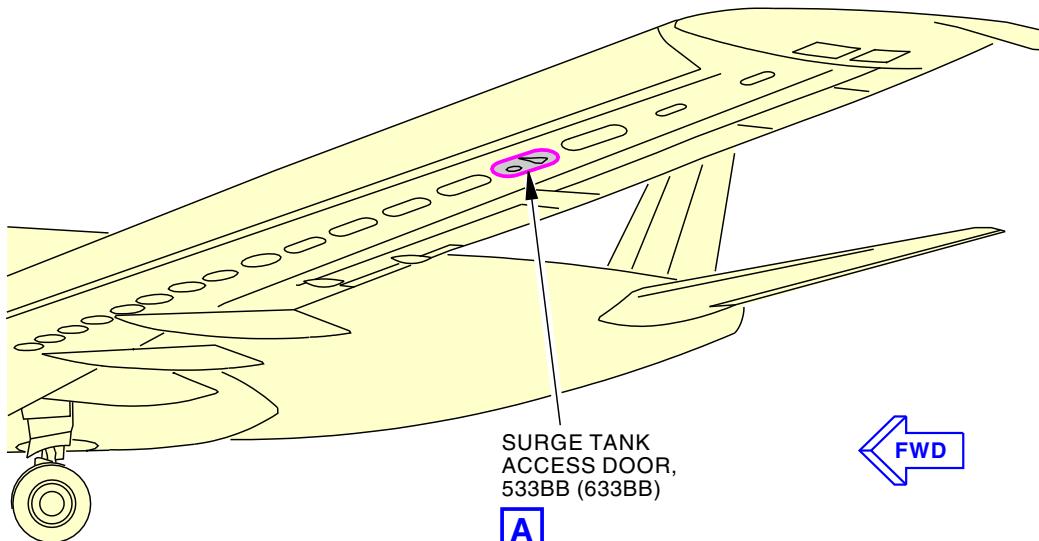
———— END OF TASK ————

EFFECTIVITY
LOM ALL

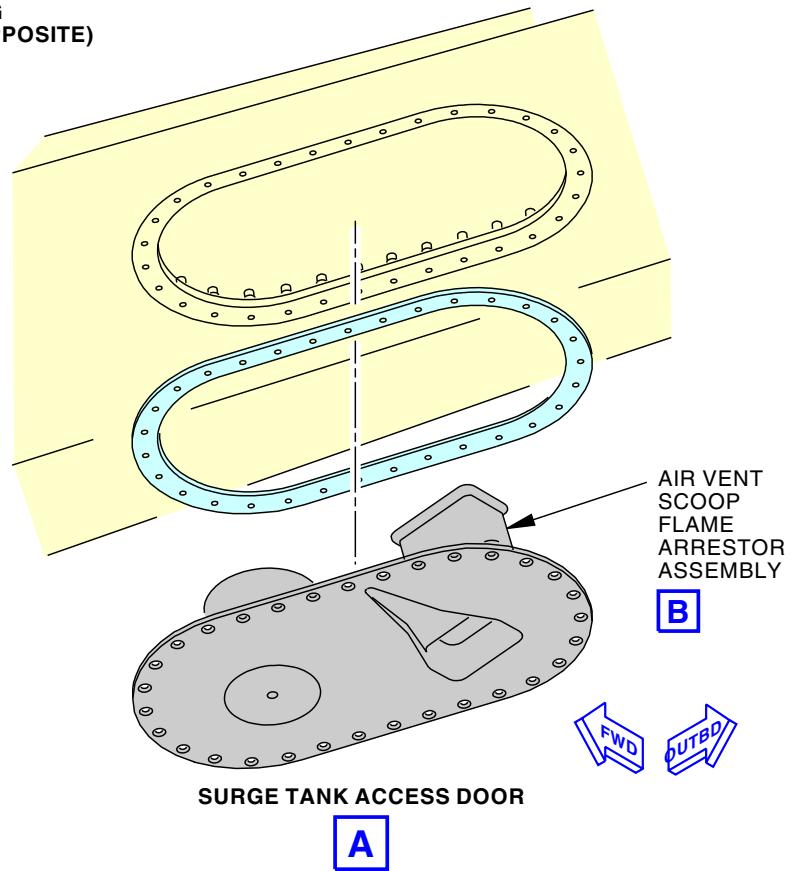
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LEFT WING
(RIGHT WING IS OPPOSITE)



A

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Air Vent Scoop Flame Arrestor Installation
Figure 401/28-13-31-990-802 (Sheet 1 of 2)

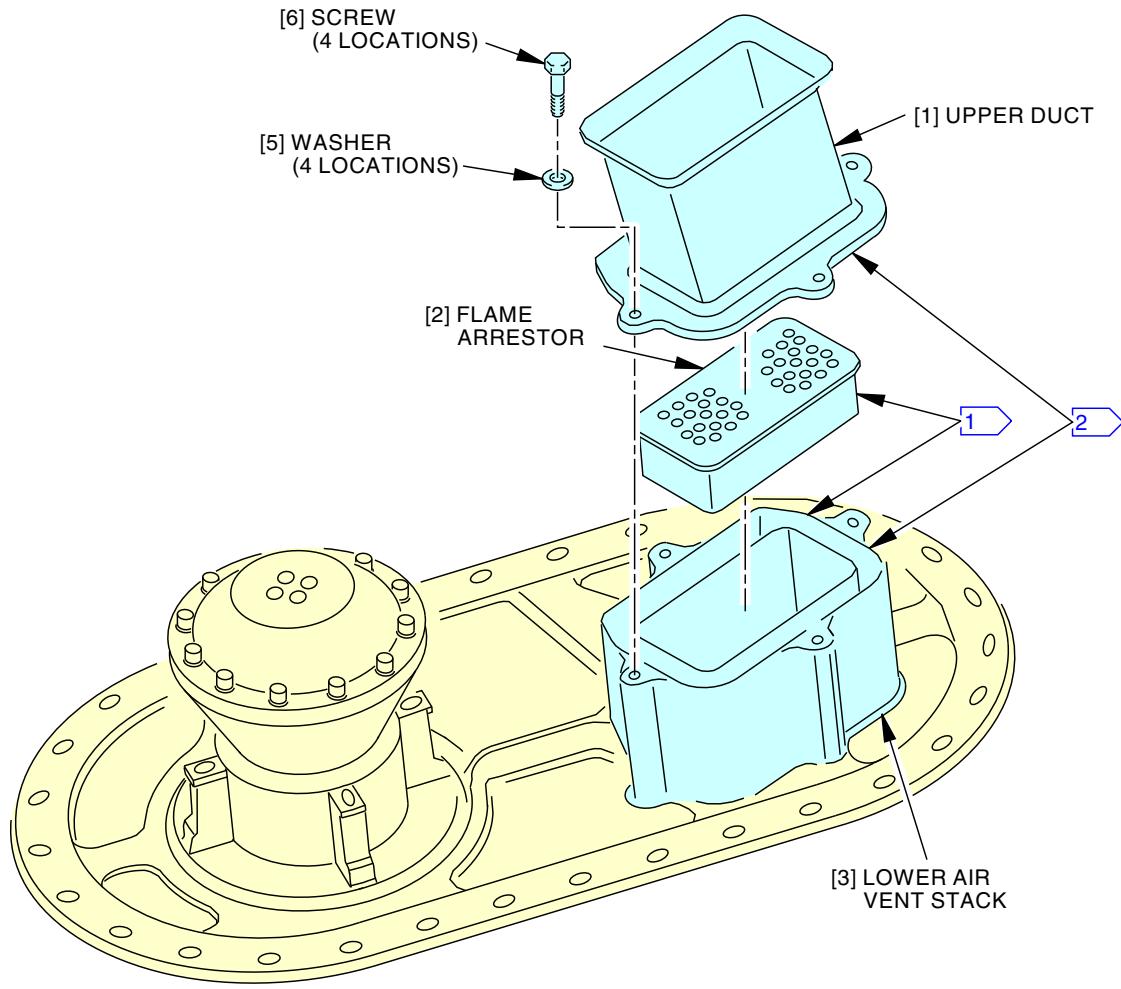
EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIR VENT SCOOP FLAME ARRESTOR ASSEMBLY
B

1 THE RESISTANCE FROM THE FLAME ARRESTER TO THE FLANGE ON THE LOWER AIR VENT STACK IS 0.010 OHM OR LESS.

2 THE RESISTANCE FROM THE FLANGE ON THE LOWER AIR VENT STACK TO THE FLANGE ON THE UPPER DUCT IS 0.010 OHM OR LESS.

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**Air Vent Scoop Flame Arrestor Installation
Figure 401/28-13-31-990-802 (Sheet 2 of 2)**

 EFFECTIVITY
LOM ALL

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TASK 28-13-31-400-801

3. Flame Arrestor Installation

(Figure 401)

A. General

- (1) For sealants in the fuel tank structure(s) that are not faying surface applications, use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are also acceptable sealants.
- (2) For faying surface seal applications:
 - (a) Inside the fuel tank, use BMS 5-45 Class B-2 sealant, A50110, or BMS 5-45 Class C sealant, A50155.
 - (b) Outside the fuel tank, use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296.
 - (c) Do not apply a faying surface seal with a temperature higher than 100°F (38°C).
- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-13-31-100-801	Air Vent Scoop Flame Arrestor Cleaning (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659





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D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01013	Solvent - Final Cleaning Prior To Fuel Tank Sealing (AMM 20-30-93) - Series 93	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Flame arrestor	28-13-51-01-025	LOM ALL

F. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

G. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

H. Procedure

SUBTASK 28-13-31-110-001



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Remove the sealant with removal tools and clean the flanges with a clean, cotton wiper, G00034, and Series 93 solvent, B01013.

SUBTASK 28-13-31-120-001

- (2) If the surge tank access door or upper duct [1] is new, then use an abrasive pad to remove the primer or paint from the faying surfaces of the upper duct [1] and the lower air vent stack [3] until bare metal shows (SWPM 20-20-00).

SUBTASK 28-13-31-210-004

- (3) Make sure the cells of the flame arrestor [2] are not blocked to airflow.

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LOM ALL

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- (a) Clean the flame arrestor [2] if it is necessary (TASK 28-13-31-100-801).

SUBTASK 28-13-31-390-004

► 28-AWL-17: CDCCL

- (4) Install a fay sealed fay surface bond between the mating surfaces of the flame arrestor [2] and the flanges on the lower air vent stack [3] (door) and the upper duct [1] (TASK 28-11-00-300-803).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296.

SUBTASK 28-13-31-420-002

- (5) Install the flame arrestor [2] on the flange of the lower air vent stack [3].

SUBTASK 28-13-31-390-005

► 28-AWL-17: CDCCL

- (6) Install a fay sealed fay surface bond between the flange on the lower air vent stack [3] (door) and the flange on the upper duct [1] (TASK 28-11-00-300-803, SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296.

SUBTASK 28-13-31-420-001

- (7) Install the upper duct [1] on the flange of the lower air vent stack [3].

- (a) Put new washers [5] below the head of each screw [6].

- (b) Install and tighten the screws [6] and washers [5] that attach the flame arrestor [2] to the lower air vent stack [3].

SUBTASK 28-13-31-280-002

► 28-AWL-17: CDCCL

- (8) Measure the electrical bonding resistance between the flame arrestor [2] and the lower air vent stack [3] (door) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

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LOM ALL

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► 28-AWL-17: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-13-31-280-001

► 28-AWL-17: CDCCL

- (9) Measure the electrical bonding resistance between the upper duct [1] and the lower air vent stack [3] (door) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-17: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-13-31-390-002

- (10) After you apply the thin layer of sealant, A00767, apply the sealant, A00767, to make a fillet seal around the flange edge (Figure 401).
(a) Use a gun or a tube to apply the sealant (TASK 28-11-00-300-803).

SUBTASK 28-13-31-410-001

- (11) Install or close the applicable access doors:

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679
633BB Surge Tank Access Door - Wing Station 679

To do this, do this task: Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803.

SUBTASK 28-13-31-860-003

- (12) Connect the battery again, if you disconnected it before this step.

SUBTASK 28-13-31-080-001

- (13) Remove all the warning signs that you installed before this step.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-13-31



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AIRCRAFT MAINTENANCE MANUAL

AIR VENT SCOOP FLAME ARRESTOR - INSPECTION/CHECK

1. General

- A. This procedure has these tasks:
 - (1) Air Vent Scoop - Bonding Resistance Check
 - (2) Air Vent Scoop Flame Arrestor Detailed Inspection.
- B. This procedure contains a functional check of the bonding resistance of the air vent scoop flame arrestor, lower air vent stack, and upper duct. The procedure contains a detailed inspection of the air vent scoop flame arrestor.

SFAR 88

TASK 28-13-31-200-801

2. Air Vent Scoop - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-614	Bonding Meters - Non-Intrinsically Safe (For use in outside Class I, Divisions I & II non-hazardous locations. For hazardous locations, use COM-1550). Part #: 247000 Supplier: 00426 Part #: 620LK Supplier: 1CRL2 Part #: BLR-0003-XX Supplier: KC432 Part #: BT51 Supplier: 00426 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659 Opt Part #: 247001 Supplier: 00426
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679

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(Continued)

Number Name/Location

633BB Surge Tank Access Door - Wing Station 679

E. Prepare for the Electrical Bonding Measurement

SUBTASK 28-13-31-862-001

- (1) Make sure that the airplane is correctly grounded to an approved and identified ground.

SUBTASK 28-13-31-210-005

- (2) Make sure that there is no remaining fuel in the surge tank.
- (a) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the sump drain valve.
 - (b) Open the applicable sump drain valve.
 - (c) Let the remaining fuel flow into a 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-31-010-004

- (3) Remove or open the applicable access panels:

(TASK 28-11-11-000-802)

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

633BB Surge Tank Access Door - Wing Station 679

F. Electrical Bonding Measurement

SUBTASK 28-13-31-760-001

- (1) Measure the electrical bonding resistance between the upper duct and door assembly with a non-intrinsically safe bonding meter, COM-614 (SWPM 20-20-00).
- (a) Make sure that the resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-13-31-760-002

- (2) Measure the electrical bonding resistance between the flame arrestor and door assembly with a non-intrinsically safe bonding meter, COM-614 (SWPM 20-20-00).
- (a) Make sure that the resistance is 0.010 ohm (10 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-13-31-410-003

- (1) Install or close the applicable access panels:

(TASK 28-11-11-400-803)

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679

633BB Surge Tank Access Door - Wing Station 679

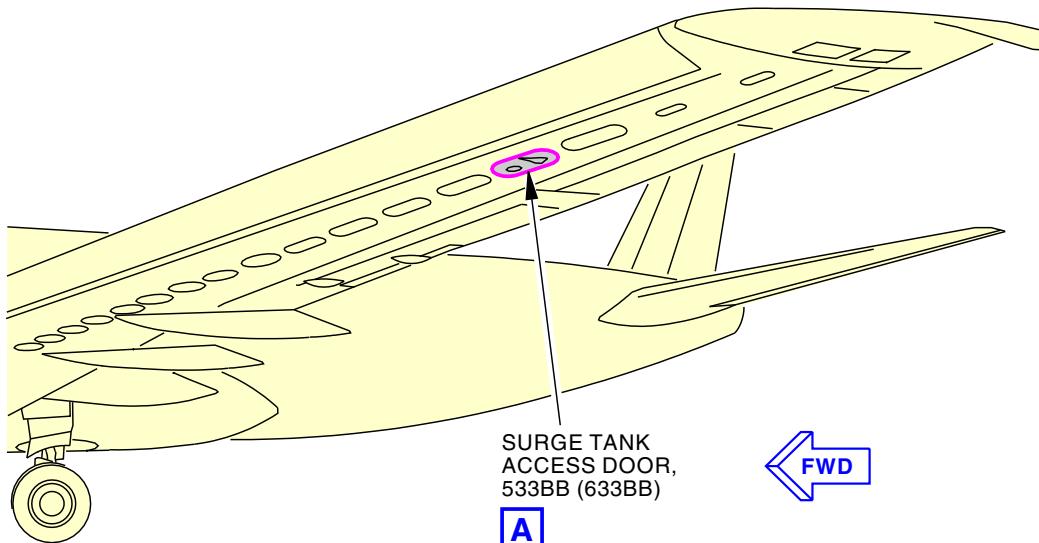
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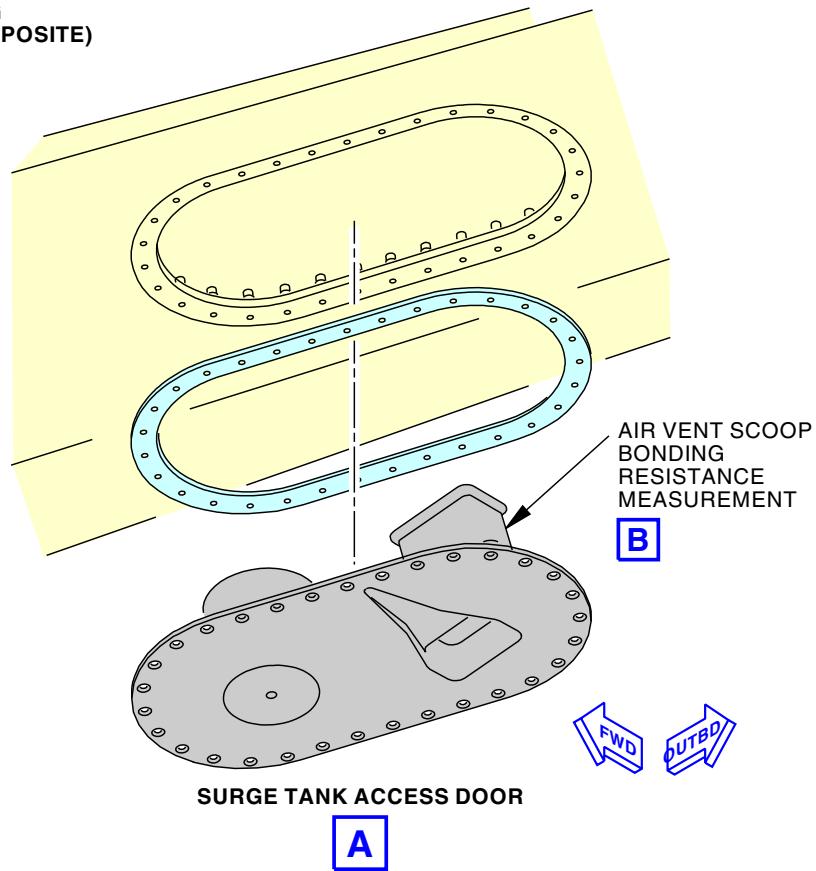
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LEFT WING
(RIGHT WING IS OPPOSITE)



SURGE TANK ACCESS DOOR

A

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Air Vent Scoop - Bonding Resistance Measurement
Figure 601/28-13-31-990-803 (Sheet 1 of 2)

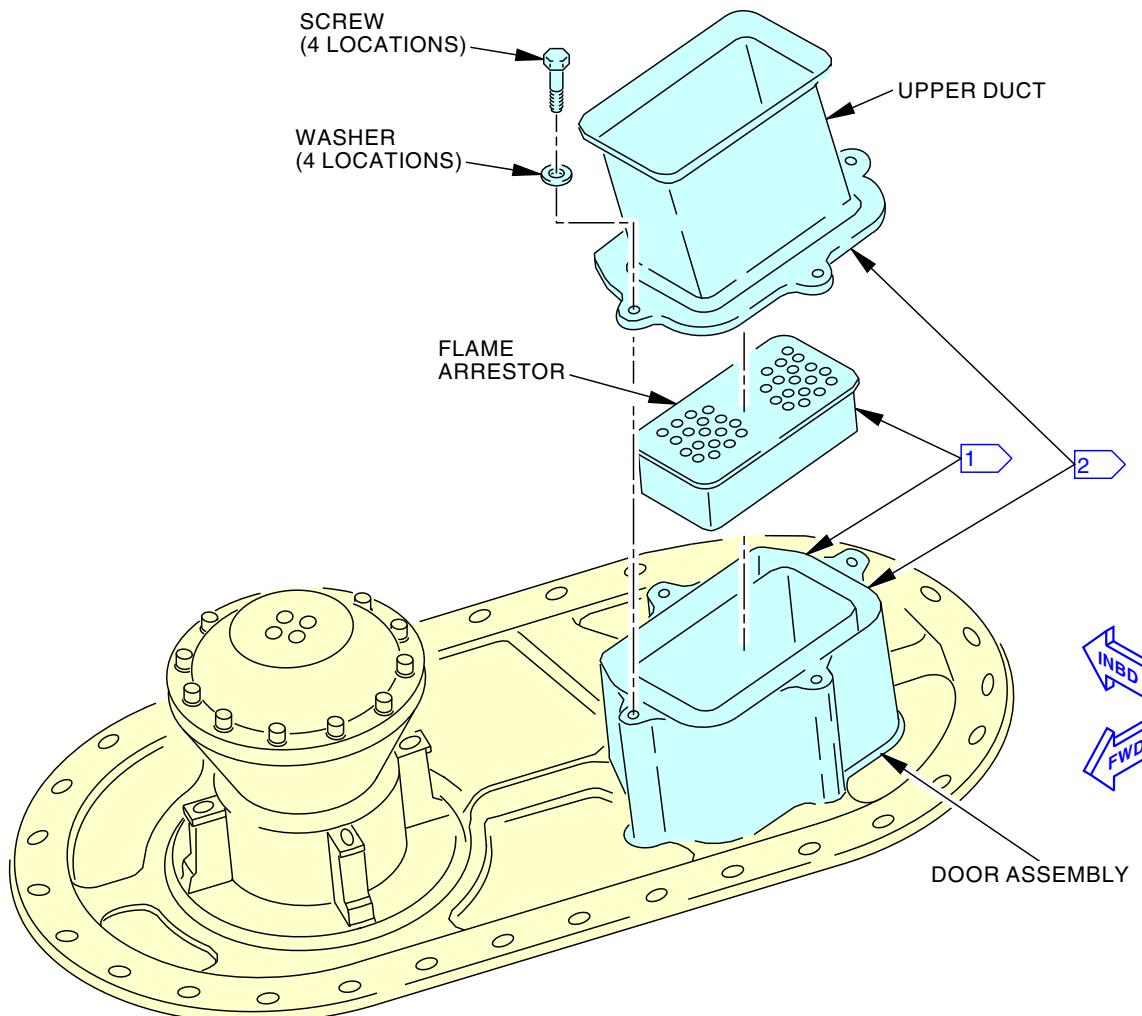
EFFECTIVITY
LOM ALL

28-13-31

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AIR VENT SCOOP BONDING RESISTANCE MEASUREMENT

B

- [1] THE RESISTANCE FROM THE FLAME ARRESTOR TO THE FLANGE ON THE DOOR ASSEMBLY IS 0.010 OHM OR LESS
- [2] THE RESISTANCE FROM THE FLANGE ON THE DOOR ASSEMBLY TO THE FLANGE ON THE UPPER DUCT IS 0.010 OHM OR LESS

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Air Vent Scoop - Bonding Resistance Measurement
Figure 601/28-13-31-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-13-31

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 28-13-31-211-801

3. Air Vent Scoop Flame Arrestor Detailed Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-13-31-000-801	Flame Arrestor Removal (P/B 401)
28-13-31-400-801	Flame Arrestor Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

E. Prepare for the Inspection

SUBTASK 28-13-31-860-007

- (1) Make sure that the airplane is correctly grounded to an approved and identified ground.

SUBTASK 28-13-31-210-007

- (2) Make sure that there is no remaining fuel in the surge tank.
- Put a 10 gallon (38 l) fuel resistant container, STD-200, below the sump drain valve.
 - Open the applicable sump drain valve.
 - Let the remaining fuel flow into a 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-31-010-006

- (3) Remove or open the applicable access panels:

(TASK 28-11-11-000-802)

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

F. Air Vent Scoop Flame Arrestor Detailed Inspection

SUBTASK 28-13-31-211-002

- (1) Hold the surge tank access door up to a light and examine the flame arrestor for unwanted particles and blocked holes.

EFFECTIVITY
LOM ALL

28-13-31



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SUBTASK 28-13-31-010-007

- (2) If there are unwanted particle or blocked holes, you must clean the flame arrestor.

- (a) Do this task: Flame Arrestor Removal, TASK 28-13-31-000-801.

NOTE: It is possible to clean the flame arrestor without removing it from the vent stack.
But it can be easier if it is removed from the vent stack.

- (b) Prepare a weak solution of water and detergent.
(c) Clean the flame arrestor in the solution.
(d) Dry the flame arrestor with an air gun.
(e) If it was removed, install the flame arrestor (TASK 28-13-31-400-801).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-13-31-410-004

- (1) Install or close the applicable access panels:

(TASK 28-11-11-400-803)

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

———— END OF TASK ————



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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIR VENT SCOOP FLAME ARRESTOR - CLEANING/PAINTING

1. General

- A. This procedure contains scheduled maintenance task data.

TASK 28-13-31-100-801

2. Air Vent Scoop Flame Arrestor Cleaning

(Figure 701)

A. References

Reference	Title
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-13-31-000-801	Flame Arrestor Removal (P/B 401)
28-13-31-400-801	Flame Arrestor Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Flame arrestor	28-13-51-01-025	LOM ALL

E. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

G. Prepare for the Procedure

SUBTASK 28-13-31-860-004

- (1) Make sure the airplane is correctly grounded to an approved and identified ground.

SUBTASK 28-13-31-210-006

- (2) Make sure there is no remaining fuel in the surge tank.
(a) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the sump drain valve.

EFFECTIVITY
LOM ALL

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- (b) Open the applicable sump drain valve.
- (c) Let the remaining fuel flow into a 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-31-010-003

- (3) Remove or open the applicable access panels:

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

To remove the access panel(s), do this task: Surge Tank Access Door Removal, TASK 28-11-11-000-802.

H. Procedure

SUBTASK 28-13-31-211-001

- (1) Hold the surge tank access door up to a light and examine the flame arrestor [2] for unwanted particles and blocked holes.

SUBTASK 28-13-31-010-001

- (2) If there are unwanted particle or blocked holes, you must clean the flame arrestor [2].

- (a) Do this task: Flame Arrestor Removal, TASK 28-13-31-000-801.

NOTE: It is possible to clean the flame arrestor without removing it from the vent stack.
But it can be easier if it is removed from the vent stack.

- (b) Prepare a weak solution of water and detergent.
 - (c) Clean the flame arrestor in the solution.
 - (d) Dry the flame arrestor with an air gun.

SUBTASK 28-13-31-160-002

- (3) Clean the surfaces near the access panel opening with a clean cotton wiper, G00034 moist with solvent, B00083.

SUBTASK 28-13-31-160-003

- (4) Clean surfaces of access panel which will touch airplane skin with a clean cotton wiper, G00034 moist with solvent, B00083.

SUBTASK 28-13-31-210-002

- (5) Examine the open tank for unwanted objects, for example tools, broken pieces of metal, and other unwanted material.

SUBTASK 28-13-31-160-004

- (6) Clean the open tank, if it is necessary.

SUBTASK 28-13-31-210-003

- (7) If you removed the flame arrestor [2] for this procedure, do this task: Flame Arrestor Installation, TASK 28-13-31-400-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-13-31-410-002

- (1) Install or close the applicable access panels:

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

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To install the access panel(s), do this task: Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803.

———— END OF TASK ————

———— EFFECTIVITY ————
LOM ALL

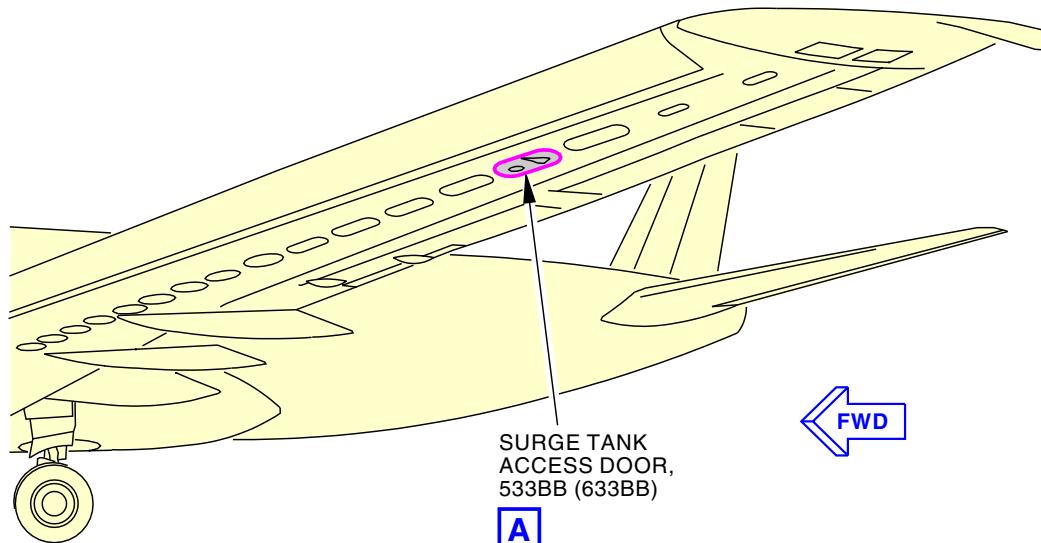
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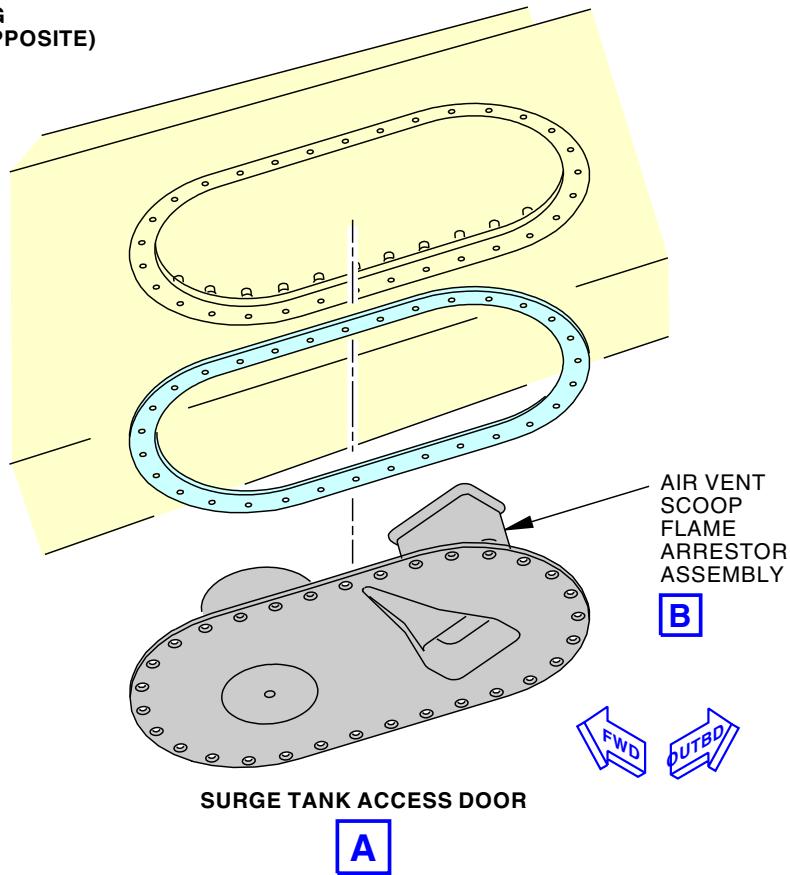
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LEFT WING
(RIGHT WING IS OPPOSITE)



F74556 S0006571363_V2

Air Vent Scoop Flame Arrestor
Figure 701/28-13-31-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

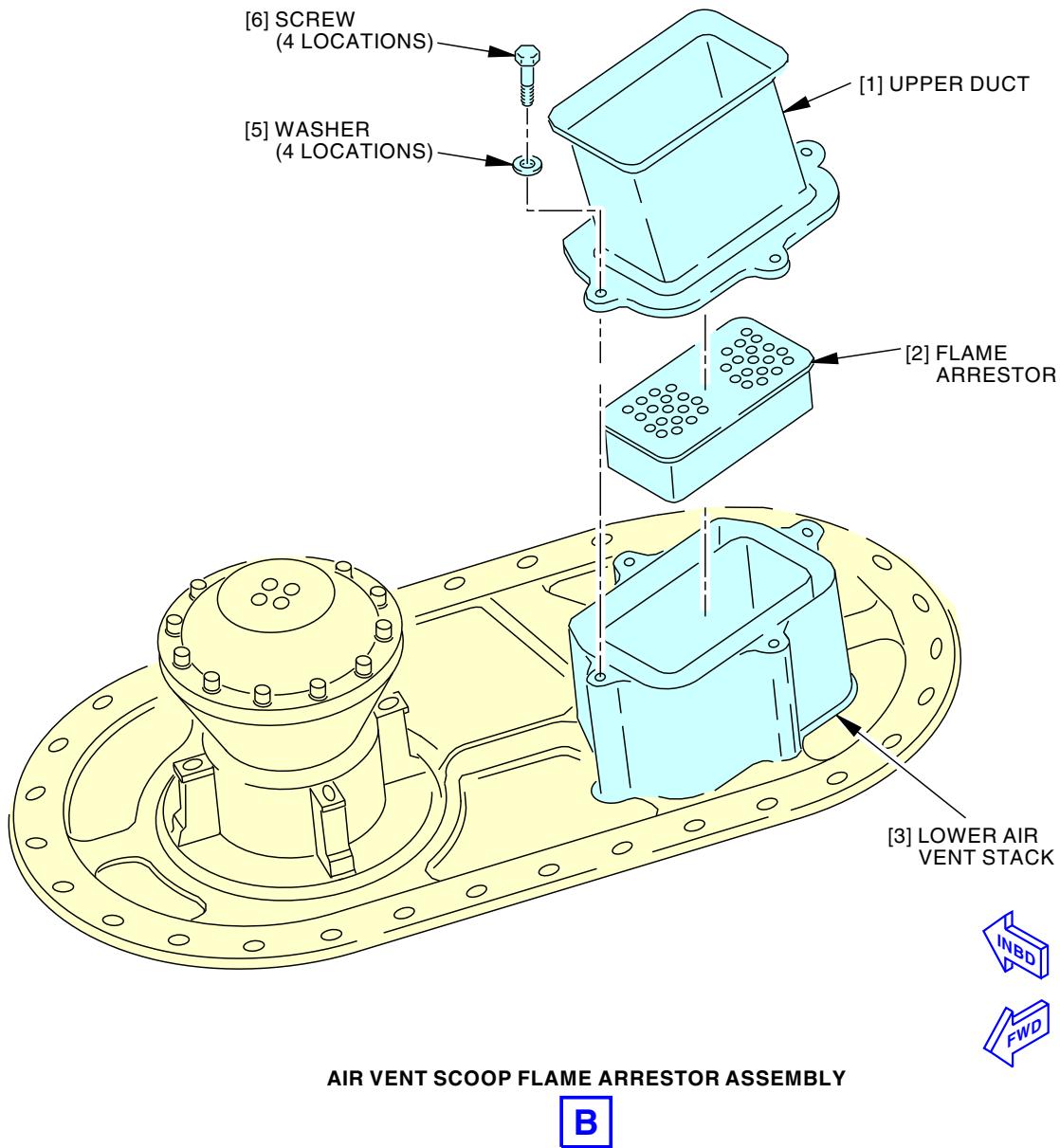
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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1863180 S0000334427_V2

Air Vent Scoop Flame Arrestor
Figure 701/28-13-31-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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SURGE TANK PRESSURE RELIEF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks:
 - (1) A task to remove the pressure relief valve.
 - (2) A task to install the pressure relief valve.
- B. It is not necessary to remove the pressure relief valve to make sure that the pressure relief valve operates at the correct pressure difference.

TASK 28-13-41-000-801

2. Pressure Relief Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Pressure Relief Valve

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-13-41-400-802	Pressure Relief Valve - Manual Operation (P/B 601)

C. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure relief valve	28-13-41-01A-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437, 438
		28-13-41-02-025	LOM 439-447, 450-999

E. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679



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G. Prepare for the Removal

SUBTASK 28-13-41-650-001



WARNING

DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Defuel the applicable tank and prepare to go into it (TASK 28-11-00-910-802).

SUBTASK 28-13-41-680-001

- (2) Make sure there is no remaining fuel in the surge tank.
 - (a) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the sump drain valve.
 - (b) Open the applicable sump drain valve.
 - (c) Let the remaining fuel flow into the 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-41-860-001



WARNING

MAKE SURE THAT THE RELIEF VALVE IS OPEN BEFORE YOU REMOVE THE ACCESS PANEL. THE SPRING THAT HOLDS THE VALVE CLOSED IS VERY STRONG. IF THE RELIEF VALVE OPENS SUDDENLY, IT CAN CAUSE INJURIES TO PERSONNEL.

- (3) Use a screwdriver to put the pressure relief valve [1] into the open position if it is not open (TASK 28-13-41-400-802).

SUBTASK 28-13-41-010-001

- (4) Remove the applicable access doors from the surge tank:
(TASK 28-11-11-000-802)

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679
633BB Surge Tank Access Door - Wing Station 679

H. Pressure Relief Valve Removal

SUBTASK 28-13-41-020-001

- (1) Remove the mounting bolts [3] that attach the pressure relief valve [1] to the door assembly [4] (Figure 401).

SUBTASK 28-13-41-020-002

- (2) Remove the pressure relief valve [1] from the door assembly [4].

SUBTASK 28-13-41-020-003

- (3) Remove the O-ring seal [2] from the flange groove.

SUBTASK 28-13-41-020-004

- (4) Discard the O-ring seal [2].

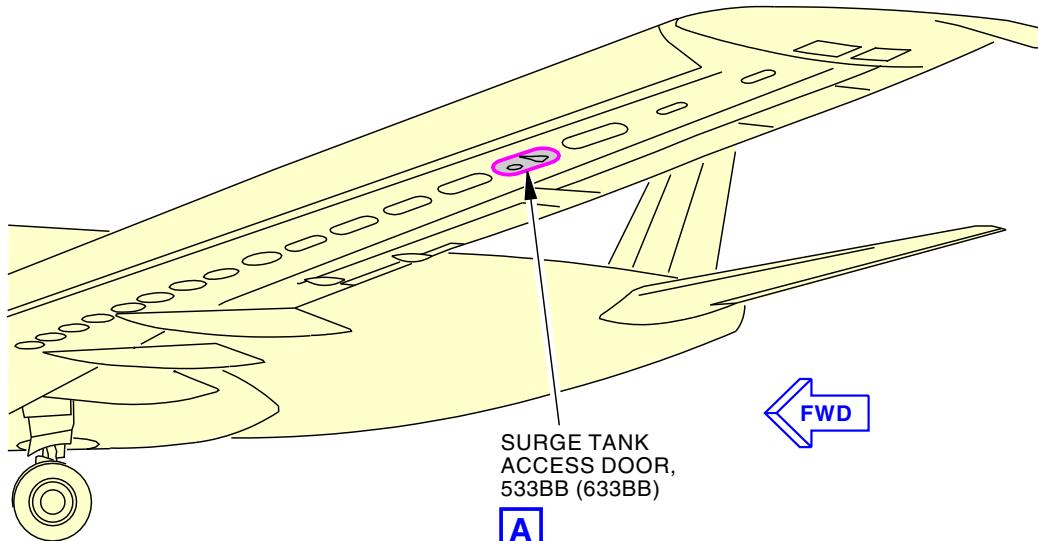
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

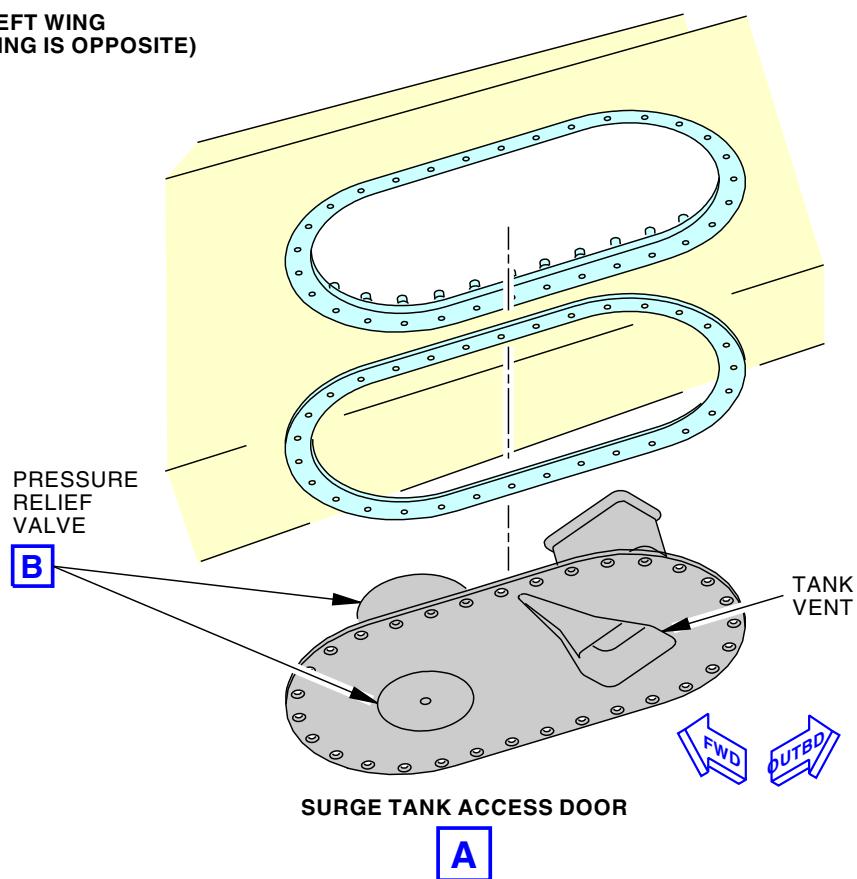
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AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)



F70725 S0006571368_V3

Surge Tank Pressure Relief Valve Installation
Figure 401/28-13-41-990-801 (Sheet 1 of 2)

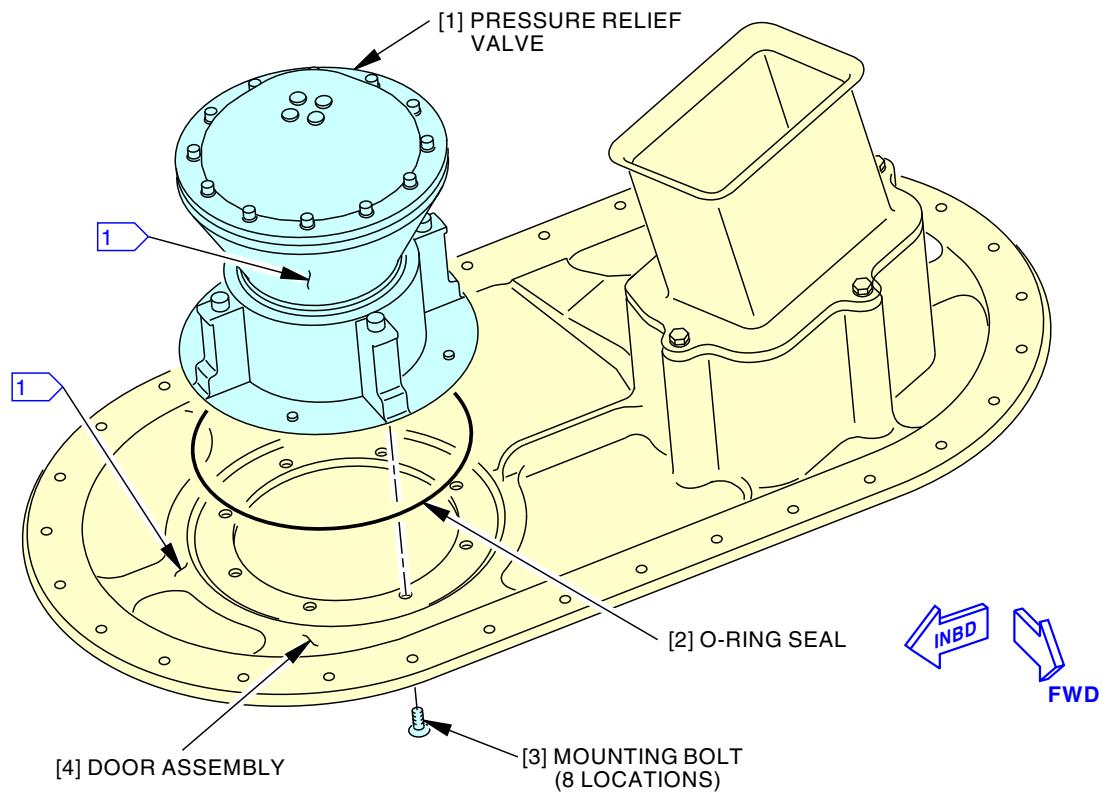
EFFECTIVITY
LOM ALL

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PRESSURE RELIEF VALVE

B

- 1 THE RESISTANCE FROM THE PRESSURE RELIEF VALVE TO THE DOOR ASSEMBLY IS 10 MILLIOHMS OR LESS.

2187745 S0000485123_V2

Surge Tank Pressure Relief Valve Installation
Figure 401/28-13-41-990-801 (Sheet 2 of 2)EFFECTIVITY
LOM ALL**28-13-41**

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TASK 28-13-41-400-801

3. Pressure Relief Valve Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
28-13-41-200-801	Pressure Relief Valve Pressure Check (P/B 601)
28-13-41-400-802	Pressure Relief Valve - Manual Operation (P/B 601)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure relief valve	28-13-41-01A-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437, 438



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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		28-13-41-02-025	LOM 439-447, 450-999
2	O-ring seal	28-13-41-01A-020	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437, 438
		28-13-41-02-020	LOM 439-447, 450-999

F. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

G. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

H. Procedure

SUBTASK 28-13-41-860-002



WARNING

MAKE SURE THE RELIEF VALVE IS OPEN WHEN YOU HOLD IT, MOVE IT, OR KEEP IT FOR A SUBSEQUENT INSTALLATION. THE DEVICE THAT OPENS THE VALVE CONTAINS A STRONG SPRING THAT CAN CAUSE INJURY TO YOUR FINGERS.

- (1) If the pressure relief valve [1] is closed, use a screwdriver to open the pressure relief valve [1] manually (TASK 28-13-41-400-802).

SUBTASK 28-13-41-110-001

► 28-AWL-17: CDCCL

- (2) Install a fay surface bond between the pressure relief valve [1] and door assembly [4] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Fully clean these surfaces with a clean, cotton wiper, G00034, moist with solvent, B00083, and dry them:
 - 1) The O-ring groove on the pressure relief valve [1]
 - 2) The mating surface of the pressure relief valve [1]
 - 3) The mating surface of the door assembly [4].

SUBTASK 28-13-41-420-001

- (3) Install a new O-ring seal [2], lightly lubricated with fuel, in the groove on the flange on the pressure relief valve [1].

SUBTASK 28-13-41-420-002

- (4) Put the pressure relief valve [1] in its correct position on the door assembly [4].



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SUBTASK 28-13-41-420-003

- (5) Attach the pressure relief valve [1] to the door assembly [4] with the eight mounting bolts [3].

SUBTASK 28-13-41-420-004

- (6) Tighten the mounting bolts [3] equally and smoothly to a torque of 32.5 ± 2.5 in-lb
(3.7 ± 0.3 N·m).

SUBTASK 28-13-41-765-001

► 28-AWL-17: CDCCL

- (7) Measure the electrical bonding resistance between the pressure relief valve [1] and the door assembly [4] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-17: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-13-41-410-001

- (8) Install the applicable surge tank access door(s):

(Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803)

Number Name/Location

533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

SUBTASK 28-13-41-860-003

- (9) Pull the T-handle to close the pressure relief valve [1] manually (TASK 28-13-41-400-802).

SUBTASK 28-13-41-710-001

- (10) Do this task: Pressure Relief Valve Pressure Check, TASK 28-13-41-200-801.

NOTE: You do not have to do this test if a new or serviceable relief valve is installed.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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SURGE TANK FLAME ARRESTOR PRESSURE RELIEF VALVE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has three tasks:
 - (1) Pressure relief valve - manual operation.
 - (2) The pressure check of the pressure relief valve.
 - (3) Pressure relief valve - bonding resistance check.
- C. If you open the relief valve, air will not go through the air vent scoop in the fuel vent system. The air usually goes out of the fuel vent system through the air vent scoop. Too much internal pressure or too much external pressure opens the valve. If the valve is open, you must close it manually.
- D. You can do a check of the pressure necessary to open the valve with the valve installed in the airplane. You can do this check with special equipment attached to the external airplane skin.
- E. You can do a bonding resistance check to make sure the electrical fay bonding surface between the pressure relief valve and the structure is within operational limits.

TASK 28-13-41-400-802

2. Pressure Relief Valve - Manual Operation

(Figure 601)

A. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

B. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

C. Procedure

SUBTASK 28-13-41-210-001

- (1) Do a check to see if the relief valve is open.

(a) These are the access panels that contain the relief valve (Figure 601).

Find this access panel:

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679

or open this access panel:

Number	Name/Location
633BB	Surge Tank Access Door - Wing Station 679

(b) Find the relief valve installed in the access panel.

(c) If the valve is open, the T-handle is in the up position.

SUBTASK 28-13-41-440-001

- (2) Open the pressure relief valve manually (Figure 601).

EFFECTIVITY
LOM ALL

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- (a) Put a small screwdriver into the pressure sense hole on this access panel:

Number **Name/Location**

533BB Surge Tank Access Door - Wing Station 679

or open this access panel:

Number **Name/Location**

633BB Surge Tank Access Door - Wing Station 679

- (b) Push up on the screwdriver.

- (c) Make sure the pressure relief valve opens.

NOTE: There is a loud noise and the pressure relief valve moves away from the screwdriver when the pressure relief valve opens.

- (d) Remove the screwdriver from the pressure sense hole.

SUBTASK 28-13-41-860-004

- (3) To close the pressure relief valve, pull the T-handle down until the pressure relief valve closes.

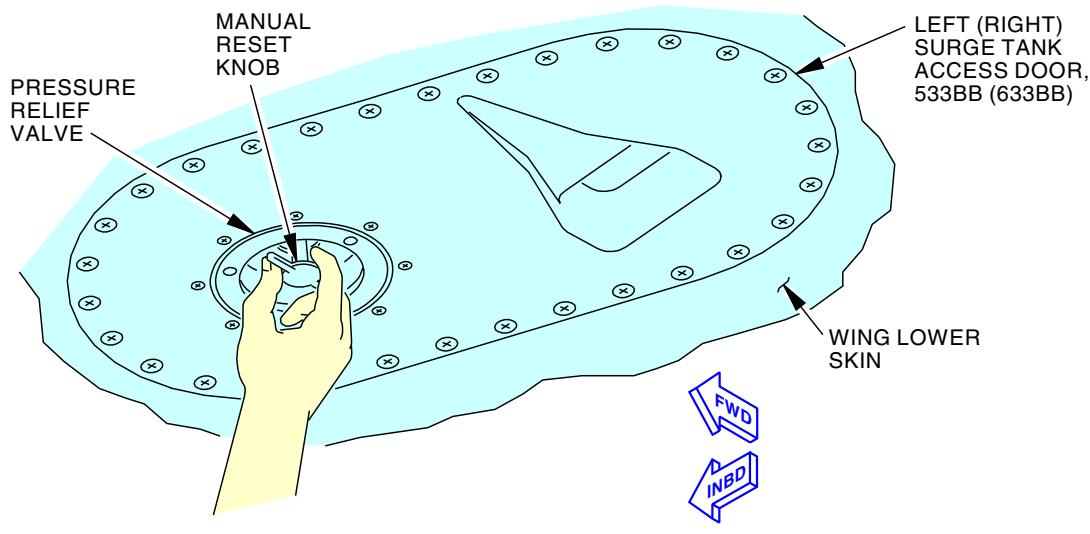
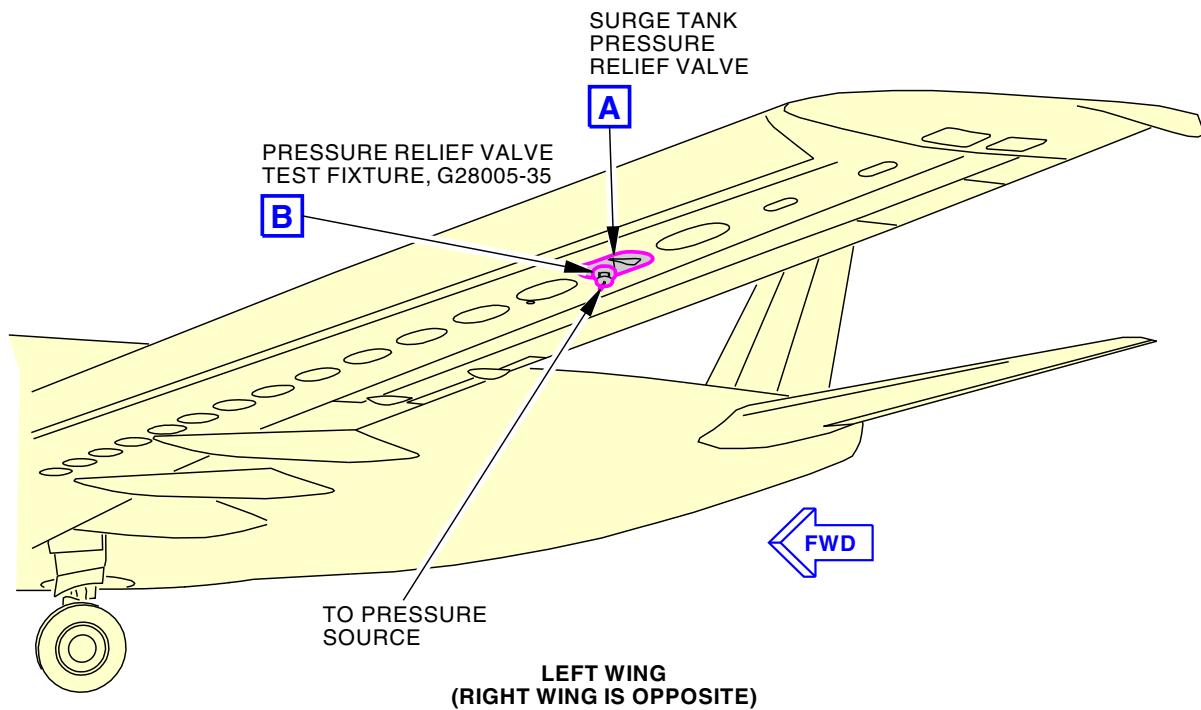
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EFFECTIVITY
LOM ALL

28-13-41



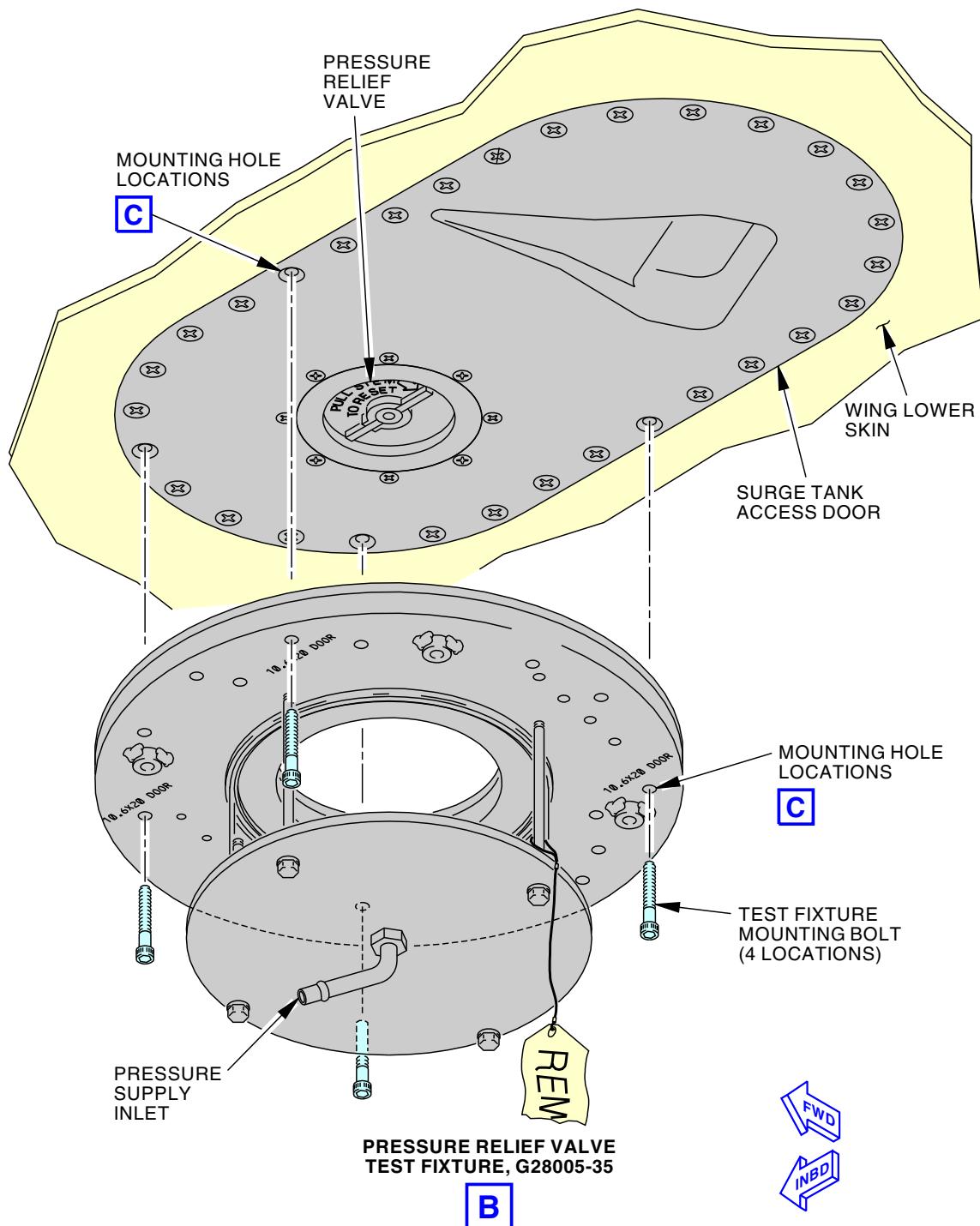
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SURGE TANK PRESSURE RELIEF VALVE
(MANUAL RESET)

EFFECTIVITY
LOM ALL

28-13-41



F71245 S0006571374_V3

Surge Tank Pressure Relief Valve Inspection with Test Fixture, G28005-35
Figure 601/28-13-41-990-802 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

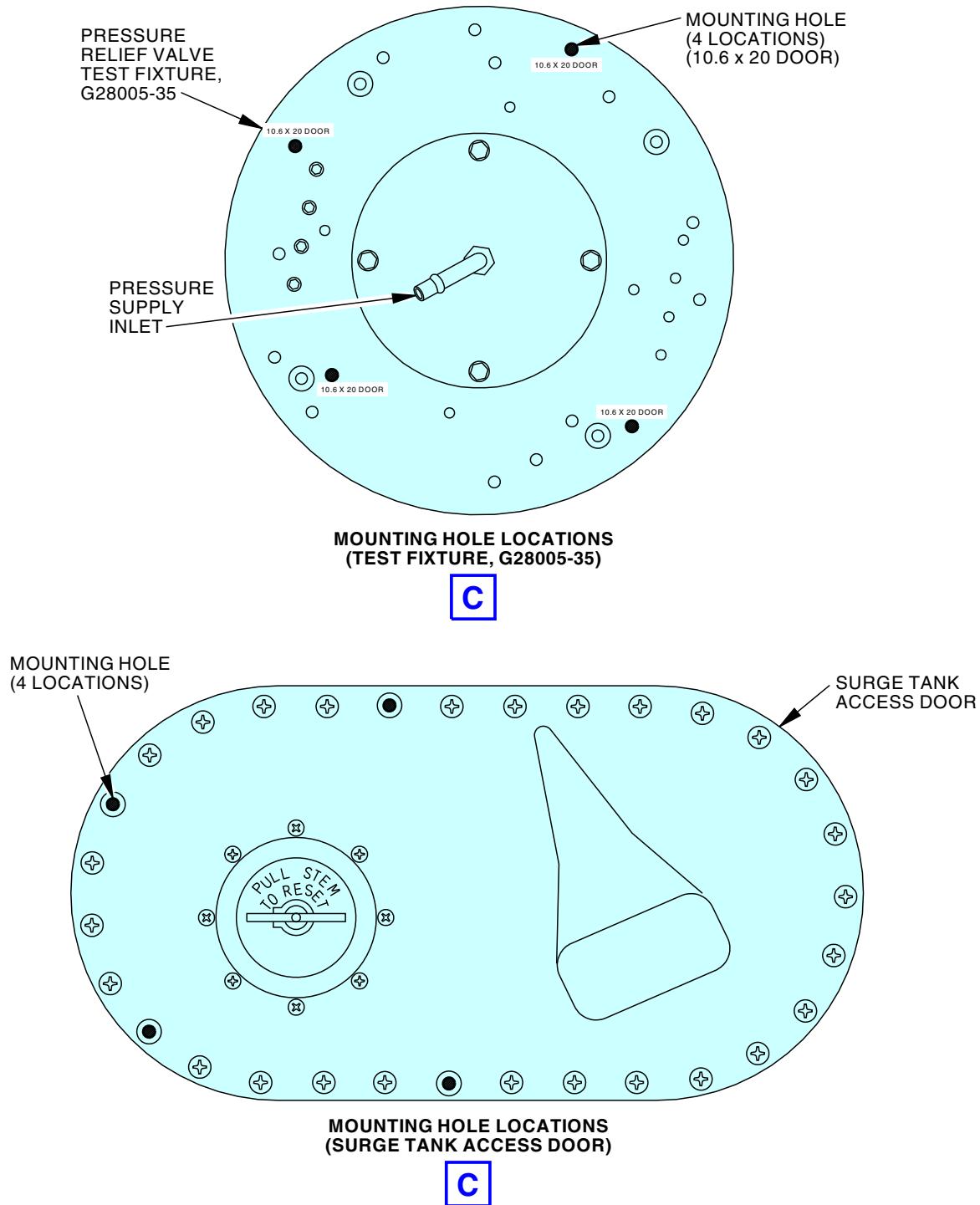
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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M05639 S0006571375_V3

Surge Tank Pressure Relief Valve Inspection with Test Fixture, G28005-35
Figure 601/28-13-41-990-802 (Sheet 3 of 3)

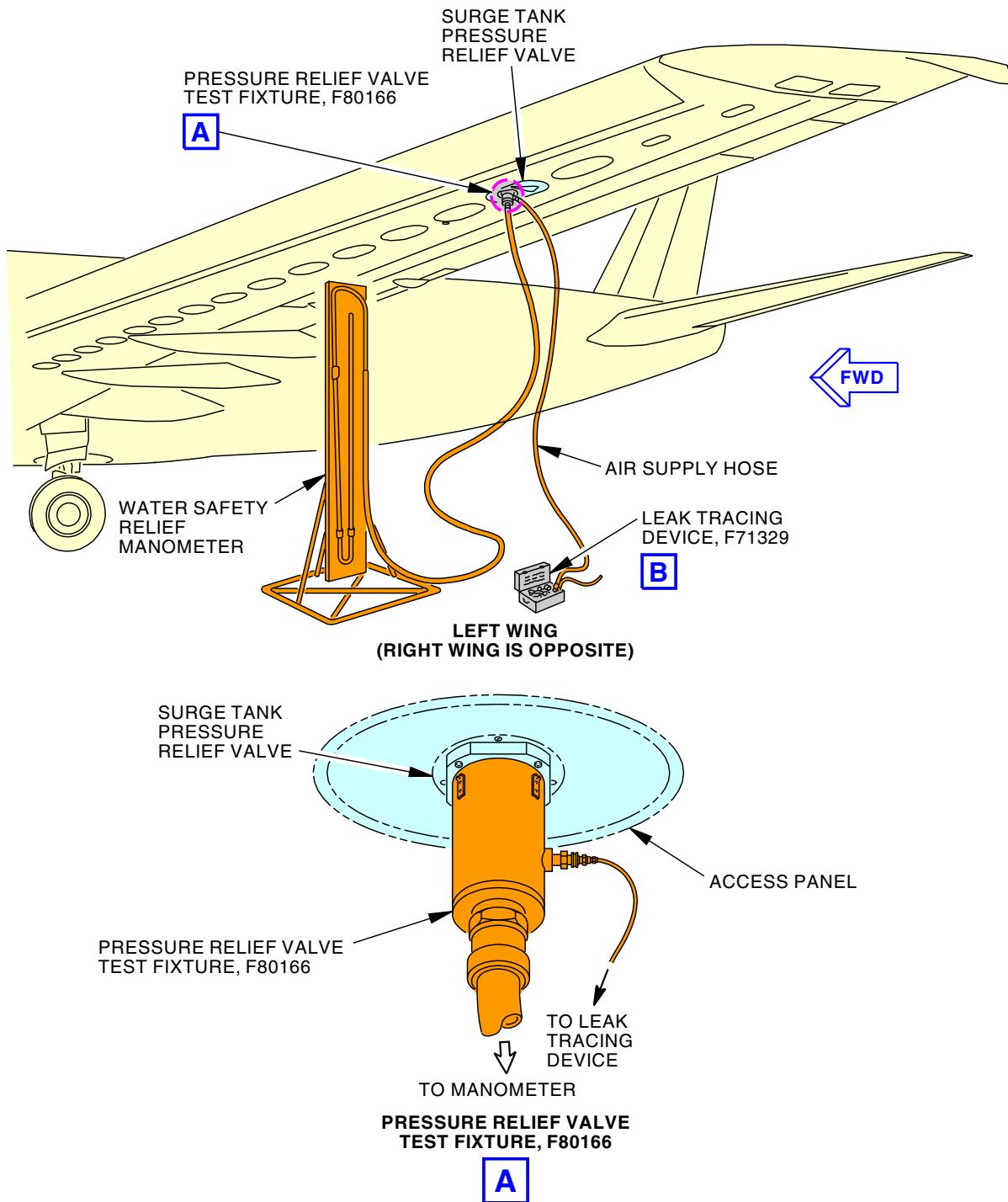
EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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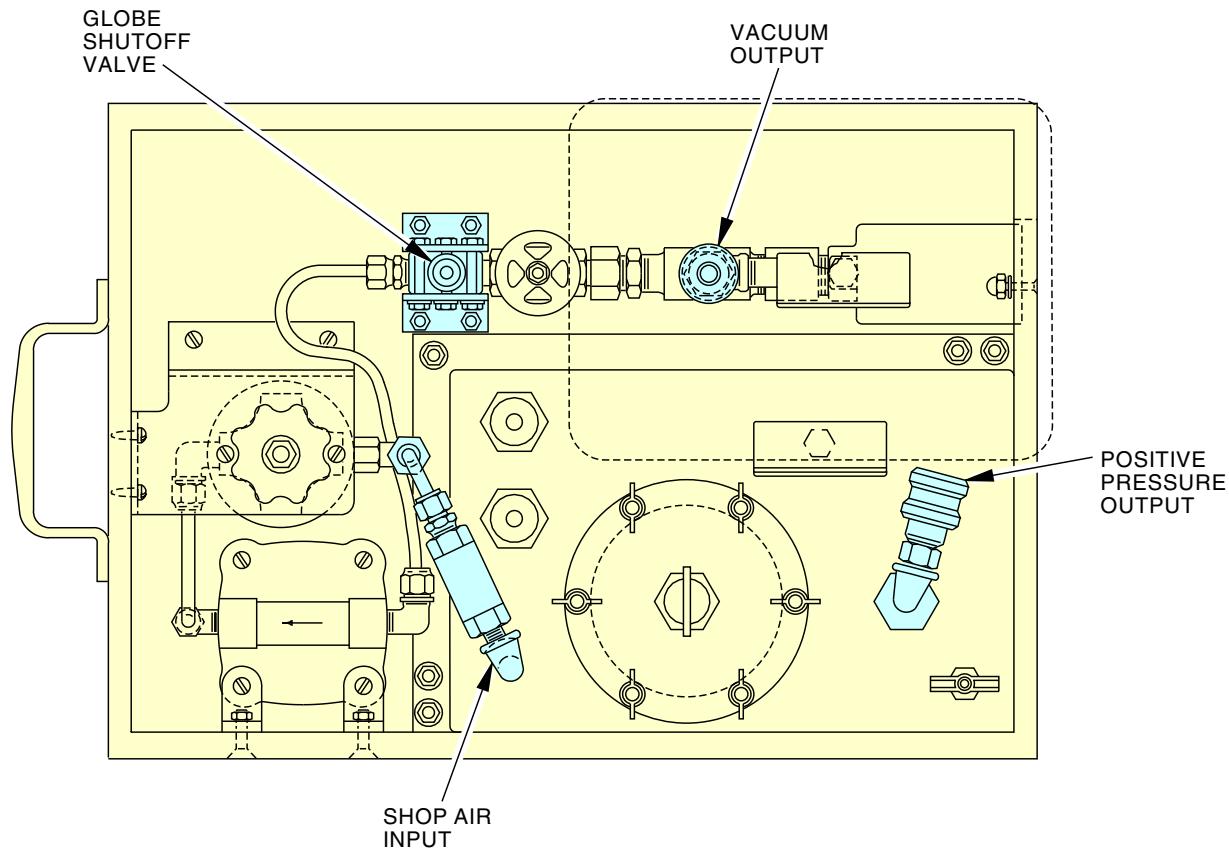
Surge Tank Pressure Relief Valve Inspection with Test Fixture, F80166
Figure 602/28-13-41-990-803 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-13-41



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LEAK TRACING DEVICE, F71329

B

1979368 S0000382264_V2

Surge Tank Pressure Relief Valve Inspection with Test Fixture, F80166
Figure 602/28-13-41-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-13-41

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-13-41-200-801

3. Pressure Relief Valve Pressure Check

(Figure 601, Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) You can use either the valve check equipment, SPL-8420, or the test fixture, SPL-3899, to accomplish this pressure check.

B. References

Reference	Title
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1761	Leakage Tracing Device, Integral Tank Leakage Test Part #: F71329 Supplier: 81205
SPL-1774	Water Manometer - Test Equipment Part #: F72951-1 Supplier: 81205
SPL-3899	Test Fixture - Pressure Relief Valve, Flame Arrestor Surge Tank Part #: F80166-1 Supplier: 81205
SPL-8420	Check Fixture Equipment - Pressure Relief Valve Part #: G28005-35 Supplier: 81205
STD-1084	Gauge - Pressure, 0-10 PSIG (0-69 KPa)
STD-3939	Air Source - Regulated, Dry Filtered, 0 to 10 psig
STD-3944	Vacuum Source, 0 to -3.0 psig

D. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

E. Prepare for the Pressure Check

SUBTASK 28-13-41-210-002

- (1) Make sure that the pressure relief valve is closed.

SUBTASK 28-13-41-440-002

- (2) If the pressure relief valve is open, pull down the T-handle to close the pressure relief valve (TASK 28-13-41-400-802).

SUBTASK 28-13-41-480-001

- (3) If you install the valve check equipment, SPL-8420, on the relief valve, do these steps (Figure 601):

- (a) Remove the four bolts from the applicable access doors:

- 1) 533BB - Surge Tank Access Door - Wing Station 679

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- 2) 633BB - Surge Tank Access Door - Wing Station 679.
- (b) Put the valve check equipment, SPL-8420, against the pressure relief valve.
 - 1) Make sure that the O-ring seal is installed in the flange groove of the test fixture.
 - 2) Make sure that the O-ring has a good seal in all positions.
- (c) Attach the valve check equipment, SPL-8420, to the relief valve.

NOTE: There are two sets of holes in the fixture for the mounting bolts. One set of holes is to be used on the left surge tank access door. The other set of holes is to be used on the right surge tank access door.

 - 1) Put four bolts of the test fixture in the positions of the four mounting bolts for the access door that you removed.
- (d) Connect the regulated 0 to 10 psig air source, STD-3939, to the valve check equipment, SPL-8420.

SUBTASK 28-13-41-420-005

- (4) If you install the test fixture, SPL-3899, do these steps (Figure 602):
 - (a) Remove four of the eight mounting screws that attach the relief valve to the access panel.
 - 1) Remove these screws and make sure that the remaining screws have equal angles of 90 degrees between them.

NOTE: The remaining screws are the corners of a square.
 - (b) Put the test fixture, SPL-3899, against the relief valve.

NOTE: The MS29513-154 O-ring seal is part of the test fixture assembly.

 - 1) Make sure that the O-ring has a good seal in all positions.
 - (c) Attach the test fixture, SPL-3899, to the relief valve.

NOTE: The MS16998-31 screws are part of the test fixture assembly.

 - 1) Put four MS16998-31 screws in the positions of the four mounting screws that you removed before this step.
 - (d) Attach the hose of the pressure gauge (0-10 PSIG) (0-69 KPa), STD-1084, or water manometer, SPL-1774, to the adapter fitting at the bottom of the test fixture, SPL-3899.

NOTE: If you use the pressure gauge (0-10 PSIG) (0-69 KPa), STD-1084, then make sure that it has sufficient accuracy.

 - 1) Make sure that there are no air leaks in the hose or the fittings.
 - (e) If you use the water manometer, SPL-1774, then do these steps to prepare the manometer to make the measurements:
 - 1) Fill the water manometer, SPL-1774, to 39 in. (99 cm) above the horizontal tube at the base of the water manometer, SPL-1774.
 - 2) Put a mark on the tube, at the level of the water, with a grease pen on the side that connects to the airplane.
 - 3) Put another mark 14 in. (36 cm) below the current mark.

NOTE: This represents a change of 28 in. (71 cm) of water.
 - 4) Place another mark 17.5 in. (44.5 cm) below the original mark.

NOTE: This represents a change of 35 in. (89 cm) of water.
 - 5) Use these values for the test for positive pressure requirements.

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- (f) Connect the test fixture, SPL-3899, hose assembly to the leakage tracing device, SPL-1761.
NOTE: You use the leakage tracing device, SPL-1761, only to adjust and control the pressure on the relief valve.
 - 1) To put positive pressure on the pressure relief valve, do these steps:
 - a) Make sure that the globe shutoff valve on the leakage tracing device, SPL-1761, is closed.
 - b) Connect the hose assembly to the fitting for positive pressure output.
- (g) Connect the 0 to 10 psig air source, STD-3939, to the leakage tracing device, SPL-1761, at the fitting for the shop air input.

F. Pressure Check

NOTE: If the pressure check did not pass the first time, do this procedure again the second time.

SUBTASK 28-13-41-780-001

- (1) Slowly and continuously supply a positive pressure of more than 1 psig (6.89 kPa) (27.7 in. (70.4 cm) of water) from the 0 to 10 psig air source, STD-3939.
 - (a) Make sure that the pressure relief valve opens at a pressure between 1 psig (6.89 kPa) (27.7 in. (70.4 cm) of water) and 1.25 psig (8.62 kPa) (34.6 in. (87.9 cm) of water).

SUBTASK 28-13-41-080-001

- (2) Put the pressure back to 0 psig (0 kPa).

SUBTASK 28-13-41-080-002

- (3) Remove the 0 to 10 psig air source, STD-3939.

SUBTASK 28-13-41-080-003

- (4) Remove the valve check equipment, SPL-8420, or test fixture, SPL-3899.

SUBTASK 28-13-41-440-003

- (5) Pull the T-handle to close the relief valve manually, do this task: Pressure Relief Valve - Manual Operation, TASK 28-13-41-400-802.

SUBTASK 28-13-41-480-003

- (6) Install the applicable test fixture on the pressure relief valve again.

SUBTASK 28-13-41-480-006

- (7) If you use the water manometer, SPL-1774, then do these steps to prepare the water manometer, SPL-1774, to make the measurements:

- (a) Put a mark 34.5 in. (87.6 cm) above the original mark (at the original water level).

NOTE: That is, a total of 73.5 in. (186.7 cm) above the horizontal tube at the base of the water manometer, SPL-1774. This represents a pressure differential of -69 in. (-175 cm) of water.

- (b) Make a second mark 38 in. (97 cm) above the original water level.

NOTE: That is, a total of 77 in. (196 cm) above the horizontal tube at the base of the water manometer, SPL-1774. This represents a pressure differential of -76 in. (-193 cm) of water.

- (c) Use these values for the test for negative pressure requirements.

SUBTASK 28-13-41-480-005

- (8) If you use the test fixture, SPL-3899, then do these steps:

- (a) Open the globe shutoff valve on the leakage tracing device, SPL-1761.

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- (b) Disconnect the hose from the positive pressure output.
- (c) Connect the hose to the vacuum output fitting.

SUBTASK 28-13-41-780-002

- (9) Install a vacuum source (0 to -3.0 psig), STD-3944, on the test fixture.

SUBTASK 28-13-41-720-001

- (10) Decrease the pressure (increase the suction) on the test fixture until the relief valve opens.
 - (a) Make sure that the pressure relief valve opens at a pressure between -2.5 psig (-17.24 kPa) (-69.25 in. (-175.90 cm) of water) and -2.75 psig (-18.96 kPa) (-76.18 in. (-193.50 cm) of water).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-13-41-860-005

- (1) Set the pressure on the vacuum source (0 to -3.0 psig), STD-3944, to 0 psig (0 kPa).

SUBTASK 28-13-41-080-004

- (2) Remove the vacuum source (0 to -3.0 psig), STD-3944, from the test fixture.

SUBTASK 28-13-41-080-005

- (3) Do these steps to remove the valve check equipment, SPL-8420, if it was installed:
 - (a) Remove the four bolts of the test fixture from the access door.
 - 1) Store the four bolts in the threaded holes on the valve check equipment, SPL-8420.
 - (b) Install the four bolts for the applicable access doors (TASK 28-11-11-400-803):
 - 1) 533BB - Surge Tank Access Door - Wing Station 679.
 - 2) 633BB - Surge Tank Access Door - Wing Station 679.

NOTE: These are the bolts that you removed at the start of this procedure.

SUBTASK 28-13-41-080-006

- (4) Do these steps to remove the test fixture, SPL-3899, if it was installed:
 - (a) Disconnect the pressure gauge (0-10 PSIG) (0-69 KPa), STD-1084, or water manometer, SPL-1774, and leakage tracing device, SPL-1761, from the area.
 - (b) Remove the test fixture, SPL-3899, from the relief valve.
 - (c) Put back the four usual mounting screws that attach the relief valve to the access panel.
- NOTE: These are the screws that you removed at the start of this procedure if you used the test fixture, SPL-3899.

SUBTASK 28-13-41-440-004

- (5) Pull down the T-handle to close the pressure relief valve (TASK 28-13-41-400-802).

———— END OF TASK ————



TASK 28-13-41-200-802

4. Pressure Relief Valve - Bonding Resistance Check

(Figure 603)

NOTE: This procedure is a scheduled maintenance task.

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A. References

Reference	Title
28-11-11-000-802	Surge Tank Access Door Removal (P/B 401)
28-11-11-400-803	Surge Tank Access Door (533BB, 633BB) - Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
533	Left Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing BL 616.75
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

D. Access Panels

Number	Name/Location
533BB	Surge Tank Access Door - Wing Station 679
633BB	Surge Tank Access Door - Wing Station 679

E. Prepare for the Procedure

SUBTASK 28-13-41-862-001

- (1) Make sure the airplane is correctly grounded to an approved and identified ground.

SUBTASK 28-13-41-710-002

- (2) Make sure there is no remaining fuel in the surge tank.
 - (a) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the sump drain valve.
 - (b) Open the applicable sump drain valve.
 - (c) Let the remaining fuel flow into a 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 28-13-41-560-001



WARNING

MAKE SURE THAT THE RELIEF VALVE IS OPEN BEFORE YOU REMOVE THE ACCESS PANEL. THE SPRING THAT HOLDS THE VALVE CLOSED IS VERY STRONG. IF THE RELIEF VALVE OPENS SUDDENLY, IT CAN CAUSE INJURIES TO PERSONNEL.

- (3) Use a screwdriver to put the relief valve into the open position if it is not open (TASK 28-13-41-400-802).

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SUBTASK 28-13-41-010-002

- (4) Remove the applicable access doors from the surge tank:
(TASK 28-11-11-000-802)

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679
633BB Surge Tank Access Door - Wing Station 679

F. Electrical Bonding Measurement

SUBTASK 28-13-41-765-002

- (1) Measure the electrical bonding resistance between the pressure relief valve and the door assembly with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
(a) Make sure the resistance is 0.010 ohm (10 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-13-41-410-002

- (1) Install the applicable access doors to the surge tank:
(Surge Tank Access Door (533BB, 633BB) - Installation, TASK 28-11-11-400-803)

Number Name/Location

533BB Surge Tank Access Door - Wing Station 679
633BB Surge Tank Access Door - Wing Station 679

SUBTASK 28-13-41-410-003

- (2) Pull the T-handle to close the pressure relief valve manually (TASK 28-13-41-400-802).

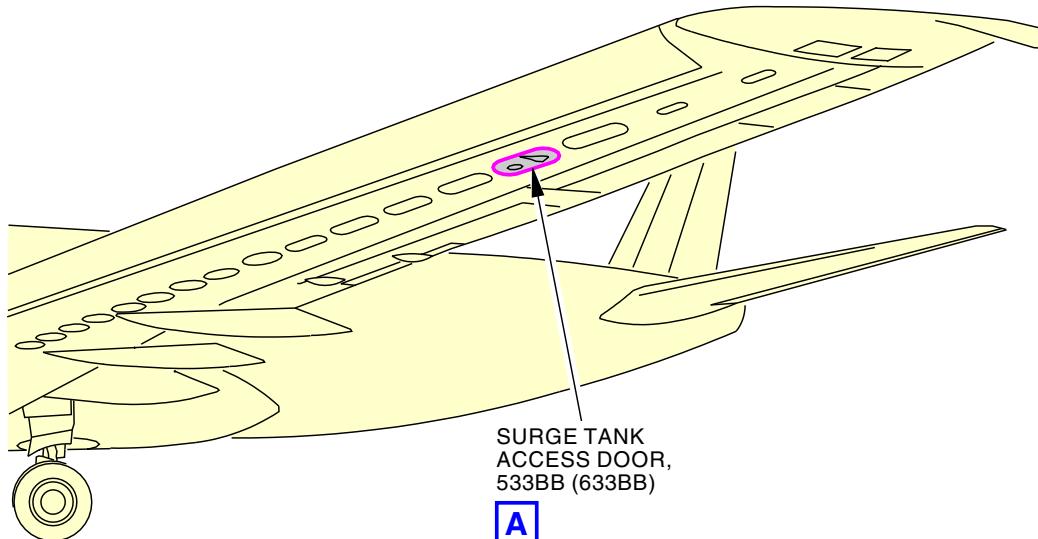
———— END OF TASK ————

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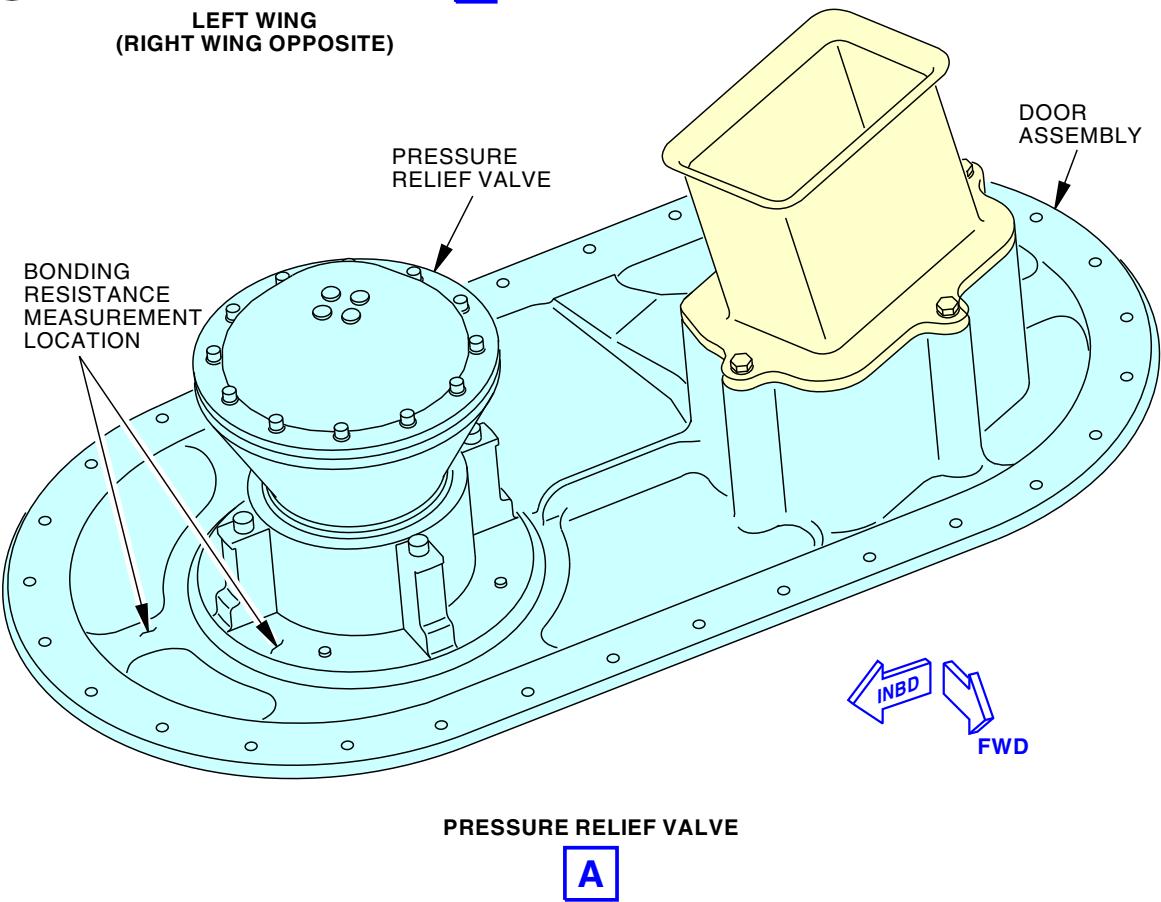
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LEFT WING
(RIGHT WING OPPOSITE)



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Pressure Relief Valve - Bonding Resistance Measurement
Figure 603/28-13-41-990-804

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REFUEL PANEL (P15) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the refuel panel (P15)
 - (2) An installation of the refuel panel (P15).

TASK 28-21-00-000-801

2. Refuel Panel (P15) Removal

(Figure 401)

A. General

- (1) This task includes the steps to remove the refuel panel (P15).

B. References

Reference	Title
28-41-61-000-801	Refuel Quantity Indicator Removal (P/B 401)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare for the Removal

SUBTASK 28-21-00-860-020

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-00-010-005

- (2) Open this access panel:

Number Name/Location

621GB	Refuel Access Panel - Slat Station 143.27
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F. Refuel Panel (P15) Removal

SUBTASK 28-21-00-010-003

- (1) Do these steps to remove the refuel panel [1]:
 - (a) Remove the bolts [9] and washers [8].
 - (b) Remove the bolts [2] and washers [3].
 - (c) Remove the nut [4] and washer [5] to disconnect the bonding jumper [6] from the refuel panel [1].
 - (d) Disconnect the electrical connector [7].

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- (e) If it is necessary, remove the quantity indicators (TASK 28-41-61-000-801).
- (f) Remove the refuel panel [1] from the refueling station.

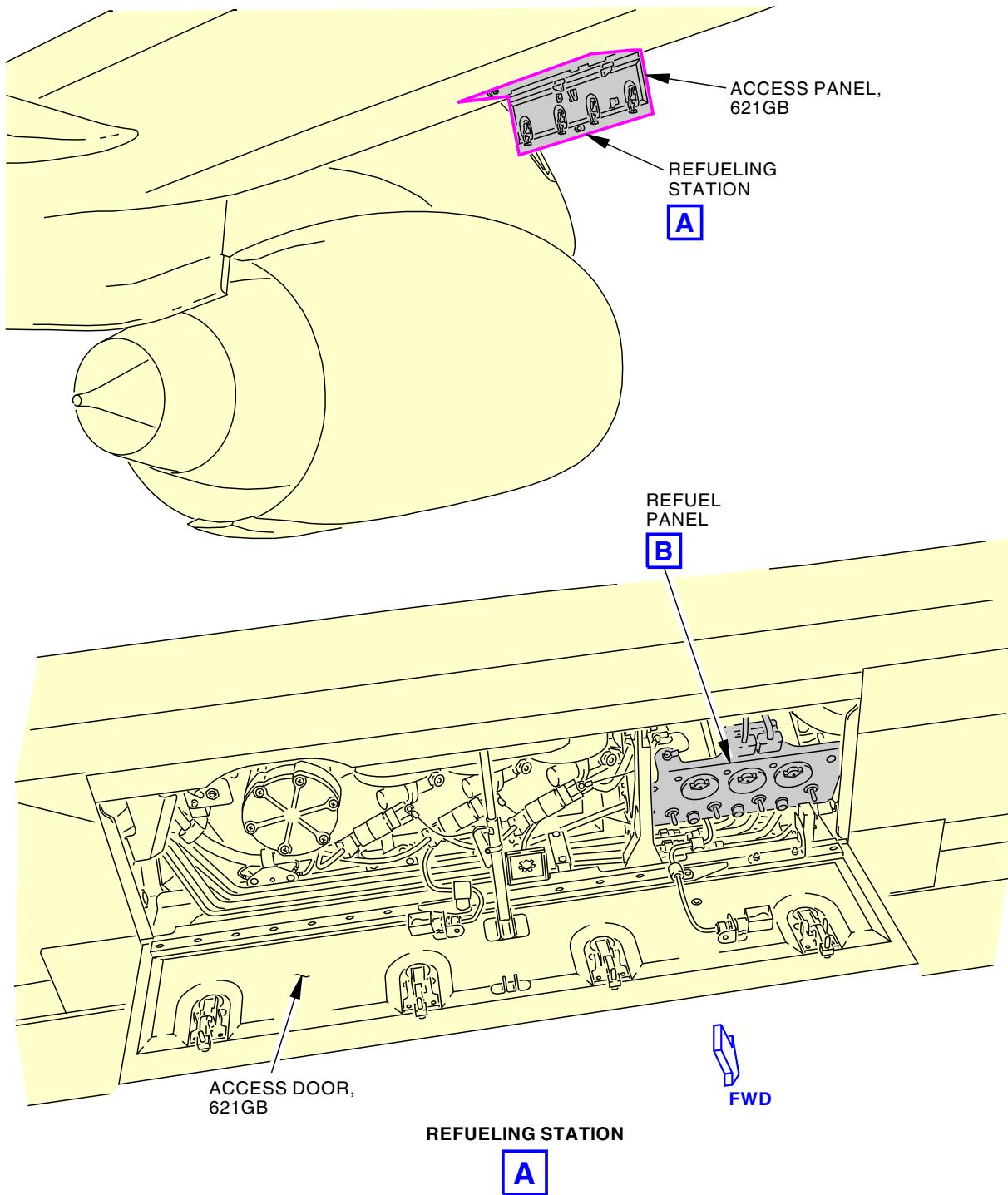
———— END OF TASK ————

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BOEING

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**Refuel Panel (P15) Installation
Figure 401/28-21-00-990-806 (Sheet 1 of 2)**

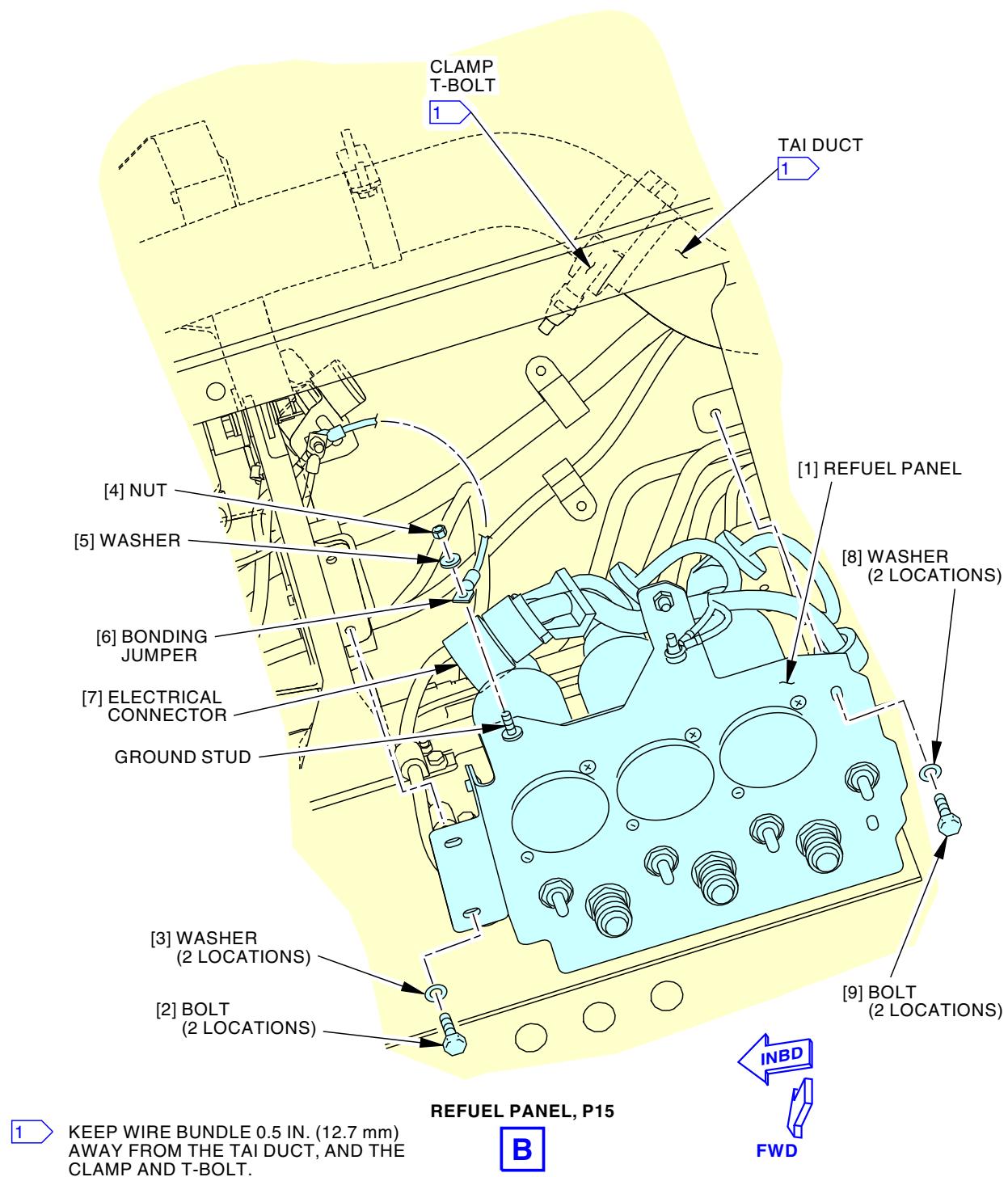
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Refuel Panel (P15) Installation
Figure 401/28-21-00-990-806 (Sheet 2 of 2)

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TASK 28-21-00-400-801

3. Refuel Panel (P15) Installation

(Figure 401)

A. General

(1) This task includes the steps to install and test the refuel panel (P15).

B. References

Reference	Title
28-41-61-400-801	Refuel Quantity Indicator Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10 Paragraph 4.D	Category 2 Fay Sealed Pre-Installed Ground Stud Assembly

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

F. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27





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G. Prepare for the Installation

SUBTASK 28-21-00-860-021

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-00-010-004

- (2) Open this access panel, if it is not open:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

- (a) Remove the pins that attach the linkage assemblies to the access door.

H. Refuel Panel (P15) Installation

SUBTASK 28-21-00-420-004

- (1) If were removed, install the quantity indicators (TASK 28-41-61-400-801).

SUBTASK 28-21-00-420-001

- (2) Do these steps to install the refuel panel [1].

- (a) Put the refuel panel [1] in its correct position between the support members for the leading edge.
- (b) To connect the bonding jumper [6], do these steps:
 - 1) Use cotton wiper, G00034, moist in solvent, B00184, to clean the mating surfaces of the airplane structure, refuel panel [1], nut [4], washer [5], and bonding jumper [6] (SWPM 20-20-00).
 - 2) Apply sealant, A50110, or sealant, A50155, to the mating surfaces of the ground stud, nut [4], washer [5], and bonding jumper [6] (SWPM 20-20-10 Paragraph 4.D).
 - 3) Install the bonding jumper [6], washer [5], and nut [4].
 - 4) Tighten the nut [4] to 28 in-lb (3.2 N·m) - 35 in-lb (4.0 N·m).
 - a) Make sure that there is squeeze out around all the interfaces of each component.
 - 5) Measure the electrical resistance between bonding jumper [6] and refuel panel [1] (SWPM 20-20-00).
 - a) Use an intrinsically safe approved bonding meter, COM-1550.
 - b) Make sure that the electrical bonding resistance is 0.001 ohm (1.0 milliohm) or less.

SUBTASK 28-21-00-760-001

- (3) Measure the electrical resistance between the refuel panel [1] and airplane structure (SWPM 20-20-00).
 - (a) Use an intrinsically safe approved bonding meter, COM-1550.
 - (b) Make sure that the electrical bonding resistance is 0.002 ohm (2.0 milliohm) or less.

SUBTASK 28-21-00-420-003

- (4) Connect the electrical connector [7].

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SUBTASK 28-21-00-420-002

- (5) Install the refuel panel [1].
 - (a) Install the bolts [9] and washers [8].
 - (b) Install the bolts [2] and washers [3].
 - (c) Make sure that the wire bundle has a 0.5 in. (12.7 mm) clearance from the TAI duct.
 - (d) Make sure that the wire bundle has a 0.5 in. (12.7 mm) clearance from the clamp and T-bolt.

SUBTASK 28-21-00-410-007

- (6) Install the pins and the washers that attach the linkages to the access door.

I. P15 Refuel Panel Installation Test

SUBTASK 28-21-00-860-025

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-00-710-016

- (2) Push each refuel valve light.
 - (a) Make sure that each refuel valve light comes on.

NOTE: The refuel valve lights are PRESS-TO-TEST buttons.

SUBTASK 28-21-00-710-017

- (3) On the P15 refuel panel, hold the fueling indication test switch to the TEST GAUGES position.
 - (a) Make sure that the three refuel quantity indicators operate correctly.

NOTE: The test blanks the display on the three refuel quantity indicators for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the fueling indication test switch to the TEST GAUGES position.

If you hold the fueling indication test switch for more than 20 seconds, the test mode times out and the refuel quantity indicators goes back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

SUBTASK 28-21-00-860-026

- (4) Release the fueling indication test switch.

SUBTASK 28-21-00-710-018

- (5) On the P15 refuel panel, make sure that the fueling shutoff valve switches operates as follows:
 - (a) Set the fueling shutoff valve switch for the No. 1 main tank to the OPEN position.
 - 1) Make sure that the refuel valve light for the No. 1 main tank comes on.
 - (b) Set the fueling shutoff valve switch for the No. 1 main tank to the CLOSED position.
 - 1) Make sure that the refuel valve light for the No. 1 main tank goes off.
 - (c) Set the fueling shutoff valve switch for the No. 2 main tank to the OPEN position.
 - 1) Make sure that the refuel valve light for the No. 2 main tank comes on.

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- (d) Set the fueling shutoff valve switch for the No. 2 main tank to the CLOSED position.
 - 1) Make sure that the refuel valve light for the No. 2 main tank goes off.
- (e) Set the fueling shutoff valve switch for the center tank to the OPEN position.
 - 1) Make sure that the refuel valve light for the center tank comes on.
- (f) Set the fueling shutoff valve switch for the center tank to the CLOSED position.
 - 1) Make sure that the refuel valve light for the center tank goes off.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-00-410-006

- (1) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

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PRESSURE FUELING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has one task, a test of the pressure fueling system.

TASK 28-21-00-700-801

2. Pressure Fueling System - Test

(Figure 501)

A. **References**

Reference	Title
20-40-11-760-801	Electrical Bonding (P/B 201)
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-21-11-000-801	Fueling Receptacle Removal (P/B 401)
28-21-11-400-801	Fueling Receptacle Installation (P/B 401)

B. **Tools/Equipment**

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. **Location Zones**

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. **Access Panels**

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. **Procedure**

SUBTASK 28-21-00-910-001



WARNING

YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO MAINTENANCE ON THE FUEL SYSTEM. IF YOU DO NOT GROUND AND BOND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

- (1) Make sure the airplane is grounded correctly (TASK 20-40-11-910-801).

SUBTASK 28-21-00-480-001

- (2) Connect a ground cable from the fueling source and other fuel equipment being used for tank maintenance to an approved and identified static ground.

SUBTASK 28-21-00-480-002

- (3) Connect a bonding cable from the fueling vehicle to an approved electrical grounding or bonding connection on the airplane.

NOTE: If the fueling vehicle has a permanently attached V or Y grounding cable, connect one part of the V or Y to an approved identified ground. Then connect the other part of the V or Y cable to an approved electrical bonding or grounding point on the airplane.

SUBTASK 28-21-00-860-023

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-00-710-001

- (5) Make sure the equipment at the refuel station (the P15 panel) operates correctly.

- (a) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

- (b) Make sure the floodlights for the refuel nozzle come on.

- (c) Make sure the refuel quantity indicators show the correct fuel quantity.

SUBTASK 28-21-00-710-002

- (6) Push each indication light that shows the fueling valve position.

- (a) Make sure the indication lights come on.

NOTE: The lights are PRESS-TO-TEST.

SUBTASK 28-21-00-710-003

- (7) Make sure the refuel quantity indicators for these tanks operate correctly:

- (a) The No. 1 fuel tank

- (b) The No. 2 fuel tank

- (c) The center tank.

- (d) Hold the test switch for these indicators in the TEST GAGES position.

- (e) Make sure the indicators operate correctly.

NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

- (f) Release the test switch.

SUBTASK 28-21-00-210-001

- (8) Examine the refuel adapter.

- (a) Examine the refuel adapter for damage that can cause the fuel nozzle not to have a good seal.

SUBTASK 28-21-00-710-004

- (9) Make sure the poppet valve in the fueling receptacle operates correctly (Figure 501).

- (a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fueling receptacle.

- (b) Push the poppet valve in the fueling receptacle.

- 1) Make sure the poppet valve has a good seal.

- 2) Make sure it moves freely to open and to close.

SUBTASK 28-21-00-710-005

- (10) Make sure the fueling shutoff valves operate correctly.

- (a) Set the switch for the fueling shutoff valve for the No. 1 tank to OPEN.

- (b) Make sure the indication light for the fueling shutoff valve for the No. 1 tank comes on.

- (c) Set the switch for the fueling shutoff valve for the No. 1 tank to CLOSE.

- (d) Make sure the indication light for the fueling shutoff valve for the No. 1 tank goes off.

- (e) Set the switch for the fueling shutoff valve for the No. 2 tank to OPEN.

EFFECTIVITY
LOM ALL

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- (f) Make sure the indication light for the fueling shutoff valve for the No. 2 tank comes on.
- (g) Set the switch for the fueling shutoff valve for the No. 2 tank to CLOSE.
- (h) Make sure the indication light for the fueling shutoff valve for the No. 2 tank goes off.
- (i) Set the switch for the fueling shutoff valve for the center tank to OPEN.
- (j) Make sure the indication light for the fueling shutoff valve for the center tank comes on.
- (k) Set the switch for the fueling shutoff valve for the center tank to CLOSE.
- (l) Make sure the indication light for the fueling shutoff valve for the center tank goes off.

SUBTASK 28-21-00-710-007

- (11) Make sure the floodlights go off when the refuel station door is closed.
 - (a) Put a thin strip of steel between the magnet and the fueling power control switch on the refuel station door (Figure 501).
NOTE: This condition is equivalent to a closed door.
 - (b) Make sure these floodlights go out:
 - 1) The two floodlights for the refuel nozzle.
 - 2) The floodlight for the refuel panel.
 - (c) Set the test switch for the refuel quantity to FUELING POWER - CONTROL.
 - (d) Make sure the lights for the refuel station come on.
 - (e) Set the test switch to OFF again.
 - (f) Remove the metal strip that you used on the proximity switch.
 - (g) Make sure the distance between the magnet and the proximity switch is 0.08 ± 0.02 in. (2.03 ± 0.51 mm).

SUBTASK 28-21-00-480-004



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (12) Do an inspection of the refuel adapter before you connect the fuel hose nozzle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws, lugs, and slots are not loose or damaged.
 - (b) If there is a problem with the refuel adapter, replace the fueling receptacle (TASK 28-21-11-000-801 and TASK 28-21-11-400-801).
 - (c) Attach the nozzle on the fuel hose to the refuel adapter.
 - 1) Open the valve in the nozzle on the fuel hose.
 - 2) Make sure the nozzle and the refuel adapter have a good seal.

SUBTASK 28-21-00-860-002

- (13) Make sure all of the fueling shutoff valves are closed.

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-00-790-001



WARNING

MAKE SURE THAT THE SOURCE PRESSURE IS LESS THAN THE SPECIFIED PRESSURE. IF THE SOURCE PRESSURE IS TOO HIGH, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (14) Do these steps to do a leak check of the pressure fueling system during the refuel operation:
- Make sure all of the fueling shutoff valves are closed.
 - Start the pump on the fuel truck or the fuel source.
 - Monitor the fuel source to make sure the pressure is not more than 55 psi (379 kPa).
 - Make sure there is no leakage at these locations:
 - The seal between the fuel nozzle and the refuel adapter.
 - The fueling receptacle
 - The fittings on the manifold
 - The fueling shutoff valves.
 - With the manual override switch, slowly open each fueling shutoff valve and close it again.
 - Make sure the fueling shutoff valves move freely.
NOTE: The fueling shutoff valves must open and close freely with the conditions of pressure fueling.
 - Make sure all of the fueling shutoff valves are closed before you continue this procedure.
 - The flowmeter on the fuel truck or the fuel source must show no fuel flow.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-860-013

- (15) Set the PRESET display on the preselect indicator to 1800.

NOTE: Turn the preset knob below the display to set the PRESET display.

LOM ALL

SUBTASK 28-21-00-860-003

- (16) Set the switch for the fueling shutoff valve for the No. 1 tank to OPEN.

SUBTASK 28-21-00-650-001

- (17) Fill the No. 1 tank with fuel.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-720-001

- (18) Make sure the fueling operation stops when the upper display of the indicator for the No. 1 tank shows a value between 1700 and 1900.

LOM ALL

SUBTASK 28-21-00-710-008

- (19) Examine these indicators to make sure that the refuel operation started:
 - The flowmeter on the fuel truck or the fuel source
 - The refuel quantity indicator for the No. 1 tank on the refuel panel (P15).

SUBTASK 28-21-00-650-002

- (20) Continue to put fuel in the tank until the DC float switch closes the fueling shutoff valve.

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-00-860-005

- (21) Set the switch for the fueling shutoff valve for the No. 1 tank to CLOSE.

SUBTASK 28-21-00-860-006

- (22) Set the switch for the fueling shutoff valve for the No. 2 tank to OPEN.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-860-015

- (23) Set the PRESET display on the preselect indicator to 1800.

NOTE: Turn the preset knob below the display to set the PRESET display.

LOM ALL

SUBTASK 28-21-00-650-003

- (24) Fill the No. 2 tank with fuel.

SUBTASK 28-21-00-710-009

- (25) Examine these indicators to make sure that the refuel operation started:

(a) The flowmeter on the fuel truck or the fuel source

(b) The refuel quantity indicator for the No. 2 tank on the refuel panel (P15).

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-720-002

- (26) Make sure the fueling operation stops when the upper display of the indicator for the No. 2 tank shows a value between 1700 and 1900.

LOM ALL

SUBTASK 28-21-00-710-010

- (27) Continue to put fuel in the tank until the DC float switch closes the fueling shutoff valve.

SUBTASK 28-21-00-860-008

- (28) Set the switch for the fueling shutoff valve for the No. 2 tank to CLOSE.

SUBTASK 28-21-00-860-009

- (29) Set the switch for the fueling shutoff valve for the center tank to OPEN.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-860-017

- (30) Set the PRESET display on the preselect indicator for the center tank to 6700.

NOTE: Turn the preset knob below the display to set the PRESET display.

LOM ALL

SUBTASK 28-21-00-650-004

- (31) Fill the center tank with fuel.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 28-21-00-720-003

- (32) Make sure the fueling operation stops when the upper display of the indicator for the center tank shows a value between 6600 and 6800.

LOM ALL

SUBTASK 28-21-00-710-011

- (33) Examine these indicators to make sure that the refuel operation started:

EFFECTIVITY
LOM ALL

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- (a) The flowmeter on the fuel truck or the fuel source
- (b) The refuel quantity indicator for the center tank on the refuel panel (P15).

SUBTASK 28-21-00-710-012

- (34) Continue to put fuel in the tank until the DC float switch closes the fueling shutoff valve.

SUBTASK 28-21-00-860-011

- (35) Set the switch for the fueling shutoff valve for the center tank to CLOSE.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-00-650-005

- (1) Stop the fuel flow from the fuel truck or the fuel source.

SUBTASK 28-21-00-080-001

- (2) Do these steps in this sequence to remove the fuel hose:
 - (a) Close the valve on the nozzle of the fuel hose.
 - (b) Disconnect the nozzle from the refuel adapter.

SUBTASK 28-21-00-160-001

- (3) Soak up the fuel that fell during the refuel operation if there is some unwanted fuel.

SUBTASK 28-21-00-080-002

- (4) Disconnect the ground cables from the fuel source and the airplane (TASK 20-40-11-910-801).

SUBTASK 28-21-00-080-003

- (5) Disconnect the bonding cable between the fueling vehicle and the airplane (TASK 20-40-11-760-801).

SUBTASK 28-21-00-410-001

- (6) Close this access panel:

Number **Name/Location**

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-00-860-024

- (7) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

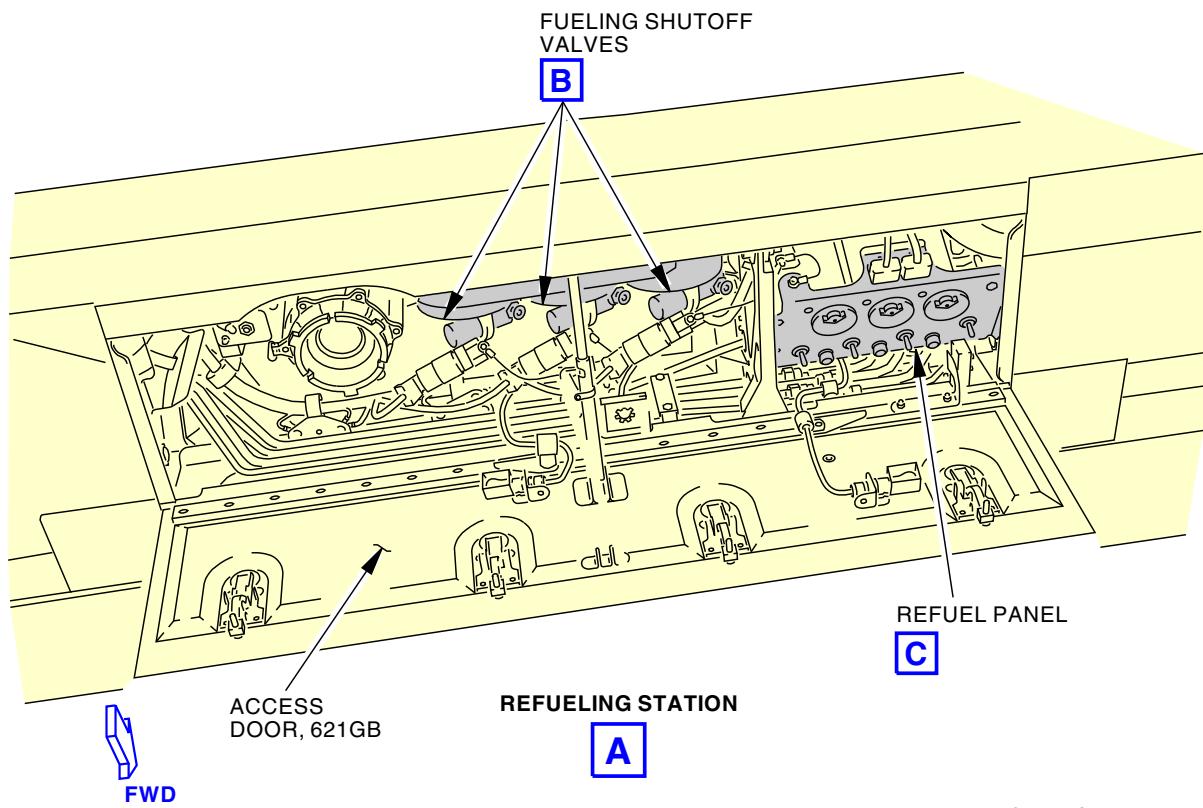
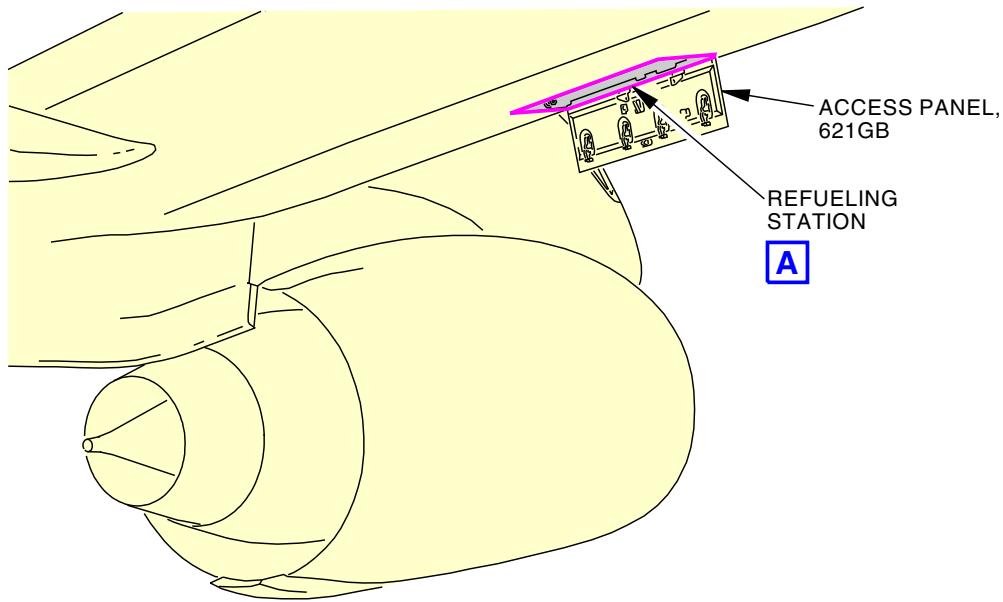
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G07813 S0006571800_V5

Pressure Fueling System Test
Figure 501/28-21-00-990-803 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-21-00

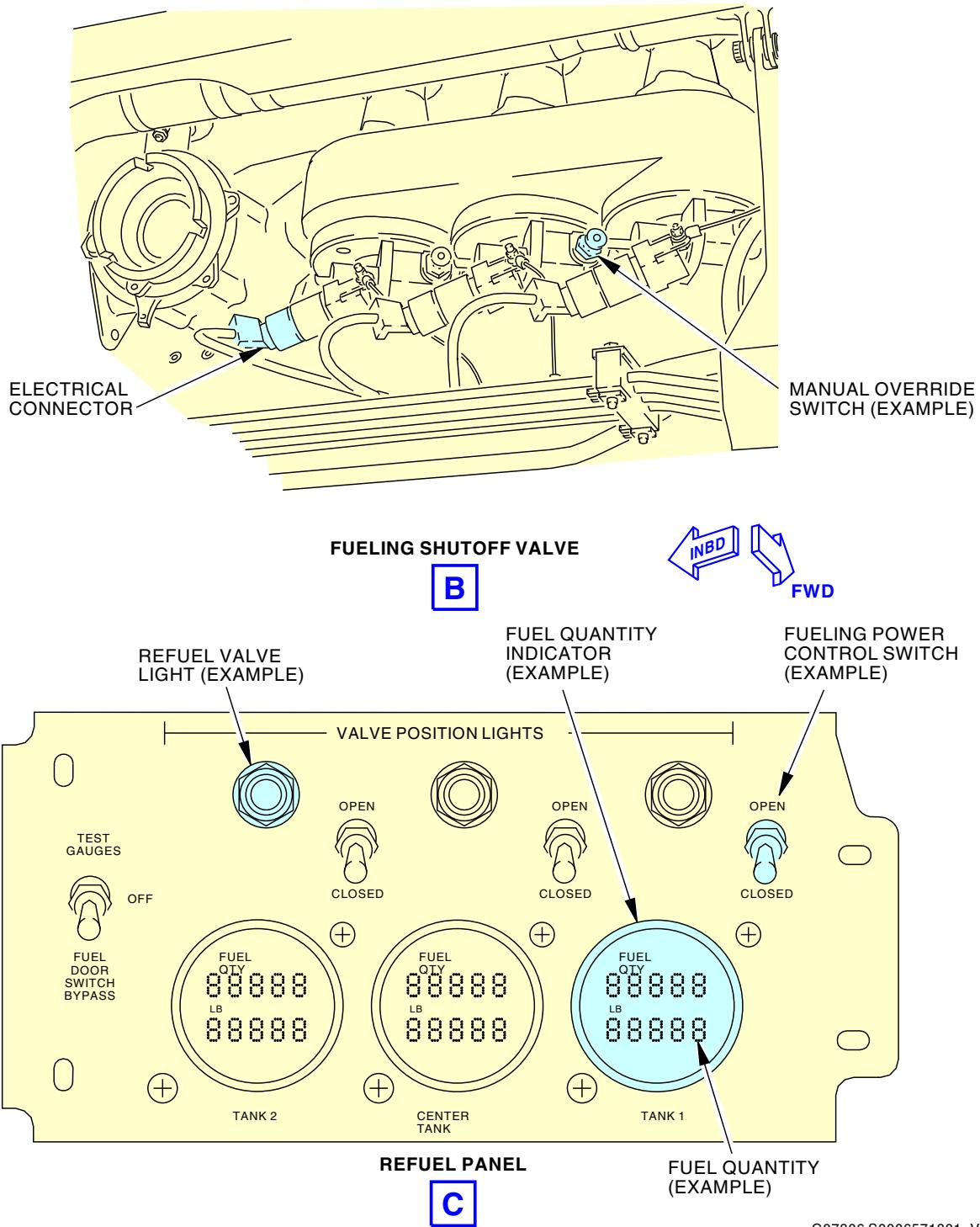
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G07806 S0006571801_V5

Pressure Fueling System Test
Figure 501/28-21-00-990-803 (Sheet 2 of 3)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 423,
424, 426-431, 437-439, 441, 445, 450-452, 457-465

28-21-00

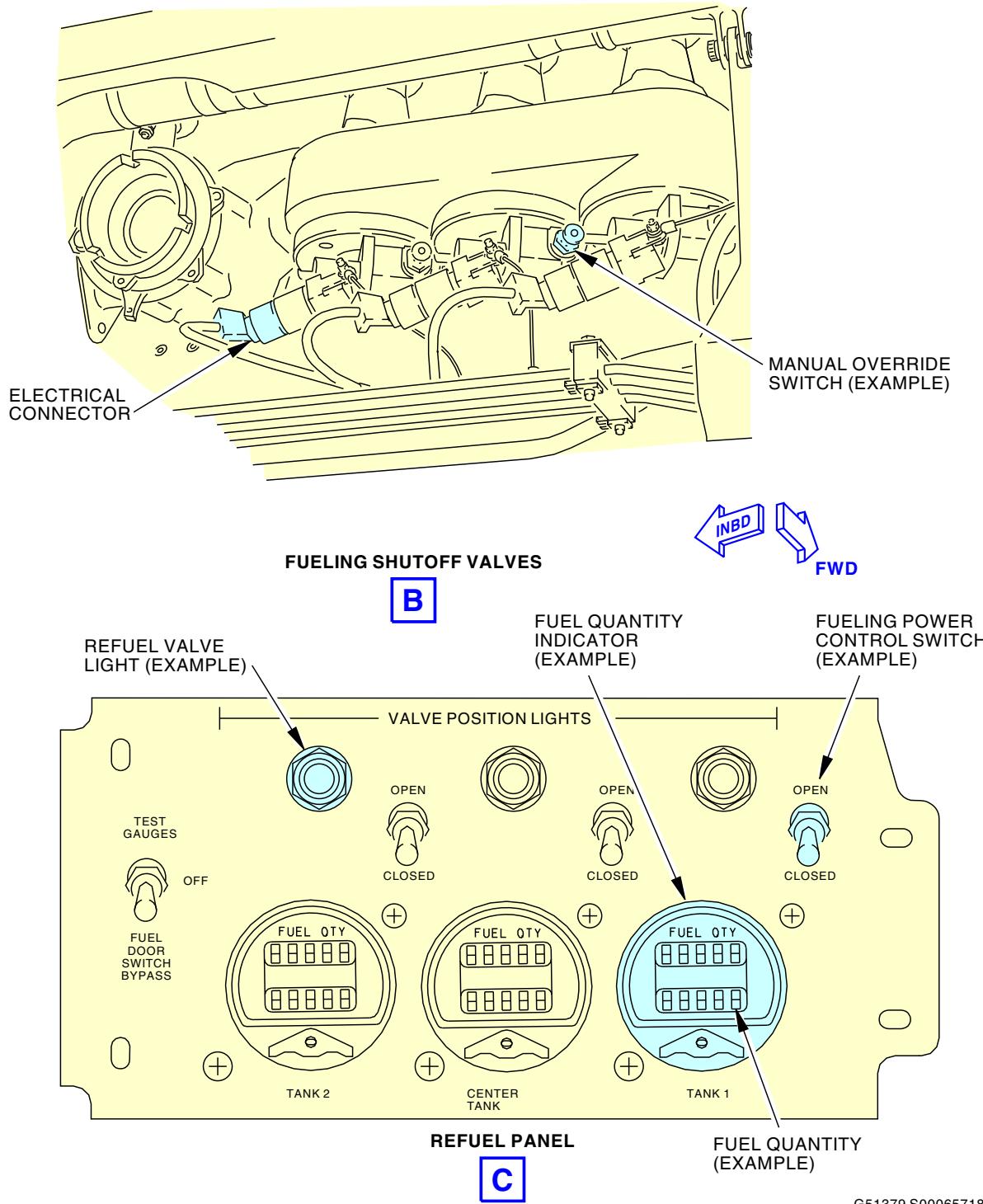
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BOEING

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AIRCRAFT MAINTENANCE MANUAL**



G51379 S0006571802_V5

Pressure Fueling System Test
Figure 501/28-21-00-990-803 (Sheet 3 of 3)

EFFECTIVITY
LOM 422, 425, 432-434, 440, 442-444, 446, 447,
453-456, 466-999

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PRESSURE FUELING SYSTEM - INSPECTION/CHECK

1. General

- A. This procedure contains instructions to do a check of the refuel receptacle adapter.
 - (1) If there is fuel leakage or damage at the refuel adapter, it must be replaced.
- B. This procedure also has a task to inspect the wire bundle for the refuel panel.

TASK 28-21-00-750-801

2. Refuel Adapter Check

(Figure 601)

A. References

Reference	Title
28-21-11-000-801	Fueling Receptacle Removal (P/B 401)
28-21-11-400-801	Fueling Receptacle Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-8626	Wear Gage - Inlet Adapter Part #: 61657-2 Supplier: 0DT23

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Procedure

SUBTASK 28-21-00-010-001

- (1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-00-211-005

- (2) Do these steps to make sure the refuel adapter is clean and does not have any damage:

- (a) Examine the refuel adapter to make sure each of the screws that attach the refuel adapter are not loose, missing or damaged.
- (b) Examine the refuel adapter for bent or cracked lugs.
- (c) Do a detailed visual examination of the cylinder area within 0.5 in. (12.7 mm) circumferentially on each side of each lug for cracks.

NOTE: The examination area includes the inside and outside surfaces of the refuel adapter from the bottom of the adapter flange to the shear groove.

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-00-750-001

- (3) Make sure the flange of the refuel adapter is in these limits:

NOTE: Use of the wear gage, COM-8626, is recommended to measure these limits (View B).

- (a) The thickness of the three lugs of the flange is more than 0.224 in. (5.690 mm) (View D).
- (b) The width of the three lugs of the flange is more than 0.425 in. (10.795 mm) (View D).
- (c) The three slots of the flange must not be worn such that a pin, oblong with full circular ends of 0.305 in. (7.747 mm) width, can be put into the slots a depth of 0.120 in. (3.048 mm) (View C).

SUBTASK 28-21-00-220-001

- (4) If you use the wear gage, COM-8626, to measure the dimensions of the flange, do these steps:

- (a) Do these steps to measure the dimensions of the slot:

- 1) Put the gage on the refuel adapter, near one lug so that the gage cap and center pin face away from the refuel adapter, toward you.
- 2) Make sure the refuel adapter groove in the opposite face of the gage (the face toward the refuel adapter, away from you) fits on the rim of the refuel adapter and moves smoothly along the rim.
- 3) There are two lines on the face of the refuel adapter toward you to help you line up the groove with the adapter rim.
- 4) The center pin must protrude out of the gage cap toward you.
- 5) Slide the gage around the rim toward the opposite lug until the center pin goes into the slot.
 - a) If the refuel adapter is OK, you will only hear a slight click and only get a slight feeling of resistance when the pin touches the slot. The pin will not move significantly into the slot. The pin will continue to protrude from the gage cap.
 - b) If the refuel adapter is not OK, you will feel more resistance when the pin enters the slot. The pin will be flush with the gage cap or lower than the gage cap.
 - c) When the pin is in the slot, do a check to make sure the pin continues to protrude from the gage cap to see if the pin has not significantly entered the slot.
 - <1> If the pin continues to protrude from the gage cap, then the slot is okay.
 - <2> If the pin is flush with the gage cap or lower than the gage cap, then the slot is not okay. Replace the refuel adapter ("flange").

- 6) Do this same check for the other two slots on the refuel adapter ("flange").

- (b) To measure the thickness of the refuel adapter lugs, use the smaller of the two notches provided on the gage.

- 1) Try to pass the smaller of the two notches across one of the lugs.
- 2) If the gage will pass completely across the lug, then the lug has less than the minimum thickness.
 - a) Replace the refuel adapter ("flange"). These are the tasks: Fueling Receptacle Removal, TASK 28-21-11-000-801, Fueling Receptacle Installation, TASK 28-21-11-400-801.
- 3) If the gage will not pass across the lug, then the lug is okay.

EFFECTIVITY
LOM ALL

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- a) Do this same check for the other two lugs
- (c) To measure the thickness of the refuel adapter lugs, use the larger of the two notches provided on the gage.
 - 1) Try to seat the gage onto the lug through the larger notch.
 - 2) If you can seat the gage onto the lug through the larger notch, then the lug has less than the minimum width.
 - a) Replace the refuel adapter ("flange"). These are the tasks: Fueling Receptacle Removal, TASK 28-21-11-000-801, Fueling Receptacle Installation, TASK 28-21-11-400-801.
 - 3) If you can not seat the gage onto the lug through the larger notch, then the lug is okay.
 - a) Do this same check for the other two lugs.

SUBTASK 28-21-00-960-001

- (5) If the flange of the refuel adapter is not in the correct limits, replace the refuel adapter.

These are the tasks:

Fueling Receptacle Removal, TASK 28-21-11-000-801,

Fueling Receptacle Installation, TASK 28-21-11-400-801.

NOTE: Make sure a new flange is installed.

F. Put the Airplane Back to its Usual Condition

SUBTASK 28-21-00-860-019



CAUTION

MAKE SURE THAT THE DEFUEL LEVER IS IN THE CORRECT POSITION, IN THE RECESS ON THE REFUEL RECEPTACLE ADAPTER. IF THE DEFUEL LEVER IS NOT IN THE CORRECT POSITION, YOU CAN CAUSE DAMAGE TO THE REFUEL RECEPTACLE ASSEMBLY.

- (1) Make sure the defuel lever is correctly positioned in the recess for refuel adapter.

SUBTASK 28-21-00-410-002

- (2) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

EFFECTIVITY
LOM ALL

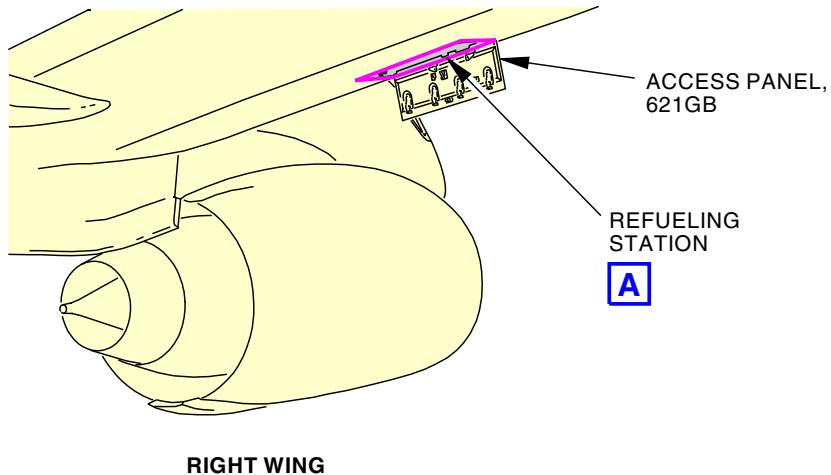
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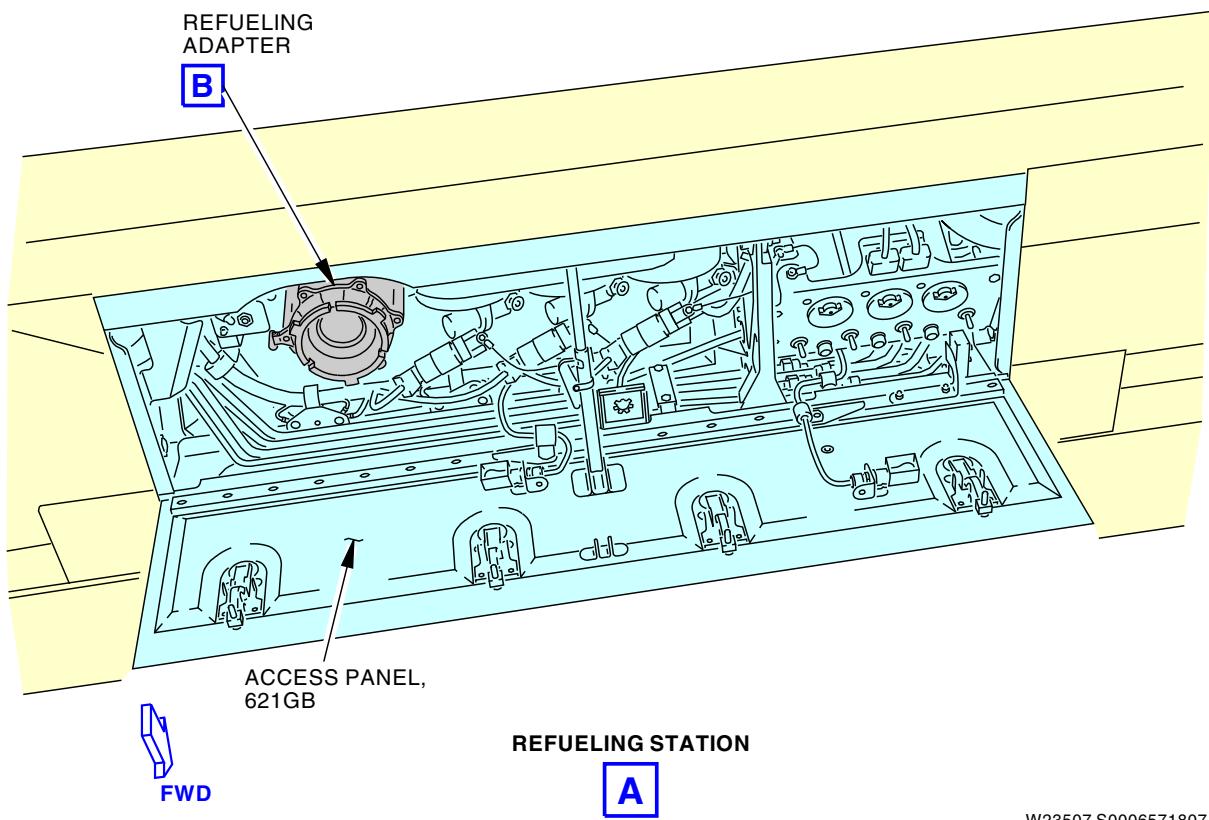
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RIGHT WING



W23507 S0006571807_V3

Refuel Adapter Inspection
Figure 601/28-21-00-990-804 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

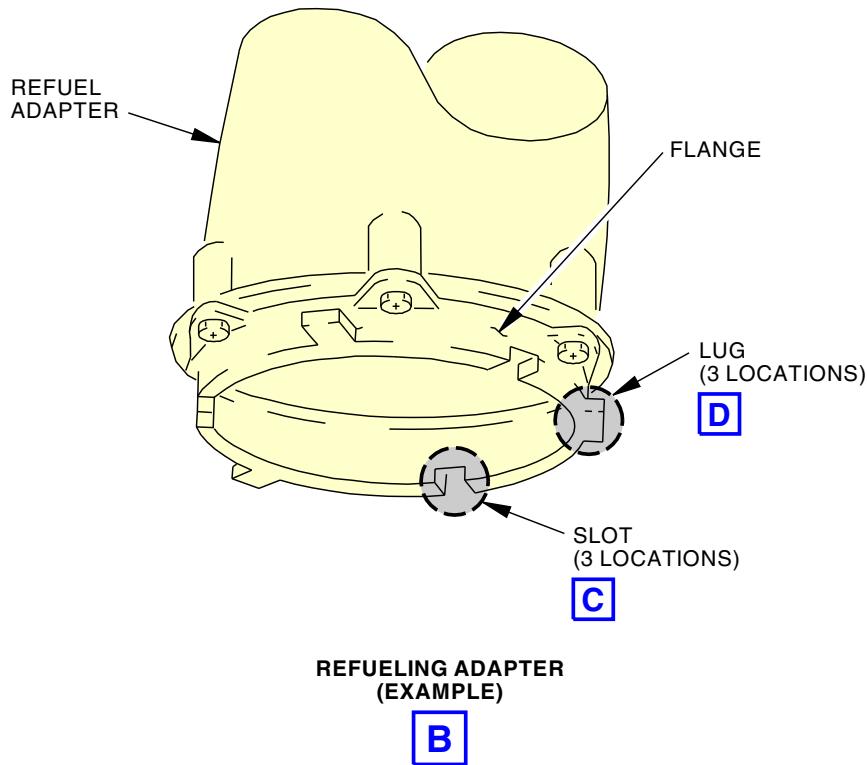
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W23536 S0006571808_V4

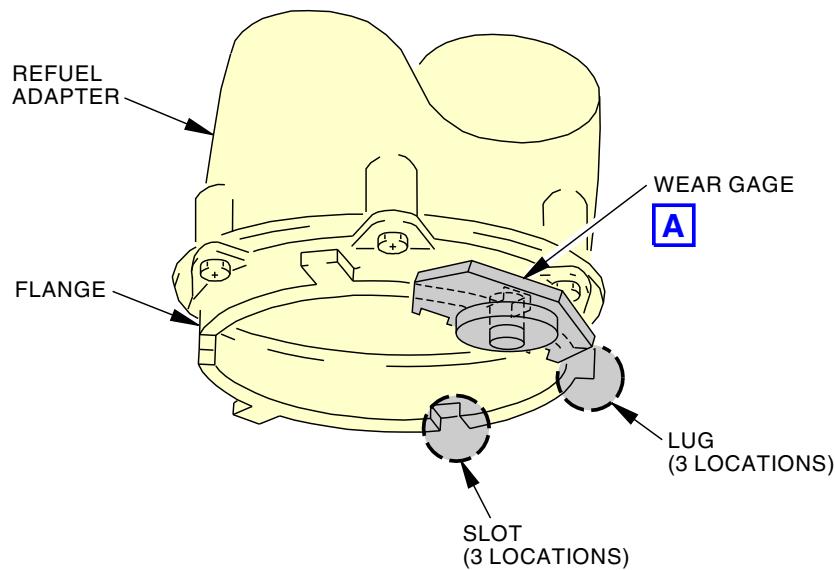
Refuel Adapter Inspection
Figure 601/28-21-00-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

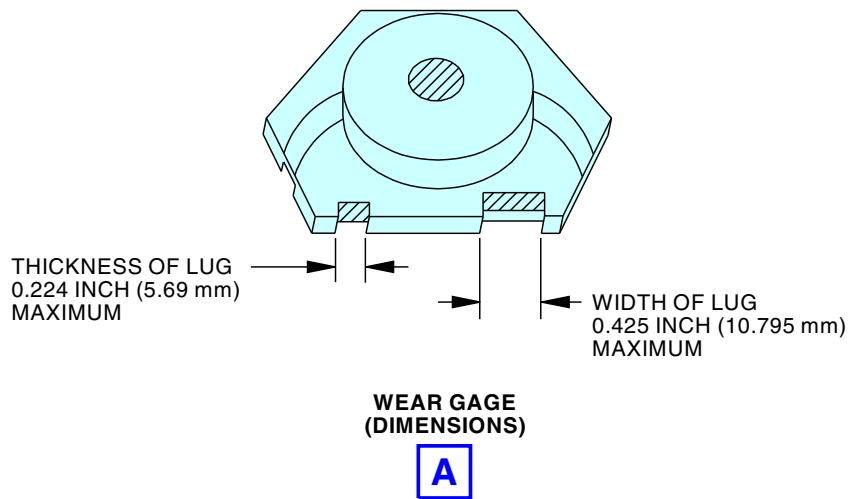
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REFUELING ADAPTER
(EXAMPLE)



1929334 S0000364327_V2

Refuel Adapter Wear Gage
Figure 602/28-21-00-990-805 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-21-00

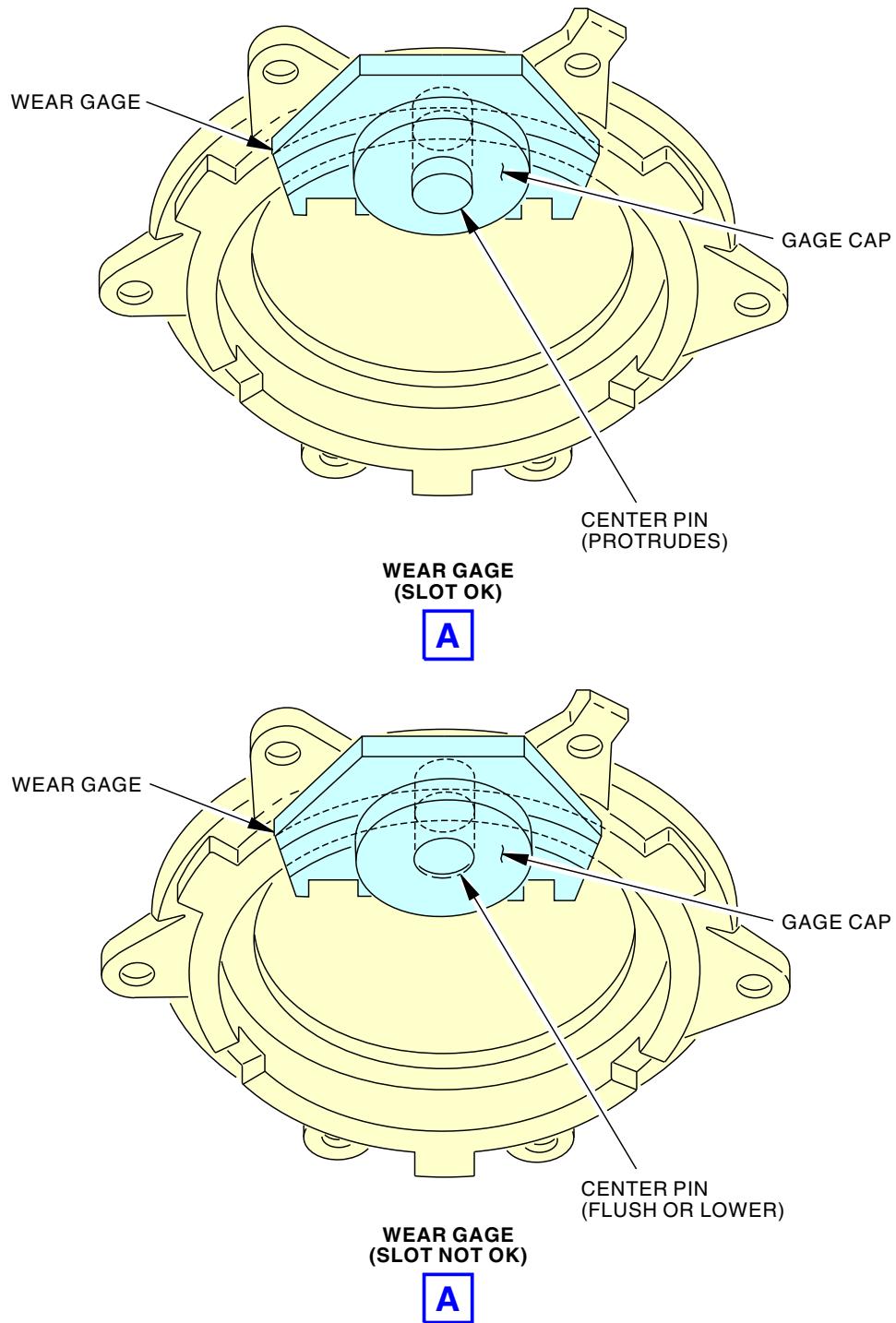
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1929393 S0000364328_V2

Refuel Adapter Wear Gage
Figure 602/28-21-00-990-805 (Sheet 2 of 3)

EFFECTIVITY	LOM ALL
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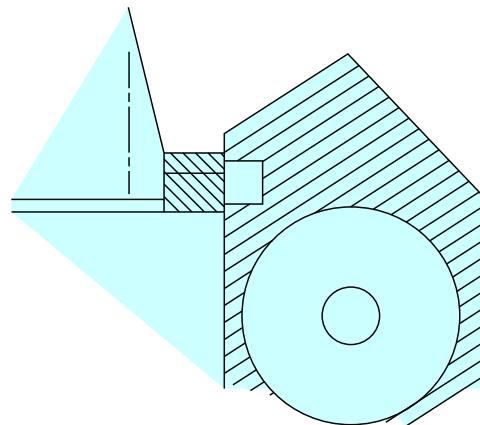
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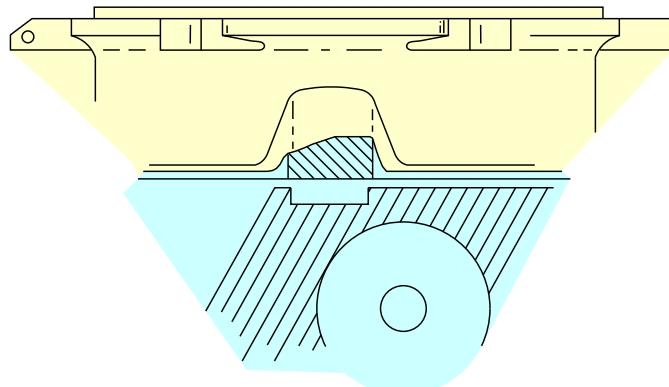
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CHECKING ADAPTER LUG THICKNESS



CHECKING ADAPTER LUG WIDTH

1929391 S0000364329_V2

Refuel Adapter Wear Gage
Figure 602/28-21-00-990-805 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

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TASK 28-21-00-211-801

3. Refuel Panel Wire Bundle Inspection

A. References

Reference	Title
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-13	Repair of Electrical Wire and Cable
SWPM 20-10-18	Standard Wiring Practices Manual
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

C. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

D. Prepare for the Inspection

SUBTASK 28-21-00-865-001

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-00-010-002

- (2) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

if it is not open.

- (a) Remove the pins that attach the linkage assemblies to the access door.

SUBTASK 28-21-00-030-001

- (3) Remove the bolts and washers (4 locations) that attach the refuel panel to the wing structure.

SUBTASK 28-21-00-030-002

- (4) Remove the nut and washer to disconnect the bonding jumper from the refuel panel.

SUBTASK 28-21-00-211-001

- (5) Remove the refuel panel.

NOTE: You can also attach the panel to the support member for the leading edge to keep it safe during this procedure.

E. Inspection

SUBTASK 28-21-00-211-004

- (1) Disconnect connector, D4578P, from the back of the P15 panel.
(2) Visually examine the wires in wire bundle, W0024, to connector, D4578P.
(a) Look for indications of these types of problems:

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- 1) Chafed wires
- 2) Damaged wires
- 3) Arcing
- 4) Loose wires with too much wire slack.
- 5) Damage to the contact pins on connector, D4578P, or to the sockets on D4578J.

SUBTASK 28-21-00-211-002

- (3) Behind the P15 panel and inside the wing structure, do a check for any marks or indications where wire chafing occurred.
 - (a) Examine these types of surfaces behind the P15 panel and inside the wing structure:
 - 1) Flat edges on the rear of the P15 panel.
 - 2) Round edges on the backshells of the refuel quantity indicators.
 - 3) Any sharp edges or objects inside the wing structure behind the P15 panel.

SUBTASK 28-21-00-211-003

- (4) If you find wires with problems or damage, then repair or replace these wires:
 - (a) If there is any damage to contact pins in connector plug, D4578P, or to sockets in D4578J, replace those pins and sockets (SWPM 20-10-13).
 - (b) Move loose and untied wires away from sharp edges and objects behind the P15 panel and inside the wing structure (SWPM 20-10-11).
 - 1) Tie these wires to the main wire bundle, W0024.
 - 2) Make sure that the wire bundle service loops have sufficient length and slack to permit the P15 panel to be pulled out and lowered from the wing structure for servicing of the refuel quantity indicators without complete removal of the panel.
 - (c) Make sure there is sufficient wire clearance and protection from chafing against edges of backshell connectors (D11318, D11320, D11322) and screws on the backs of the refuel quantity indicators.
 - 1) If it is necessary, loosen and turn the backshell connectors to give clearance from wires.



CAUTION DO NOT USE HEAT ON THE TEFLON WRAPPING SLEEVE. THE TEFLON WRAPPING SLEEVE USED IN THIS LOCATION IS A NON-SHRINKABLE TYPE. HEAT CAN CAUSE DAMAGE TO THE WIRE INSULATION BELOW THE SLEEVE.

- (d) Install protective sleeving around wires where the wires are routed close to sharp edges and objects on the back of P15 panel (SWPM 20-10-18).
 - 1) Where it is necessary, replace Teflon wrapping sleeves and add new sleeves to protect wires from chafing.
 - 2) For additional protection, wires that are routed near sharp edges can be wrapped with one additional Teflon sleeve.
- (5) Connect connector, D4578P, to the back of the P15 panel.

F. Install the Refuel Panel

SUBTASK 28-21-00-765-002

- (1) Prepare these surfaces for an electrical faying surface bond (SWPM 20-20-00):
 - (a) Contact surface of the refuel panel where the bonding jumper attaches.

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- (b) Contact surface of the bonding jumper and washer.

SUBTASK 28-21-00-430-004

- (2) Put the refuel panel in its correct position between the support members for the leading edge.

SUBTASK 28-21-00-430-001

- (3) Install the bolts and washers (4 locations) in the refuel panel.

SUBTASK 28-21-00-430-002

- (4) Install the nut and washer to attach the bonding jumper to the refuel panel.

SUBTASK 28-21-00-765-001

- (5) Do these steps to do a check of the electrical bonding resistance (SWPM 20-20-00):

- (a) Measure the electrical resistance between the refuel panel and the airplane structure.

- 1) Make sure the resistance is less than 0.002 ohm (2 milliohms).

SUBTASK 28-21-00-430-003

- (6) Install the pins and the washers that attach the linkages to the access door.

G. Operational Test

SUBTASK 28-21-00-865-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-00-710-013

- (2) Push each fueling valve position light.

- (a) Make sure each fueling valve position light comes on.

NOTE: The lights are PRESS-TO-TEST.

SUBTASK 28-21-00-710-014

- (3) Set the FUELING INDICATION TEST SWITCH on the refuel control panel to the TEST position.

- (a) Make sure all of the refuel quantity indicators operate correctly.

NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

SUBTASK 28-21-00-710-015

- (4) Make sure the fueling shutoff valves operate correctly.

- (a) Set the switch for the fueling shutoff valve for the No. 1 tank to OPEN.

- (b) Make sure the indication light for the fueling shutoff valve for the No. 1 tank comes on.

- (c) Set the switch for the fueling shutoff valve for the No. 1 tank to CLOSE.

- (d) Make sure the indication light for the fueling shutoff valve for the No. 1 tank goes off.

- (e) Set the switch for the fueling shutoff valve for the No. 2 tank to OPEN.

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- (f) Make sure the indication light for the fueling shutoff valve for the No. 2 tank comes on.
- (g) Set the switch for the fueling shutoff valve for the No. 2 tank to CLOSE.
- (h) Make sure the indication light for the fueling shutoff valve for the No. 2 tank goes off.
- (i) Set the switch for the fueling shutoff valve for the center tank to OPEN.
- (j) Make sure the indication light for the fueling shutoff valve for the center tank comes on.
- (k) Set the switch for the fueling shutoff valve for the center tank to CLOSE.
- (l) Make sure the indication light for the fueling shutoff valve for the center tank goes off.

SUBTASK 28-21-00-410-005

- (5) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

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FUELING RECEPTACLE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A task to remove the fueling receptacle.
 - (2) A task to install the fueling receptacle.

TASK 28-21-11-000-801

2. Fueling Receptacle Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fueling Receptacle.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

F. Prepare for the Removal

SUBTASK 28-21-11-010-001

- (1) For the refuel station, do this step:

Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-11-650-001

- (2) Transfer the fuel from the right main tank (#2 tank) to the center tank prior to removing the fueling receptacle [1] (TASK 28-26-00-650-802).

NOTE: The fuel quantity must be less than 3500 lb (1588 kg) in the #2 tank.

SUBTASK 28-21-11-860-002

- (3) If electrical power is connected, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

G. Fueling Receptacle Removal

SUBTASK 28-21-11-680-001

- (1) Drain the remaining fuel from the fueling receptacle [1].

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- (a) Put a 1 quart oil/fuel resistant container, STD-195 below the fueling receptacle [1] to catch the fuel.
- (b) Push the poppet valve [5] in the fueling receptacle [1].
- (c) Let the fuel drain from the fueling receptacle [1] and the refueling manifold [2].

SUBTASK 28-21-11-020-002

- (2) Remove the mounting screws [3] from the refuel adapter [4] (six locations).

SUBTASK 28-21-11-020-003

- (3) Pull the fueling receptacle [1] down in a straight line until the valve is out of the refueling manifold [2].
 - (a) Discard the O-ring [6].

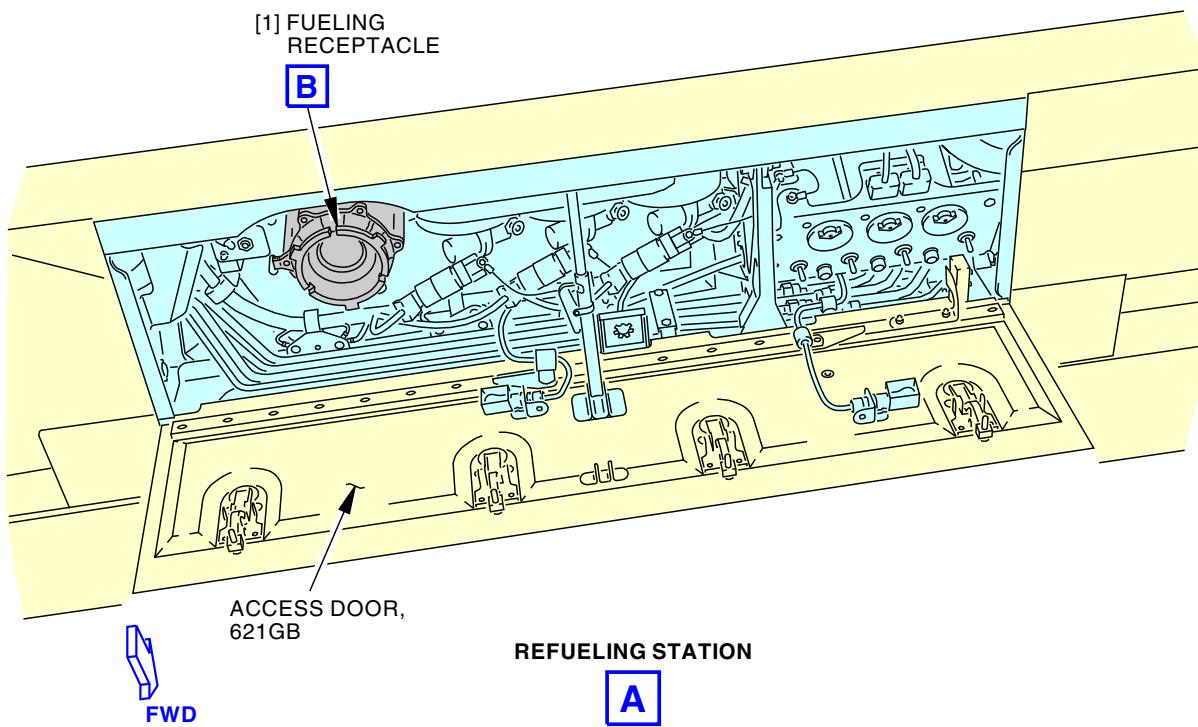
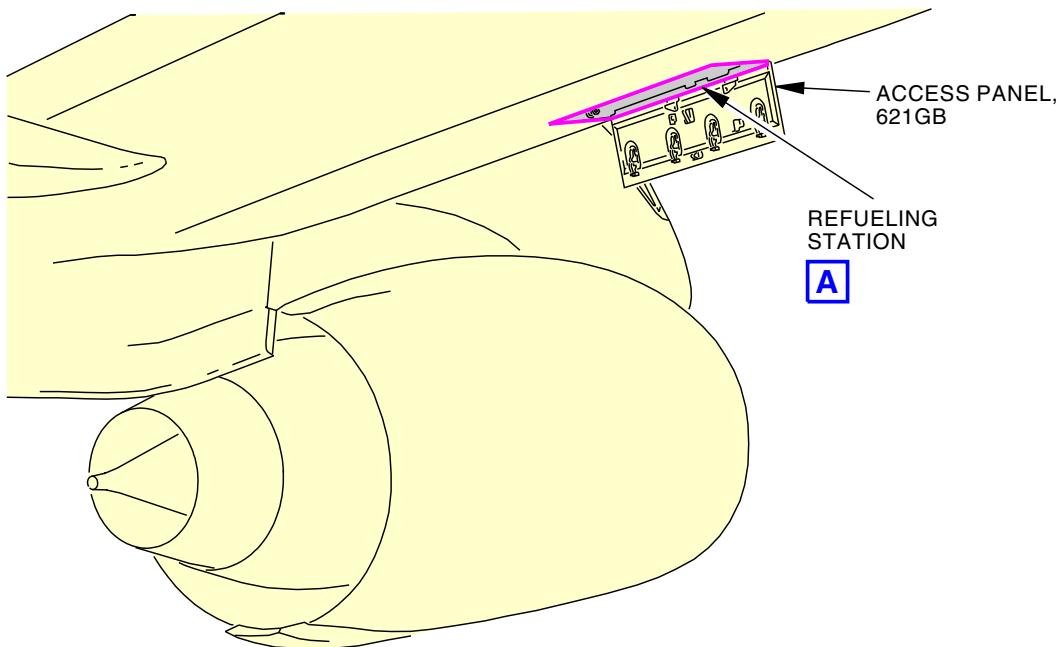
———— END OF TASK ————

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**Fueling Receptacle Installation
Figure 401/28-21-11-990-802 (Sheet 1 of 2)**

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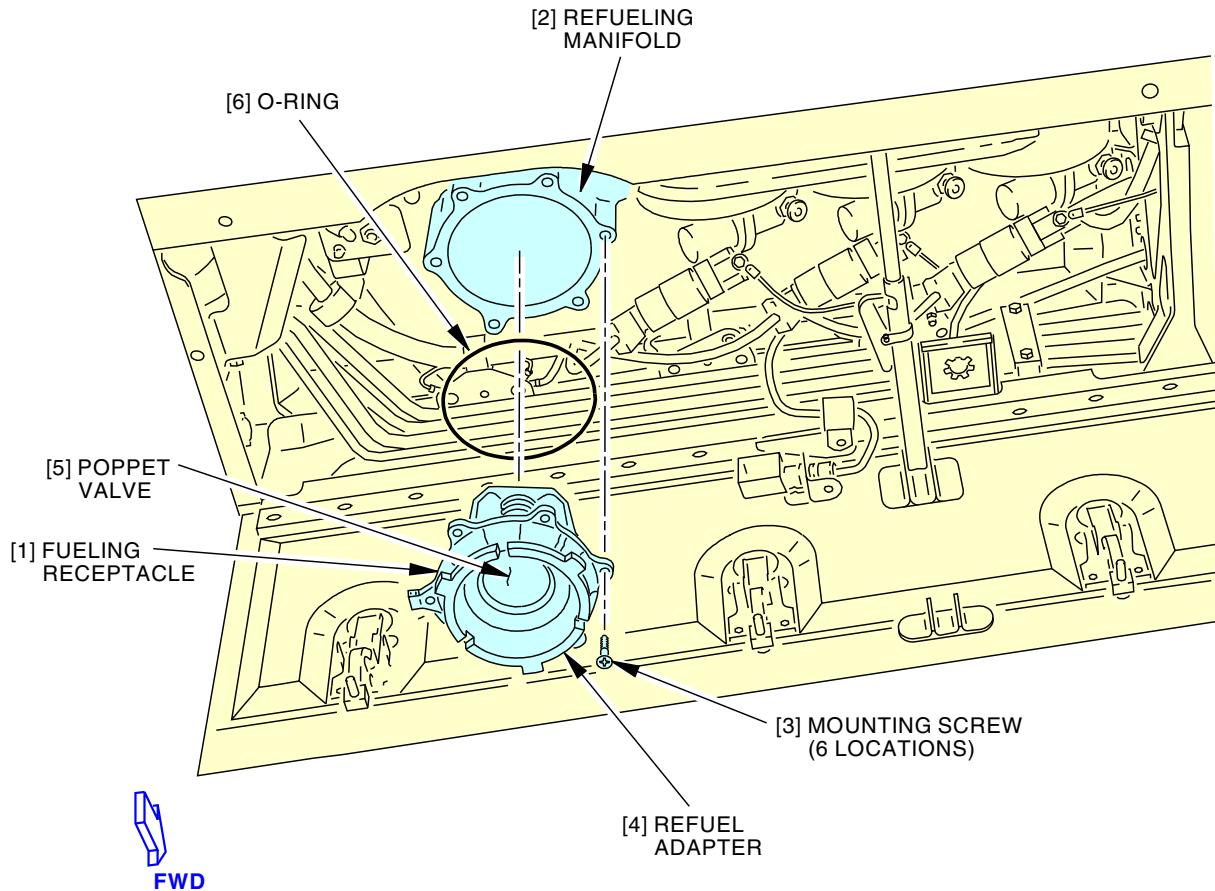
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FUELING RECEPTACLE

B

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Fueling Receptacle Installation
Figure 401/28-21-11-990-802 (Sheet 2 of 2)

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TASK 28-21-11-400-801

3. Fueling Receptacle Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fueling Receptacle.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Refuel adapter	28-21-52-51-055	LOM ALL
6	O-ring	28-21-52-51-050	LOM ALL

E. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

F. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

G. Fueling Receptacle Installation

SUBTASK 28-21-11-210-001

- (1) Clean these surfaces with solvent, B00083, dry with a cotton wiper, G00034:
- All of the machined surfaces on the refueling manifold [2].
 - All of the O-ring grooves on the refueling manifold [2].
 - All of the machined surfaces on the refuel adapter [4].
 - All of the O-ring grooves on the refuel adapter [4].

SUBTASK 28-21-11-420-001

- (2) Put a new O-ring [6], lightly lubricated with fuel, into the groove on the refuel adapter [4].

SUBTASK 28-21-11-420-002

- (3) Put the refuel adapter [4] into the refueling manifold [2].



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SUBTASK 28-21-11-420-003



CAUTION

DO NOT LOOSEN THE O-RING OR PUSH IT OUT OF ITS CORRECT SHAPE.
IF YOU CAUSE DAMAGE TO THE O-RING, A FUEL LEAK CAN EASILY
OCCUR.

- (4) Turn the refuel adapter [4] to align the screw holes with the holes in the refueling manifold [2].

SUBTASK 28-21-11-420-004

- (5) Install the mounting screws [3] for the fueling receptacle [1].
(a) Tighten the mounting screws [3] to 26 in-lb (3 N·m).
(b) Make sure that the flange of the refuel adapter [4] is parallel to the flange of the refueling manifold [2] during this procedure.

SUBTASK 28-21-11-710-001

- (6) Make sure that the poppet valve [5] operates correctly.
(a) Push the poppet valve [5] and make sure that the valve opens freely.
(b) Make sure that the poppet valve [5] closes easily when you release it again.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-11-650-002

- (1) Refuel or transfer fuel to the right main tank (#2 tank) (TASK 12-11-00-650-802 or TASK 28-26-00-650-802).

SUBTASK 28-21-11-710-003

- (2) Make sure that the fueling receptacle [1] is clean and there are no fuel leaks.

SUBTASK 28-21-11-410-001

- (3) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

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FUELING RECEPTACLE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance between the structure and the fueling receptacle.

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TASK 28-21-11-200-801

2. Fueling Receptacle - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-51-760-801	Electrical Resistance Specifications in the Fuel Tank Check (P/B 401)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
STD-195	Container - 1 Quart, Oil/Fuel Resistant

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare for the Procedure

SUBTASK 28-21-11-010-002

- (1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-11-710-002

- (2) Make sure the manual defueling valve is closed.

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SUBTASK 28-21-11-862-001

- (3) If there is electrical power, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-21-11-616-001

- (4) Drain the remaining fuel from the fueling receptacle.
- (a) Put a 1 quart oil/fuel resistant container, STD-195 below the fueling receptacle to catch the fuel.
 - (b) Push the poppet valve in the fueling receptacle.
 - (c) Let the fuel drain from the fueling receptacle and the refueling manifold.

F. Electrical Bonding Measurement

SUBTASK 28-21-11-765-001

- (1) Measure the electrical bonding resistance between the fueling receptacle (manifold) and the structure with a intrinsically safe approved bonding meter, COM-1550 (TASK 20-10-51-760-801).
- (a) Make sure the electrical fay surface bonding resistance is less than 0.0025 ohm (2.5 milliohms).

G. Put the Airplane Back to Its Usual Condition

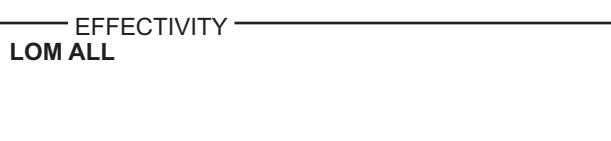
SUBTASK 28-21-11-410-002

- (1) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————



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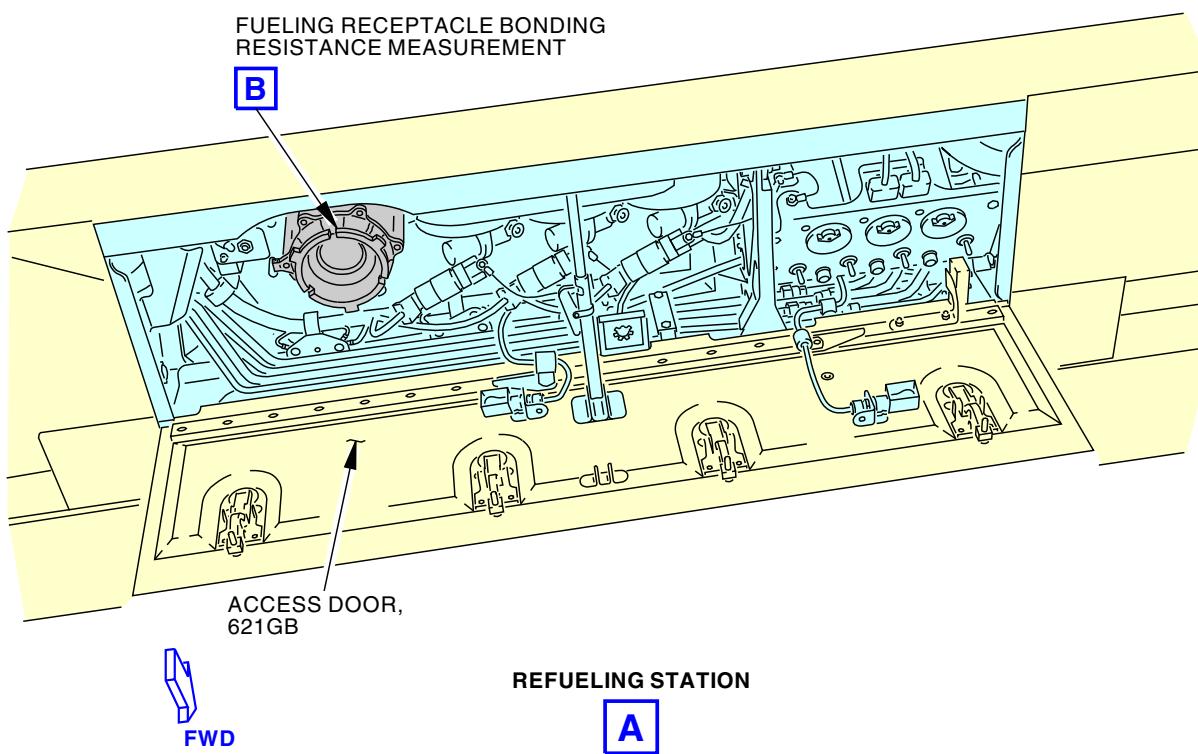
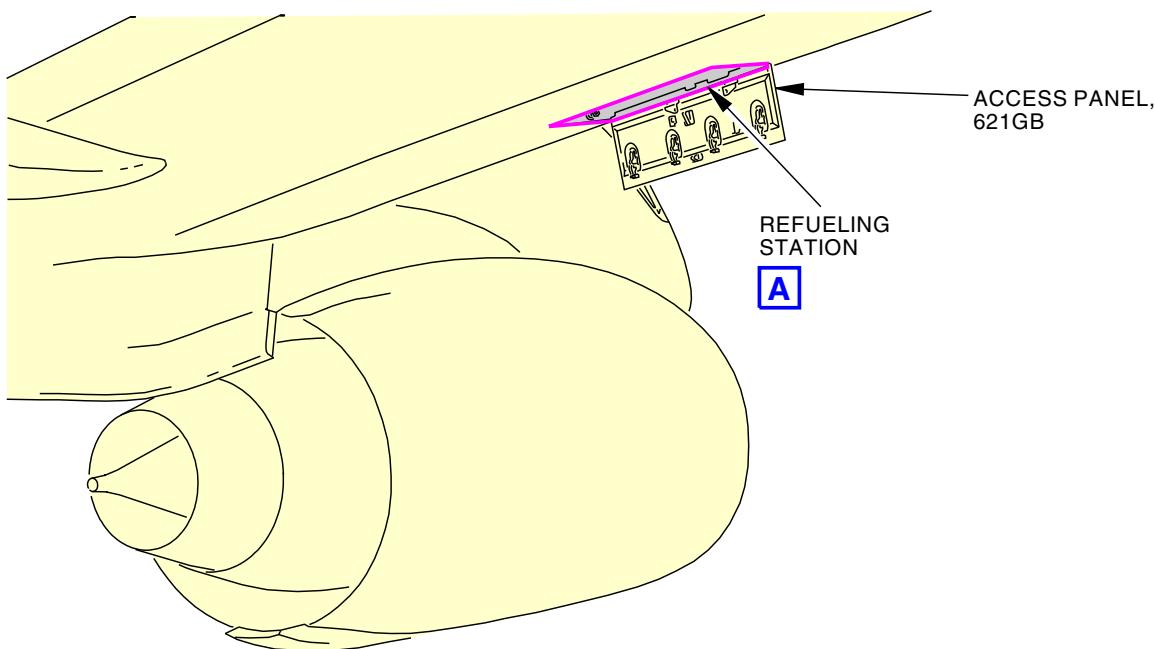
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BOEING

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**Fueling Receptacle - Bonding Resistance Measurement
Figure 601/28-21-11-990-803 (Sheet 1 of 2)**

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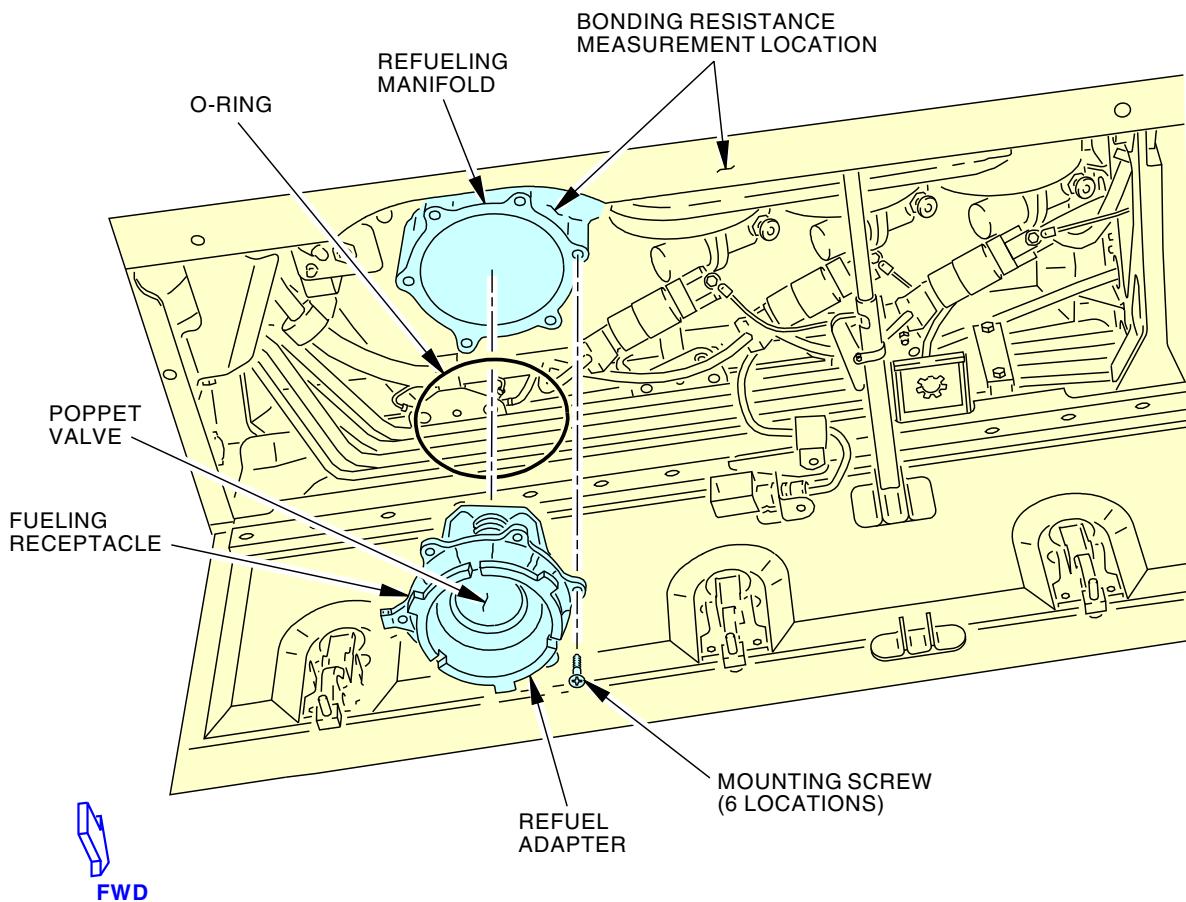
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FUELING RECEPTACLE BONDING RESISTANCE MEASUREMENT

B

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Fueling Receptacle - Bonding Resistance Measurement
Figure 601/28-21-11-990-803 (Sheet 2 of 2)

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REFUELING MANIFOLD - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the refueling manifold
 - (2) An installation of the refueling manifold
 - (3) A replacement of the refueling panel floodlight.

TASK 28-21-21-000-801

2. Refueling Manifold Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Refueling Manifold.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-21-11-000-801	Fueling Receptacle Removal (P/B 401)
28-21-51-000-801	Fueling Shutoff Valve - Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
28-26-11-010-801	Actuator Handle Assembly Removal (P/B 401)
28-41-61-000-801	Refuel Quantity Indicator Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

E. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15
621GB	Refuel Access Panel - Slat Station 143.27
621HB	Lower Leading Edge Access Panel - Slat Station 170.21

F. Prepare for the Removal

SUBTASK 28-21-21-650-001

- (1) Defuel the No. 2 tank or transfer fuel out of the No. 2 tank to a fuel quantity less than 3500 lb (1588 kg).

NOTE: The No. 2 tank must contain less than 3500 lb (1588 kg) to do this procedure.

- (a) To defuel the No.2 tank, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.
- (b) To transfer fuel out of the No.2 tank, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

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SUBTASK 28-21-21-860-003

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-21-21-010-001

- (3) Open this access panel:

Number **Name/Location**

621GB Refuel Access Panel - Slat Station 143.27

- (a) Remove the pins that attach the linkage assemblies to the access door.

SUBTASK 28-21-21-010-002

- (4) Do these steps to remove this access panel:

Number **Name/Location**

621HB Lower Leading Edge Access Panel - Slat Station 170.21

(outboard of the refuel station).

- (a) Remove the refuel quantity indicators from the refuel instrument panel (TASK 28-41-61-000-801).

 1) Make a mark on the fuel quantity indicators to install them again in the correct position.

- (b) Remove the screws that attach the refuel instrument panel to the wing structure.

- (c) Remove the refuel instrument panel to get access to the manifold support fitting [1].

NOTE: You can also attach the panel to the support member for the leading edge to keep it safe during this procedure.

SUBTASK 28-21-21-010-003

- (5) Remove the two bolts to remove the TAI duct shield [5].

SUBTASK 28-21-21-860-002

- (6) Do these steps to make sure that the defueling valve is closed (TASK 28-26-11-010-801):

- (a) Open this access panel:

Number **Name/Location**

621EB Defuel Access Panel - Slat Station 95.15

- (b) Make sure that the manual defueling valve is closed.

- (c) Close this access panel:

Number **Name/Location**

621EB Defuel Access Panel - Slat Station 95.15

G. Refueling Manifold Removal

SUBTASK 28-21-21-680-001

- (1) Drain the fuel from the refueling manifold [21].

- (a) Put a 1 quart oil/fuel resistant container, STD-195, below the fueling receptacle.

- (b) Push the poppet valve in the fueling receptacle.

- (c) Let the remaining fuel drain from the fueling receptacle and from the refueling manifold [21].

SUBTASK 28-21-21-010-004

- (2) Remove the fueling shutoff valves (TASK 28-21-51-000-801).

NOTE: If you are scheduled to remove the fueling receptacle, refer to the task: Fueling Receptacle Removal, TASK 28-21-11-000-801.

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SUBTASK 28-21-21-020-001

- (3) Disconnect the screw [8], washers [9], and nut [10] that attach the bonding jumper [11] installed on the aft inboard side of the refueling manifold [21] adjacent to the airplane structure.
 - (a) Make sure the bonding jumpers [11] that are installed from the fueling shutoff valves to the refueling manifold [21] are disconnected.

SUBTASK 28-21-21-020-002

- (4) Remove the bolts [6] and washers [7] that attach the refueling manifold [21] to the defuel port [22] (three locations).

SUBTASK 28-21-21-010-005

- (5) Carefully move the electrical wiring to one side to permit the removal of the refueling manifold [21].

SUBTASK 28-21-21-020-003

- (6) Remove the screws [18], washers [19], and packings [20] that attach the refueling manifold [21] to the check valves [23].

SUBTASK 28-21-21-020-004

- (7) Hold the refueling manifold [21] up and remove the bolt [2], washer [3], bushing [4], bolt [12], washer [13], and bushing [14] that attach the refueling manifold [21] to the support members for the leading edge.

SUBTASK 28-21-21-020-005

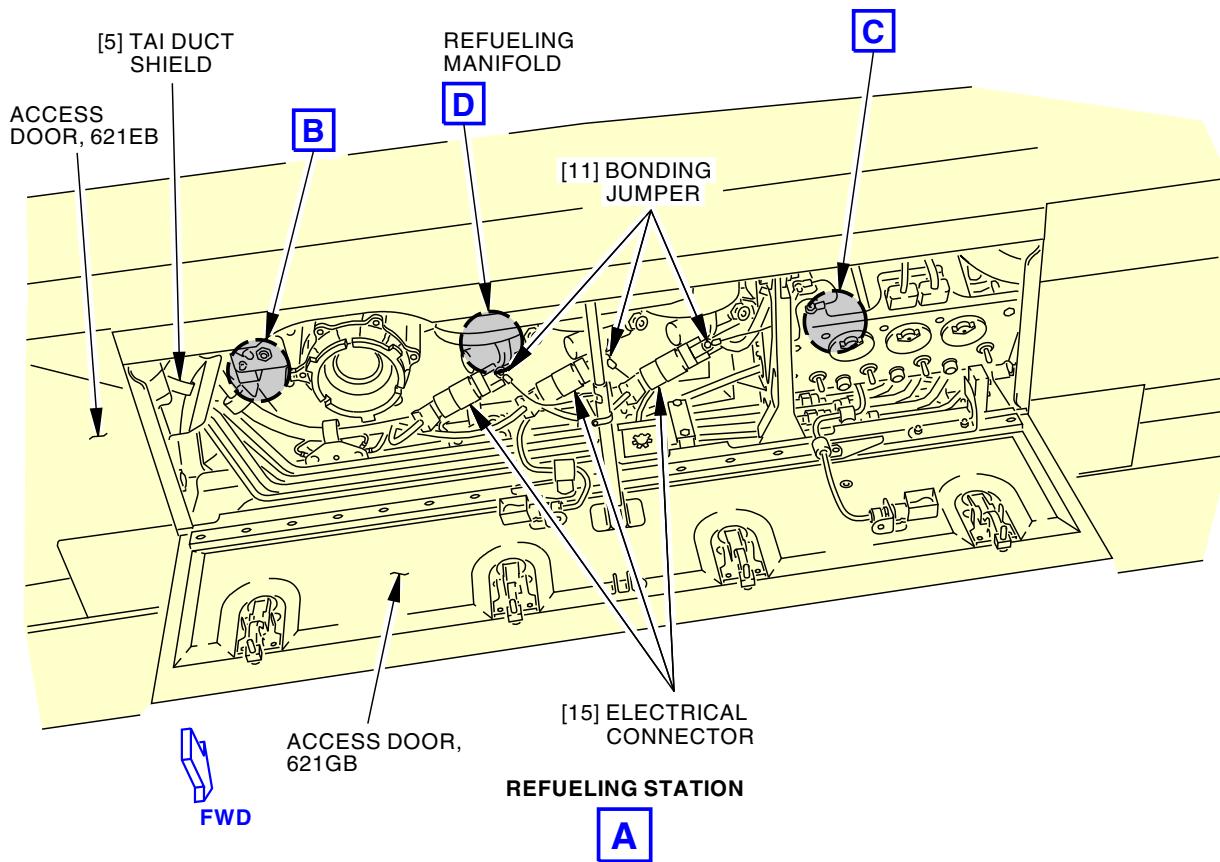
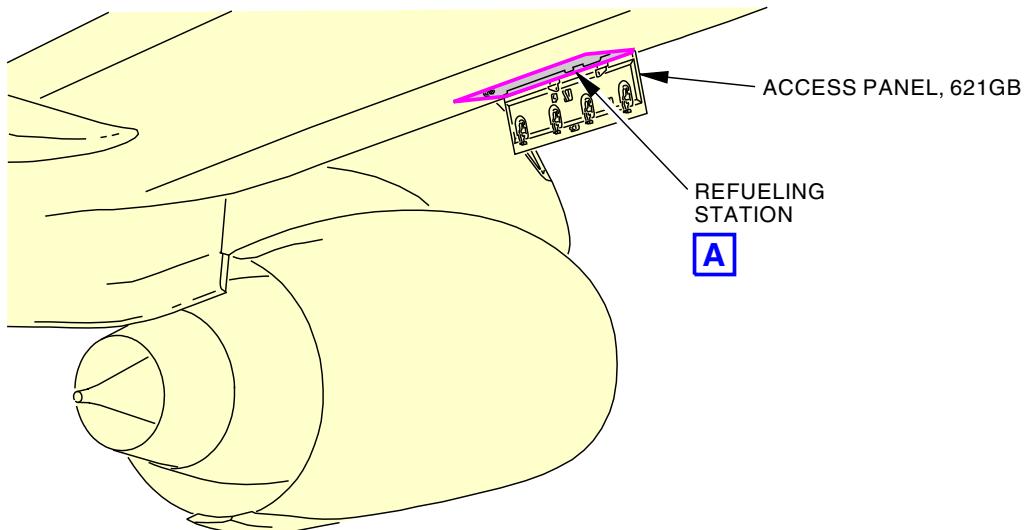
- (8) Remove the refueling manifold [21] through this access panel:

<u>Number</u>	<u>Name/Location</u>
621GB	Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-21-21



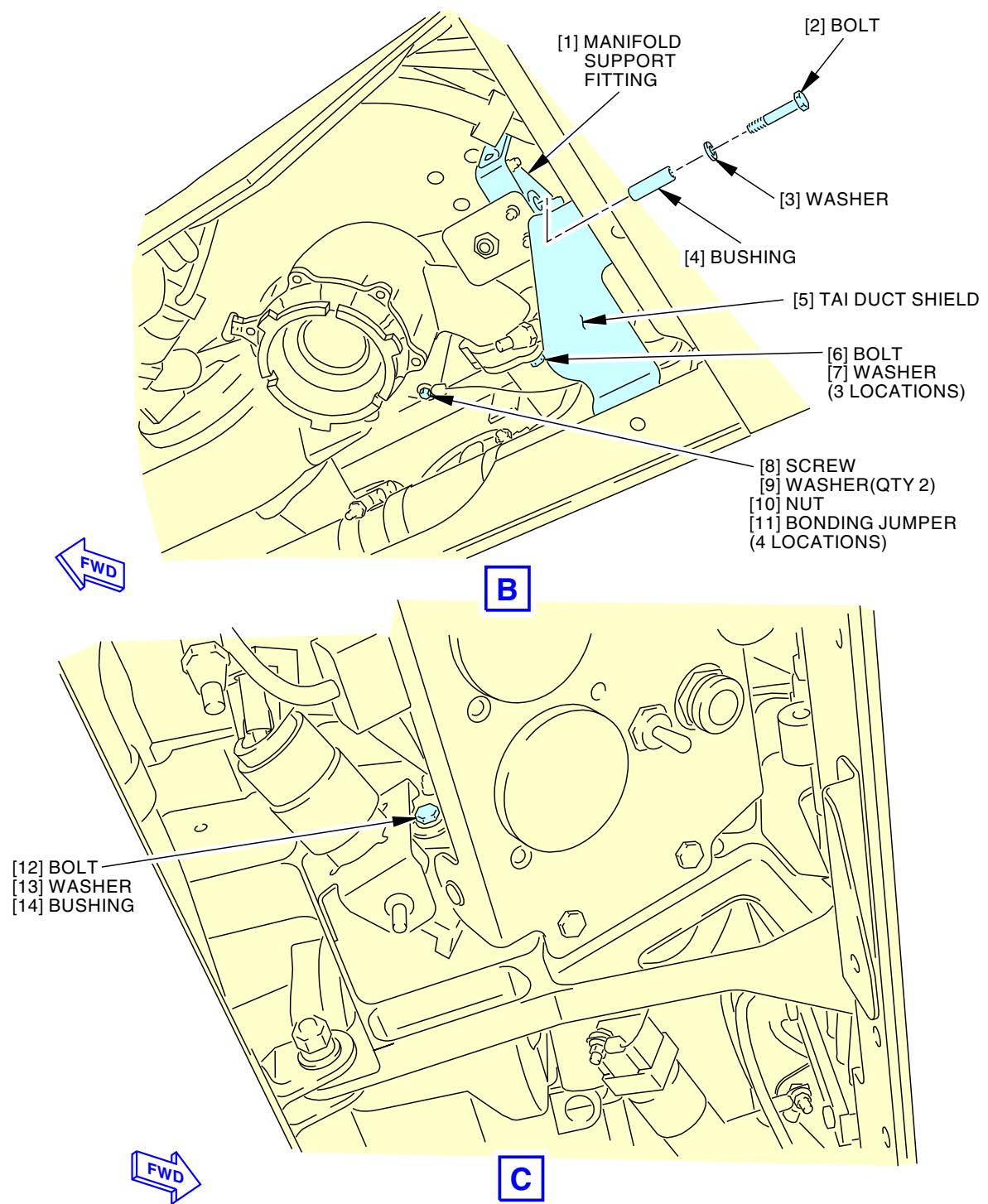
F96217 S0006571820_V3

Refueling Manifold Installation
Figure 401/28-21-21-990-802 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-21-21

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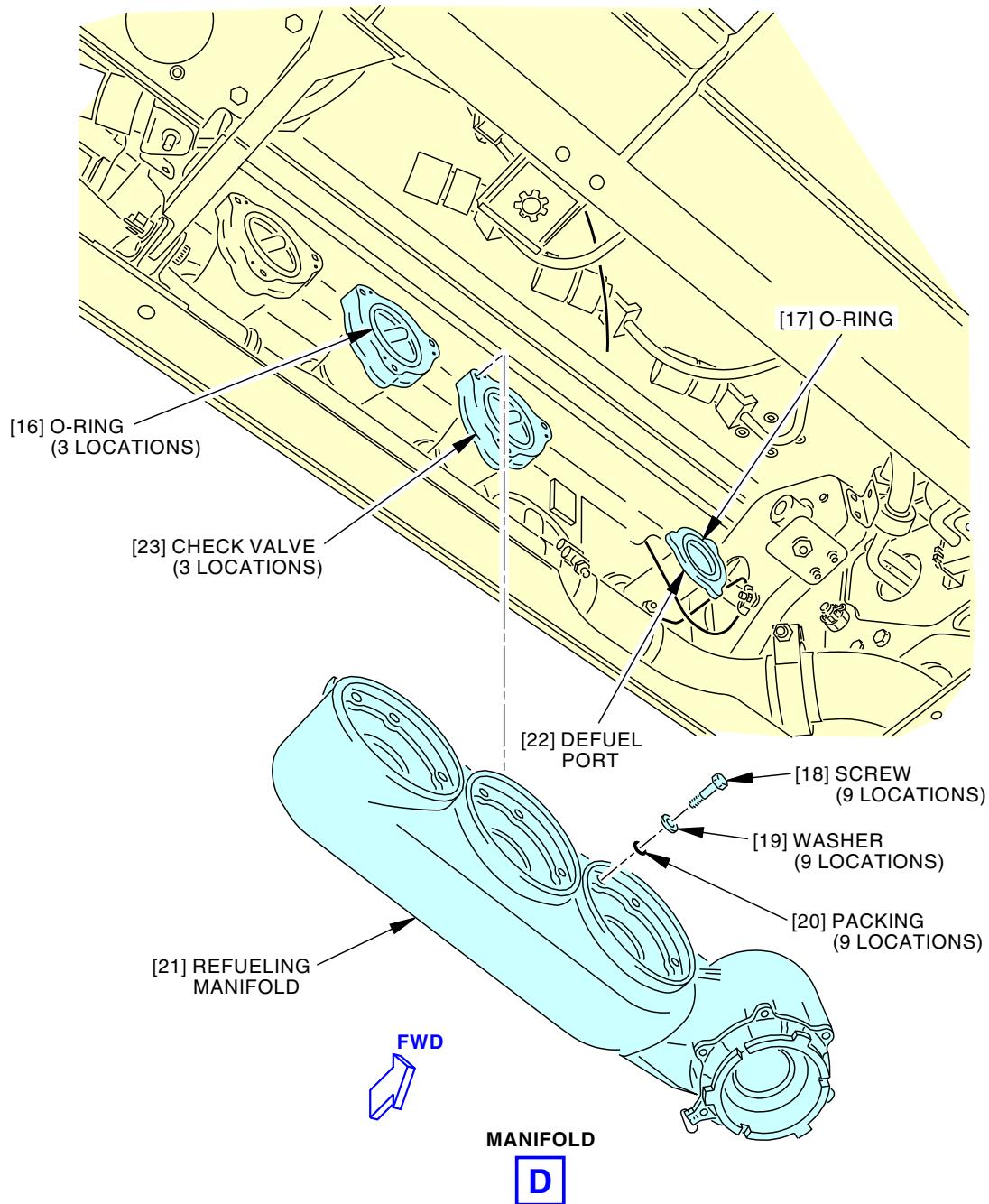
Refueling Manifold Installation
Figure 401/28-21-21-990-802 (Sheet 2 of 3)

EFFECTIVITY
 LOM ALL

28-21-21

D633A101-LOM

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G06074 S0006571822_V3

Refueling Manifold Installation
Figure 401/28-21-21-990-802 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

28-21-21

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 28-21-21-400-801

3. Refueling Manifold Installation

Figure 401

A. General

- (1) This task gives instructions to install the Refueling Manifold.

B. References

Reference	Title
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
28-21-11-400-801	Fueling Receptacle Installation (P/B 401)
28-21-51-400-801	Fueling Shutoff Valve - Installation (P/B 401)
28-41-61-400-801	Refuel Quantity Indicator Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
16	O-ring	28-21-52-51-095	LOM ALL
17	O-ring	28-21-52-51-080	LOM ALL
20	Packing	28-21-52-51-090	LOM ALL
21	Refueling manifold	28-21-52-01A-115	LOM ALL

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27
621HB	Lower Leading Edge Access Panel - Slat Station 170.21

F. Refueling Manifold Installation

SUBTASK 28-21-21-160-001

- (1) Clean these surfaces with solvent, B00083 and dry with a cotton wiper, G00034.
- All of the machined surfaces on the refueling manifold [21]
 - The O-ring grooves of the check valves [23]
 - The O-ring grooves of the defuel port [22].

SUBTASK 28-21-21-420-001

- (2) Install new o-rings [16] (three locations) and o-ring [17] lightly lubricated with fuel, on the check valves [23] (three locations) and the defuel port [22].

EFFECTIVITY
LOM ALL

28-21-21



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SUBTASK 28-21-21-420-002



CAUTION

DO NOT LOOSEN THE O-RINGS OR PUSH THEM OUT OF THEIR CORRECT SHAPE WHEN YOU INSTALL THE MANIFOLD. A FUEL LEAK CAN EASILY OCCUR.

- (3) Install the refueling manifold [21].

- Put the refueling manifold [21] in its correct position between the support members for the leading edge.
- Engage the bolt [2] and bolt [12] with your fingers.

NOTE: Do not install washers or bushings on the support bolts at this time.

SUBTASK 28-21-21-420-003

- (4) Engage the screws [18], washers [19], and packings [20] that attach the refueling manifold [21] to the check valves [23].

- Tighten all of the screws [18] equally (nine locations) to a final torque of 28 ± 4 in-lb (3.16 ± 0.45 N·m).

SUBTASK 28-21-21-420-004

- (5) Engage the bolts [6] and the washers [7] that attach the refueling manifold [21] to the defuel port [22] (three locations).

- Tighten all of the bolts [6] equally (three locations) to a final torque of 28 ± 4 in-lb (3.16 ± 0.45 N·m).

SUBTASK 28-21-21-420-005

- (6) Remove the bolt [2] and bolt [12] and do these steps:

NOTE: Use the bushings [4,14] to make a good fit between the refueling manifold [21] and the support members for the leading edge when you tighten the bolts.

- Install the bolt [2], washer [3], and bushing [4].
- Install the bolt [12], washer [13], and bushing [14].
- Tighten the bolt [2] and bolt [12] to a final torque of 80 ± 8 in-lb (9 ± 1 N·m).

SUBTASK 28-21-21-410-001

- (7) Install the fueling shutoff valves (TASK 28-21-51-400-801).

SUBTASK 28-21-21-410-002

- (8) Install the fueling receptacle if you removed it (TASK 28-21-11-400-801).

SUBTASK 28-21-21-420-006

- (9) Connect the bonding jumper [11] on the aft inboard side of the refueling manifold [21] to the airplane structure.

SUBTASK 28-21-21-420-007

- (10) Make sure the bonding jumpers [11] from the fueling shutoff valves to the refueling manifold [21] are connected (three locations).

SUBTASK 28-21-21-760-001

- (11) Do a check of the electrical bond between the refueling manifold [21] and the airplane structure (SWPM 20-20-00).
(a) The resistance must not be more than 0.001 ohm (1 milliohm).

SUBTASK 28-21-21-420-008

- (12) Connect the electrical connectors [15] to each of the fueling shutoff valves (three locations).

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-21-010-006

- (13) Install the TAI duct shield [5] with its two bolts.

SUBTASK 28-21-21-410-003

- (14) Install the refuel instrument panel.

- Put the refuel instrument panel in its correct position between the support members for the leading edge.
- Put the screws in the refuel instrument panel.

SUBTASK 28-21-21-410-004

- (15) Install the refuel quantity indicators in the refuel instrument panel (TASK 28-41-61-400-801).

G. Put the Airplane Back to its Usual Condition

SUBTASK 28-21-21-410-005

- (1) Install this access panel:

Number Name/Location

621HB Lower Leading Edge Access Panel - Slat Station 170.21

immediately outboard of this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-21-420-009

- (2) Install the pins and the washers that attach the linkages to this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-21-710-001

- (3) Do this task: Pressure Fueling System - Test, TASK 28-21-00-700-801.

SUBTASK 28-21-21-410-006

- (4) Make sure this access panel is closed:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

END OF TASK

TASK 28-21-21-960-801

4. Refueling Panel Floodlight Replacement

(Figure 402)

A. General

- (1) This task gives instructions to replace the refueling panel floodlights.

B. Consumable Materials

Reference	Description	Specification
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

EFFECTIVITY
LOM ALL

28-21-21



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C. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Refueling Panel Floodlight Replacement

SUBTASK 28-21-21-860-006

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT

SUBTASK 28-21-21-010-014

- (2) Open this access panel:

Number Name/Location

621GB	Refuel Access Panel - Slat Station 143.27
-------	---

SUBTASK 28-21-21-020-006

- (3) Remove the conduit nut and remove the wire contact plunger

SUBTASK 28-21-21-020-007

- (4) Remove the locknut, the lock washer and the shipping spacer (if installed).

- (a) Discard the shipping spacer.

SUBTASK 28-21-21-020-008

- (5) Remove the light assembly.

SUBTASK 28-21-21-420-010

- (6) Put the replacement light assembly through the mounting bracket and turn it until the groove pin engages in the bracket cutout and is flush with the bracket.

SUBTASK 28-21-21-420-011

- (7) Install the lock washer and lockut.

- (a) Tighten the locknut.

NOTE: Do not over tighten.

- (b) Adjust the hood on the light assembly as shown in Figure 402 (Sheet 2).

SUBTASK 28-21-21-160-002

- (8) Clean the surfaces that you will seal with cotton wipers, G00034.

SUBTASK 28-21-21-390-001

- (9) Apply a thin, narrow brush coat of sealant, A50153, on the top of the exposed threads of the light assembly.

NOTE: Do not get the sealant into the light assembly space where the contact plunger engages the lamp.

NOTE: The amount of time that the sealant is workable varies. For example, BMS5-45 Class A-2 has an application time of 2 hours.

EFFECTIVITY
LOM ALL

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SUBTASK 28-21-21-420-012

- (10) Put the wire contact plunger into the light assembly and tighten the conduit nut with your fingers only.

SUBTASK 28-21-21-390-002

- (11) Apply a fillet seal with sealant, A50153, on the rear of the conduit nut and fill the space.

NOTE: The cure time for this sealant is 72 hours.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-21-410-008

- (1) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-21-860-007

- (2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row Col Number Name

A 3 C00032 FUEL FUELING CONT

———— END OF TASK ————

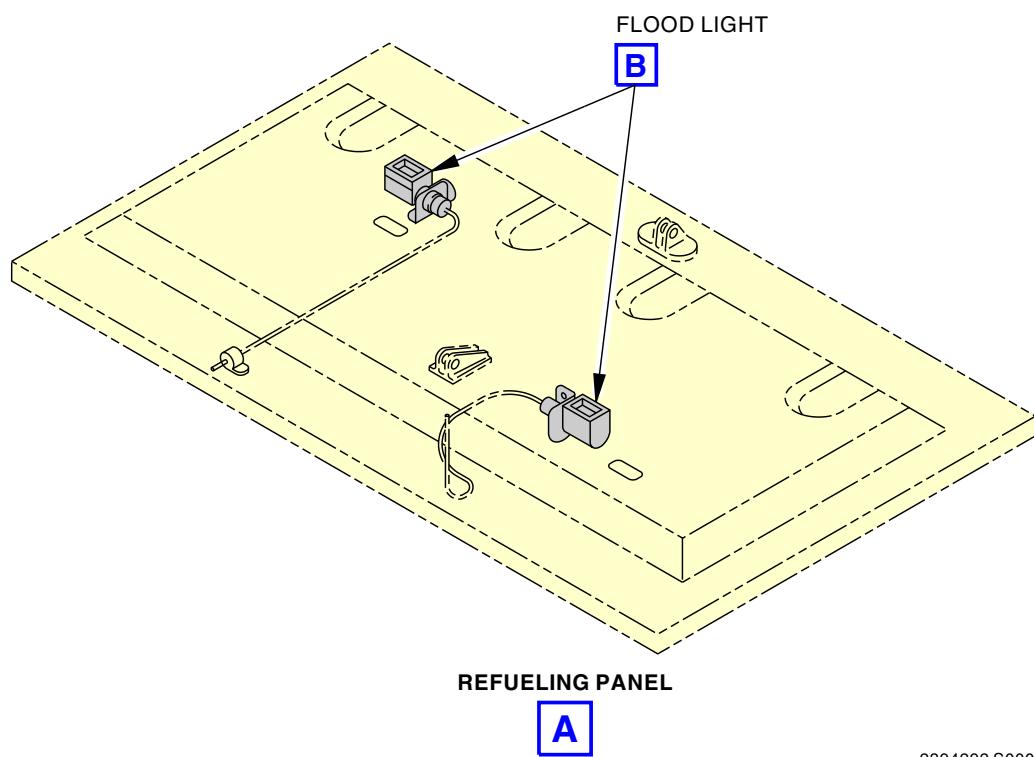
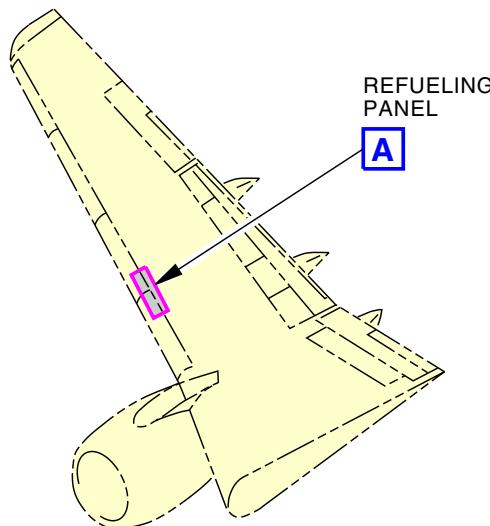
EFFECTIVITY
LOM ALL

28-21-21

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BOEING
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Refueling Panel Floodlight Installation
Figure 402/28-21-21-990-803 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-21-21

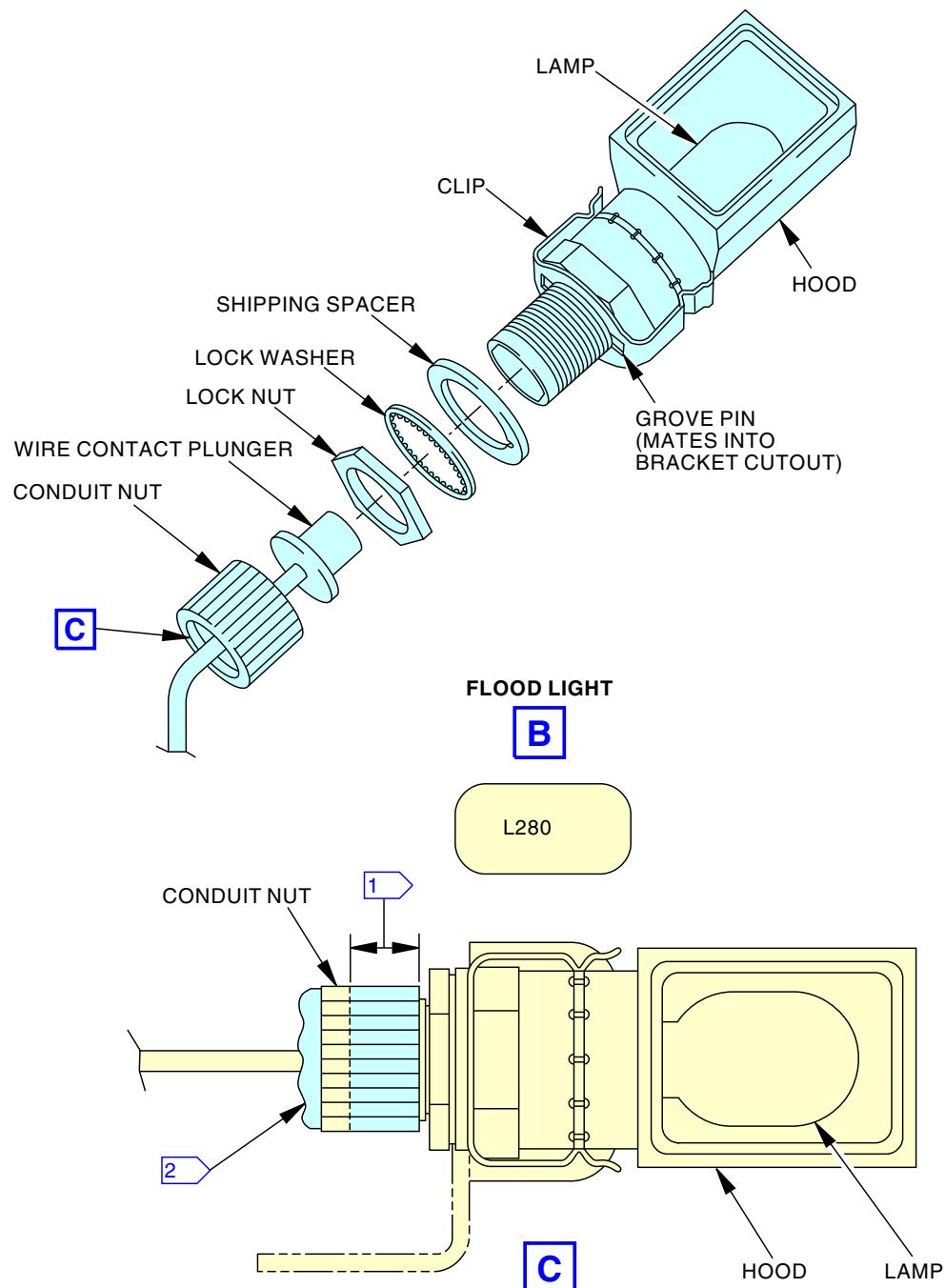
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1 APPPLY SEALANT ON EXPOSED THREADS BEFORE
INSTALLING CONDUIT NUT AND CONTACT PLUNGER.

2 APPPLY SEALANT

2394373 S0000549996_V1

Refueling Panel Floodlight Installation
Figure 402/28-21-21-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

FUELING CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A task to remove the fueling check valve
 - (2) A task to install the fueling check valve.

TASK 28-21-32-000-801

2. Fueling Check Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fueling Check Valve.

B. References

Reference	Title
28-21-21-000-801	Refueling Manifold Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

E. Prepare for the Removal

SUBTASK 28-21-32-650-001



WARNING

DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Defuel the No. 2 tank (TASK 28-26-00-650-801) or transfer fuel out of the No. 2 tank (TASK 28-26-00-650-802) to a fuel quantity less than 3,500 pounds (1,590 kilograms).
 - (a) The No. 2 tank must contain less than 3,500 pounds (1,590 kilograms) to do this procedure.

SUBTASK 28-21-32-860-001

- (2) Make sure that the manual defueling valve is closed.

SUBTASK 28-21-32-010-001

- (3) Do this task: Refueling Manifold Removal, TASK 28-21-21-000-801.

F. Fueling Check Valve Removal

SUBTASK 28-21-32-480-001

- (1) Put a 1 quart oil/fuel resistant container, STD-195, below the check valve to catch fuel.

SUBTASK 28-21-32-020-001

- (2) Remove the screws [1] that attach the fueling check valve [2].

EFFECTIVITY
LOM ALL

28-21-32



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SUBTASK 28-21-32-020-002

- (3) Remove the fueling check valve [2].

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

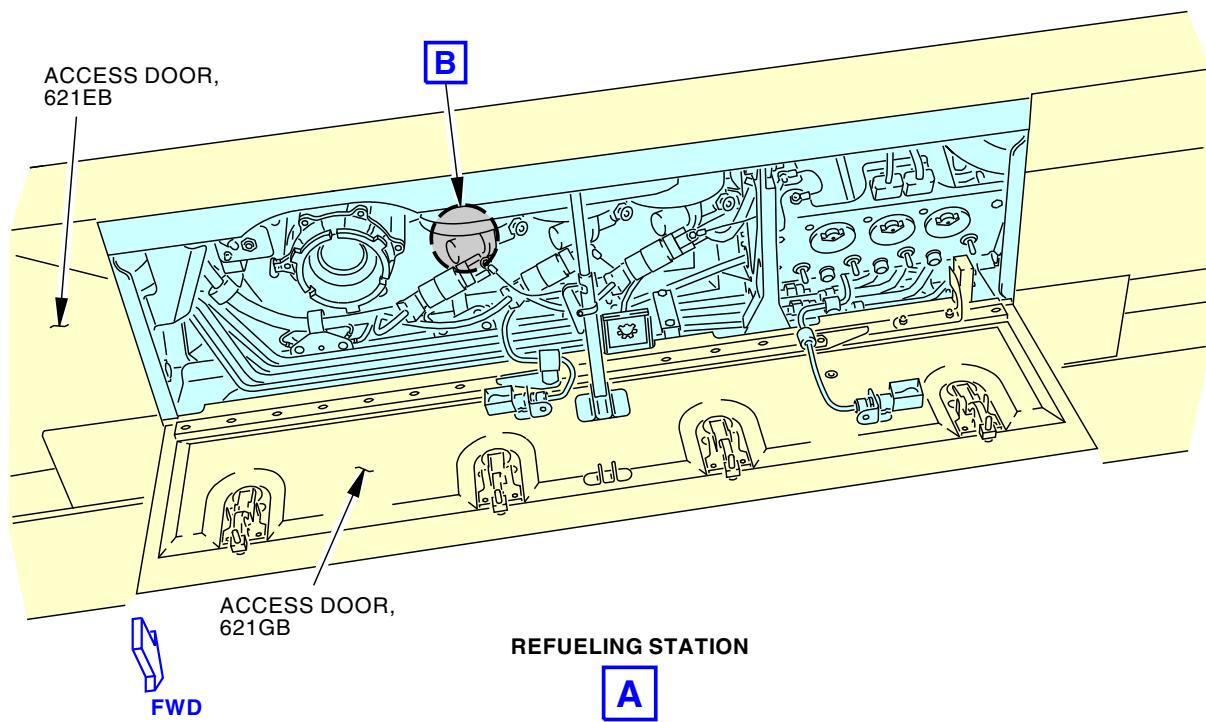
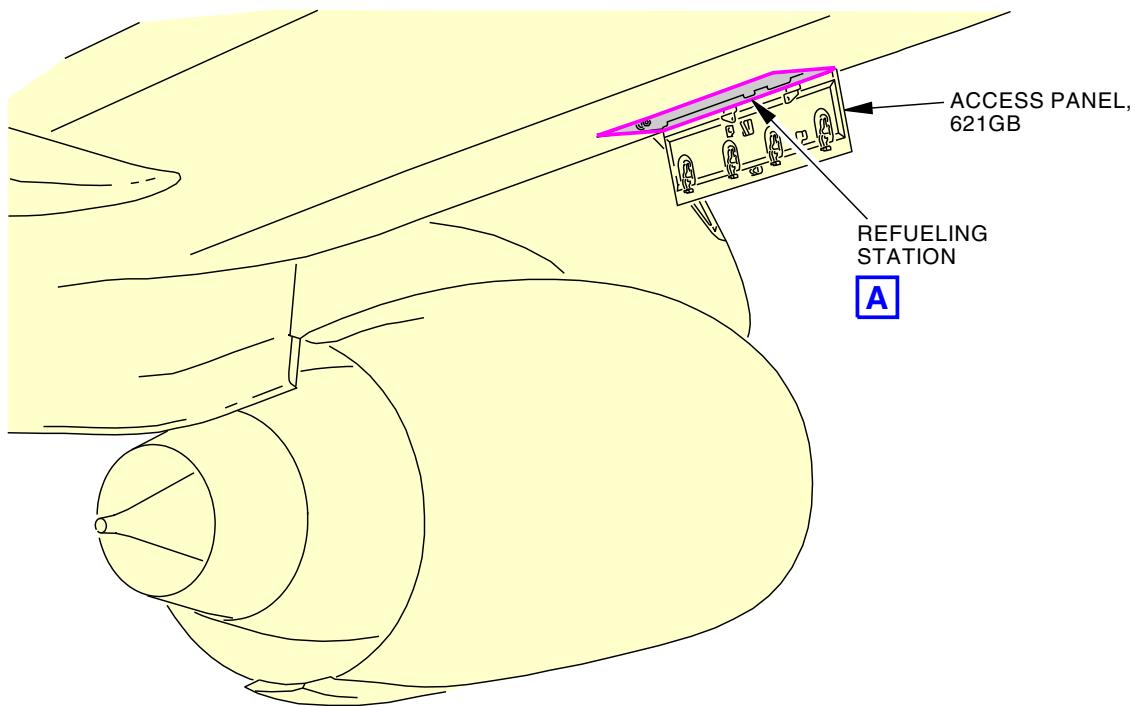
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AIRCRAFT MAINTENANCE MANUAL



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Fueling Check Valve Installation
Figure 401/28-21-32-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-21-32

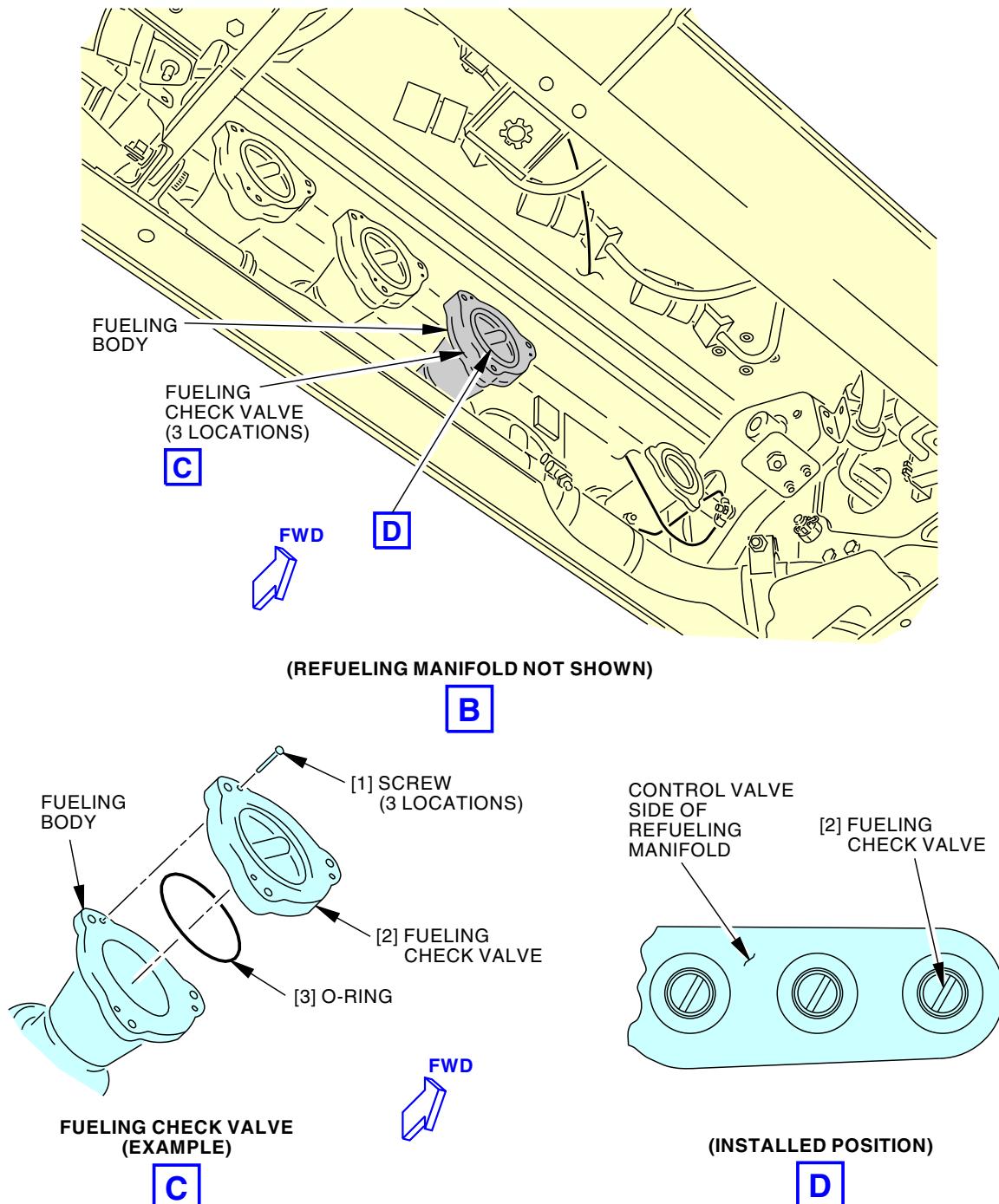
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G06802 S0006571829_V3

Fueling Check Valve Installation
Figure 401/28-21-32-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-21-32-400-801

3. Fueling Check Valve Installation

A. General

- (1) This task gives instructions to install the Fueling Check Valve.

B. References

Reference	Title
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
28-21-21-400-801	Refueling Manifold Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Fueling check valve	28-21-52-51-105	LOM ALL
3	O-ring	28-21-52-51-095	LOM ALL

E. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

F. Fueling Check Valve Installation

SUBTASK 28-21-32-160-001

- (1) Clean these surfaces with solvent, B00083 and dry with a cotton wiper, G00034.
- The machined surface of the body assembly.
 - The O-ring [3] groove of the fueling check valve [2].

SUBTASK 28-21-32-420-001

- (2) Install a new O-ring [3], lightly lubricated with fuel, on the fueling check valve [2].

NOTE: Make sure that you put the O-ring [3] on the side of the fueling check valve [2] that has the poppet valve.

SUBTASK 28-21-32-420-002



CAUTION DO NOT LOOSEN THE O-RING OR PUSH IT OUT OF ITS CORRECT SHAPE. IF YOU CAUSE DAMAGE TO THE O-RING, A FUEL LEAK CAN EASILY OCCUR.

- (3) Install the fueling check valve [2].

- Put the fueling check valve [2] on the fueling body in its correction position as shown in View D (Figure 401).
- Turn the fueling check valve [2] to align the screw holes with the holes in the fueling body.
- Install the screws [1] in the fueling check valve [2].

EFFECTIVITY
LOM ALL

28-21-32



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AIRCRAFT MAINTENANCE MANUAL

- (d) Tighten all of the screws [1] equally to a final torque of 12.0 in-lb (1.4 N·m) - 14.0 in-lb (1.6 N·m).
- (e) Make sure that the fueling check valve [2] is parallel to the flange of the body assembly.

SUBTASK 28-21-32-410-001

- (4) Do this task: Refueling Manifold Installation, TASK 28-21-21-400-801.

SUBTASK 28-21-32-710-001

- (5) If you did not do it during the refueling manifold installation, do this task: Pressure Fueling System - Test, TASK 28-21-00-700-801

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-21-32



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FUELING BODY OR DEFUEL PORT ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) A task to remove the fueling body assembly or the defueling port assembly from the wing front spar.
 - (2) A task to install the fueling body assembly or the defueling port assembly on the wing front spar.
- B. Three fueling body assemblies and one defueling port assembly are installed on the wing front spar. The procedure to remove and to install these parts is almost the same.

TASK 28-21-41-000-801

2. Fueling Body Assembly or Defueling Port Assembly Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fueling Body Assembly or Defueling Port Assembly.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-21-21-000-801	Refueling Manifold Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

D. Access Panels

Number	Name/Location
632FB	Main Tank Access Door - Wing Station 367

E. Prepare for the Removal

SUBTASK 28-21-41-650-001



DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Defuel the No. 2 fuel tank and prepare to go into it (TASK 28-11-00-910-802).

SUBTASK 28-21-41-650-002

- (2) If you are scheduled to remove the fueling body assembly for the center or the No. 1 tank, defuel the applicable tank (TASK 28-26-00-650-801) or (TASK 28-26-00-650-802).

SUBTASK 28-21-41-010-001

- (3) Do this task: Refueling Manifold Removal, TASK 28-21-21-000-801.

EFFECTIVITY
LOM ALL

28-21-41



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SUBTASK 28-21-41-010-002

- (4) Get access to the rear of the wing front spar.
 - (a) Remove this access panel which is adjacent to the refuel station area:
(TASK 28-11-11-000-801)

Number **Name/Location**

632FB Main Tank Access Door - Wing Station 367

F. Fueling Body Assembly or Defueling Port Assembly Removal

SUBTASK 28-21-41-020-001

- (1) Do these steps to remove the fueling body assembly or the defueling port assembly.

NOTE: Two persons are necessary to do this procedure.

- (a) One person in the tank must disconnect these parts that attach the applicable fueling body assembly or the defueling port assembly:
 - 1) The fuel line [6] connected to the applicable fueling body [1] or the defueling port [2]
(TASK 28-22-15-000-801).
 - 2) The mounting nut [5] at the rear of the front spar.
 - 3) The washer [4] at the rear of the front spar.
- (b) A second person out of the tank must hold up the fueling body [1] or the defueling port [2].
- (c) Then the second person removes the applicable fueling body [1] or the defueling port [2].

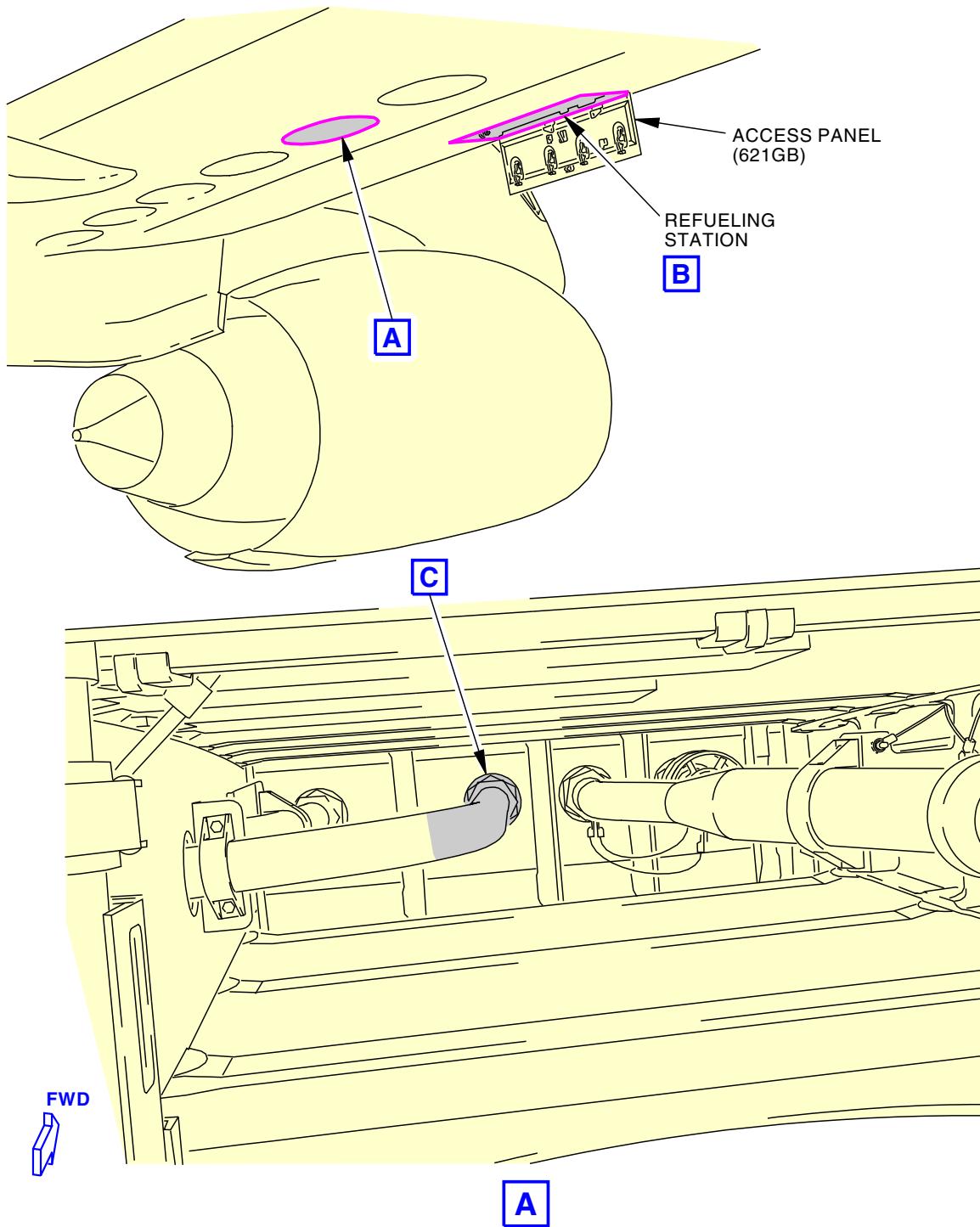
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EFFECTIVITY
LOM ALL

28-21-41



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AIRCRAFT MAINTENANCE MANUAL



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Fueling Body or Defueling Port Installation
Figure 401/28-21-41-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-21-41

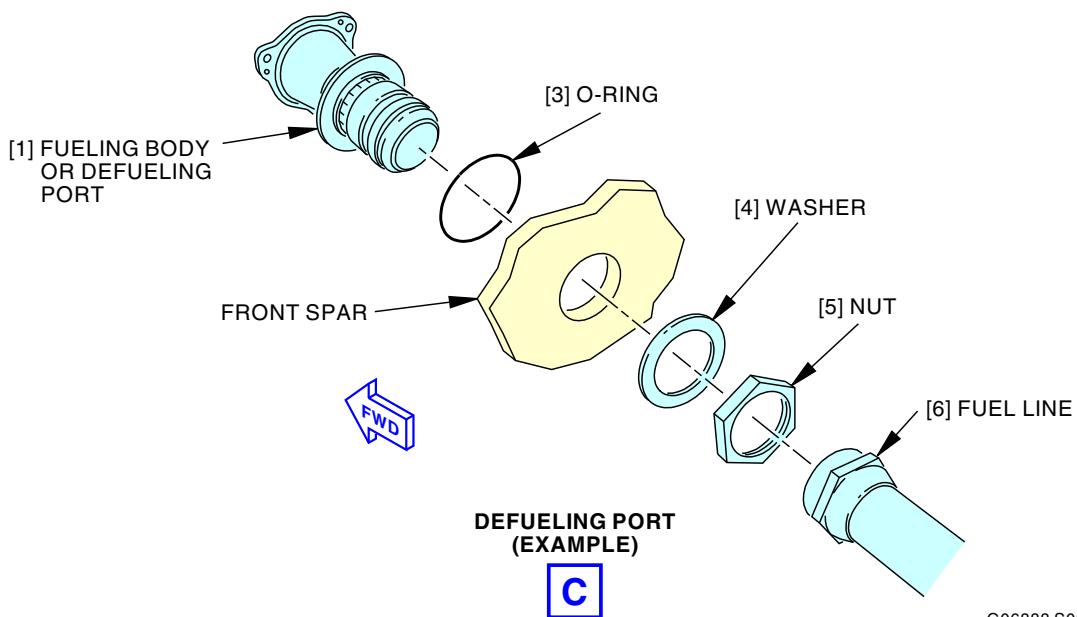
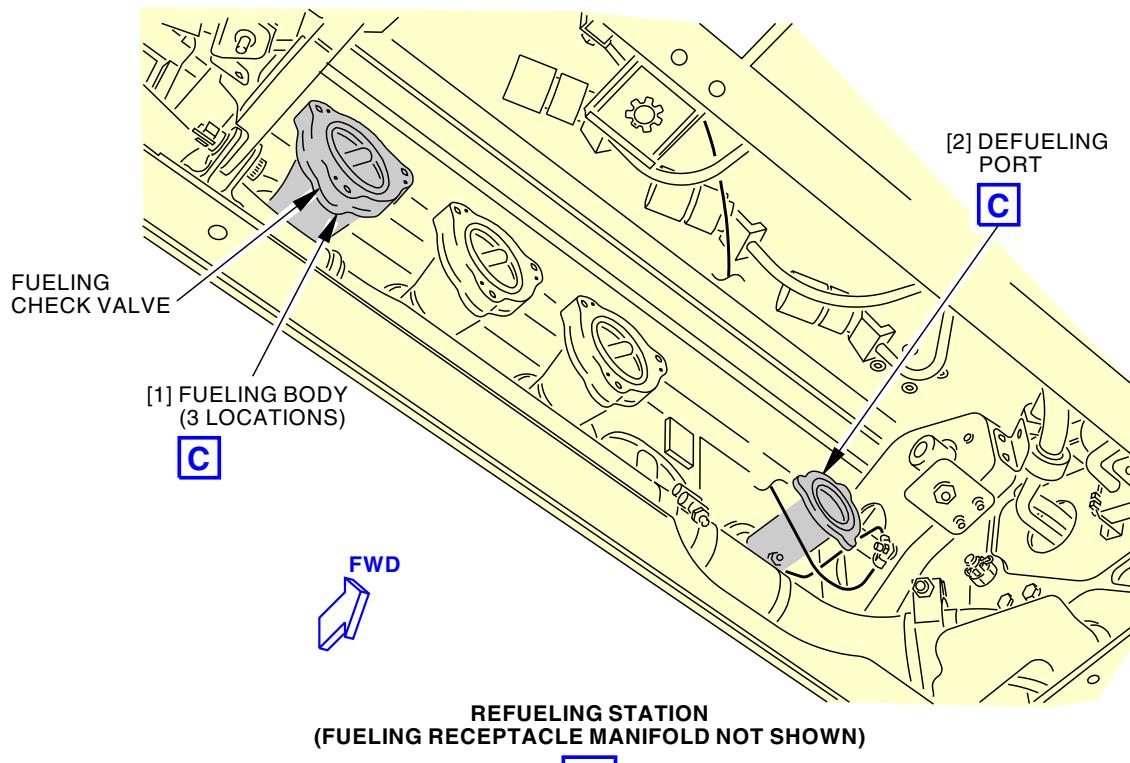
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Fueling Body or Defueling Port Installation
Figure 401/28-21-41-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-21-41

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AIRCRAFT MAINTENANCE MANUAL

TASK 28-21-41-400-801

3. Fueling Body Assembly or Defueling Port Assembly Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fueling Body Assembly or Defueling Port Assembly.

B. References

Reference	Title
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
28-21-21-400-801	Refueling Manifold Installation (P/B 401)
28-21-32-400-801	Fueling Check Valve Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
620	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Outboard of Nacelle Strut

E. Access Panels

Number	Name/Location
632FB	Main Tank Access Door - Wing Station 367

F. Fueling Body Assembly or Defueling Port Assembly Installation

SUBTASK 28-21-41-160-001

- (1) Clean these surfaces with solvent, B00083, and dry with a cotton wiper, G00034:
- The O-ring grooves of the fueling body assembly or the defueling port assembly.
 - The two sides of the front spar opening.

SUBTASK 28-21-41-420-001

- (2) Install a new O-ring [3], lightly lubricated with fuel, into the groove on the fueling body [1] or the defueling port [2].

SUBTASK 28-21-41-020-002



DO NOT LOOSEN THE O-RING OR PUSH IT OUT OF ITS CORRECT SHAPE WHEN YOU INSTALL THE FUELING BODY OR THE ELBOW ASSEMBLY. A FUEL LEAK CAN EASILY OCCUR.

- (3) Install the fueling body [1] assembly or the defueling port [2] assembly.

NOTE: Two persons are necessary to do this procedure.

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- (a) One person out of the tank must put the fueling body [1] or the defueling port [2] through the opening in the front spar.
- (b) A second person in the tank must connect these parts to attach the applicable fueling body [1] or the defueling port [2]:
 - 1) The washer [4] at the rear of the front spar.
 - 2) The mounting nut [5] at the rear of the front spar
- (c) Tighten the nut [5] with your fingers.

SUBTASK 28-21-41-410-001

- (4) Install the check valve assembly if you removed it (TASK 28-21-32-400-801).

SUBTASK 28-21-41-410-002

- (5) Do this task: Refueling Manifold Installation, TASK 28-21-21-400-801.

SUBTASK 28-21-41-420-002

- (6) Tighten the nut [5] on the fueling body [1] or the defueling port [2] to a torque of 855 in-lb (97 N·m) - 945 in-lb (107 N·m).

SUBTASK 28-21-41-420-003

- (7) Attach the applicable fuel line [6] to the fueling body [1] or defueling port [2] (TASK 28-22-15-400-801).

G. Fueling Body Assembly or Defueling Port Assembly Installation Test

SUBTASK 28-21-41-410-003

- (1) Install this access panel:

Number Name/Location

632FB Main Tank Access Door - Wing Station 367
(TASK 28-11-11-400-801).

SUBTASK 28-21-41-710-001

- (2) Do this task: Pressure Fueling System - Test, TASK 28-21-00-700-801.

———— END OF TASK ————



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FUELING SHUTOFF VALVE - MAINTENANCE PRACTICES

1. General

- A. This procedure has one task:
- (1) A task for the fueling shutoff valve.

TASK 28-21-51-100-801

2. Fueling Shutoff Valve - Maintenance Practices

Figure 201

A. General

- (1) This task includes the steps to clean residue from the shutoff valve exterior.
- (2) The shutoff valve may not work properly due to debris.

B. References

Reference	Title
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
28-21-51-000-801	Fueling Shutoff Valve - Removal (P/B 401)
28-21-51-400-801	Fueling Shutoff Valve - Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
B50073	Alcohol - Isopropyl	ASTM D 770
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

F. Prepare for the Procedure

SUBTASK 28-21-51-010-005

- (1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-51-860-013

- (2) Make sure that all the fueling shutoff valve switches at the fueling station are in the CLOSE position.

SUBTASK 28-21-51-860-014

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT

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(Continued)

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

G. Procedure

SUBTASK 28-21-51-110-005

- (1) Clean the shutoff fueling valves:



DO NOT GET ISOPROPYL ALCOHOL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ISOPROPYL ALCOHOL. KEEP THE ISOPROPYL ALCOHOL AWAY FROM SPARKS, FLAME, AND HEAT. ISOPROPYL ALCOHOL IS POISONOUS AND FLAMMABLE, WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Use a spray bottle with alcohol, B50073 and apply it to the fueling shutoff valves and manual override switches.
- (b) Clean the fueling shutoff valves and manual override switches.
- (c) Rub the surfaces dry with a cotton wiper, G00034.
- (d) Repeat the process until completely cleaned or most residue is removed.

SUBTASK 28-21-51-860-015

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-51-710-004

- (3) Make sure the shutoff valve opens and closes normally by pressing the manual override switch.
(a) Do this task: Pressure Fueling System - Test, TASK 28-21-00-700-801.

SUBTASK 28-21-51-900-001

- (4) Replace the shutoff valves if they do not move freely. Do the following tasks:
 - Fueling Shutoff Valve - Removal, TASK 28-21-51-000-801
 - Fueling Shutoff Valve - Installation, TASK 28-21-51-400-801

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-51-410-004

- (1) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

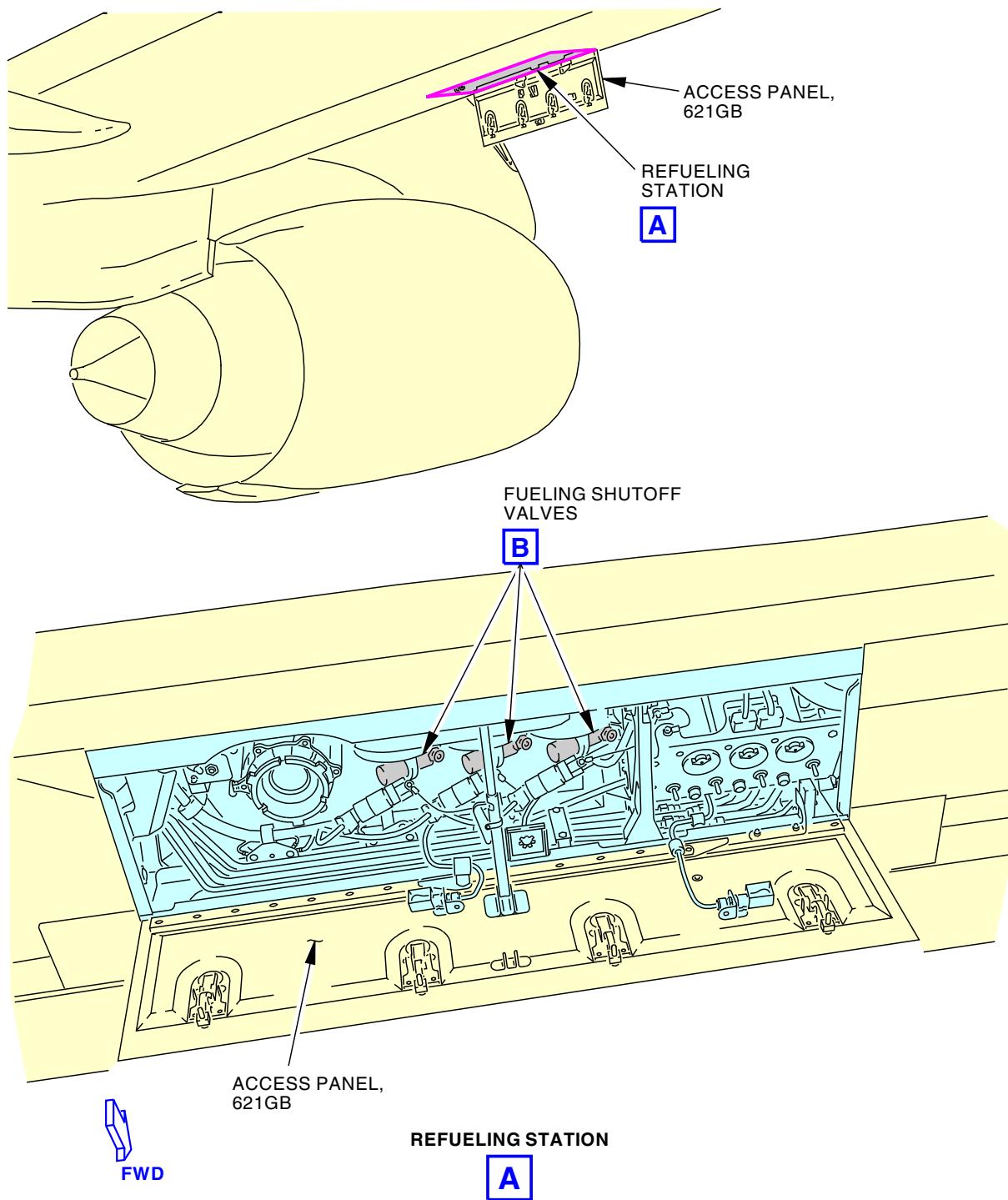
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Fueling Shutoff Valve Maintenance
Figure 201/28-21-51-990-804

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FUELING SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the fueling shutoff valve
 - (2) An installation of the fueling shutoff valve.

TASK 28-21-51-000-801

2. Fueling Shutoff Valve - Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fueling Shutoff Valve.

B. References

Reference	Title
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-195	Container - 1 Quart, Oil/Fuel Resistant

D. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

F. Prepare for the Removal

SUBTASK 28-21-51-650-001

- (1) For the No. 2 tank fueling shutoff valve, do one of the following steps:
 - (a) Defuel the No. 2 tank (TASK 28-26-00-650-801).
 - (b) Transfer fuel out of the No. 2 tank until the No. 2 tank contains less than 3500 lb (1588 kg) (TASK 28-26-00-650-802).

SUBTASK 28-21-51-010-001

- (2) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-51-860-001

- (3) Make sure that the manual defueling valve is closed.

SUBTASK 28-21-51-860-002

- (4) Make sure that all the fueling shutoff valve switches at the fueling station are in the CLOSE position.



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SUBTASK 28-21-51-860-003

- (5) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-51-680-001

- (6) Put the 1 quart oil/fuel resistant container, STD-195, below the receptacle to catch fuel.

SUBTASK 28-21-51-860-004

- (7) Push the poppet valve in the receptacle.

- (a) Let the remaining fuel drain from the receptacle and the manifold.

SUBTASK 28-21-51-020-002

- (8) Disconnect the electrical connector [8] from the fueling shutoff valve [2].

- (a) If more than one fueling shutoff valve [2] is replaced, install identification tags on the electrical connectors [8].

NOTE: This will help to make sure that the correct electrical connector is re-installed to the correct fueling shutoff valve.

SUBTASK 28-21-51-020-003

- (9) Disconnect the bonding jumper [3] from the fueling shutoff valve [2].

SUBTASK 28-21-51-860-006

- (10) Put the container below the fueling shutoff valve [2] to catch fuel.

G. Fueling Shutoff Valve Removal

SUBTASK 28-21-51-020-004

- (1) Hold the fueling shutoff valve [2] and remove the bolts [7], washers [6], backup rings [5], and O-rings [4] that attach the valve to the refueling manifold [9].

- (a) Discard the O-rings [4] and backup rings [5].

SUBTASK 28-21-51-020-005

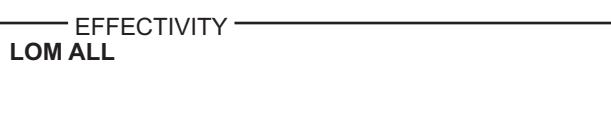
- (2) Remove the fueling shutoff valve [2] from the refueling manifold [9].

SUBTASK 28-21-51-020-008

- (3) Remove the O-ring [1] from the fueling shutoff valve [2].

- (a) Discard the O-ring [1].

———— END OF TASK ————

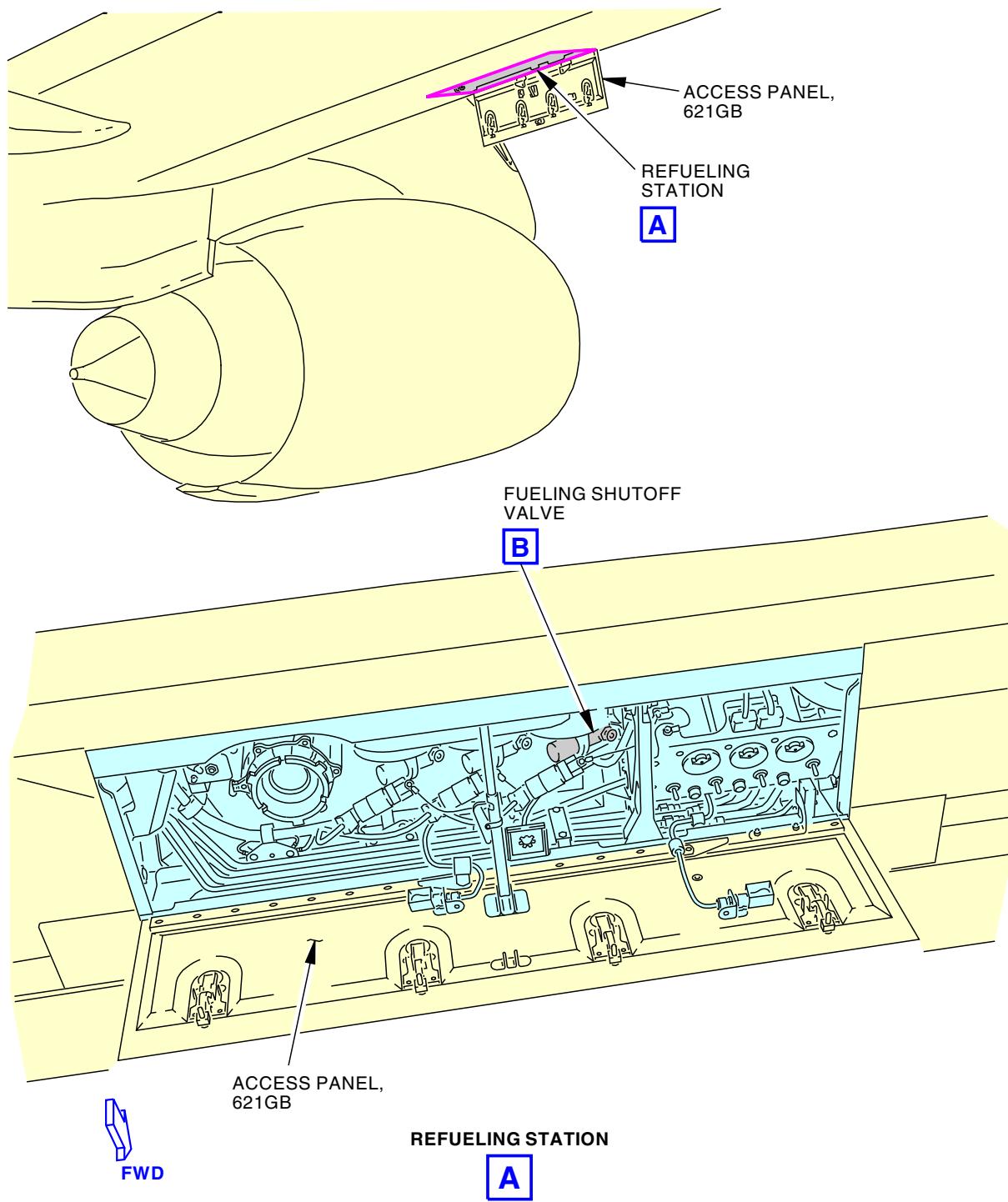


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Fueling Shutoff Valve Installation
Figure 401/28-21-51-990-802 (Sheet 1 of 2)

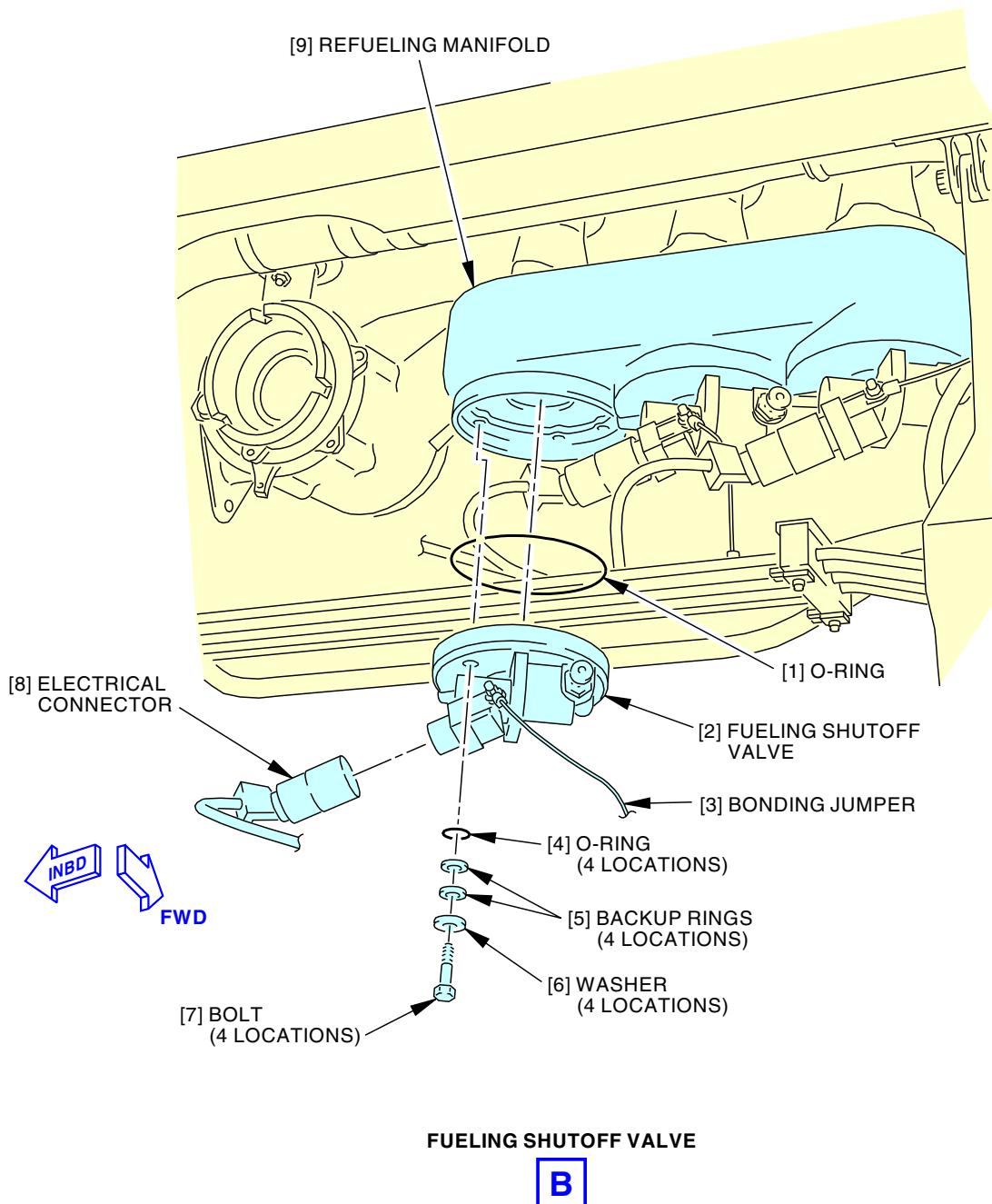
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Fueling Shutoff Valve Installation
Figure 401/28-21-51-990-802 (Sheet 2 of 2)

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TASK 28-21-51-400-801

3. Fueling Shutoff Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-21-51-200-801	Fueling Shutoff Valve - Bonding Resistance Check (P/B 601)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B50073	Alcohol - Isopropyl	ASTM D 770
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	28-21-52-51-025	LOM ALL
2	Fueling shutoff valve	28-21-52-51-035	LOM ALL
4	O-ring	28-21-52-51-020	LOM ALL
5	Backup ring	28-21-52-51-015	LOM ALL

D. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

F. Fueling Shutoff Valve Installation

SUBTASK 28-21-51-110-001

- (1) Clean the bolts [7] and washers [6] with solvent, B00083, or alcohol, B50073.

SUBTASK 28-21-51-110-002

- (2) Dry the bolts [7] and washers [6] with a cotton wiper, G00034.

SUBTASK 28-21-51-420-001

- (3) Install the washers [6] and new backup rings [5] on the bolts [7] that attach the fueling shutoff valve [2].

SUBTASK 28-21-51-420-002

- (4) Install new O-rings [4], lightly lubricated with fuel, on the bolts [7].

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SUBTASK 28-21-51-110-003

- (5) Clean the machined surfaces of the refueling manifold [9] and fueling shutoff valve [2] with solvent.

SUBTASK 28-21-51-110-004

- (6) Rub the surfaces of the refueling manifold [9] and fueling shutoff valve [2] dry with a cotton wiper, G00034.

SUBTASK 28-21-51-420-003

- (7) Install a new O-ring [1], lightly lubricated with fuel, on the fueling shutoff valve [2].

SUBTASK 28-21-51-420-004

- (8) Put the fueling shutoff valve [2] into the refueling manifold [9].

SUBTASK 28-21-51-420-005



**DO NOT REMOVE OR HOLD THE O-RING TOO TIGHTLY WHEN YOU TURN
THE FUELING SHUTOFF VALVE. YOU CAN CAUSE DAMAGE TO THE
O-RING IF YOU ARE NOT CAREFUL.**

- (9) Turn the fueling shutoff valve [2] until the bolt holes align with the holes in the refueling manifold [9].

SUBTASK 28-21-51-420-006

- (10) Install the bolts [7], washers [6], backup rings [5], and O-rings [4].
(a) Tighten the bolts [7] with fingers while the fueling shutoff valve [2] is held in its position.

SUBTASK 28-21-51-420-007

- (11) Tighten the bolts [7] to 25 in-lb (2.82 N·m) - 32 in-lb (3.62 N·m).

SUBTASK 28-21-51-420-008

- (12) Connect the bonding jumper [3] to the fueling shutoff valve [2].
(a) Measure the electrical bonding resistance between the bonding jumper [3] and the spar (TASK 28-21-51-200-801).
1) Make sure that the bonding resistance is 0.001 ohm (1 milliohm) or less.
(b) Apply a fillet seal with sealant, A02315, to the terminal lugs of the bonding jumper [3] (SWPM 20-20-10, TASK 51-31-00-390-804).

SUBTASK 28-21-51-420-009

- (13) Connect the electrical connector [8] to the fueling shutoff valve [2].
(a) If more than one fueling shutoff valve [2] is installed, make sure that the correct electrical connector [8] is installed on the correct fueling shutoff valve [2].
1) Remove the identification tags from the electrical connectors [8].

SUBTASK 28-21-51-420-010

- (14) Measure the electrical bonding resistance between the fueling shutoff valve [2] and the structure (TASK 28-21-51-200-801).
(a) Make sure that the resistance is 0.0010 ohm (1.0 milliohm) or less.

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G. Fueling Shutoff Valve Installation Test

SUBTASK 28-21-51-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-51-710-001

- (2) Use 500 lb (227 kg) of fuel to make sure that the fueling shutoff valve [2] operates correctly, do one of the following steps:
 - (a) Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.
 - (b) Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-21-51-710-002

- (3) Make sure that fueling has stopped once the fueling shutoff valve [2] is commanded to CLOSE.

SUBTASK 28-21-51-710-005

- (4) Make sure that there is no fuel leakage at the fueling shutoff valve [2].

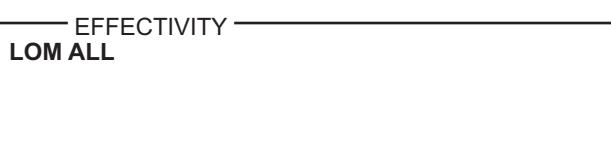
H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-51-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
621GB	Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————



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FUELING SHUTOFF VALVE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance between the fueling shutoff valve solenoid and the structure.

SFAR 88

TASK 28-21-51-200-801

2. Fueling Shutoff Valve - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II

D. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

E. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27



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F. Prepare for the Bonding Resistance Check

SUBTASK 28-21-51-010-002

- (1) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-51-710-002

- (2) Make sure that the manual defueling valve is closed.

SUBTASK 28-21-51-710-003

- (3) Make sure that all the fueling shutoff valve switches at the fueling station are in the CLOSED position.

SUBTASK 28-21-51-865-001

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

G. Electrical Bonding Measurement

SUBTASK 28-21-51-862-001

- (1) Disconnect the electrical connector from the fueling shutoff valve (three locations).

SUBTASK 28-21-51-765-001

- (2) Measure the electrical bonding resistance between the fueling shutoff valve bonding jumper lug (at the actuator assembly bonding lug) and the spar with an intrinsically safe approved bonding meter, COM-1550 (three locations) (SWPM 20-20-00, SWPM 20-20-10).

(a) Make sure that the bonding resistance is 0.001 ohm (1 milliohm) or less.

(b) If not previously accomplished, apply a sealant, A02315, to the terminal lugs of the bonding jumper (SWPM 20-20-10, TASK 51-31-00-390-804).

SUBTASK 28-21-51-860-018

- (3) Connect the electrical connector to the fueling shutoff valve (three locations).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-51-865-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-21-51-700-002

- (2) Use 500 lb (227 kg) of fuel to make sure that the fueling shutoff valve operates correctly, do one of the following steps:

(a) Do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

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(b) Do this task: Pressure Fueling System - Test, TASK 28-21-00-700-801.

SUBTASK 28-21-51-410-003

(3) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

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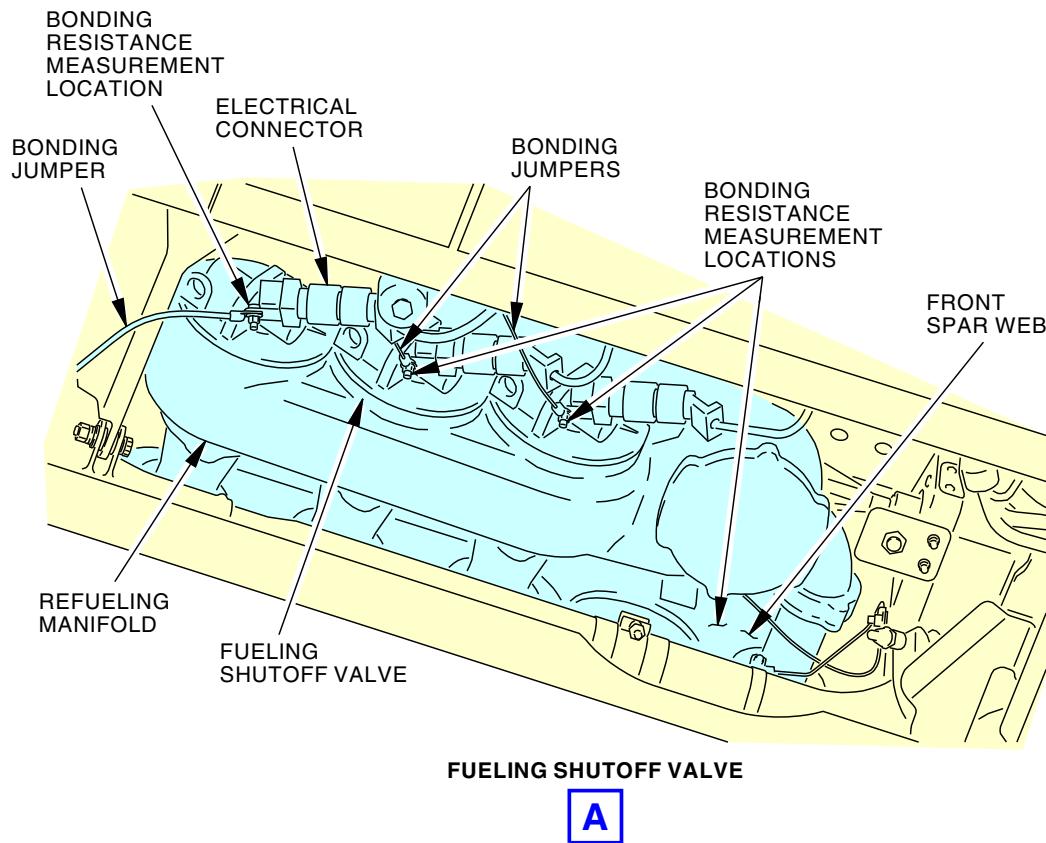
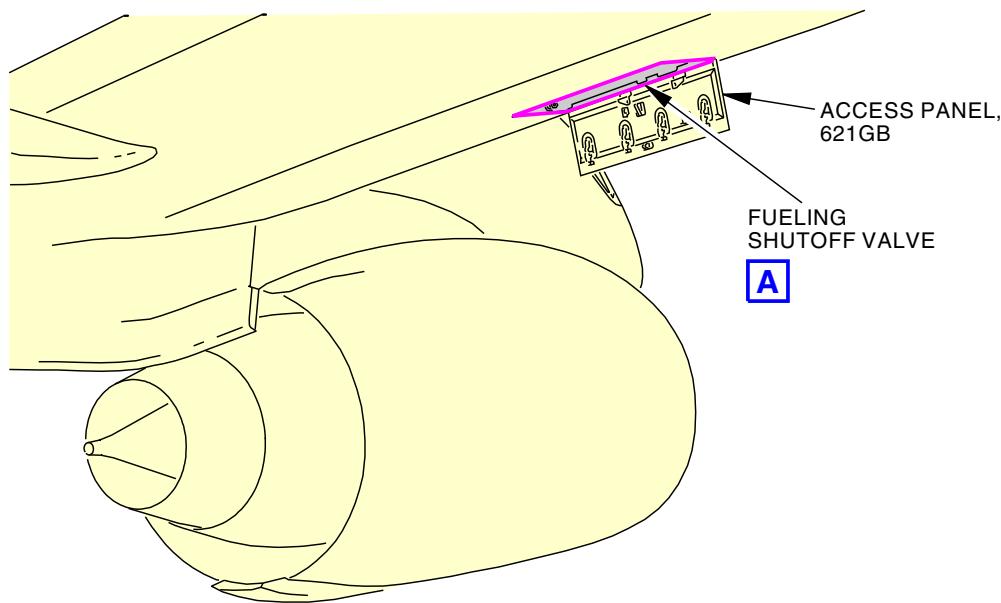
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Fueling Shutoff Valve - Bonding Resistance Measurement
Figure 601/28-21-51-990-803

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FUELING FLOAT SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A task to remove the float switch (Type II) in each fuel tank.
 - (2) A task to install the float switch (Type II) in each fuel tank.
- B. The fueling float switch is referred to as the float switch in this procedure.
- C. A float switch in each fuel tank monitors the level of the fuel during the refuel procedure. The float switch stops the refuel operation when the tank is full. The electrical wires that go to the switches are in a conduit with connections that fuel cannot go through. Some wire splices are installed adjacent to the applicable conduit bulkhead fitting at the wing front spar.
- D. The Type II float switch does not have an elbow joint below the float switch (Figure 402). The Type II float switch has a green float shell. In the No. 1 and No. 2 tanks, the Type II float switch conduit must be replaced if the float switch is replaced. In the center tank, the conduit for the Type II float switch contains a liner which must be replaced each time the float switch is replaced. Service Bulletin 737-28-1142 replaces the Type I float switch installation with the Type II float switch installation.
- E. The liner provides protection against chafing between the float switch wiring and the conduit. Additionally, the liner protects the conduit from rupturing, which can be caused by freezing water that condenses inside the conduit, by permitting instant drainage of such water.
- F. The convoluted tube assembly is referred to as the liner in this procedure.

TASK 28-21-71-020-801

2. Float Switch Removal

A. General

- (1) This task gives instructions to remove the Float Switch.
- (2) In the center tank, the conduit may be removed only when necessary, however, the conduit liner must be replaced each time the Type II float switch is replaced.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

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D. Access Panels

Number	Name/Location
131AB	Center Tank Access
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
532PB	Main Tank Access Door - Wing Station 576
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
632PB	Main Tank Access Door - Wing Station 576

E. Prepare for the Removal

SUBTASK 28-21-71-860-006



WARNING

MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES. THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES CAN EXTEND AND RETRACT QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.



WARNING

MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 28-21-71-650-004



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Prepare to go into the applicable fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-21-71-860-007

- (3) Make sure that the fueling shutoff valves at the refuel station are closed.

SUBTASK 28-21-71-860-008

- (4) If electrical power is connected, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-21-71-010-002

- (5) Do these steps to get access to the float switches:

- (a) To get access to the float switch in the No. 1 tank, remove this access panel:

Number **Name/Location**

532PB Main Tank Access Door - Wing Station 576

(TASK 28-11-11-000-801).

- (b) To get access to the float switch in the No. 2 tank, remove this access panel:

Number **Name/Location**

632PB Main Tank Access Door - Wing Station 576

(TASK 28-11-11-000-801).

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- (c) To get access to the float switch in the center tank (TASK 28-11-31-000-801).

Remove this access panel:

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access

F. No. 1 or No. 2 Tank Fueling Float Switch and Conduit Removal (TYPE II FLOAT SWITCH)

SUBTASK 28-21-71-020-016

- (1) Prepare to cut the wires that go to the float switch [102] (Figure 401).
- Go out of the fuel tank.
 - Separate the wires that go to the float switch [102] from the wire bundle, forward of the wing front spar.
 - Find the splice in the wires that go to the float switch [102].

SUBTASK 28-21-71-020-017

- (2) Cut the wires at a good point adjacent to the splice.
- Make sure that the wire has a sufficient length for a new splice.
 - Put a tag on the wires to identify them.

SUBTASK 28-21-71-020-018

- (3) Do these steps to remove the float switch [102] and conduit [101]:

NOTE: It is necessary to remove the conduit each time that you remove the float switch.

- (a) Remove the applicable access panel:

<u>Number</u>	<u>Name/Location</u>
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
621SB	Lower Leading Edge Access Panel - Slat Station 356.15

- Remove the lockwire from the coupling ring [95] to the bolt [93].
- Loosen and remove the coupling ring [95] to permit the float switch electrical cable [84] to move freely (Figure 402).
- With one person in the tank and one person out of the tank, loosen and remove the bolts [93], nuts [115], washers [122], washers [124], washer [125] and packings [123] that attach the retainer [119] (Figure 402).

NOTE: This step protects the retainer from damage while you loosen the conduit mounting nut [94].

- Remove the lockwire as follows:
 - Remove the lockwire from the conduit captive nut [116] and bulkhead union [91].
 - Remove the lockwire [108] from the mounting nut [107] and bracket [109].
 - Remove the lockwire [106] from the conduit captive nut [105] and mounting nut [107].
 - Remove the lockwire from the conduit mounting nut [94] and bolt [93].
- Pull the retainer [119] back from the front spar.
- From outside the tank, loosen and remove the conduit mounting nut [94] (Figure 401).
 - Remove and discard the o-ring [118] and packings [123].
- From inside the tank, loosen the bulkhead conduit captive nut [116] (Figure 402).

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- 5) Disconnect the bonding jumper [104] from the ground stud of the float switch [102].
- 6) Disconnect the bonding jumper [103] from the conduit [101]:
 - a) Remove the nut [83], washers [82], screw [81], and clamp [80].
- 7) Loosen the conduit captive nut [105] from the float switch [102].
- 8) Loosen the mounting nut [107] for the float switch [102].
- 9) Separate the float switch [102] from the conduit [101] and from the conduit liner sufficiently to remove the float switch [102] and the conduit [101] from the bracket [109].
- 10) Move the switch out to the side of the bracket [109].
- 11) Disengage the conduit [101] from the bulkhead.
- 12) Pull the remaining wiring through the bulkhead and remove the float switch [102] and the conduit [101] from the tank as a unit.

G. Center Tank Fueling Float Switch Removal (TYPE II FLOAT SWITCH)

SUBTASK 28-21-71-020-019

- (1) Prepare to cut the wires that go to the float switch [141] (Figure 401).
 - (a) Go out of the fuel tank.
 - (b) Separate the wires that go to the float switch [141] from the wire bundle, forward of the wing front spar.
 - (c) Find the splice in the wires that go to the float switch [141].

SUBTASK 28-21-71-020-020

- (2) Cut the wires at a good point adjacent to the splice.
 - (a) Make sure that the wire has a sufficient length for a new splice.
 - (b) Put a tag on the wires to identify them.

SUBTASK 28-21-71-020-021

- (3) Do these steps to remove the drain port [165] to permit the float switch electrical cable [160] to move freely (Figure 403):
 - (a) Remove the lockwire [164] from the bolt [93] and the drain port [165].
 - (b) Remove the drain port [165].

SUBTASK 28-21-71-020-022



DO NOT LET THE TOOLS OR THE TANK COMPONENTS FALL. DAMAGE TO THE FUEL CELL OR THE BOTTOM SKIN CAN EASILY OCCUR.

CAUTION

- (4) Do these steps to remove the float switch [141] in the center tank (Figure 403):
 - (a) Remove the lockwire [155] from the screw [154], mounting nut [143], bolt [146] and conduit captive nut [156].
 - (b) Loosen the conduit captive nut [156] from the float switch [141].
 - (c) Loosen the mounting nut [143] from the float switch [141].
 - (d) Remove the two bolts [146], washers [147], washers [148], nuts [149], screw [154], washers [153], and nut [152] that attach the bracket [142] to the bracket [145].
 - (e) Hold the float switch [141] with its attaching parts and do not let it fall while you pull the wires for the float switch out of the conduit [157].

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- (f) Make loops in the wire to make the wire and the float switch [141] easy to move.
- (g) Remove the float switch [141] from the fuel tank.
 - 1) If you are scheduled to install a different float switch, separate the float switch from the mounting bracket [142].
 - 2) Keep the mounting bracket [142] for subsequent installation of the float switch.
- (h) Pull the formed section of the conduit liner [162] forward out of the conduit [157] with needle-nose pliers or a similar tool.
- (i) Cut off the formed end of the conduit liner [162].
NOTE: This step makes it easier to pull the conduit liner out of the conduit from inside the tank.
- (j) From inside the tank, pull the conduit liner [162] out of the conduit [157] from the end that was attached to the float switch [141].
- (k) Remove the conduit liner [162] from the fuel tank.
 - 1) Discard the liner [162].

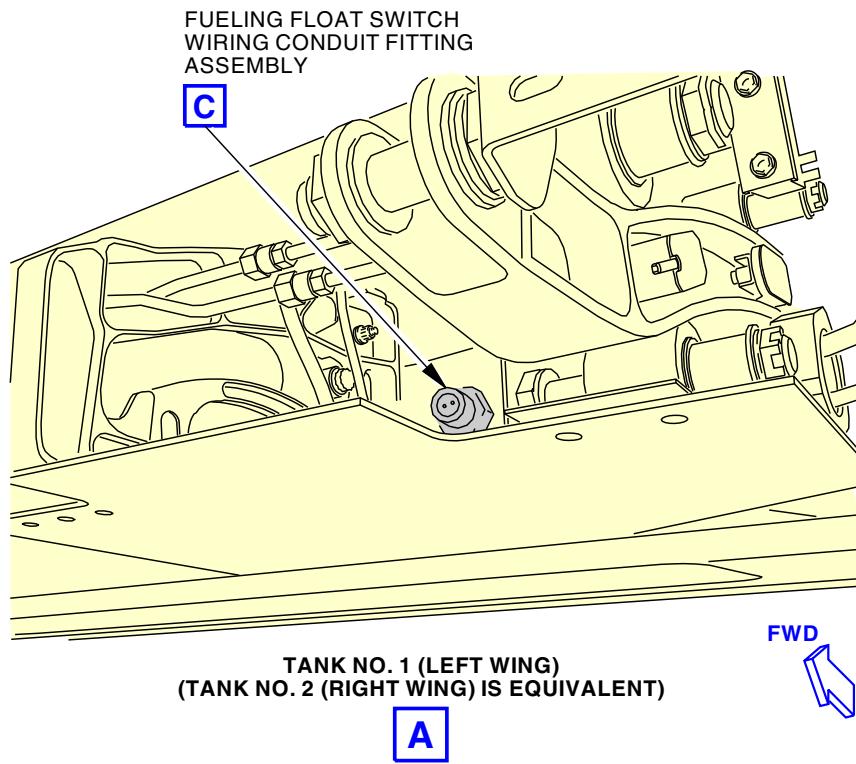
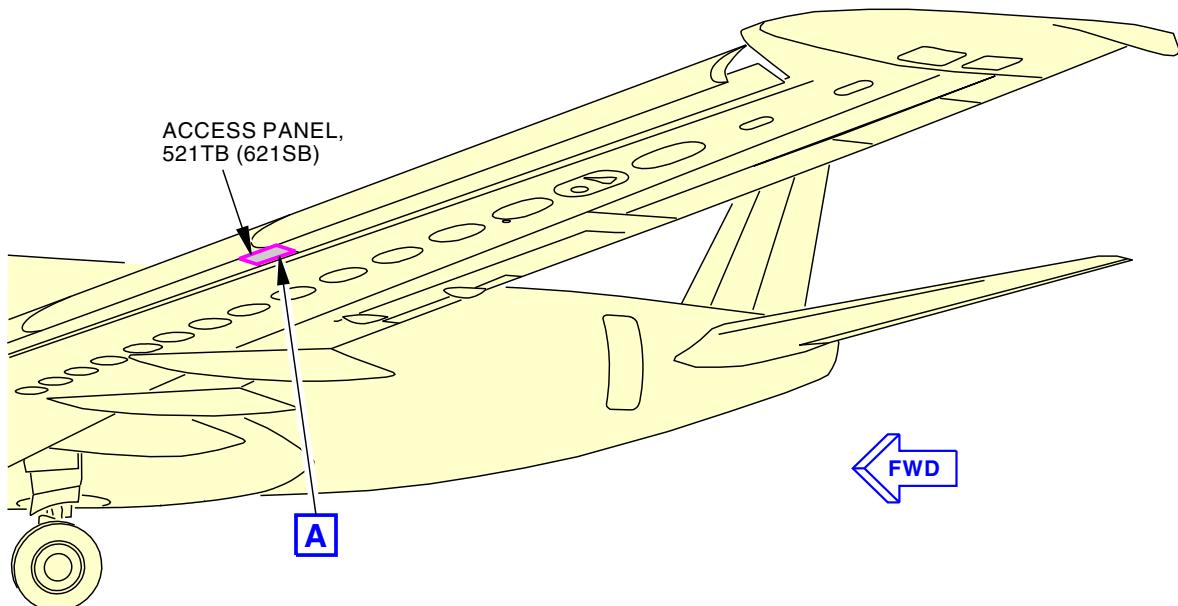
SUBTASK 28-21-71-020-023

- (5) When it is necessary, do these steps to remove the conduit [157] for the float switch wiring in the center tank (Figure 404):
 - (a) Remove the lockwire [168] and lockwire [166] from the bolt [93], conduit mounting nut [94], conduit captive nut [167] and bulkhead union [91].
 - (b) With one person in the tank and one person out of the tank, loosen and remove the bolts [93], nuts [211], washers [207], washers [209], washers [210], and packings [208] that attach the retainer [206].
NOTE: This step protects the retainer from damage while you loosen the conduit mounting nut [94].
 - 1) Pull the retainer [206] back from the front spar.
 - (c) Loosen and remove the screw [198], nut [202], and washers [199], washers [203] that attach the clamp [200].
 - (d) Remove the clamp [200] and spacers [201].
 - (e) Remove the bulkhead conduit captive nut [167] (Figure 404).
 - (f) Loosen the screws [182], washers [183], washers [187], and nuts [186] to disconnect the bonding jumper [184].
 - (g) Cut the lockwire [188] and loosen the conduit captive nut [181].
 - (h) Disconnect the forward section of the conduit [157] from the aft section of the conduit [157].
 - (i) Remove the forward and the aft sections of the conduit [157] and retainer [206].
 - (j) Loosen and remove the conduit mounting nut [94].
 - (k) Remove the bulkhead union [91] and discard the o-ring [205].

— END OF TASK —

EFFECTIVITY
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**TANK NO. 1 (LEFT WING)
(TANK NO. 2 (RIGHT WING) IS EQUIVALENT)**

A



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**Fueling Float Switch Wiring Conduit Fitting Installation
Figure 401/28-21-71-990-830 (Sheet 1 of 4)**

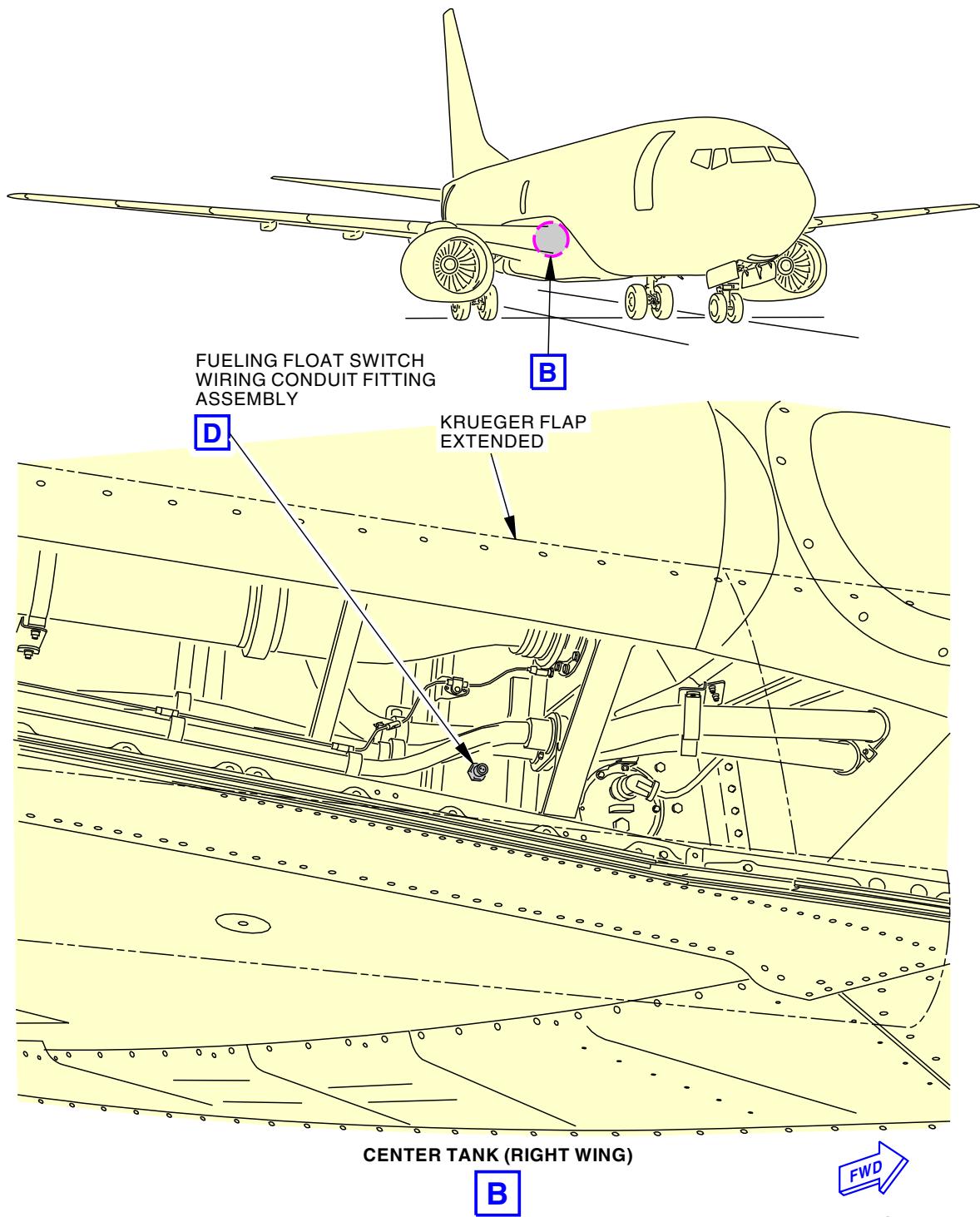
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Fueling Float Switch Wiring Conduit Fitting Installation
Figure 401/28-21-71-990-830 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

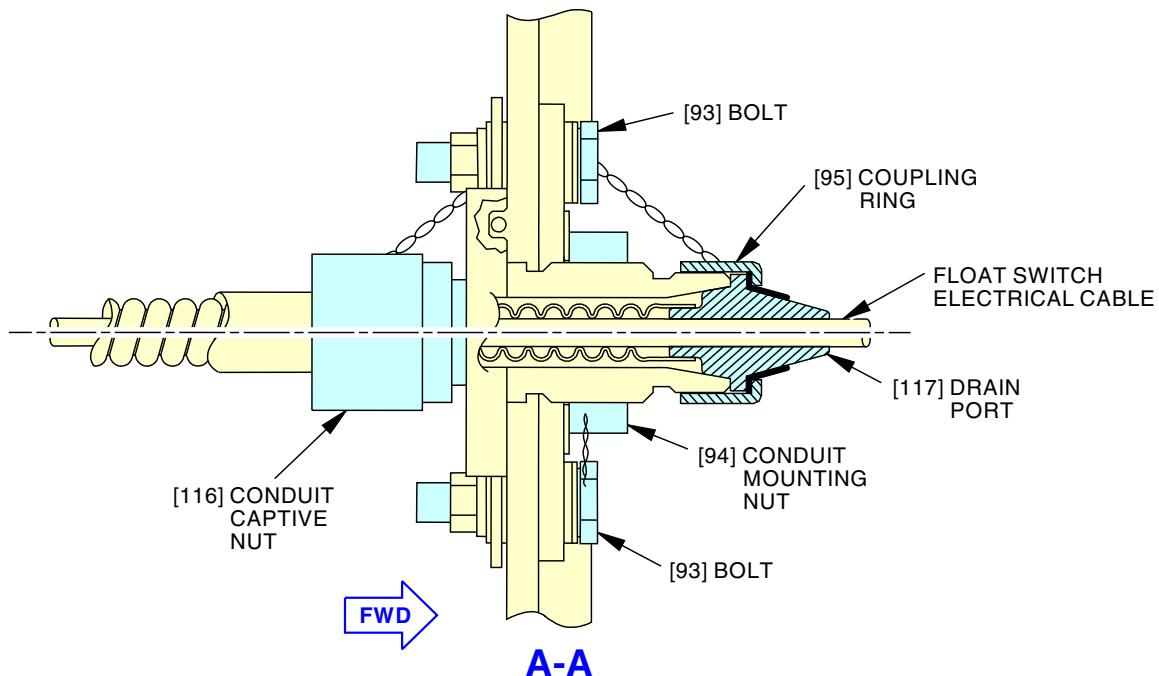
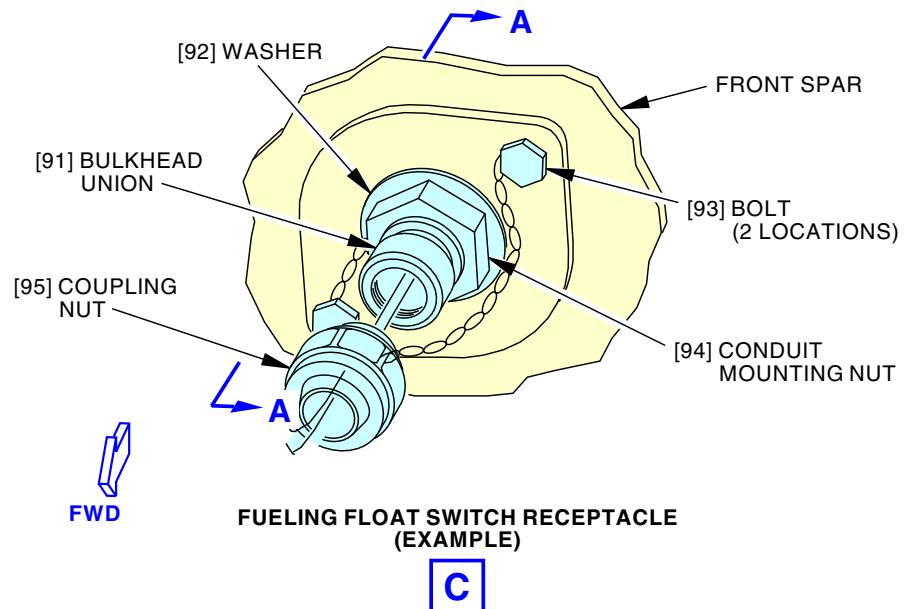
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Fueling Float Switch Wiring Conduit Fitting Installation
Figure 401/28-21-71-990-830 (Sheet 3 of 4)

EFFECTIVITY
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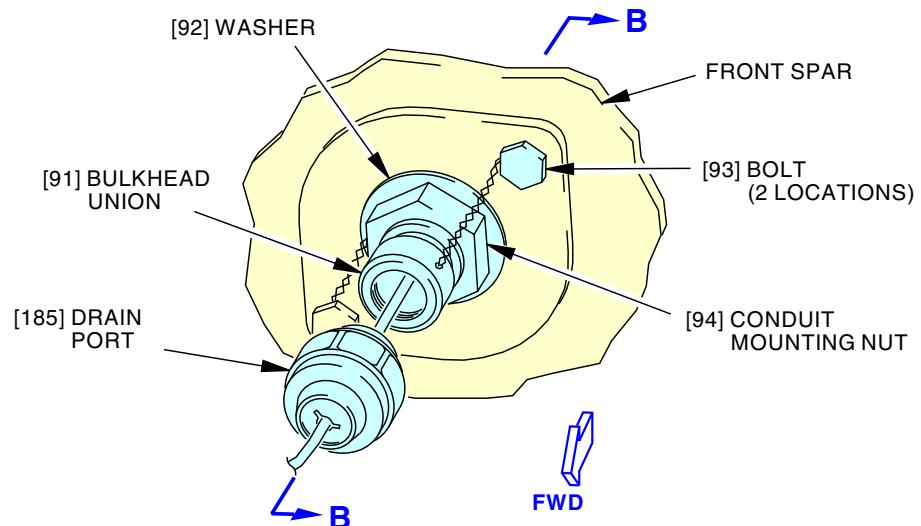
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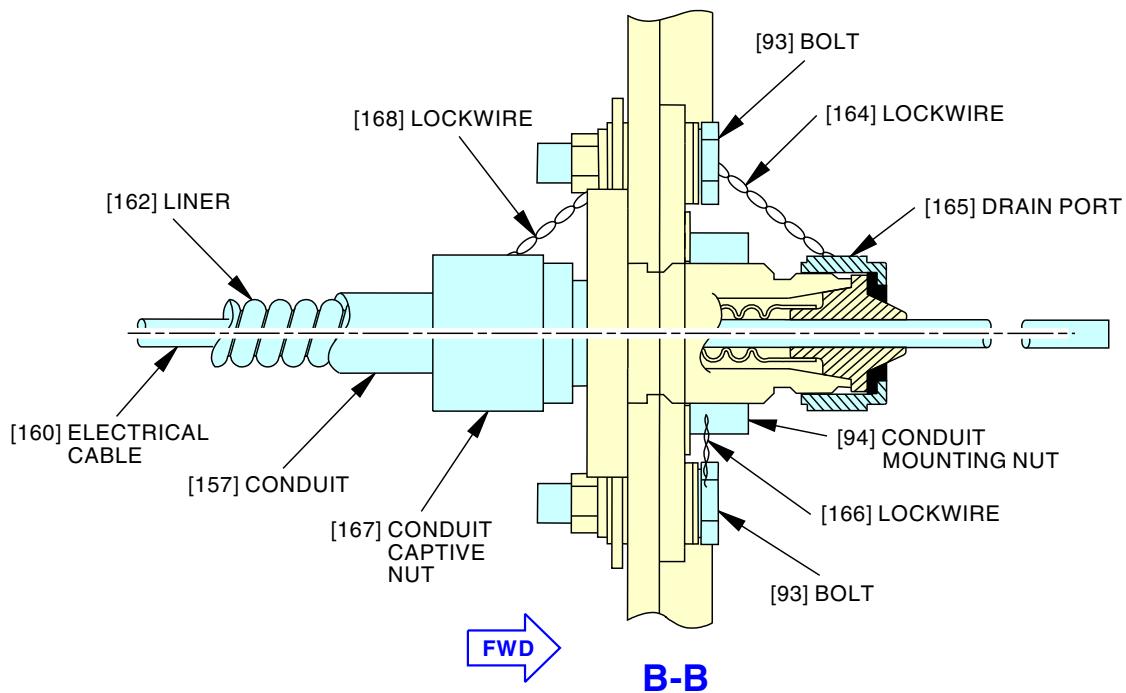


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FUELING FLOAT SWITCH WIRING CONDUIT FITTING ASSEMBLY
(CENTER TANK)

D



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Fueling Float Switch Wiring Conduit Fitting Installation
Figure 401/28-21-71-990-830 (Sheet 4 of 4)

EFFECTIVITY
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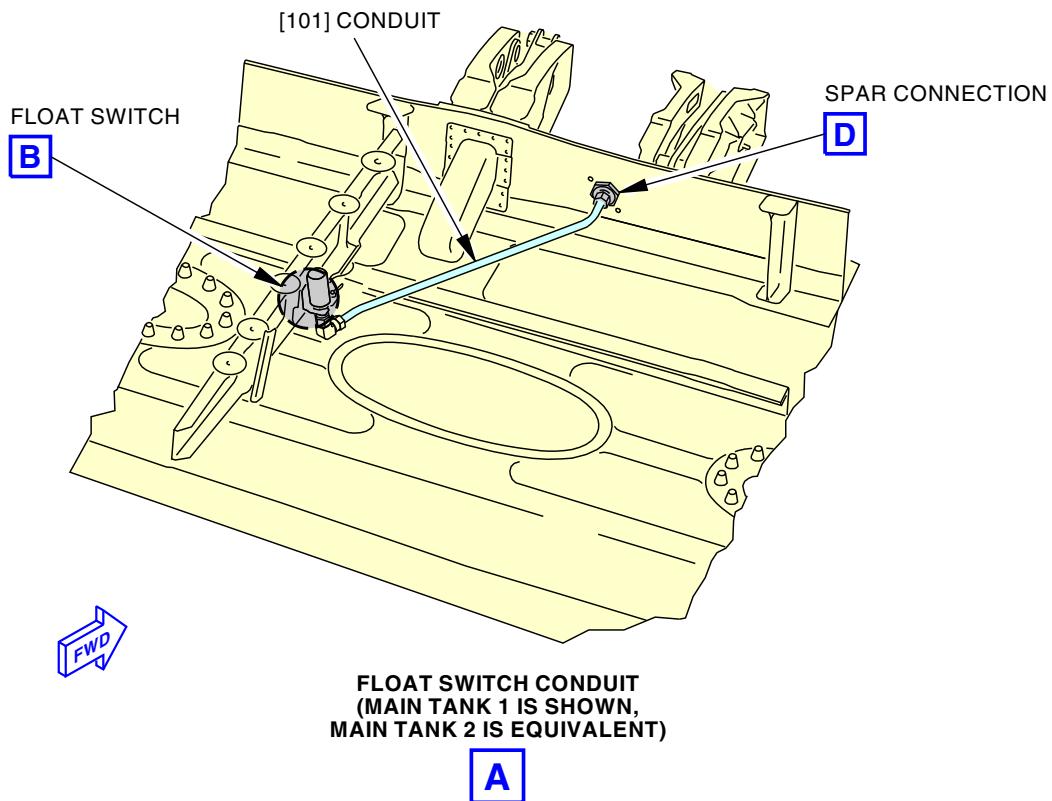
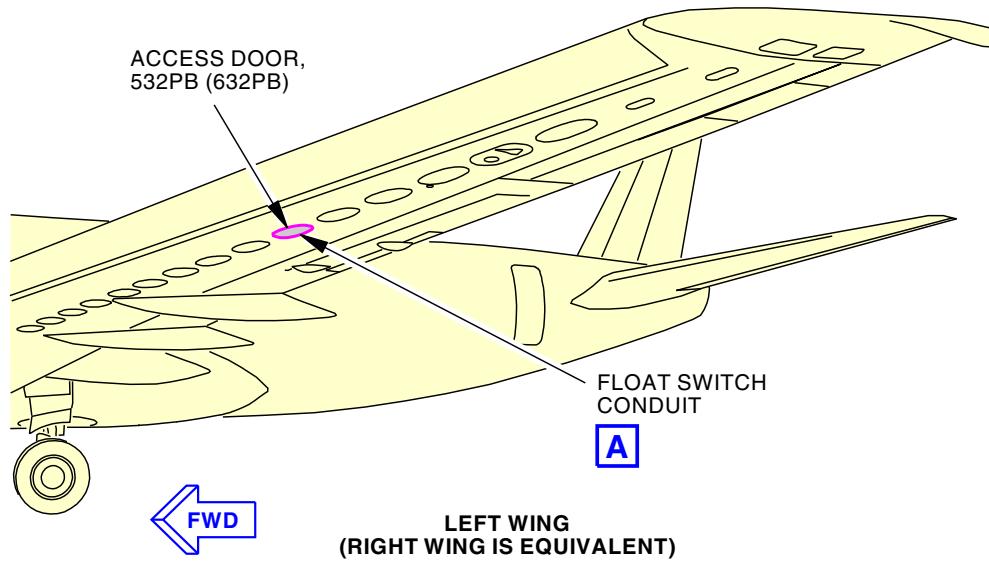
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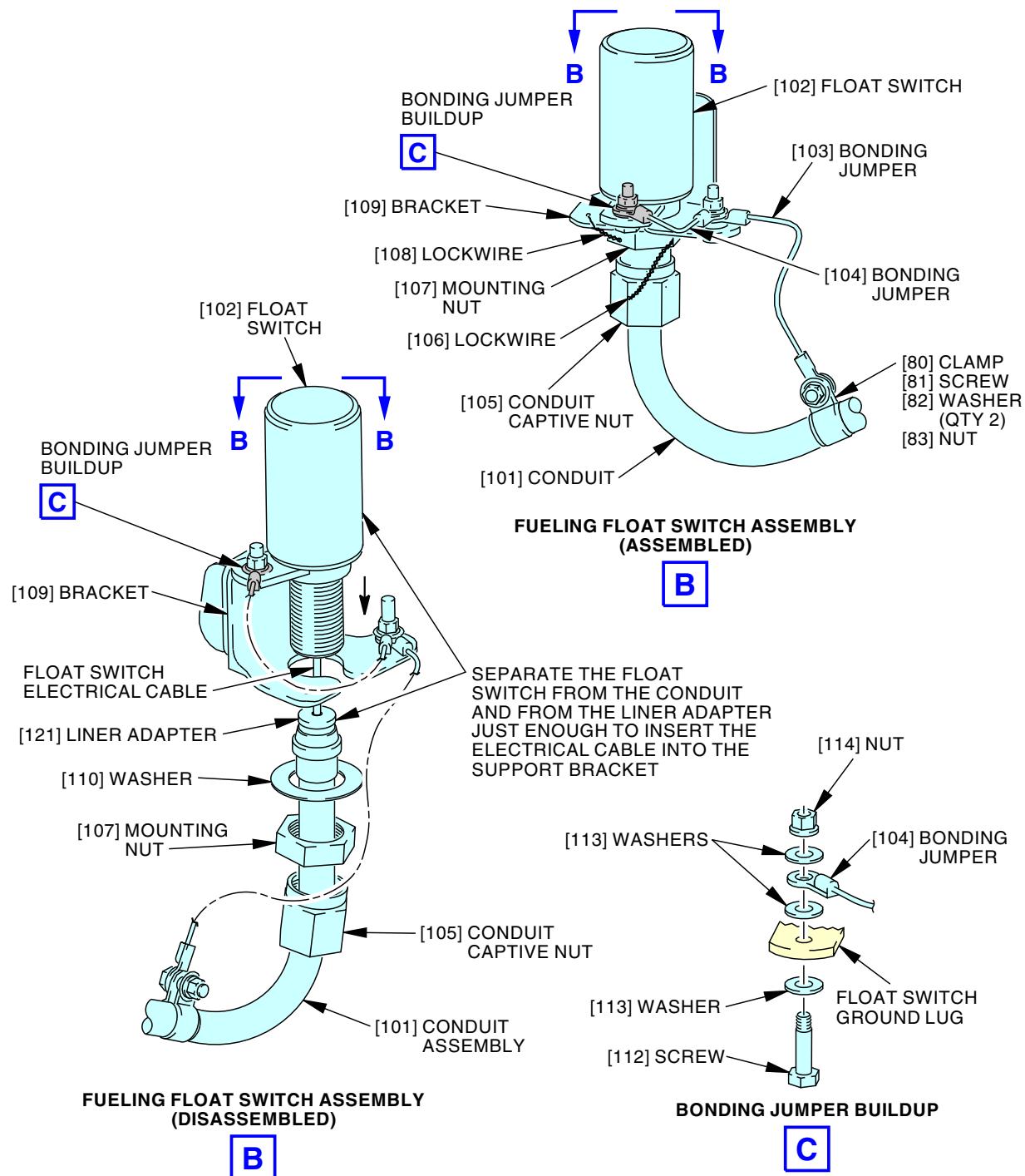
Main Fuel Tank Float Switch and Conduit Installation
Figure 402/28-21-71-990-831 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

28-21-71

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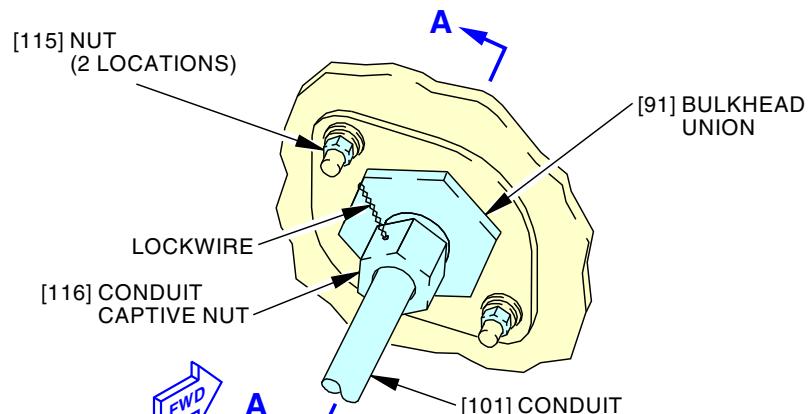
Main Fuel Tank Float Switch and Conduit Installation
Figure 402/28-21-71-990-831 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

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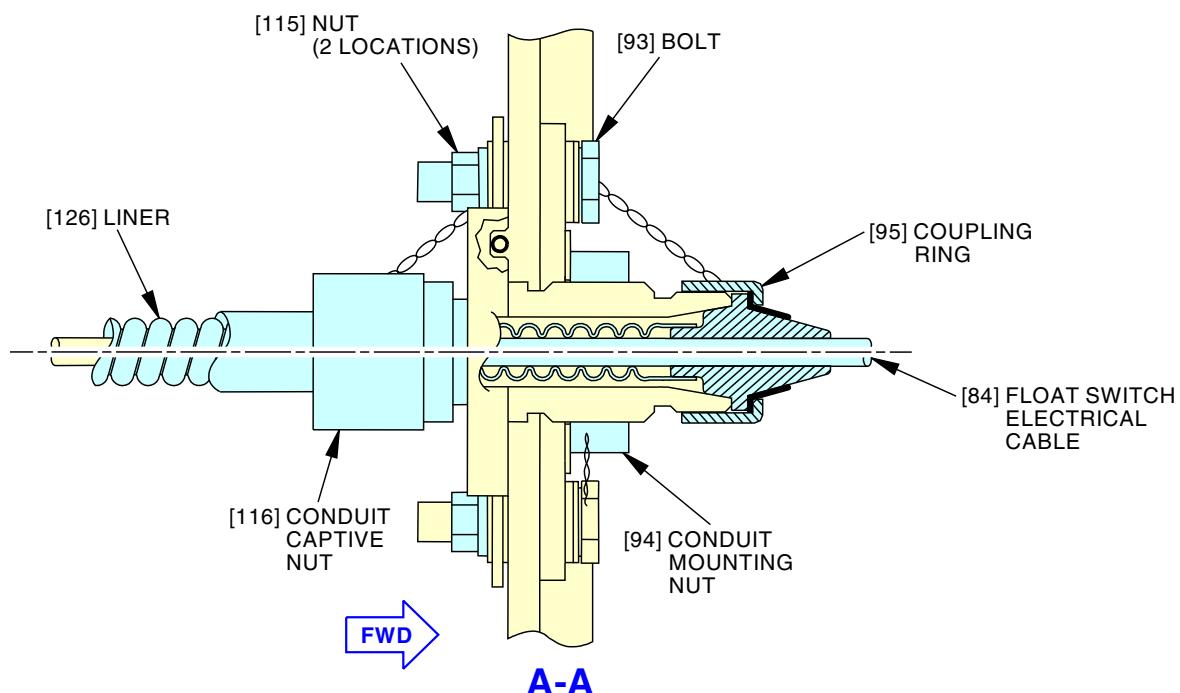


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SPAR CONNECTION
(ASSEMBLED)

D



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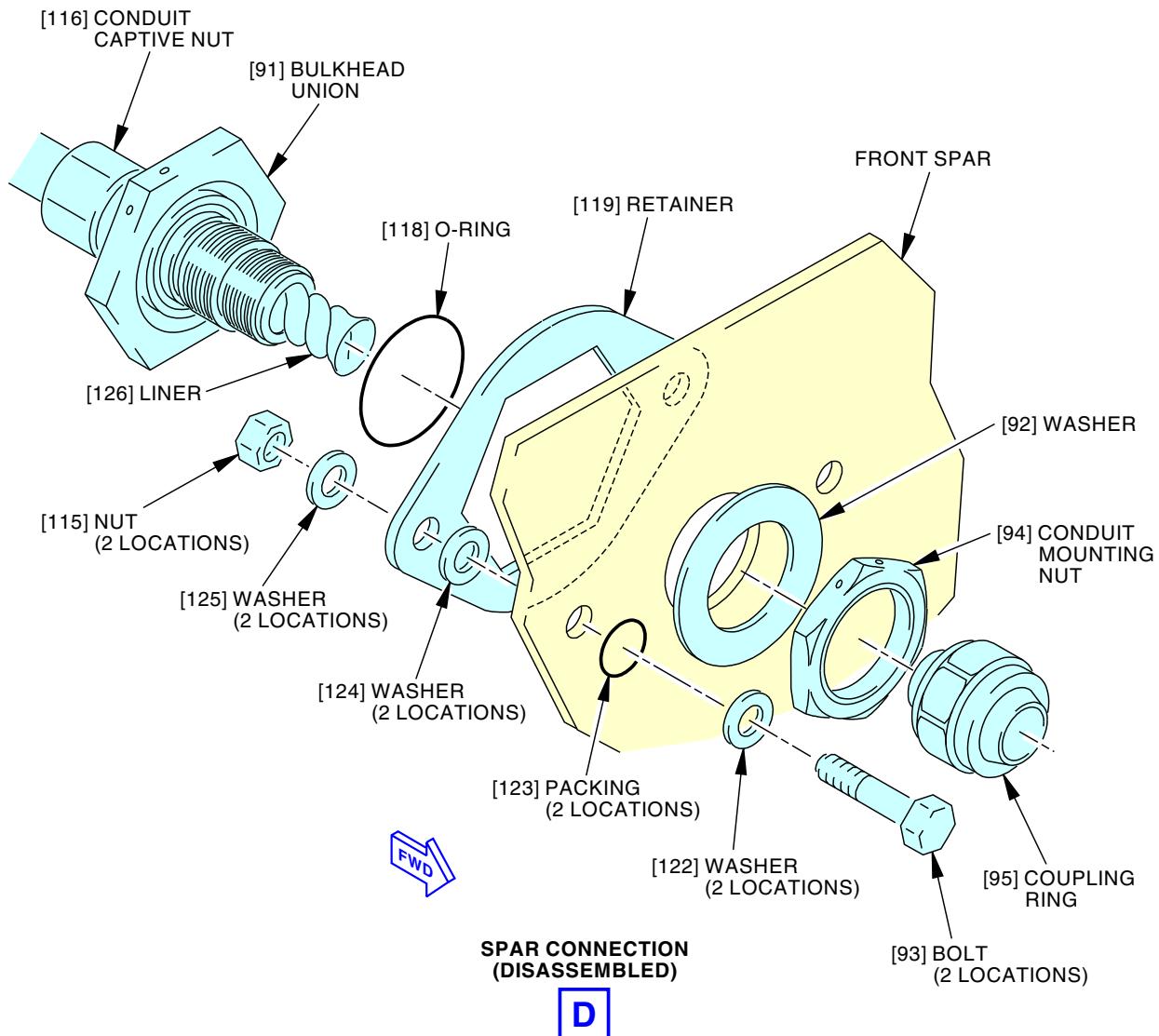
Main Fuel Tank Float Switch and Conduit Installation
Figure 402/28-21-71-990-831 (Sheet 3 of 5)

EFFECTIVITY
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Main Fuel Tank Float Switch and Conduit Installation
Figure 402/28-21-71-990-831 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

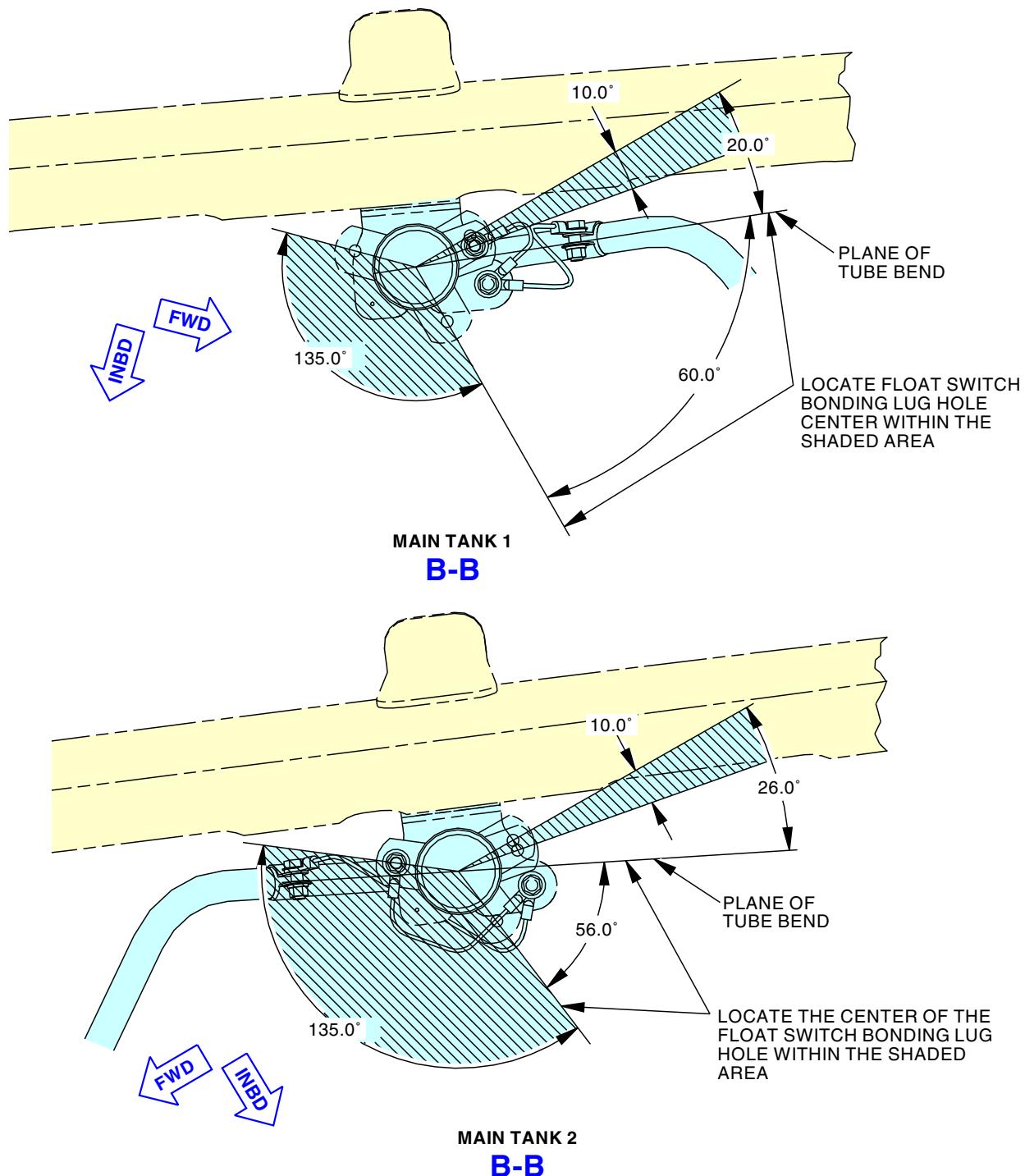
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Main Fuel Tank Float Switch and Conduit Installation
Figure 402/28-21-71-990-831 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

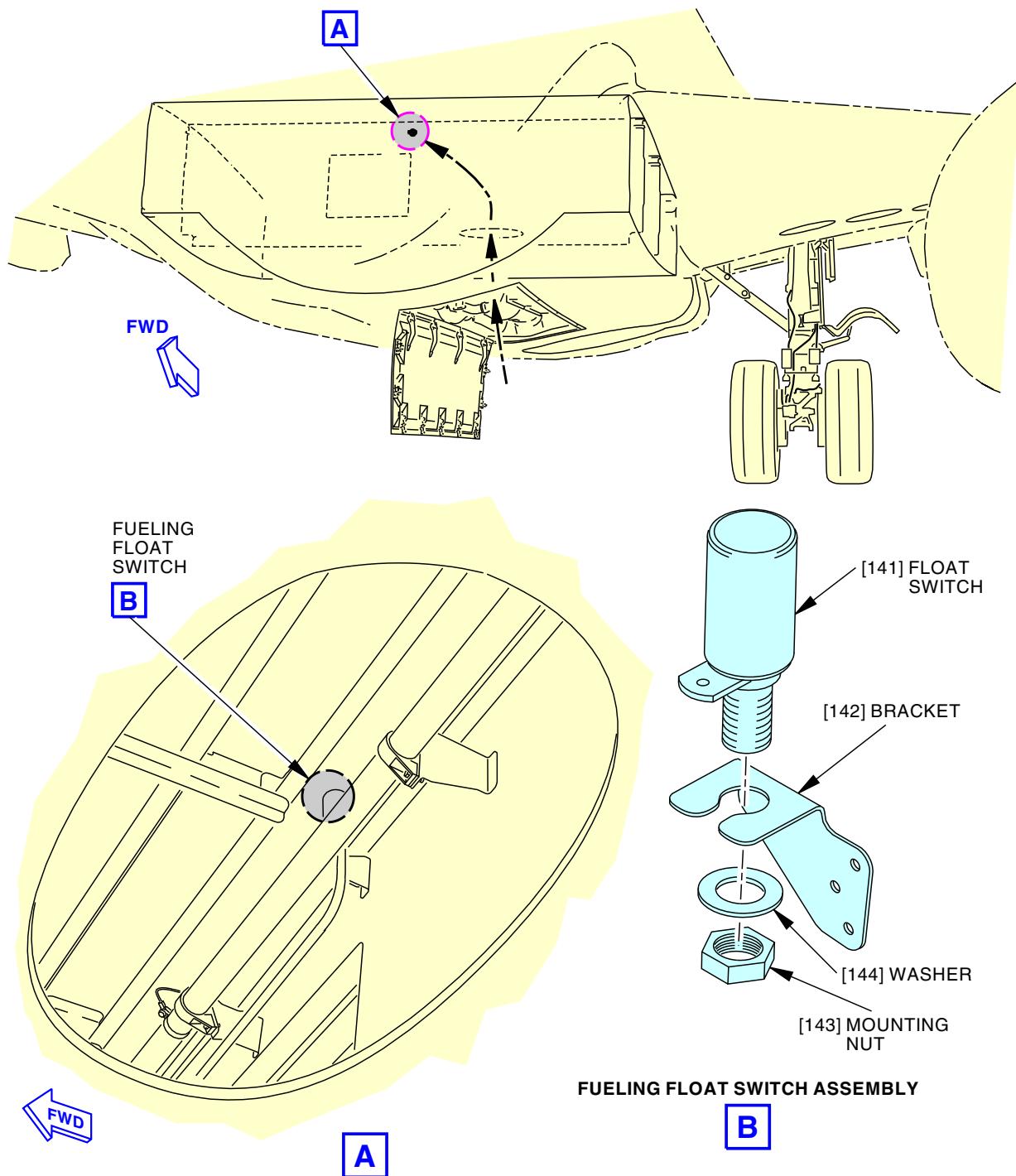
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Center Tank Fueling Float Switch Installation
Figure 403/28-21-71-990-832 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

28-21-71

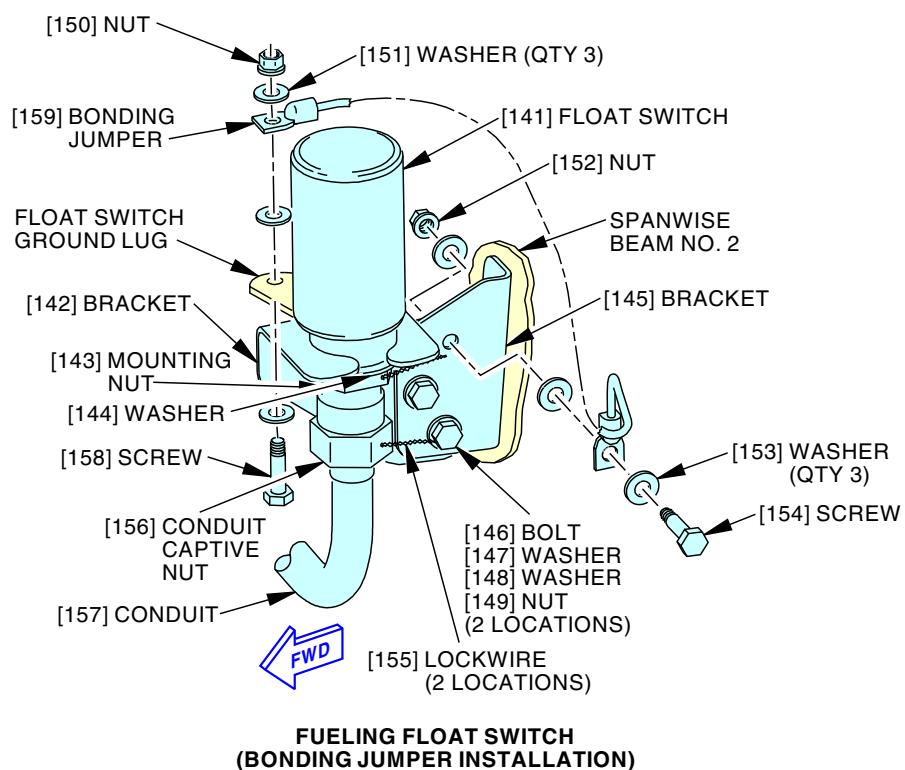
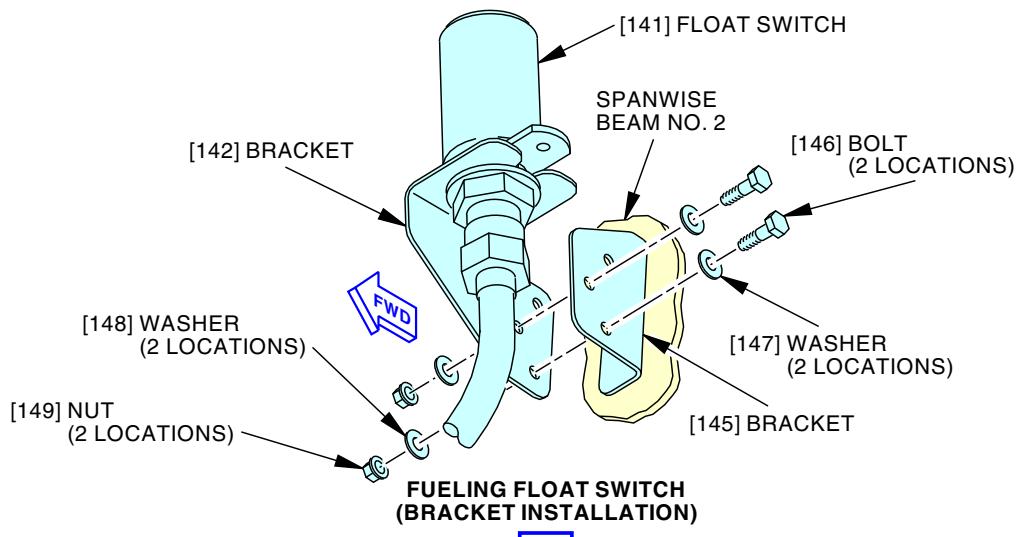
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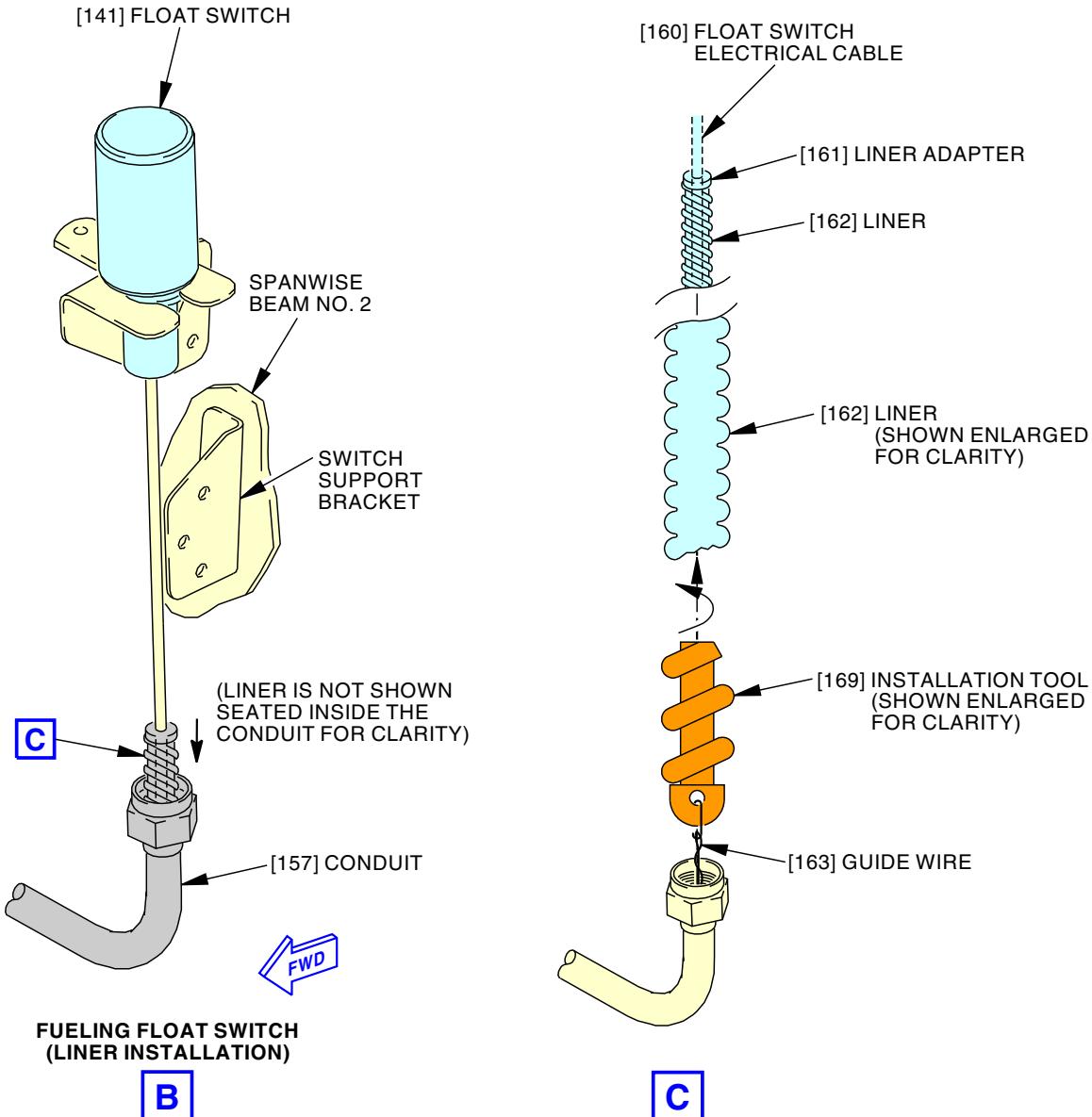


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Center Tank Fueling Float Switch Installation
Figure 403/28-21-71-990-832 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

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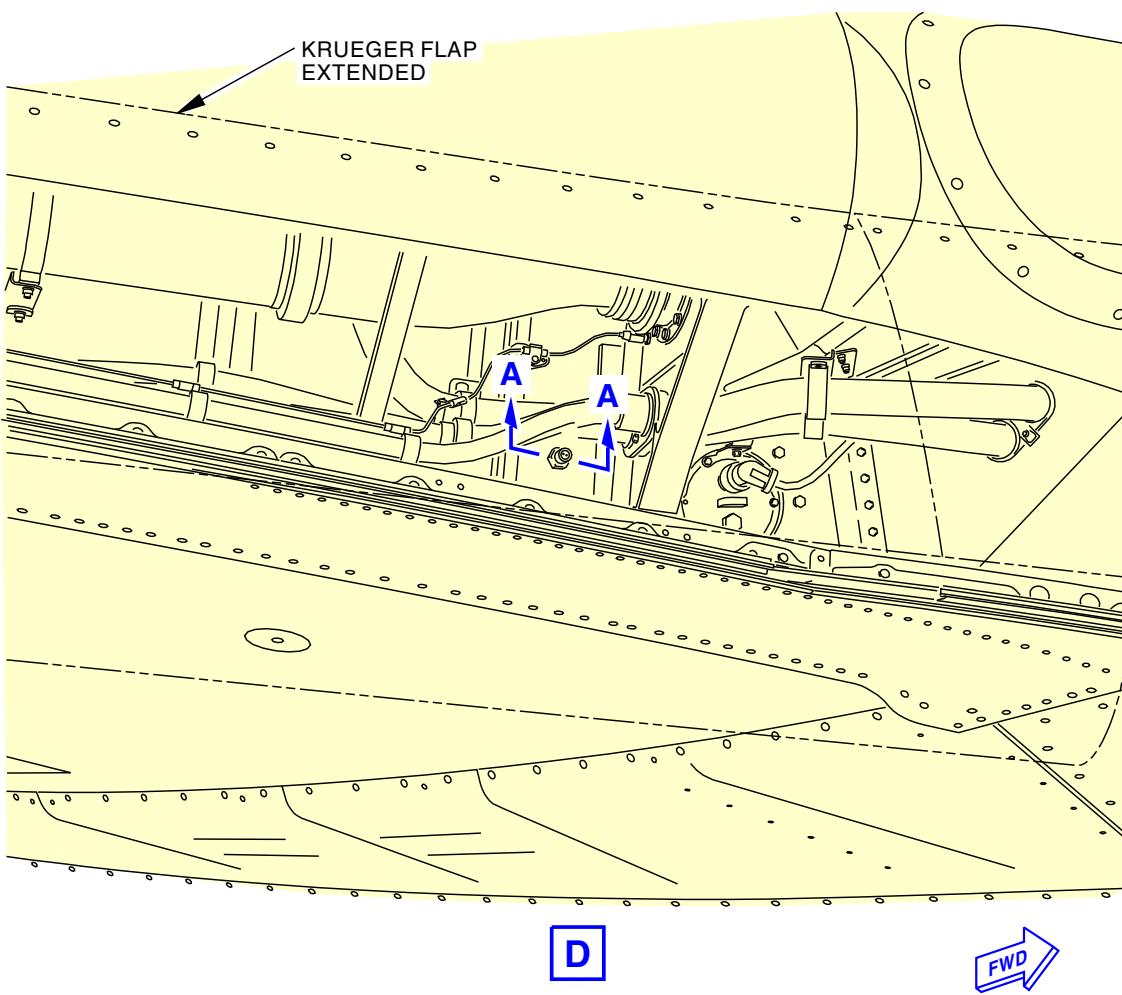
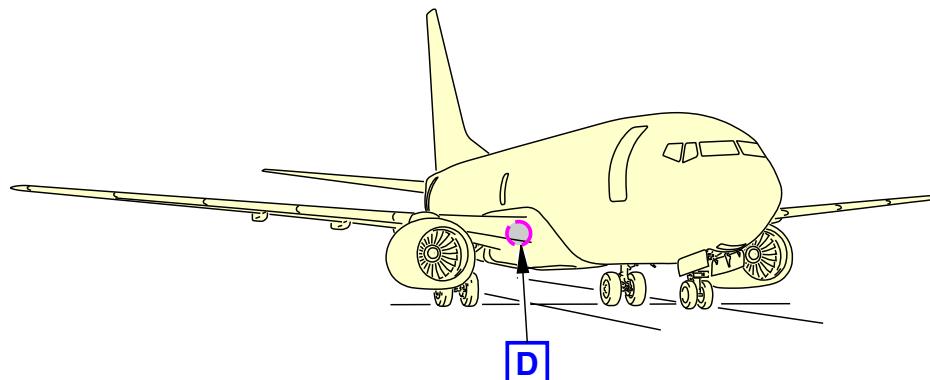
Center Tank Fueling Float Switch Installation
Figure 403/28-21-71-990-832 (Sheet 3 of 5)

EFFECTIVITY
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Center Tank Fueling Float Switch Installation
Figure 403/28-21-71-990-832 (Sheet 4 of 5)

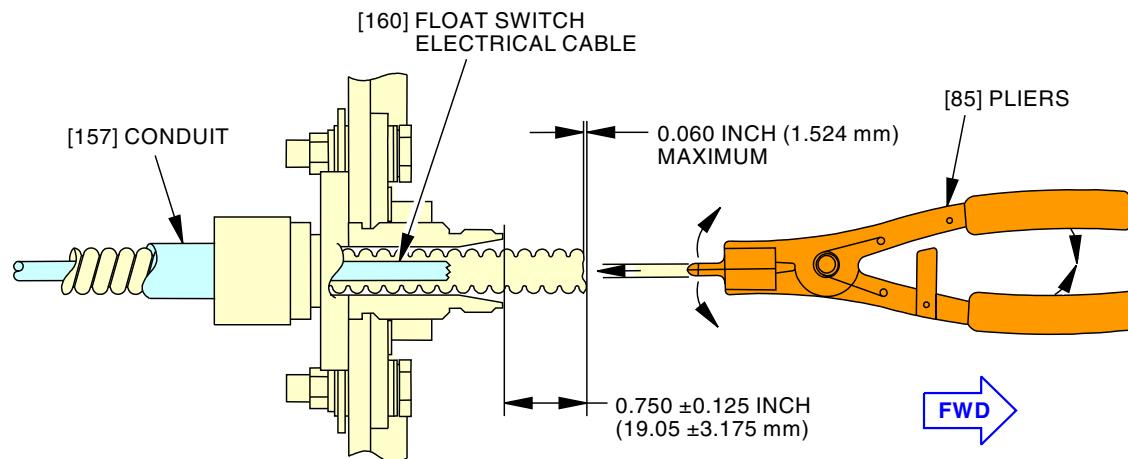
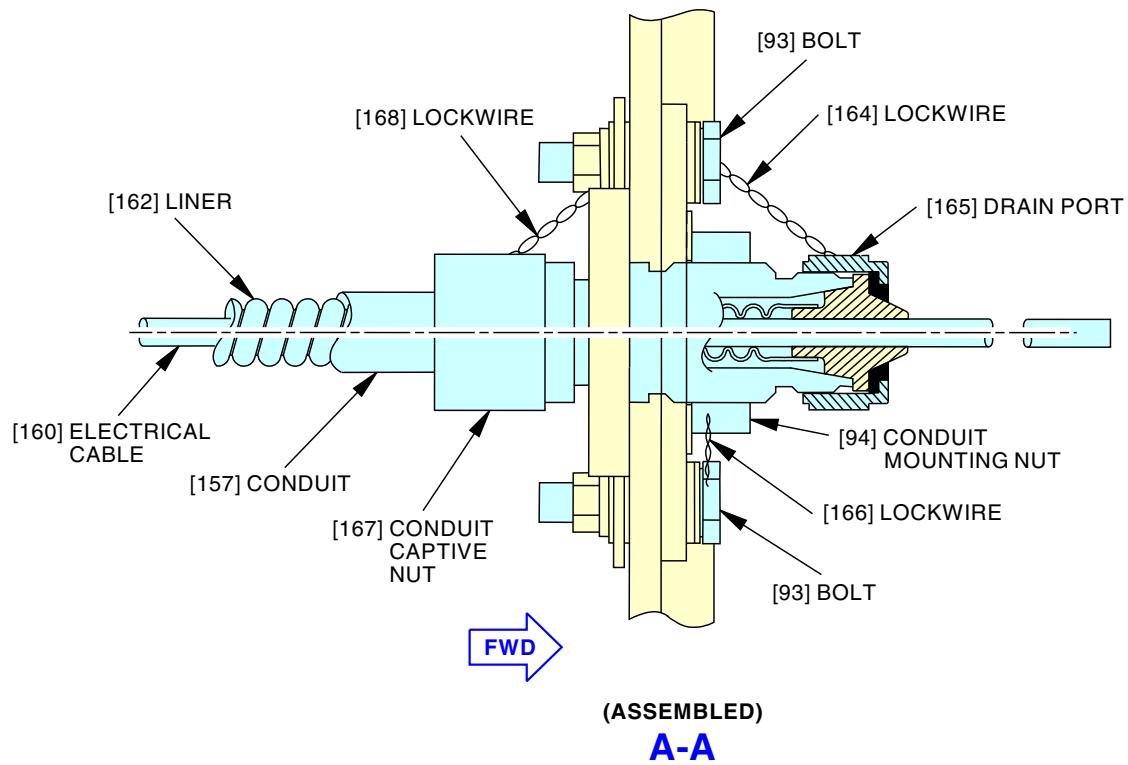
EFFECTIVITY
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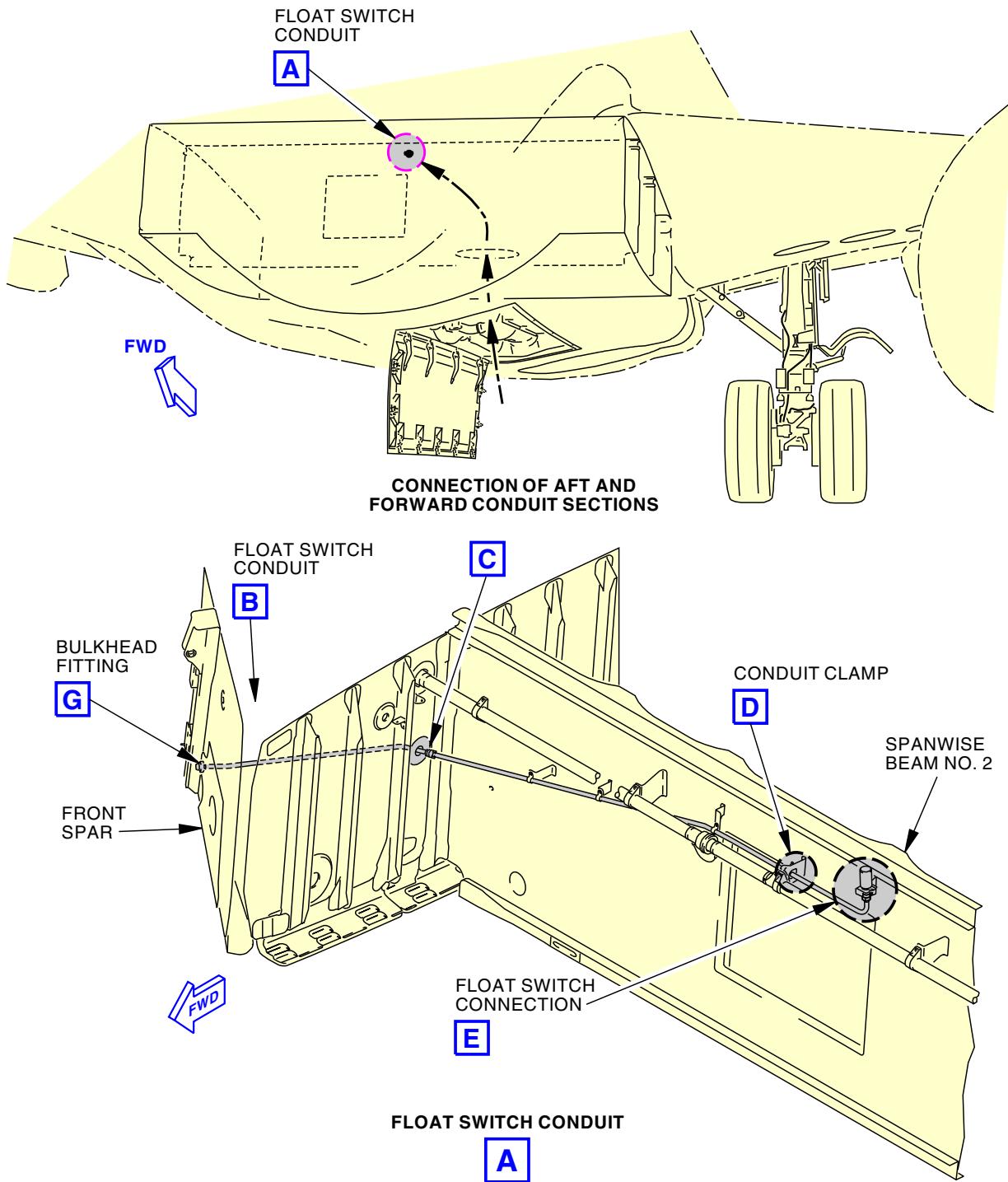
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Center Tank Fueling Float Switch Installation
Figure 403/28-21-71-990-832 (Sheet 5 of 5)

EFFECTIVITY
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BOEING
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AIRCRAFT MAINTENANCE MANUAL



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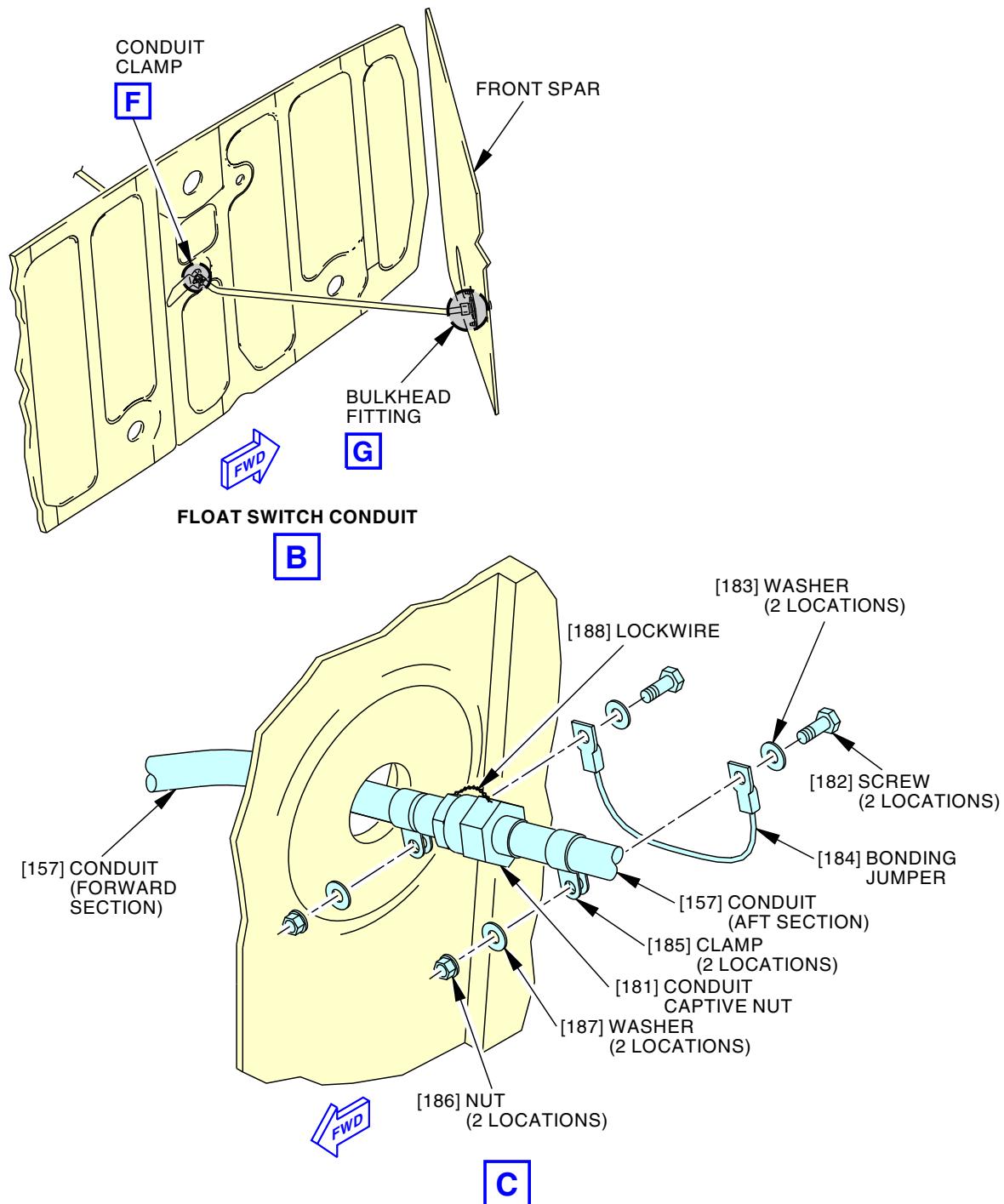
Center Fuel Tank Float Switch Conduit Installation
Figure 404/28-21-71-990-833 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

28-21-71

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

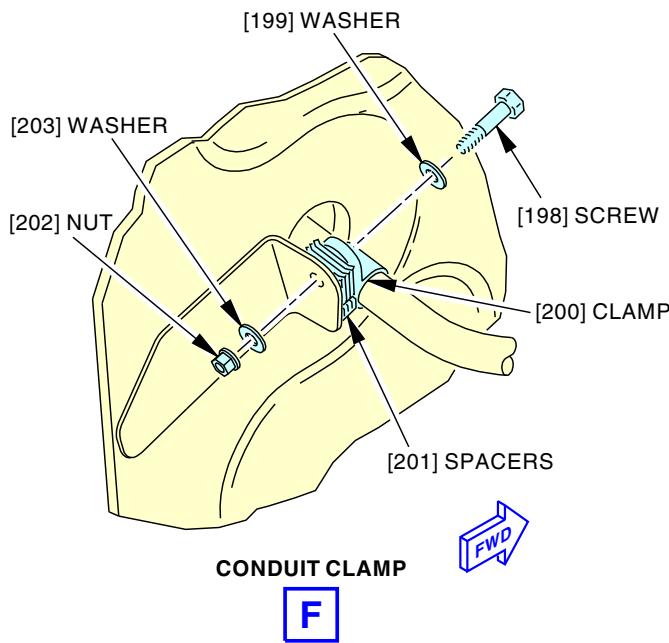
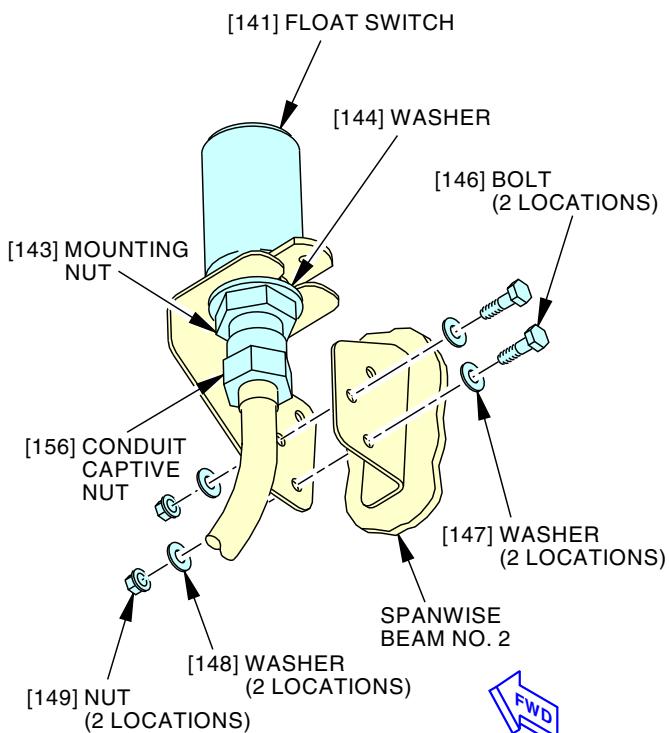
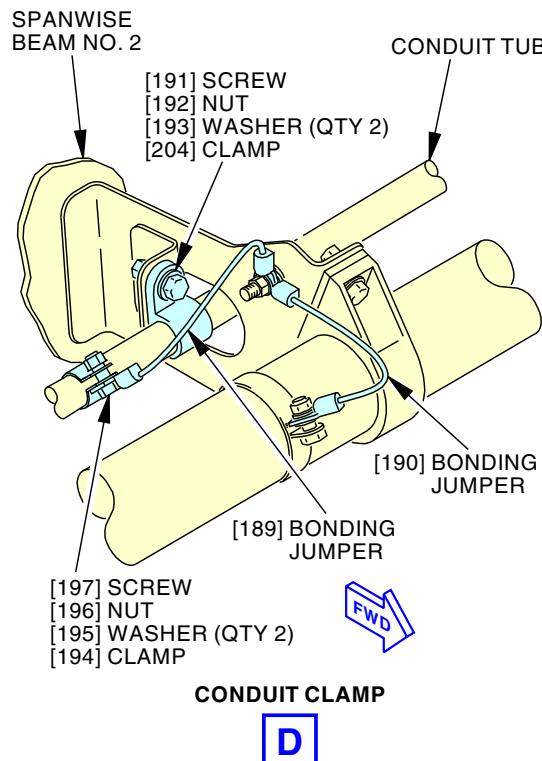


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Center Fuel Tank Float Switch Conduit Installation
Figure 404/28-21-71-990-833 (Sheet 2 of 5)

EFFECTIVITY
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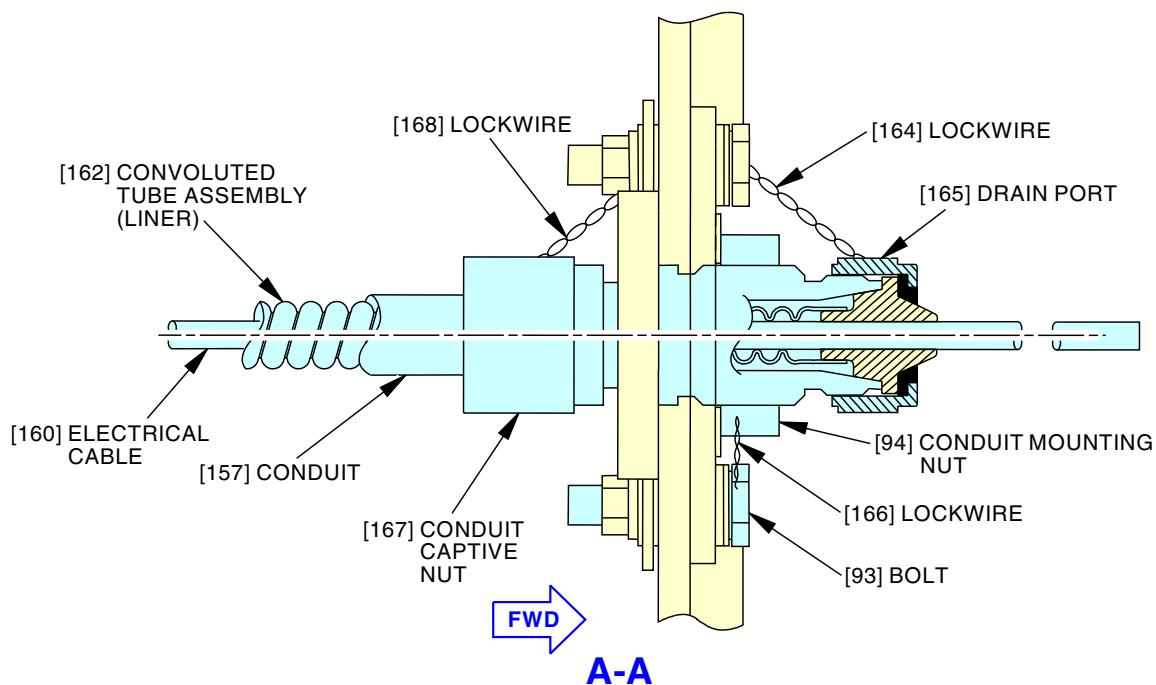
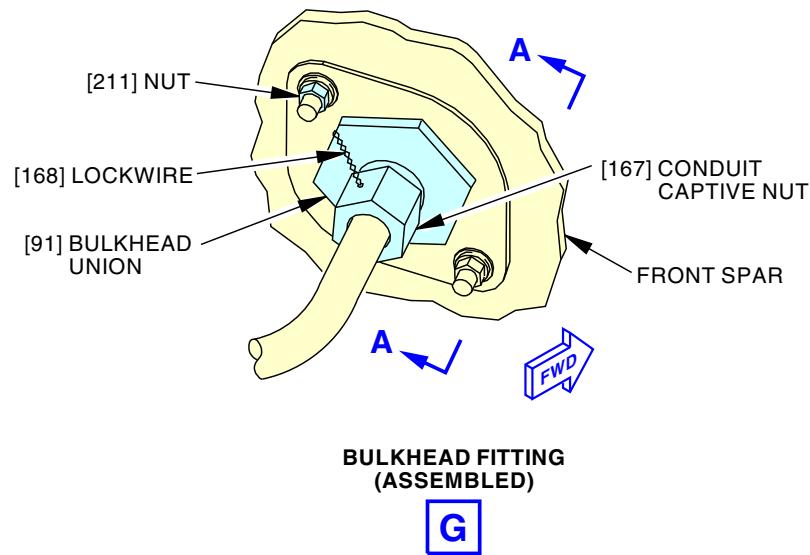
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Center Fuel Tank Float Switch Conduit Installation
Figure 404/28-21-71-990-833 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

28-21-71

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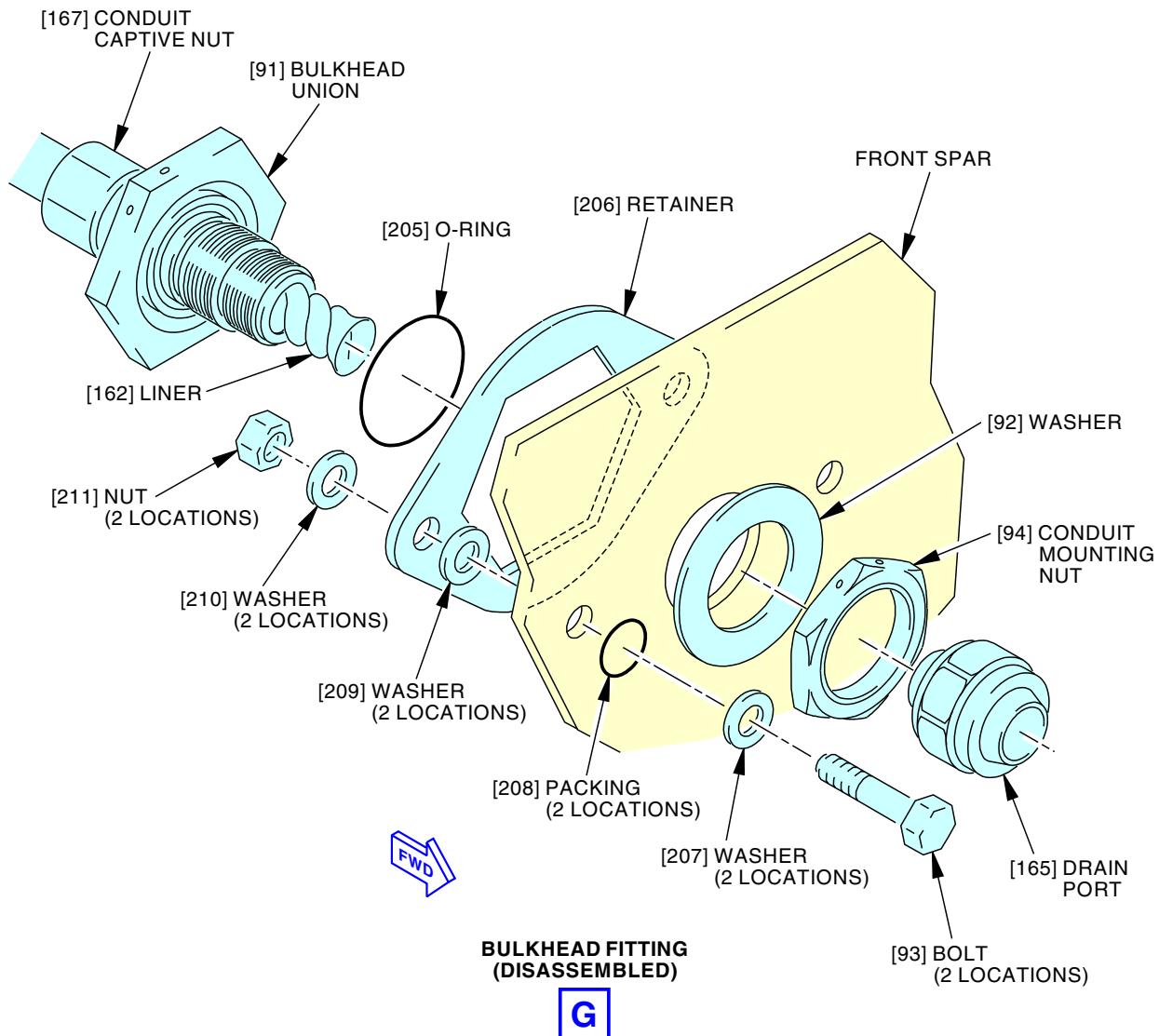
Center Fuel Tank Float Switch Conduit Installation
Figure 404/28-21-71-990-833 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

28-21-71



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N89959 S0006571880_V3

Center Fuel Tank Float Switch Conduit Installation
Figure 404/28-21-71-990-833 (Sheet 5 of 5)

EFFECTIVITY
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 28-21-71-400-802

3. Float Switch Installation

A. General

- (1) In the center tank, the conduit may be replaced only when necessary, however, the conduit liner must be replaced each time the Type II float switch is replaced.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation
SWPM 20-30-12	Assembly of Splices

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-4325	Test Equipment - Float Switch Conduit - 737 With Center Tank Type II Switch Part #: C28012-1 Supplier: 81205
SPL-5674	Adapter - Wire Puller Part #: 21A00355 Supplier: 07418
SPL-5675	Pliers - Spreader, Conduit Flare Part #: 04E00063 Supplier: 07418

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D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00504	Grease - Petrolatum	VV-P-236
G00150	Tape - Nitto P-421 NAT (Formerly Permacel) PTFE Film Tape	
G50152	Tape - Flat Braided Lacing, Nomex, Hydraulic Fluid Resistant, Max 260 degrees C	BMS13-54 Type III Grade D Class 1 Finish C
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50710	Tube - Flexible, Flame-Retardant, Adhesive-Lined, Polyolefin Heat-Shrinkable Tubing (Tyco Electronics DWP-125)	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
101	Conduit	28-21-52-08A-095	LOM ALL
		28-21-52-08A-100	LOM ALL
102	Float switch	28-21-52-08A-070	LOM ALL
118	O-ring	28-21-52-08A-135	LOM ALL
123	Packing	28-21-52-08A-130	LOM ALL
141	Float switch	28-21-52-02B-075	LOM ALL
157	Conduit	28-21-52-02B-130	LOM ALL
		28-21-52-02B-145	LOM ALL
205	O-ring	28-21-52-02B-115	LOM ALL
208	Packing	28-21-52-02B-110	LOM ALL

F. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
131AB	Center Tank Access
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
532PB	Main Tank Access Door - Wing Station 576
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
632PB	Main Tank Access Door - Wing Station 576

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H. No. 1 or No. 2 Tank Float Switch and Conduit Assembly Installation (TYPE II FLOAT SWITCH)

28-AWL-15: CDCCL

SUBTASK 28-21-71-420-092

- (1) Use a new float switch [102] and conduit [101] (float switch assembly).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCL.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

SUBTASK 28-21-71-420-054

- (2) For the float switch in the No. 1 or No. 2 tank, separate the float switch [102] from the conduit [101] and from the liner adapter [121] sufficiently to slide the float switch cable into the bracket [109] slot (Figure 402).

NOTE: Separate the float switch [102] from the conduit [101] just enough to slip the float switch cable into the bracket [109] slot, while keeping the liner [126] from sliding out of the conduit [101]. Too much separation can cause the loss of moisture seal in the conduit [101].

SUBTASK 28-21-71-420-055

- (3) Put the electrical cable for the float switch [102] into the slot on the float switch mounting bracket [109].

SUBTASK 28-21-71-640-001

- (4) Lubricate the new o-ring [118] with grease, D00504, and install it on the bulkhead union [91].

SUBTASK 28-21-71-420-056

- (5) Put the bulkhead union [91] with the o-ring [118] and retainer [119] into the hole in the front spar (Figure 402).
(a) Make sure that the liner [126] extends out of the bulkhead union [91] sufficiently to be attached to the coupling ring [95] subsequently.

SUBTASK 28-21-71-420-057

- (6) Install the float switch mounting nut [107] and washer [110] (Figure 402).
(a) Tighten the mounting nut [107] with your hand only.

SUBTASK 28-21-71-420-058

- (7) Install the conduit captive nut [105].
(a) Tighten the conduit captive nut [105] with your hand only.

SUBTASK 28-21-71-420-059

- (8) From outside the tank, install the washer [92] and conduit mounting nut [94] on the bulkhead union [91] (Figure 402).
(a) Tighten the conduit mounting nut [94] on to the bulkhead union [91] with your hand only.

SUBTASK 28-21-71-420-060

- (9) Put the retainer [119] in its correct position to align the mounting holes on the retainer [119] with the bolt holes in the front spar.
(a) Do not install the retainer [119] yet, because the installation torque that you will apply to the bulkhead union [91] could break the retainer [119] if it is installed.

SUBTASK 28-21-71-420-061

- (10) Inside the tank, turn the bulkhead union [91] to mate with the retainer [119] when it is in its position for installation.

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SUBTASK 28-21-71-420-062

- (11) Outside the tank, torque the conduit mounting nut [94] to 360 ± 18 in-lb (41 ± 2 N·m).

SUBTASK 28-21-71-420-063

- (12) Do these steps to install the retainer [119]:

- (a) Outside the tank, install the two bolts [93] with the washers [122] and new packings [123] that go through the holes in the front spar for the retainer [119].
- (b) Inside the tank, install the washer [124], washer [125], and nuts [115] that hold the retainer [119] in its position.

SUBTASK 28-21-71-420-064

- (13) Inside the tank, turn the float switch [102] so that the center of the float switch bonding lug hole is within the shaded area shown in view B-B (Figure 402) in a position that causes the minimum torsional load on the float switch cable.

NOTE: Do not turn the float switch [102] too much, it can cause the float switch [102] to separate from the electrical cable sooner than necessary.

SUBTASK 28-21-71-420-065

- (14) Do these steps to tighten the parts that attach the float switch [102] (Figure 402):

- (a) Torque the float switch mounting nut [107] to 280 ± 14 in-lb (32 ± 2 N·m).
- (b) Torque the conduit captive nut [105] for the float switch [102] to 280 ± 14 in-lb (32 ± 2 N·m).
- (c) Torque the bulkhead conduit captive nut [116] to 280 ± 14 in-lb (32 ± 2 N·m) (Figure 402).
- (d) Loosen the float switch mounting nut [107] sufficiently to relax the torque temporarily (Figure 402).
- (e) Loosen the conduit captive nut [105] for the float switch [102] sufficiently to relax the torque temporarily.
- (f) Loosen the bulkhead conduit captive nut [116] sufficiently to relax the torque temporarily (Figure 402).
- (g) The final torque for each of these nuts must be witnessed and written in the maintenance records for the airplane:
 - 1) Torque the float switch mounting nut [107] to 280 ± 14 in-lb (32 ± 2 N·m).
 - 2) Torque the conduit captive nut [105] for the float switch [102] to 280 ± 14 in-lb (32 ± 2 N·m).
 - 3) Torque the bulkhead conduit captive nut [116] to 280 ± 14 in-lb (32 ± 2 N·m).
 - 4) Make sure that the final torque for each of these nuts is written in the maintenance records.

SUBTASK 28-21-71-420-084

- (15) Outside of the tank, install the coupling ring [95] on the end of the bulkhead union [91].
- (a) Make sure that the grommet end of the coupling ring [95] is firmly installed inside the clear liner [126].
 - (b) Torque the coupling ring [95] to 35 ± 3 in-lb (4 ± 0 N·m).

SUBTASK 28-21-71-420-066

- (16) Do these steps to install the bonding jumpers (Figure 402):

- (a) Install the electrostatic bonding jumper [104] on the ground lug for the float switch [102].

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- 1) Choose a jumper whose length will prevent too much loose bonding jumper after the bonding jumper [104] is installed.
 - 2) Install screw [112], washers [113], bonding jumper [104] and nut [114].
- (b) Install the other end of the electrostatic bonding jumper [104] on the ground lug on the switch bracket [109].
- 1) Adjust the jumper lug position as necessary to remove the loose part of the bonding jumper [104].
- (c) Install the electrostatic bonding jumper [103] on the ground lug on the switch support bracket [109].
- (d) Install the other end of the electrostatic bonding jumper [103] on the conduit [101].
- 1) Adjust the jumper lug position as necessary to remove the loose part of the bonding jumper [103].
 - 2) Install the clamp [80], screw [81], washers [82], and nut [83].

SUBTASK 28-21-71-760-006

- (17) Measure the resistance from the float switch ground lug to the primary structure of the wing rib (SWPM 20-20-00 and SWPM 20-20-10).
- (a) Use an intrinsically safe approved bonding meter, COM-1550.
 - (b) Make sure that the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-21-71-765-001

- (18) Measure the resistance from the conduit [101] to the primary structure of the wing rib (SWPM 20-20-00).
- (a) Use an intrinsically safe approved bonding meter, COM-1550.
 - (b) Make sure that the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-21-71-765-002

- (19) Measure the resistance between the terminal of the bonding jumper [103] and bracket [109] (SWPM 20-20-00 and SWPM 20-20-10).
- (a) Make sure that the resistance is less than 0.0010 ohm (1 milliohm).

SUBTASK 28-21-71-765-003

- (20) At the other end of the bonding jumper [103], measure the resistance from the terminal of the bonding jumper [103] to the conduit [101] (SWPM 20-20-00 and SWPM 20-20-10).
- (a) Use an intrinsically safe approved bonding meter, COM-1550.
 - (b) Make sure that the resistance is less than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-21-71-420-067

- (21) Install MS20995NC32 lockwire, G50347 in these locations:
- (a) Inside the tank, install MS20995NC32 lockwire, G50347 from the bulkhead conduit captive nut [116] to the bulkhead union [91] (Figure 402) (TASK 20-10-44-400-801).
 - (b) Install lockwire [108] MS20995NC32 lockwire, G50347 from the mounting nut [107] for the float switch [102] to the float switch bracket [109] (Figure 402) (TASK 20-10-44-400-801).
 - (c) Install lockwire [106] MS20995NC32 lockwire, G50347 from the conduit captive nut [105] to the mounting nut [107] (Figure 402) (TASK 20-10-44-400-801).
 - (d) Outside the tank, install MS20995NC32 lockwire, G50347 from the conduit mounting nut [94] to the bolt [93] (Figure 401) (TASK 20-10-44-400-801).

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- (e) Install MS20995NC32 lockwire, G50347 from the coupling ring [95] to the bolt [93] (Figure 401) (TASK 20-10-44-400-801).

SUBTASK 28-21-71-420-068

- (22) Do these steps to splice the float switch electrical cable to the airplane wire harness:
- (a) Cut the float switch electrical cable as necessary to permit a wire splice to the airplane wire harness without leaving more than 1 in. (25 mm) of excess wire.
 - (b) Use the sleeve material DWP-125 heat-shrink tube, G50710.
 - (c) Cut the sleeve to a minimum of 3 in. (76 mm) longer than the length of the splice (this allows for 1.5 in. (38.1 mm) on each side of the splice).
 - (d) Slide the sleeve over one of the wires.
 - (e) Splice the float switch electrical cable to the airplane wire harness with the applicable crimp tool (SWPM 20-30-12).
 - (f) Apply sealant, A00247, to the splice and each end of the splice.
 - 1) Make sure that the splice has a full layer of sealant on it.
 - (g) Move the sleeve, filled with sealant, A00247, to the center of the splice.
 - 1) Make sure that there are no air bubbles in the sleeve.
 - (h) Use the lockstitch to tie a knot with tape, G50152, approximately 0.25 in. (6.35 mm) from each end of the sleeve.
 - (i) If it is necessary, record the splice number on the sleeve.
 - (j) Put two layers of Nitto P-421 tape, G00150, over the splice to prevent damage from water and fuel.
 - (k) Use the lockstitch to tie a knot with tape, G50152, approximately 0.25 in. (6.35 mm) from each end of the sleeve.
 - (l) Remove the tags from the wires.

I. Center Tank Float Switch Installation (TYPE II FLOAT SWITCH)

► 28-AWL-15: CDCCL

SUBTASK 28-21-71-420-093

- (1) Use a new float switch [141] and the liner [162] system.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCL.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

SUBTASK 28-21-71-420-069

- (2) Install the float switch [141] in the bracket [142] with the float switch mounting nut [143] and washer [144] (Figure 403).

- (a) Leave the mounting nut [143] loose to permit the float switch [141] to align itself with the position where the torsional load is.

NOTE: This permits the float switch [141] to turn to the position that keeps the torsional load on the electrical cable [160] to a minimum during subsequent steps.

SUBTASK 28-21-71-420-070

- (3) When it is necessary, do these steps to put the conduit [157] into its position (Figure 404):

- (a) Apply grease, D00504, to the threads of the two sections of the conduit [157].
- (b) Put the two sections of the conduit [157] into their positions.

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- (c) Attach the forward section of the conduit [157] to the aft section.
 - 1) Hand-tighten this connection.
- (d) Attach the forward section of the conduit [157] to the front spar bulkhead union [91].

SUBTASK 28-21-71-420-071



WARNING

INSTALL A NEW LINER EACH TIME THAT YOU REPLACE THE CONDUIT.
INSTALL A NEW LINER EACH TIME THAT YOU REPLACE THE FLOAT
SWITCH. THE LINER KEEPS THE WIRING AWAY FROM THE FUEL. IF YOU
IGNORE THESE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE
TO EQUIPMENT CAN OCCUR.

- (4) When it is necessary, do these steps to install the liner [162] and the electrical cable [160] in the conduit [157] (Figure 403):
 - (a) Put the installation tool [169] wire puller adapter, SPL-5674, into the non-ferrule end of the liner [162].
 - (b) Attach a guide wire [163] (10 ft (3 m)) to the installation tool [169] wire puller adapter, SPL-5674.
 - (c) At the end of the conduit [157] adjacent to the float switch [141], push the guide wire [163] through the conduit [157] until the guide wire [163] comes out of the far end of the conduit [157] at the front spar.
 - (d) Insert the electrical cable [160] for the float switch into the ferrule end of the liner [162] until it touches the installation tool [169] wire puller adapter, SPL-5674, at the other end of the liner [162].
 - (e) Put the liner [162] and the float switch electrical cable [160] into the open end of the conduit [157] as a single unit.
 - (f) Pull on the guide wire [163] and push on the liner [162] and electrical cable [160] together.
 - (g) Turn the liner [162] as necessary to make it easier to put the liner [162] and electrical cable [160] into the conduit [157].
 - (h) Continue to put the liner [162] and electrical cable [160] into the conduit [157] until the liner adapter [161] is seated inside the conduit [157].
 - (i) Remove the installation tool [169] wire puller adapter, SPL-5674, and guide wire [163].
 - 1) If it is necessary, discard the guide wire [163].

SUBTASK 28-21-71-640-002

- (5) Lubricate the new o-ring [205] with grease, D00504, and install it on the bulkhead union [91].

SUBTASK 28-21-71-420-086

- (6) Put the bulkhead union [91] with the o-ring [205] and retainer [206] into the hole in the front spar (Figure 404).
 - (a) Make sure that the liner [162] extends out of the bulkhead union [91] sufficiently to be attached to the drain port [165] subsequently.

SUBTASK 28-21-71-420-087

- (7) From outside the tank, install the washer [92] and conduit mounting nut [94] on the bulkhead union [91] (Figure 404).
 - (a) Tighten the conduit mounting nut [94] on to the bulkhead union [91] with your hand only.

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SUBTASK 28-21-71-420-088

- (8) Put the retainer [206] in its correct position to align the mounting holes on the retainer [206] with the bolt holes in the front spar.
 - (a) Do not install the retainer [206] yet, because the installation torque that you will apply to the bulkhead union [91] could break the retainer [206] if it is installed.

SUBTASK 28-21-71-420-089

- (9) Inside the tank, turn the bulkhead union [91] to mate with the retainer [206] when it is in its position for installation.

SUBTASK 28-21-71-420-090

- (10) Outside the tank, torque the conduit mounting nut [94] to 360 ± 18 in-lb (41 ± 2 N·m).

SUBTASK 28-21-71-420-091

- (11) Do these steps to install the retainer [206]:
 - (a) Outside the tank, install the two bolts [93] with the washer [207] and new packing [208] that go through the holes in the front spar for the retainer [206].
 - (b) Inside the tank, install the washer [209], washer [210], and nuts [211] that hold the retainer [206] in its position.

SUBTASK 28-21-71-420-072

- (12) Do these steps to trim and flare the end of the liner [162] (Figure 403).

NOTE: Be careful not to damage the electrical cable [160].

- (a) Make sure that the coupling nuts that connect the two conduit sections and the forward conduit section to the front spar are hand tight.
- (b) Hold the end of the liner [162] that extends out of the front spar bulkhead union so the liner adapter [161] is seated firmly inside the conduit [157].
- (c) Pull the float switch electrical cable [160] back out of the liner [162] just sufficiently so that the end of the electrical cable [160] is inside the union.
- (d) Trim the liner at 90 degrees to its center line so that 0.750 ± 0.125 in. (19.050 ± 3.175 mm) extends out of the union when the liner adapter [161] is firmly seated inside the conduit [157].
- (e) With the pliers [85], pliers, SPL-5675, flare the liner [162].
 - 1) Form the cut end of the liner [162] to accept the shoulder of the drain port assembly.
 - 2) After you form the cut end of the tube assembly, the edge perimeter of the tube assembly must be even to within 0.060 in. (1.524 mm).
- (f) Push the float switch electrical cable [160] out past the trimmed end of the liner [162].
- (g) Pull any extra electrical cable out through the liner [162].

SUBTASK 28-21-71-420-073

- (13) Install the bracket [142] and float switch [141] that you assembled before in its position on spanwise beam No. 2 with only the two lower sets of bolts [146], washers [147], washers [148], and nuts [149] (Figure 403).

SUBTASK 28-21-71-760-007

- (14) Measure the resistance from the bracket [142] to spanwise beam No. 2.
 - (a) Make sure that the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-21-71-420-074

- (15) Do these steps for the installation of the conduit [157] (Figure 404):

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- (a) Align the conduit [157] so the conduit can be connected to the float switch [141].
- (b) Make sure that the conduit [157] lines up with positions of the clamps to be installed in the subsequent two steps.
- (c) Loosely install the clamp [204], screw [191], washers [193], and nut [192].
- (d) Loosely install the clamp [200], screw [198], washer [199], washer [203], nut [202], and spacers [201] (as necessary).
 - 1) First install the clamp with no spacers between the clamp and bracket.
 - 2) Install spacers as necessary to remove pre-loading of the conduit sections.
 - 3) You can use a maximum of six spacers to do this.

SUBTASK 28-21-71-420-075

- (16) Torque the float switch mounting nut [143] to 280 ± 14 in-lb (32 ± 2 N·m) (Figure 403).

SUBTASK 28-21-71-420-076

- (17) Do these steps to complete the float switch [141] installation (Figure 403):
- (a) Apply grease, D00504, to the threads of the conduit captive nut [156].
 - (b) Torque the conduit captive nut [156] to 280 ± 14 in-lb (32 ± 2 N·m).
 - (c) Loosen the conduit captive nut [156] again to relax the torque.
 - (d) The subsequent step must be witnessed and written in the maintenance documentation for the airplane.
 - (e) Torque the conduit captive nut [156] again to 280 ± 14 in-lb (32 ± 2 N·m).
 - (f) Make sure that the final torque is written in the maintenance records.

SUBTASK 28-21-71-420-077

- (18) Do these steps to complete the conduit [157] installation:
- (a) Torque the conduit captive nut [181] at the conduit join to 280 ± 14 in-lb (32 ± 2 N·m) (Figure 404).
 - (b) Loosen the conduit captive nut [181] again to relax the torque.
 - (c) Torque the bulkhead conduit captive nut [167] at the front spar bulkhead union to 280 ± 14 in-lb (32 ± 2 N·m).
 - (d) Loosen the conduit captive nut [167] again to relax the torque.
 - (e) The subsequent two steps must be witnessed and written in the maintenance documentation for the airplane.
 - (f) Torque the conduit captive nut [181] at the conduit join to 280 ± 14 in-lb (32 ± 2 N·m).
 - (g) Torque the conduit captive nut [167] at the front spar bulkhead union to 280 ± 14 in-lb (32 ± 2 N·m).
 - (h) Make sure that the final torques on these conduit captive nuts are written in the maintenance records.
 - (i) Install the clamp [200].
 - 1) Add or remove spacers as necessary to remove pre-load in the conduit [157].
 - 2) Make sure that the minimum clearance between the conduit [157] and structure at the attach point is 0.1 in. (2.5 mm).
 - (j) Install the electrostatic bonding jumper [189] from the bracket to the conduit clamp [194].
 - 1) Install the clamp [194], screw [197], washer [195], bonding jumper [189], washer [195], and nut [196].

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- (k) Measure the resistance from terminal of bonding jumper [189] and bonding jumper [190] to the bracket structure to which the bonding jumper is attached (SWPM 20-20-00 or SWPM 20-20-10).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) For each bonding jumper, the resistance must be less than 0.0010 ohm (1 milliohm).
- (l) Measure the resistance from the conduit tube to spanwise beam No. 2 (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance is less than 0.010 ohm (10 milliohms).
- (m) Measure the resistance from the terminal of the bonding jumper [189] and the conduit tube (SWPM 20-20-00 or SWPM 20-20-10).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance is less than 0.0015 ohm (1.5 milliohms).
- (n) Measure the resistance from the refueling tube to spanwise beam No. 2 (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance from the refueling tube to spanwise beam No. 2 is less than 0.010 ohm (10 milliohms).
- (o) Install the electrostatic bonding jumper [184].
 - 1) Install the clamps [185] on the fwd and aft section of the conduit [157].
 - 2) Install the screws [182], washers [183], bonding jumper [184], washers [187], and nuts [186].
- (p) Measure the resistance from each terminal of bonding jumper [184] to the conduit [157] (SWPM 20-20-00 or SWPM 20-20-10).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance is less than 0.0015 ohm (1.5 milliohms).
- (q) Measure the resistance from each section of the conduit [157] (FWD and AFT) to side of body rib (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance is less than 0.030 ohm (30 milliohms).

SUBTASK 28-21-71-420-078

- (19) At the front spar, cut the electrical cable to a length of 38.00 ± 2.00 in. (965.20 ± 50.80 mm) beyond point where it comes out of the front spar.

SUBTASK 28-21-71-420-079

- (20) Do these steps to complete the installation of the float switch [141] (Figure 403):
 - (a) Clean the bonding surface on the float switch ground lug.
 - (b) Clean the bonding surface on the float switch bracket [142].
 - (c) Install the electrostatic bonding jumper [159] on the float switch ground lug with the screw [158], nut [150], and washers [151].
 - (d) Install the other end of the electrostatic bonding jumper [159] on the float switch bracket [145] with the screw [154], nut [152], and washer [153].

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SUBTASK 28-21-71-760-008

- (21) Measure the resistance from the float switch lug to spanwise beam number 2 (SWPM 20-20-00 or SWPM 20-20-10).
- Use an intrinsically safe approved bonding meter, COM-1550.
 - Make sure that the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-21-71-420-080

- (22) Install lockwire in these locations (Figure 403):
- Install the lockwire [155] MS20995NC32 lockwire, G50347 from the screw [154] to the float switch mounting nut [143].
 - Install the lockwire [155] MS20995NC32 lockwire, G50347 from the bolt [146] to the conduit captive nut [156].

SUBTASK 28-21-71-020-024

- (23) Install lockwire in these locations (TASK 20-10-44-400-801) (Figure 404):
- Install the lockwire [168] MS20995NC32 lockwire, G50347 from the bulkhead conduit captive nut [167] to the bulkhead union [91].
 - Install the lockwire [188] MS20995NC32 lockwire, G50347 from the conduit captive nut [181] at the conduit join to the fitting on the forward conduit section.

SUBTASK 28-21-71-790-005

- (24) Do these steps to do a pressure test of the conduit [157] and float switch [141]:
- Install a Test Assembly, SPL-4325, into the center tank float switch conduit at the front spar to permit you to do the pressure test.
NOTE: The float switch electrical cable [160] and the end of the convoluted tube that comes out of the bulkhead union [91] must be inserted into the Test Assembly, SPL-4325, to permit the conduit [157] to be pressurized.
 - Attach a pressure source to the Test Assembly, SPL-4325.
NOTE: The pressure source must be able to supply and control pressures from 0 to 6 psig (41 kPa). The gage must have an accuracy of ± 0.05 psig (0.3 kPa).
 - Pressurize the float switch conduit [157] to 5 ± 1 psig (34 ± 7 kPa).
 - Close the test bench shutoff valve to hold the pressure in the conduit [157].
 - Permit the pressure to become stable for 1 - 2 minutes.
 - Write the pressure in the conduit [157].
 - Make sure that the pressure in the conduit [157] is 5 ± 1 psig (34 ± 7 kPa).
 - Permit the conduit [157] to hold pressure for 1 - 2 minutes.
 - Write the pressure in the conduit [157].
 - Make sure that the pressure is ± 0.05 psig (0.34 kPa) of the pressure written at the start of the test.
 - Slowly reduce the pressure from the float switch conduit [157].
 - Remove the Test Assembly, SPL-4325, from the center tank float switch conduit [157].

SUBTASK 28-21-71-210-002

- (25) Before you install the drain port [165], make sure that it is witnessed that the liner [162] is installed in the conduit [157].

NOTE: The liner [162] is important to the safety of the float switch installation. This is the last step where a person can make sure it is installed and document that fact.

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

- (a) Make sure that the installation of the liner [162] in the conduit [157] is written in the maintenance records for the airplane.

SUBTASK 28-21-71-420-081

- (26) Do these steps to install the drain port [165] (Figure 401, Figure 404):
- (a) Put the float switch electrical cable [160] into the hole in the drain port [165].
 - (b) Slide the drain port [165] along the electrical cable [160] to the front spar bulkhead union [91].
 - (c) Install the drain port [165] on the front spar bulkhead union [91].
 - 1) Make sure that the drain port shoulder is seated inside the liner [162].
 - (d) Tighten the drain port [165] to a torque of 10 ± 1 in-lb (1 ± 0 N·m).
 - (e) Install the lockwire [164] MS20995NC32 lockwire, G50347 from the drain port [165] to the bolt [93] (TASK 20-10-44-400-801).
 - (f) Install the lockwire [166] MS20995NC32 lockwire, G50347 from the conduit mounting nut [94] to the bolt [93] (TASK 20-10-44-400-801).

SUBTASK 28-21-71-420-082

- (27) Do these steps to splice the float switch electrical cable [160] to the airplane wire harness:
- (a) Cut the electrical cable [160] as necessary to permit a wire splice to the airplane wire harness without leaving more than 1.0 in. (25.4 mm) of excess wire.
 - (b) Use the sleeve material DWP-125 heat-shrink tube, G50710.
 - (c) Cut the sleeve to a minimum of 3 in. (76 mm) longer than the length of the splice.

NOTE: This lets there be 1.5 in. (38.1 mm) on each side of the splice.
 - (d) Slide the sleeve over one of the wires.
 - (e) Splice the float switch electrical cable [160] to the airplane wire harness with the applicable crimp tool (SWPM 20-30-12).
 - (f) Apply sealant, A00247, to the splice and each end of the splice.
 - 1) Make sure that the splice has a full layer of sealant on it.
 - (g) Move the sleeve, filled with sealant, A00247, to the center of the splice.
 - 1) Make sure that there are no air bubbles in the sleeve.
 - (h) Use the lockstitch to tie a knot with tape, G50152, approximately 0.25 in. (6.35 mm) from each end of the sleeve.
 - (i) If it is necessary, record the splice number on the sleeve.
 - (j) Put two layers of Nitto P-421 tape, G00150, over the splice to prevent damage from water and fuel.
 - (k) Use the lockstitch to tie a knot with tape, G50152, approximately 0.25 in. (6.35 mm) from each end of the sleeve.
 - (l) Remove the tags from the wires.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-71-410-005

- (1) Install the applicable access panel:

Number Name/Location

521TB	Lower Leading Edge Access Panel - Slat Station 356.14
621SB	Lower Leading Edge Access Panel - Slat Station 356.15

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SUBTASK 28-21-71-410-003

- (2) Install the access panels that you removed to get access to the fuel tank.
(a) For the No. 1 or No. 2 tank, install this access panel:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

or open this access panel:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

Do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

- (b) Install this access panel:

Number Name/Location

131AB Center Tank Access

For the center tank, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-21-71-650-005

- (3) Fill the tank with fuel and make sure the float switch stops the refuel operation correctly (TASK 28-21-00-700-801).

SUBTASK 28-21-71-790-006

- (4) With fuel in the tank, do a check for fuel leakage at the bulkhead fitting for the conduit.
(a) No leakage is permitted.

SUBTASK 28-21-71-080-003



WARNING

CAREFULLY REMOVE THE LEADING EDGE FLAP ACTUATOR LOCK TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

SUBTASK 28-21-71-860-009



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

———— END OF TASK ———

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FUELING FLOAT SWITCH - INSPECTION/CHECK

1. General

- A. There are two types of float switch that can be installed. The Type I float switch installation has an elbow joint immediately below the float switch. The conduit for the Type I float switch does not contain a liner. The Type II float switch does not have an elbow joint below the float switch. The Type I float switch has a red float shell. The Type II float switch has a green float shell. Service Bulletin 737-28-1142 replaces the Type I float switch installation with the Type II float switch installation.
- B. The data in this procedure is applicable only for the Type II float switch installed in the center tank.
- C. This procedure has two tasks:
 - (1) A task to inspect the drain slots in the drain port
 - (2) A task to make sure the conduit liner is installed and that the conduit does not have leakage

TASK 28-21-71-210-801

2. Drain Port Inspection

(Figure 601)

A. General

- (1) This task is applicable for the drain port for the Type II float switch conduit installed in the center tank.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Procedure

SUBTASK 28-21-71-020-026

- (1) Do these steps to remove the drain port:
 - (a) Find the drain port for the center tank conduit.
 - (b) Remove the lockwire for the drain port.
 - (c) Loosen the drain port from the conduit and slide it along the wire back from the front spar bulkhead union.

SUBTASK 28-21-71-210-003

- (2) Do these steps to examine the six (6) drain slots of the drain port and to clean them if it is necessary:
 - (a) With a flashlight, make sure each of the six slots in the drain port are not blocked.
 - (b) If any of the drain slots are blocked, clean them with compressed air.
 - 1) Apply compressed air from the side of the drain port that is towards the fuel tank when it is installed.
 - (c) Make sure the blockage is removed and the six slots are open to permit drainage of the conduit.

SUBTASK 28-21-71-210-004

- (3) Make sure there is no indication of fuel leakage from the conduit.

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SUBTASK 28-21-71-210-005

- (4) Make sure a liner (clear convoluted plastic tube) is installed in the conduit.

SUBTASK 28-21-71-420-083

- (5) Do these steps to re-install the drain port:

- (a) Slide the drain port assembly along the electrical cable [160] to the front spar bulkhead union.
- (b) Install the drain port on the front spar bulkhead union.
NOTE: Make sure the drain port shoulder is seated inside the formed liner.
- (c) Tighten the drain port to a torque of 9.0 - 11.0 inch-pounds.
- (d) Install lockwire from the coupling nut to the bolt (TASK 20-10-44-400-801).

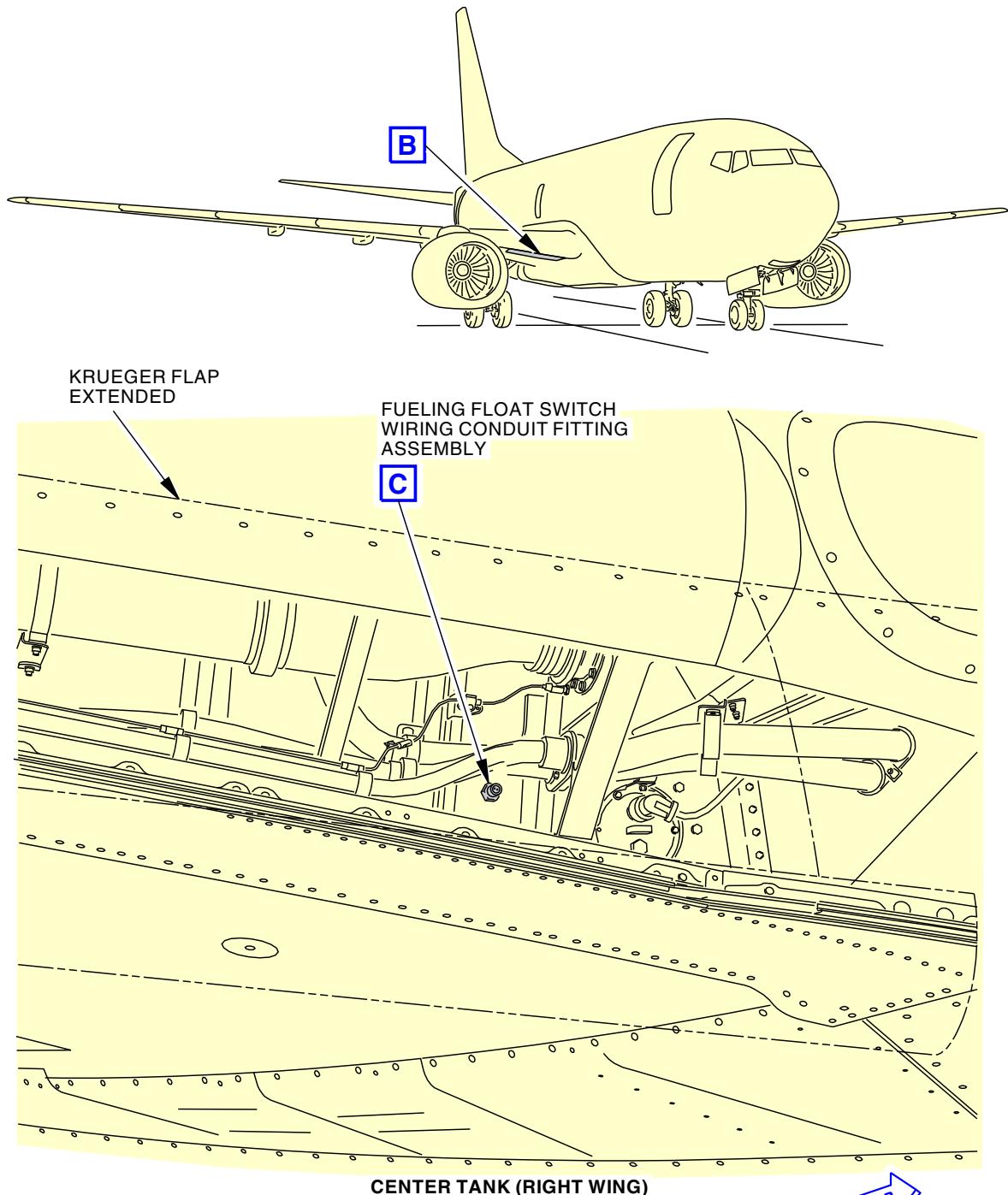
———— END OF TASK ————

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL



N52872 S0006571904_V2

Center Fueling Float Switch Wiring Conduit Inspection (Type II)
Figure 601/28-21-71-990-824 (Sheet 1 of 2)

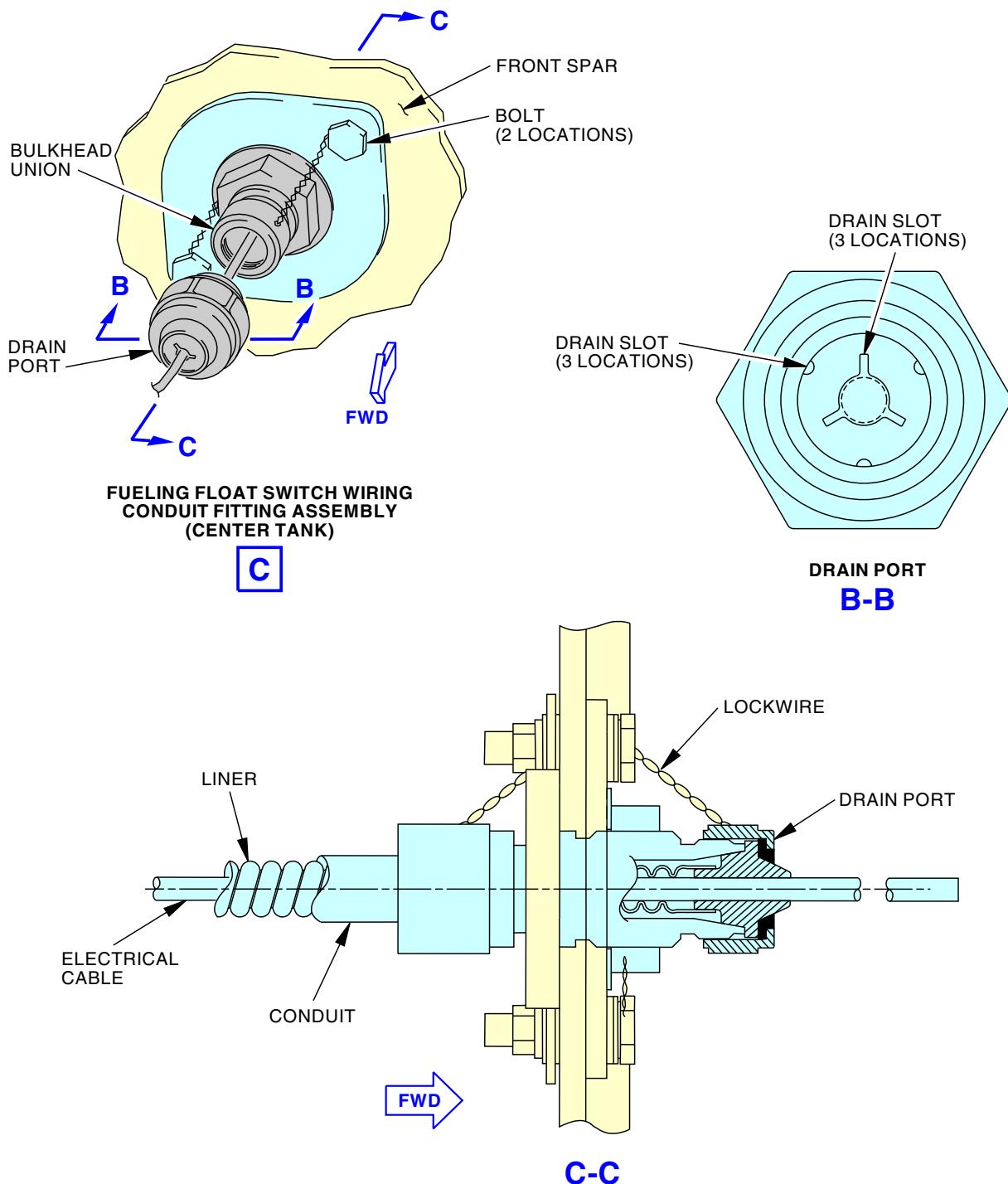
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LOM ALL

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N52897 S0006571905_V2

Center Fueling Float Switch Wiring Conduit Inspection (Type II)
Figure 601/28-21-71-990-824 (Sheet 2 of 2)

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AIRCRAFT MAINTENANCE MANUAL

FUELING POWER CONTROL SWITCH - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) A removal of the fueling power control switch sensor magnet
 - (2) An installation of the fueling power control switch sensor magnet
 - (3) A removal of the actuator switch for the fueling power control switch
 - (4) An installation of the actuator switch for the fueling power control switch.

TASK 28-21-81-000-801

2. Fueling Power Control Switch Sensor Magnet Removal

(Figure 201)

A. References

Reference	Title
24-22-00-860-814	Remove External Power (P/B 201)

B. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

C. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

D. Fueling Power Control Switch Sensor Magnet Removal

SUBTASK 28-21-81-860-006



WARNING

MAKE SURE THAT AN EXTERNAL POWER SUPPLY IS NOT CONNECTED TO THE AIRCRAFT. IF EXTERNAL POWER IS ON, 28 VDC POWER WILL BE AVAILABLE AT THE REFUEL POWER CONTROL SWITCH. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 28-21-81-860-001

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND

SUBTASK 28-21-81-010-001

- (3) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-81-020-003

- (4) Remove the screws [1], nuts [3], and washers [2] to remove the sensor mounting bracket [4] with the sensor magnet [5].

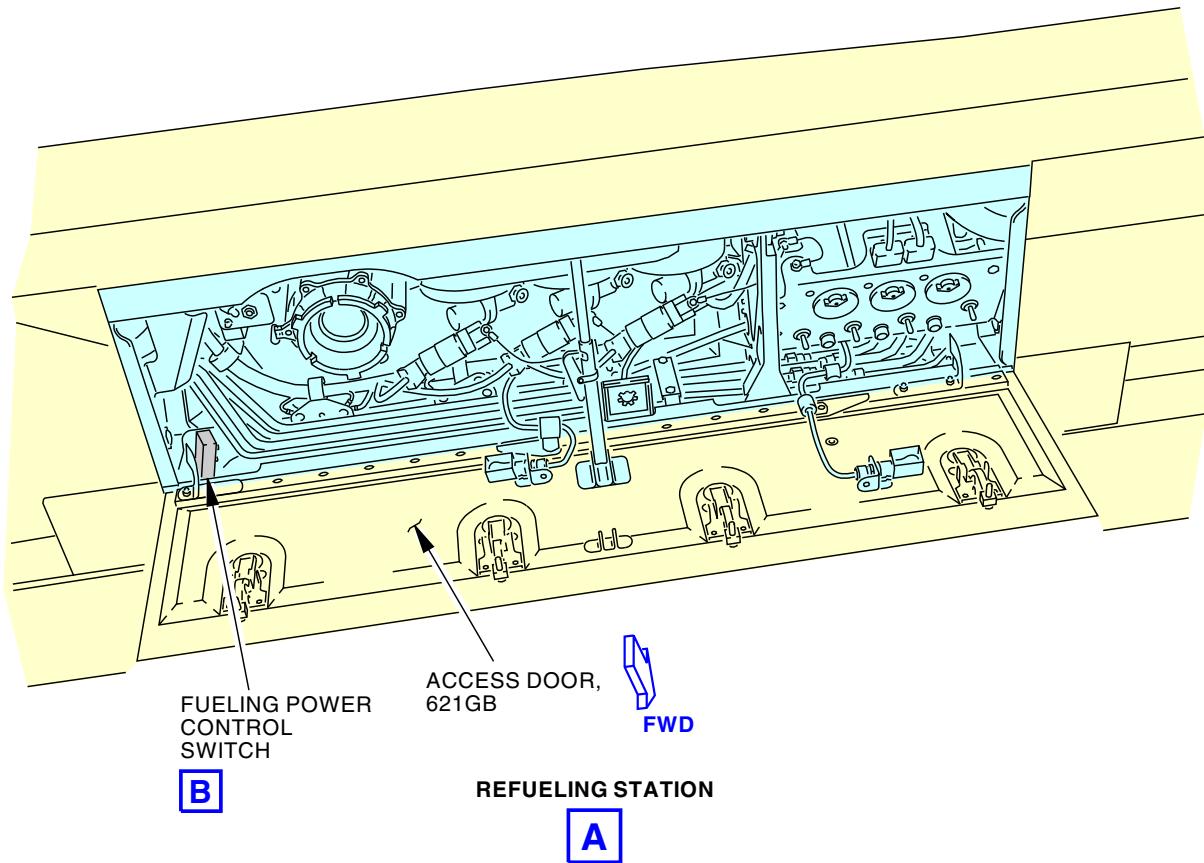
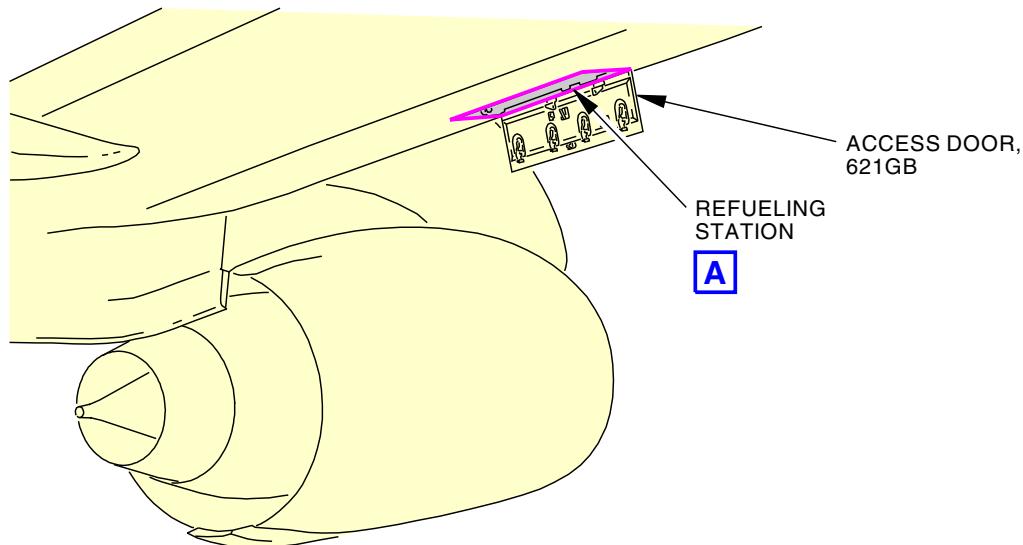
— END OF TASK —

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL



G06889 S0006571910_V4

Fueling Power Control Switch Installation
Figure 201/28-21-81-990-801 (Sheet 1 of 3)

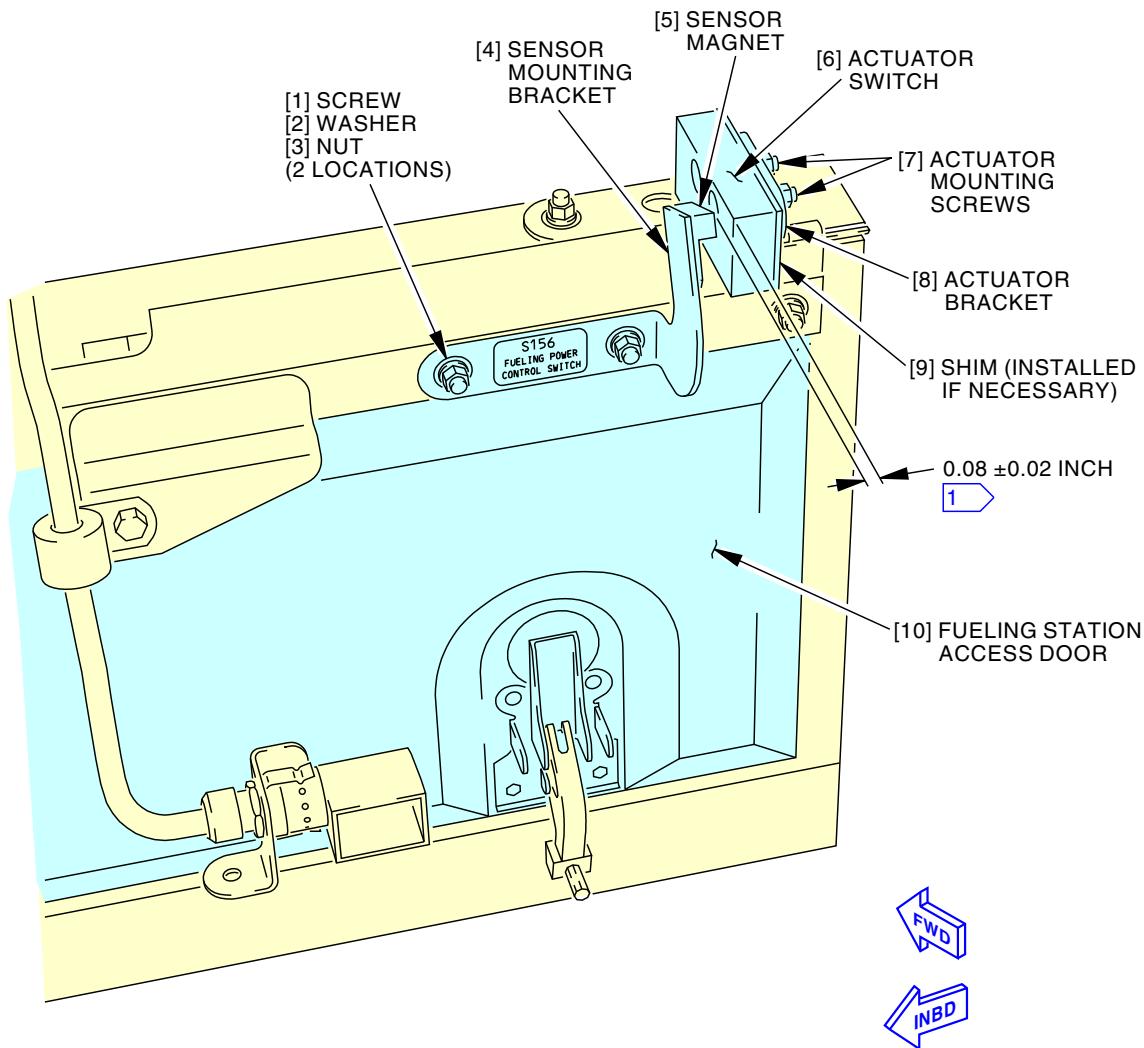
EFFECTIVITY
LOM ALL

28-21-81

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1 USE A NON-MAGNETIC FEELER GAGE.

FUELING POWER CONTROL SWITCH

B

G06946 S0006571911_V2

Fueling Power Control Switch Installation Figure 201/28-21-81-990-801 (Sheet 2 of 3)

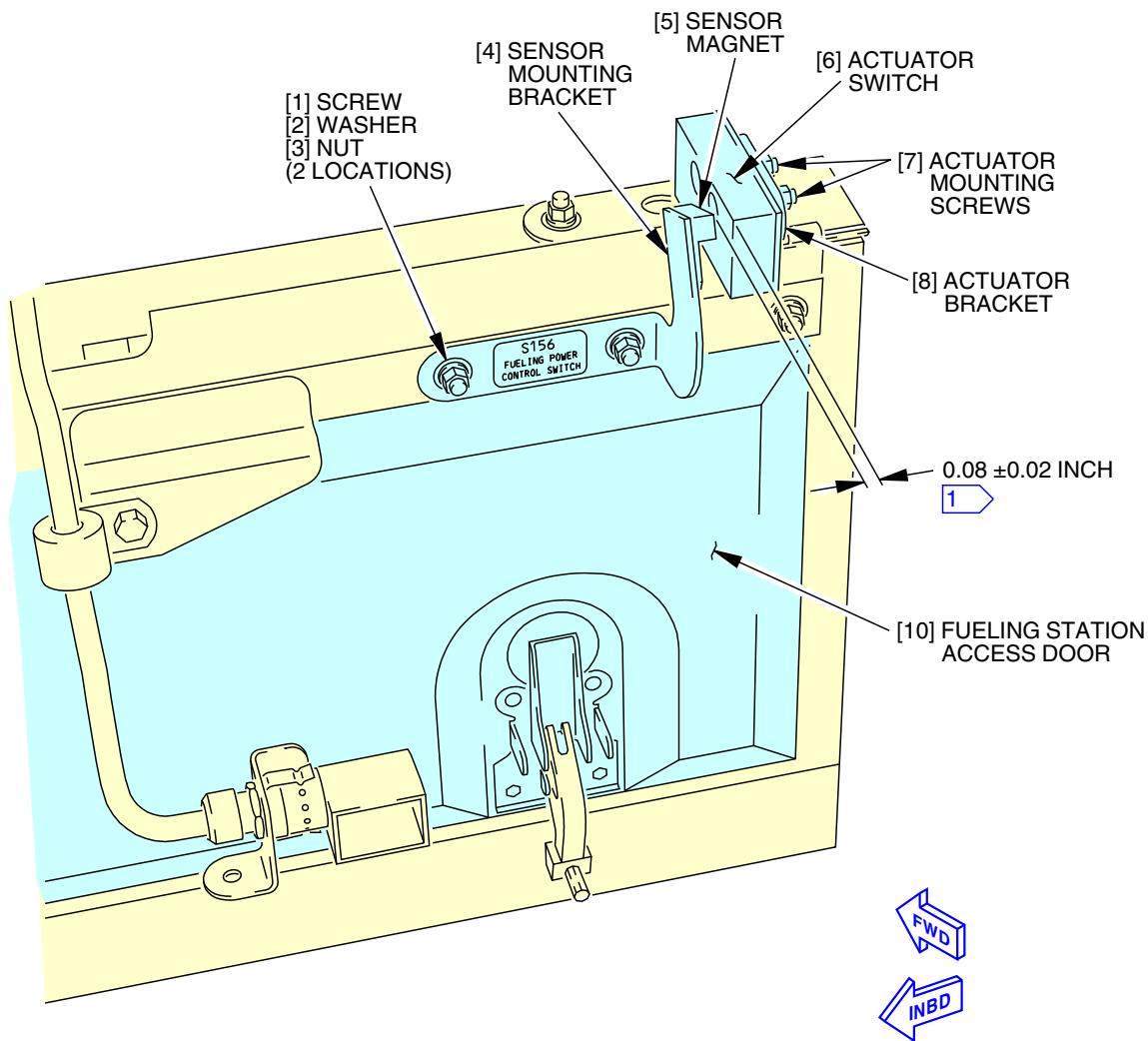
EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-426

28-21-81

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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FUELING POWER CONTROL SWITCH

B

3075134 S0000833863_V1

Fueling Power Control Switch Installation
Figure 201/28-21-81-990-801 (Sheet 3 of 3)EFFECTIVITY
LOM 427-434, 437-447, 450-999

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TASK 28-21-81-400-801

3. Fueling Power Control Switch Sensor Magnet Installation

(Figure 201)

A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Sensor magnet	28-21-81-01-030	LOM ALL

B. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

C. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

D. Fueling Power Control Switch Sensor Magnet Installation

SUBTASK 28-21-81-420-001

- (1) Install the sensor mounting bracket [4] and sensor magnet [5] with the mounting screws [1], nuts [3], and washers [2].

SUBTASK 28-21-81-820-001

- (2) Use the non-magnetic feeler gage to make sure that the clearance between the actuator switch [6] and sensor magnet [5] is correct.

NOTE: The clearance must be 0.08 ± 0.02 in. (2.032 ± 0.508 mm) at all the positions of the access door between the open and closed positions.

SUBTASK 28-21-81-860-002

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND

SUBTASK 28-21-81-710-001

- (4) Fully open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

- (a) Make sure that the fueling panel floodlights come on.

NOTE: This makes sure that the sensor magnet is installed correctly.

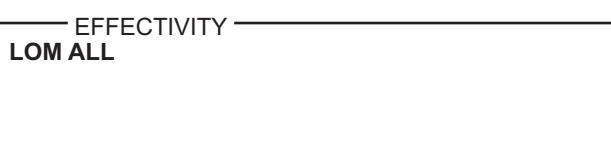
SUBTASK 28-21-81-410-001

- (5) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————



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TASK 28-21-81-350-801

4. **Actuator Switch for the Fueling Power Control Switch Removal**

(Figure 201)

A. **References**

Reference	Title
24-22-00-860-814	Remove External Power (P/B 201)
WDM 28-44-11	Ground Refueling

B. **Location Zones**

Zone	Area
621	Right Wing - Leading Edge to Front Spar

C. **Access Panels**

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

D. **Actuator Switch for the Fueling Power Control Switch Removal**

SUBTASK 28-21-81-860-005



MAKE SURE THAT AN EXTERNAL POWER SUPPLY IS NOT CONNECTED TO THE AIRCRAFT. IF EXTERNAL POWER IS ON, 28 VDC POWER WILL BE AVAILABLE AT THE REFUEL POWER CONTROL SWITCH. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 28-21-81-860-003

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND

SUBTASK 28-21-81-010-002

- (3) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-21-81-020-004

- (4) Remove the hot pigtail wire for the actuator switch [6] at splice location SP280.

SUBTASK 28-21-81-020-005

- (5) Disconnect the ground pigtail wire's dual ground connections for the actuator switch [6] at the GD1054-DC ground terminals (WDM 28-44-11).

SUBTASK 28-21-81-020-006

- (6) Loosen and remove the actuator mounting screws [7].

SUBTASK 28-21-81-160-001

- (7) Remove the actuator switch [6].

———— END OF TASK ————

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TASK 28-21-81-350-802

5. Actuator Switch for the Fueling Power Control Switch Installation

(Figure 201)

A. References

Reference	Title
SWPM 20-30-12	Assembly of Splices
WDM 28-44-11	Ground Refueling

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Actuator switch	28-21-81-01-070	LOM ALL
9	Shim	28-21-81-01-075	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Actuator Switch for the Fueling Power Control Switch Installation

SUBTASK 28-21-81-160-002

- (1) Put the actuator switch [6] in its position.

SUBTASK 28-21-81-820-002

- (2) Make sure that the clearance between the sensor magnet [5] and actuator switch [6] is correct.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426

SUBTASK 28-21-81-820-003

- (3) If it is necessary to adjust the clearance between the sensor magnet [5] and actuator switch [6], do these steps:
 - (a) Add the shim [9] or equivalent between the actuator switch [6] and actuator bracket [8].
 - 1) Adjust the shim [9] to give the correct clearance between the sensor magnet [5] and actuator switch [6].

LOM ALL

SUBTASK 28-21-81-020-007

- (4) Install the actuator mounting screws [7] on the actuator bracket [8].
 - (a) Tighten the actuator mounting screws [7].

SUBTASK 28-21-81-020-008

- (5) Connect the ground pigtail wire for the actuator switch [6] to GD1054-DC ground terminals with dual ground connections (WDM 28-44-11).
 - (a) Trim back excess pigtail wire length.

SUBTASK 28-21-81-020-009

- (6) Splice the hot pigtail wire for the actuator switch [6] to W1664-1035-20 wire (SWPM 20-30-12) at splice location SP280 (WDM 28-44-11) in the flammable leakage zone.

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AIRCRAFT MAINTENANCE MANUAL

- (a) Trim back excess pigtail wire length.

SUBTASK 28-21-81-860-004

- (7) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND

SUBTASK 28-21-81-710-002

- (8) Fully open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

- (a) Make sure that the fueling panel floodlights come on.

NOTE: This makes sure that the actuator switch is installed correctly.

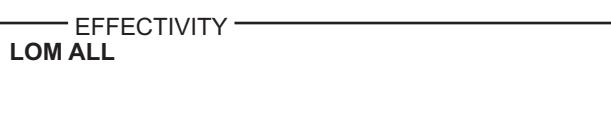
SUBTASK 28-21-81-010-003

- (9) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————



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AIRCRAFT MAINTENANCE MANUAL

ENGINE FUEL FEED SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) Engine Fuel Feed Pumps - Functional Test
 - (2) Crossfeed Valve - Functional Test
 - (3) Engine Fuel Spar Valve - Electrical and Indication Test
 - (4) Emergency Fuel Shutoff Battery - Operational Test
 - (5) Engine Fuel Spar Valve Installation - Test
 - (6) Fuel Scavenge System - Operational Test
 - (7) Fuel Boost Pump Output Pressure Test
 - (8) Center Tank Boost Pump Auto Shutoff Functional Test
 - (9) Engine Fuel Suction Feed - Operational Test

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248

- (10) Center Tank Fuel Pump Uncommanded On - Functional Test
- (11) Pump Reversal - Operational Test

LOM ALL

- (12) Fuel Boost Pump - Insulation Resistance Test

TASK 28-22-00-730-801

2. Engine Fuel Feed Pumps - Functional Test

(Figure 501, Figure 503, Figure 504)

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
521	Left Wing - Leading Edge to Front Spar

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Prepare for the Test

SUBTASK 28-22-00-860-001

- (1) Make sure that the switches are in the positions shown (Table 501):

EFFECTIVITY	
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Table 501/28-22-00-993-807 Fuel Pump and Crossfeed Valve Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
ENG 1 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 2 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-860-183

- (2) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
B	7	C00361	FUEL CROSS FEED VALVE
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

SUBTASK 28-22-00-010-021

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-002



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-22-00



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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-650-001

- (5) Make sure that the fuel tanks have the fuel quantities as follows (Figure 501):
- Make sure that there is 500 lb (227 kg) of fuel (or more) in the No. 1 tank.
 - Make sure that there is 500 lb (227 kg) of fuel (or more) in the No. 2 tank.
 - Make sure that there is 2000 lb (907 kg) of fuel (or more) in the center fuel tank.
 - To refuel the fuel tanks (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

EFFECTIVITY
LOM ALL

28-22-00

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D633A101-LOM



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E. Test of the Fuel Boost Pumps - Control and Indication

SUBTASK 28-22-00-860-081



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-00-210-001

- (2) Make sure that the amber LOW PRESSURE light is on for these switches, on the P5 Overhead Panel:

- (a) FUEL PUMP TANK 1 - AFT
- (b) FUEL PUMP TANK 1 - FWD
- (c) FUEL PUMP TANK 2 - AFT
- (d) FUEL PUMP TANK 2 - FWD.

SUBTASK 28-22-00-860-004

- (3) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the ON position.
 - (a) Make sure that the amber LOW PRESSURE light goes off (in approximately 15 seconds), for the FUEL PUMP TANK 1 - FWD switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-005

- (4) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the OFF position.
 - (a) Make sure that the amber LOW PRESSURE light is on, for the FUEL PUMP TANK 1 - FWD switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-006

- (5) Set the FUEL PUMP TANK 1 - AFT switch, on the P5 Overhead Panel, to the ON position.
 - (a) Make sure that the amber LOW PRESSURE light goes off (in approximately 15 seconds), for the FUEL PUMP TANK 1 - AFT switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-007

- (6) Set the FUEL PUMP TANK 1 - AFT switch, on the P5 Overhead Panel, to the OFF position.
 - (a) Make sure that the amber LOW PRESSURE light is on, for the FUEL PUMP TANK 1 - AFT switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-008

- (7) Set the FUEL PUMP TANK 2 - FWD switch, on the P5 Overhead Panel, to the ON position.
 - (a) Make sure that the amber LOW PRESSURE light goes off (in approximately 15 seconds), for the FUEL PUMP TANK 2 - FWD switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-009

- (8) Set the FUEL PUMP TANK 2 - FWD switch, on the P5 Overhead Panel, to the OFF position.
 - (a) Make sure that the amber LOW PRESSURE light is on, for the FUEL PUMP TANK 2 - FWD switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-010

- (9) Set the FUEL PUMP TANK 2 - AFT switch, on the P5 Overhead Panel, to the ON position.

EFFECTIVITY
LOM ALL

28-22-00



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- (a) Make sure that the amber LOW PRESSURE light goes off (in approximately 15 seconds), for the FUEL PUMP TANK 2 - AFT switch on the P5 Overhead Panel.

SUBTASK 28-22-00-860-011

- (10) Set the FUEL PUMP TANK 2 - AFT switch, on the P5 Overhead Panel, to the OFF position.
(a) Make sure that the amber LOW PRESSURE light is on, for the FUEL PUMP TANK 2 - AFT switch on the P5 Overhead Panel.

SUBTASK 28-22-00-410-009

- (11) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-720-027

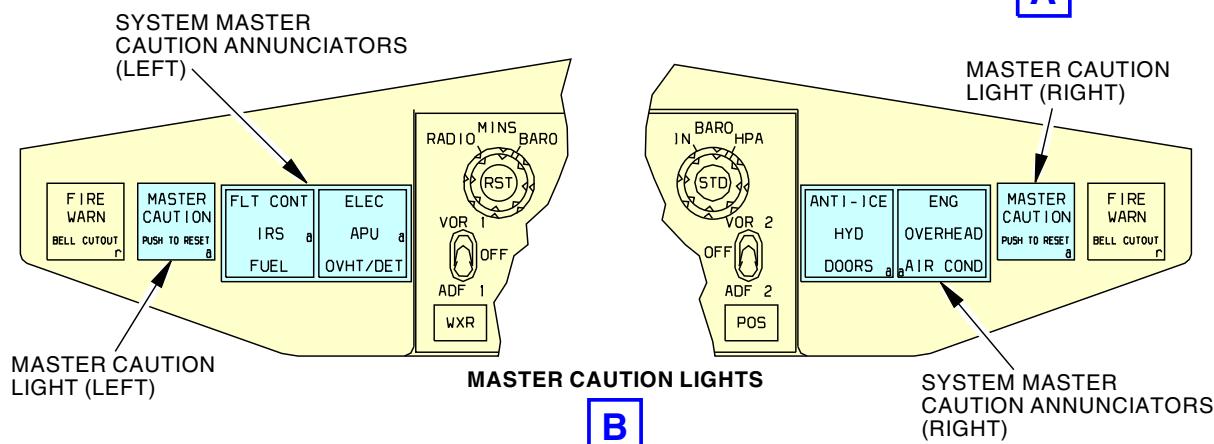
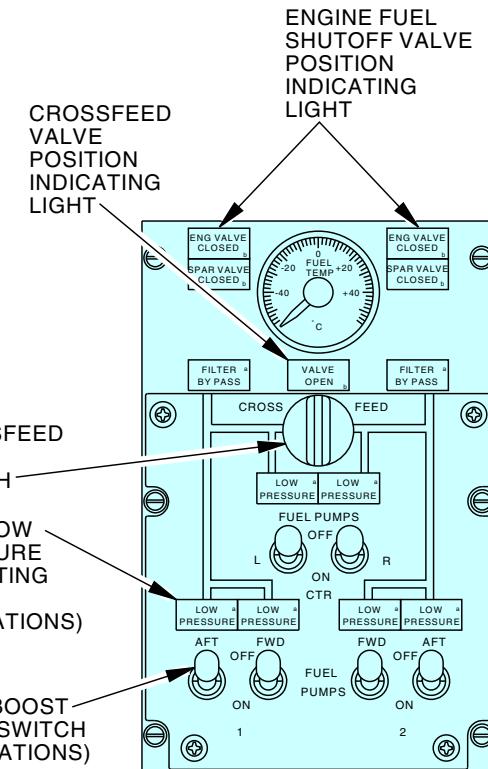
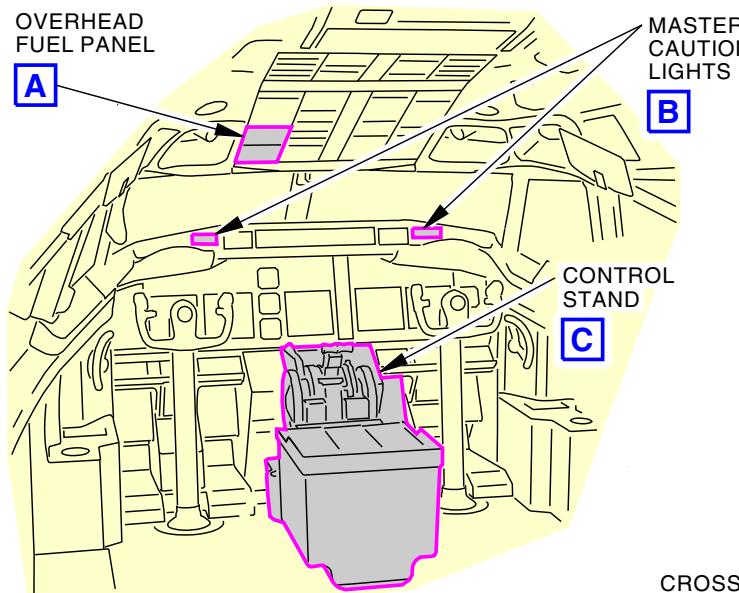
- (12) Do this task: Center Tank Boost Pump Auto Shutoff Functional Test, TASK 28-22-00-720-805.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-22-00

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G07787 S0006571919_V2

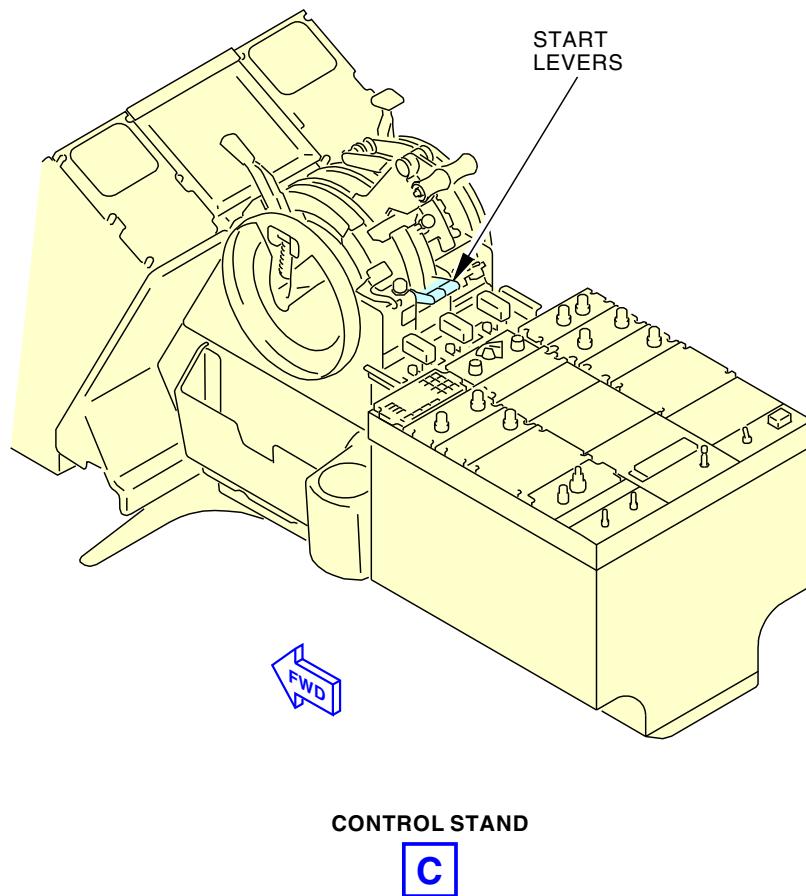
Engine Fuel Feed System
Figure 501/28-22-00-990-816 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-22-00



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G07811 S0006571920_V2

Engine Fuel Feed System
Figure 501/28-22-00-990-816 (Sheet 2 of 3)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-461

28-22-00

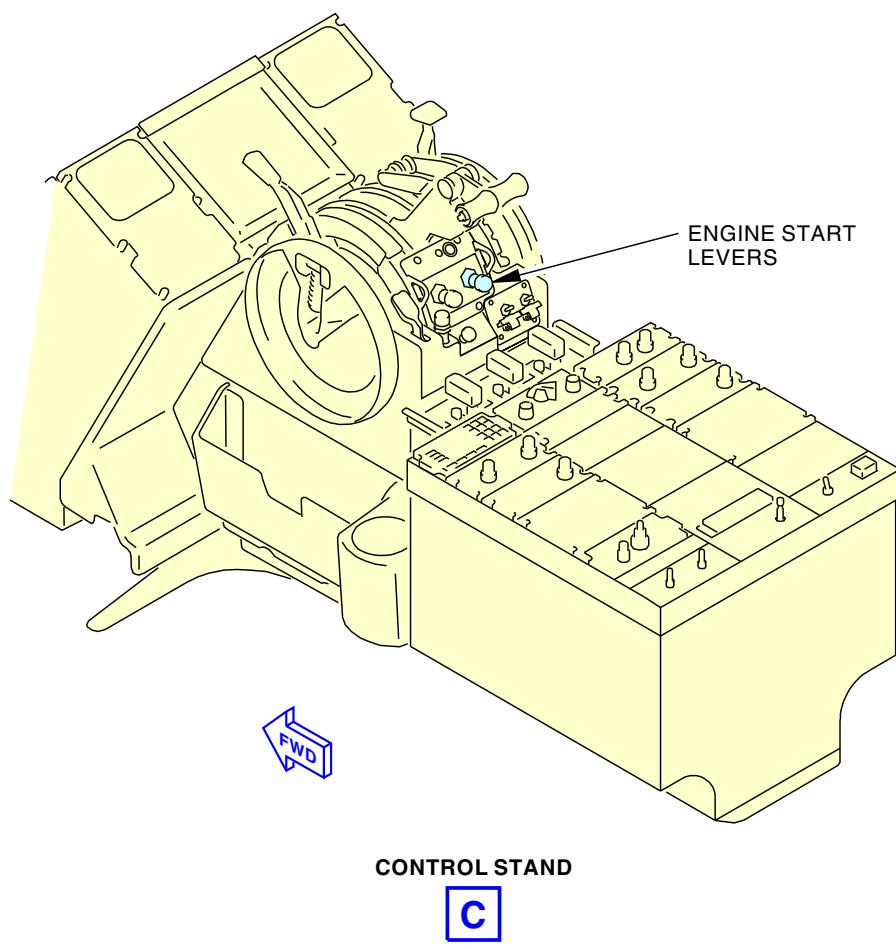
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2337192 S0000531975_V3

Engine Fuel Feed System
Figure 501/28-22-00-990-816 (Sheet 3 of 3)

EFFECTIVITY
LOM 462-999

28-22-00

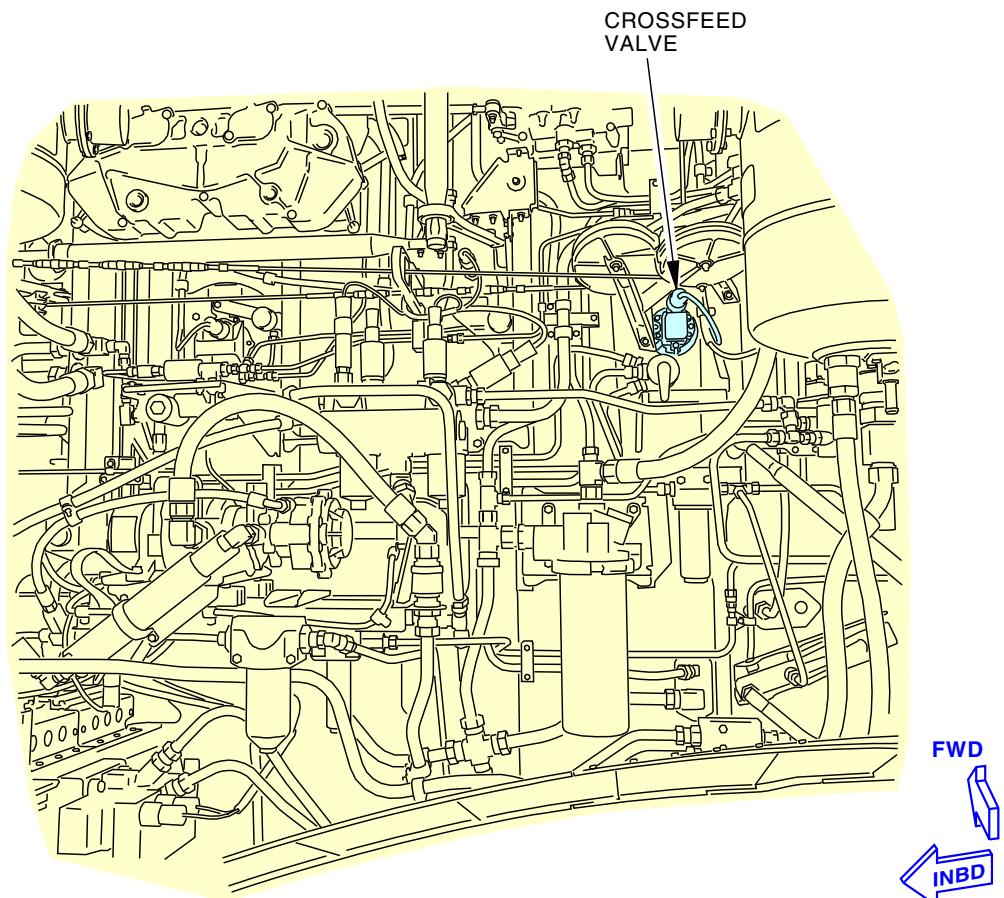
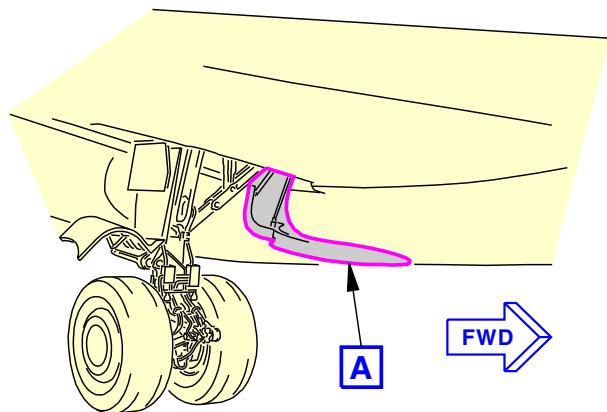
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE IS SHOWN)

A

G07819 S0006571921_V2

Crossfeed Valve Location
Figure 502/28-22-00-990-817

EFFECTIVITY
LOM ALL

28-22-00

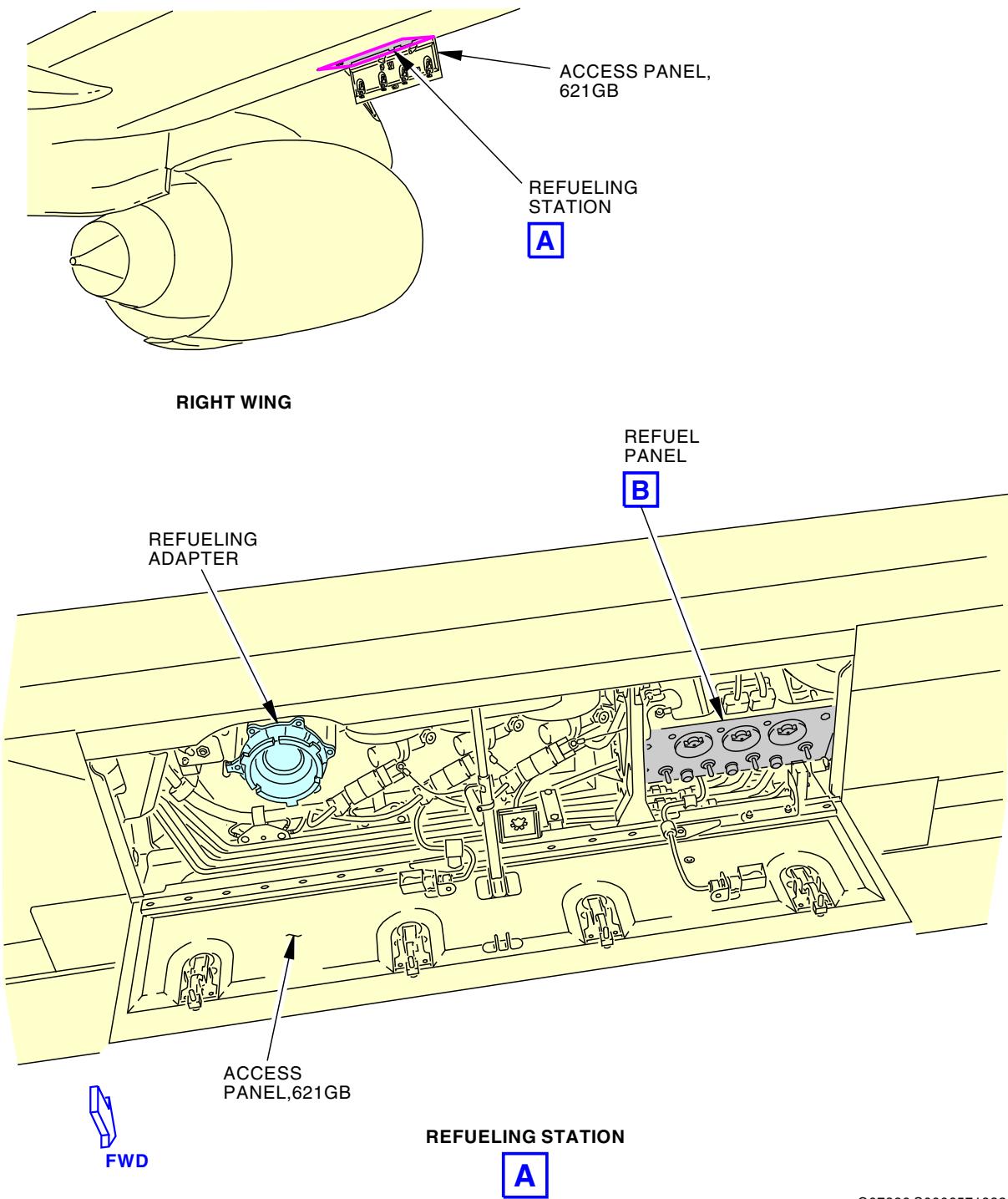
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G07826 S0006571922_V3

Refueling Station Location
Figure 503/28-22-00-990-818 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

D633A101-LOM

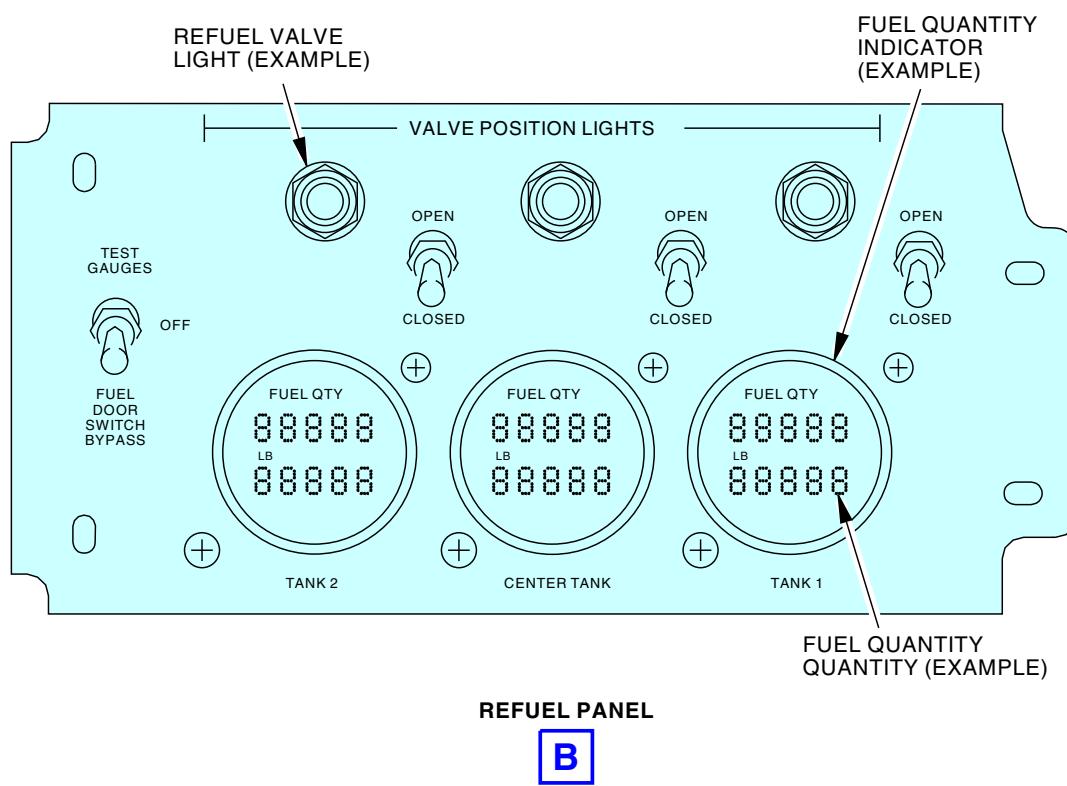
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G38996 S0006571923_V3

Refueling Station Location
Figure 503/28-22-00-990-818 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-22-00

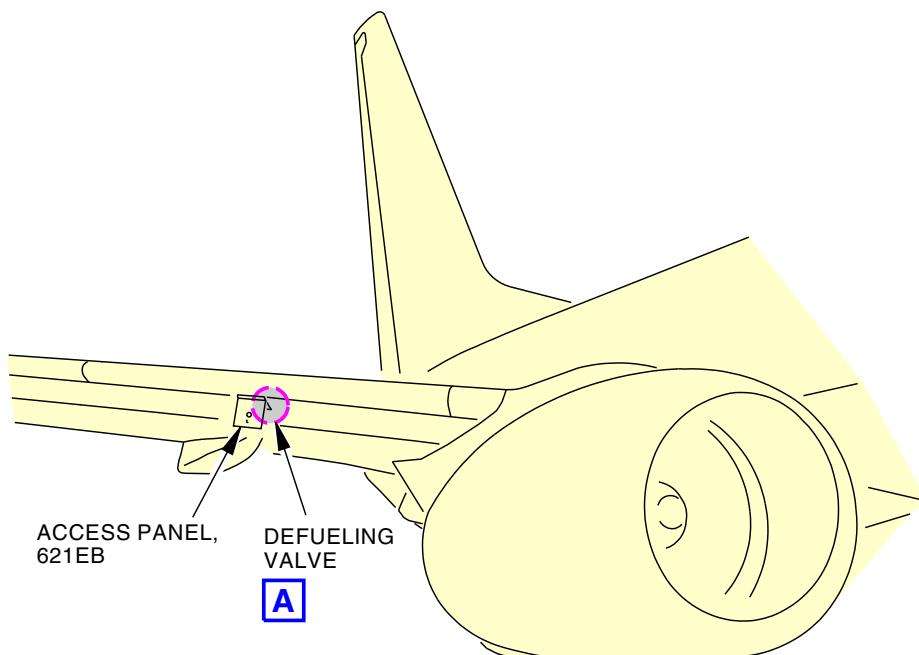
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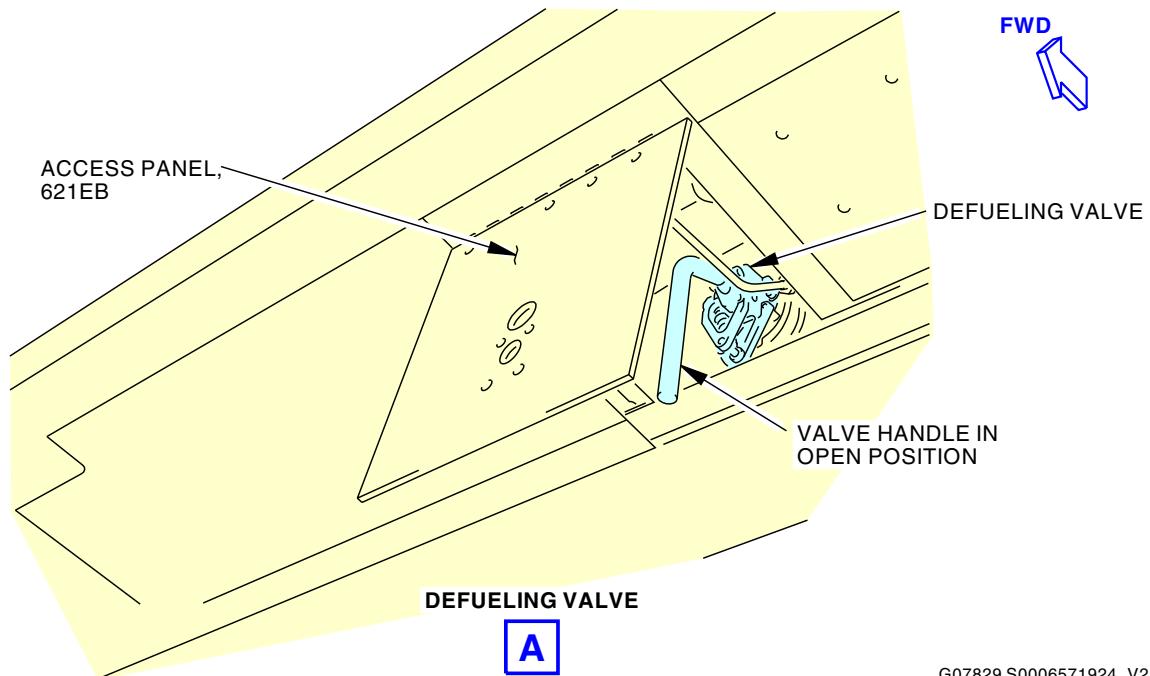
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RIGHT WING



G07829 S0006571924_V2

Defueling Valve Location
Figure 504/28-22-00-990-819

EFFECTIVITY
LOM ALL

28-22-00

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TASK 28-22-00-730-802

3. Crossfeed Valve - Functional Test

(Figure 501, Figure 502, Figure 503, Figure 504)

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
621	Right Wing - Leading Edge to Front Spar

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
621EB	Defuel Access Panel - Slat Station 95.15
621GB	Refuel Access Panel - Slat Station 143.27

D. Prepare for the Test

SUBTASK 28-22-00-860-066

- (1) Make sure that the switches are in the positions shown (Table 502):

Table 502/28-22-00-993-816 Fuel Pump and Crossfeed Valve Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
ENG 1 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 2 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

EFFECTIVITY
LOM ALL

28-22-00



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SUBTASK 28-22-00-860-184

- (2) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
B	7	C00361	FUEL CROSS FEED VALVE
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

SUBTASK 28-22-00-010-017

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

SUBTASK 28-22-00-860-067



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT



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LOM 402, 404, 406 (Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406			
D	2	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406			
D	4	C00829	FUEL BOOST PUMP TANK 2 FWD
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT
LOM 402, 404, 406			
D	6	C00846	FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-410-010

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-650-007

- (6) Make sure that the fuel tanks have the fuel quantities as follows (Figure 501):
(a) Make sure that there is 500 lb (227 kg) of fuel (or more) in the No. 1 tank.
(b) Make sure that there is 500 lb (227 kg) of fuel (or more) in the No. 2 tank.
(c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

E. Test the Engine Fuel Crossfeed Valves

SUBTASK 28-22-00-860-069

- (1) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-22-00-860-070

- (2) On the wing fueling panel, P15, put the switch for the fueling shutoff valve for the No. 2 tank in the OPEN position.

SUBTASK 28-22-00-860-071

- (3) Do these steps to open the defuel valve (Figure 504):

- (a) Open this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

- (b) Set the defueling valve handle to OPEN.

SUBTASK 28-22-00-860-072

- (4) On the P5 Overhead Panel, set the CROSSFEED valve switch to the OPEN position.

EFFECTIVITY
LOM ALL

28-22-00



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- (a) Make sure that the VALVE OPEN light for the crossfeed valve comes on bright during valve transit.
- (b) Make sure that the VALVE OPEN light stays on dim after the valve is fully open.

SUBTASK 28-22-00-860-147



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-00-860-073

- (6) Push the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the ON position.
 - (a) Make sure a minimum of 200 lb (91 kg) of fuel is transferred from the No. 1 tank to the No. 2 tank.

NOTE: The fuel will transfer in approximately 2 minutes.

SUBTASK 28-22-00-860-074

- (7) Push the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-860-075

- (8) Set the CROSSFEED switch, on the P5 Overhead Panel, to the CLOSED position.
 - (a) Make sure that the VALVE OPEN light for the crossfeed valve goes from dim to bright during valve transit.
 - (b) Make sure that the VALVE OPEN light goes off after the valve is fully closed.

NOTE: Wait for approximately one minute for the fuel to become stable before you continue to the next step.

SUBTASK 28-22-00-860-076

- (9) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the ON position.
 - (a) Make sure no fuel is transferred, as shown on the fuel quantity indicators, from the No. 1 tank to the No. 2 tank.

NOTE: Three minutes is sufficient time to make sure that there is no fuel transfer.

SUBTASK 28-22-00-860-077

- (10) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-860-078

- (11) On the wing fueling panel, P15, set the switch for the fueling shutoff valve for the No. 2 tank to the CLOSED position.

SUBTASK 28-22-00-860-079

- (12) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-22-00-860-080

- (13) Put the defuel valve handle to the closed position.

EFFECTIVITY
LOM ALL

28-22-00

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SUBTASK 28-22-00-410-003

- (14) Close this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

———— END OF TASK ————

TASK 28-22-00-710-801

4. Engine Fuel Spar Valve - Electrical Control and Indication Test

(Figure 501, Figure 505)

A. General

- (1) This test checks the left and right engine fuel spar valves indication and electrical control.

B. References

Reference	Title
57-41-02-000-801	Leading Edge Access Panel Removal (P/B 201)
57-41-02-400-801	Leading Edge Access Panel Installation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

E. Spar Valve Electrical Control and Indication Test

SUBTASK 28-22-00-860-026

- (1) Make sure that the switches are in the positions shown (Table 503):

Table 503/28-22-00-993-808 Spar Valve Electrical Control and Indication Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
ENG 1 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 2 FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND

EFFECTIVITY
LOM ALL

28-22-00



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Table 503/28-22-00-993-808 Spar Valve Electrical Control and Indication Test (Continued)

SWITCH/CONTROL	POSITION	LOCATION
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-760-012



WARNING OBEY THE APPLICABLE PROCEDURES FOR MAINTENANCE ON ENERGIZED ELECTRICAL SYSTEMS. IF YOU DO NOT OBEY, INJURY TO PERSONNEL CAN OCCUR.



CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (2) Do these steps to do a check of each of the two redundant wires that supply power to close the engine fuel spar valve:

- (a) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
C	6	C01472	FUEL SHUTOFF VALVES BUS

- (b) To remove the applicable lower leading edge access panels, refer to TASK 57-41-02-000-801.

Open these access panels:

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

- (c) To do a check of the left spar valve, disconnect the connector for the left spar valve actuator, D788.
- (d) To do a check of the right spar valve, disconnect the connector for the right spar valve actuator, D790.
- (e) For the left spar valve, do a check for 0 VDC power (2.0 VDC maximum) between these pins on the connector, D788:

EFFECTIVITY
LOM ALL

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Table 504/28-22-00-993-822

D788	D788
pin 5 -----	pin 7
pin 6 -----	pin 7

- (f) For the right spar valve, do a check for 0 VDC power (2.0 VDC maximum) between these pins on the connector, D790:

Table 505/28-22-00-993-823

D790	D790
pin 5 -----	pin 7
pin 6 -----	pin 7

- (g) For the left spar valve, do a continuity check between pins 5 and 6 on the connector, D788.
1) Make sure that the resistance is 5 ohms or less.
- (h) For the right spar valve, do a continuity check between pins 5 and 6 on the connector, D790.
1) Make sure that the resistance is 5 ohms or less.
- (i) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
C	6	C01472	FUEL SHUTOFF VALVES BUS

- (j) For the left spar valve, do a check for 28 VDC power (26.0 VDC minimum, 30.0 VDC maximum) between these pins on the connector, D788:

Table 506/28-22-00-993-818

D788	D788
pin 5 -----	pin 7
pin 6 -----	pin 7

- (k) For the right spar valve, do a check for 28 VDC power (26.0 VDC minimum, 30.0 VDC maximum) between these pins on the connector, D790:

EFFECTIVITY
LOM ALL

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

Table 507/28-22-00-993-819

D790	D790
pin 5 -----	pin 7
pin 6 -----	pin 7

- (l) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
C	6	C01472	FUEL SHUTOFF VALVES BUS

- (m) For the left spar valve, re-connect the connector for the left spar valve actuator, D788.
(n) For the right spar valve, re-connect the connector for the right spar valve actuator, D790.
(o) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
C	6	C01472	FUEL SHUTOFF VALVES BUS

SUBTASK 28-22-00-720-001

- (3) Do these steps to test the left spar valve:
(a) Make sure that the Engine START switches are in the OFF position, on the P5 overhead panel.

EFFECTIVITY
LOM ALL

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LOM 429-432; AIRPLANES WITH AUTO-IGNITION

- 1) The AUTO position is the OFF position.

LOM ALL

- (b) Put a DO-NOT-OPERATE placard on the left and right engine START switches, on the P5 overhead panel.
- (c) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

- (d) Put the Engine 1 Start Lever on the P10 Control Stand to the IDLE position (Figure 501).
- (e) Make sure that the position indication light of the left spar valve shows these effects:
 - 1) The light comes on bright to show a change in the position.
 - 2) The light goes off to show that the spar valve is open.
- (f) Examine the position of the manual override lever on the left spar valve to make sure that the valve is open.



CAUTION
DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (g) Pull the L FIRE HANDLE to the FIRE position, on the P8 Aisle Stand (Figure 501).
- (h) Make sure that the position indication light for the left spar valve shows these effects:
 - 1) The light comes on bright to show a change in the valve position.
 - 2) The light stays on dim to show that the spar valve is closed.
- (i) Examine the position of the manual override lever on the left spar valve to make sure that the valve is closed (Figure 505).



CAUTION
DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (j) Push the L FIRE HANDLE to the NORMAL position, on the P8 Aisle Stand.
- (k) Make sure that the position indication light for the left spar valve shows these effects:
 - 1) The light comes on bright to show a change in the valve position.
 - 2) The light goes off to show that the spar valve is open.
- (l) Put the Engine 1 Start Lever on the P10 Control Stand to the CUTOFF position.
- (m) Make sure that the position indication light for the left spar valve shows these effects:

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LOM ALL

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- 1) The light comes on bright to show a change in the valve position.
 - 2) The light stays on dim to show that the spar valve is closed.
- (n) Remove the DO-NOT-OPERATE placards from the left and right engine START switches, on the P5 overhead panel.
- (o) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 28-22-00-700-003

- (4) Do these steps to test the right spar valve:
- (a) Make sure that the Engine Start Switches on the P5 Overhead Panel are in the OFF position.

LOM 429-432; AIRPLANES WITH AUTO-IGNITION

- 1) The AUTO position is the OFF position.

LOM ALL

- (b) Put a DO-NOT-OPERATE placard on the left and right engine START switches, on the P5 overhead panel.
- (c) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

- (d) Put the Engine 2 Start Lever on the P10 Control Stand to the IDLE position (Figure 501).
- (e) Make sure that the position indication light of the right spar valve shows these effects:
 - 1) The light comes on bright to show a change in the position.
 - 2) The light goes off to show that the spar valve is open.
- (f) Examine the position of the manual override lever on the right spar valve to make sure that the valve is open.

EFFECTIVITY
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DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (g) Pull the R FIRE HANDLE to the FIRE position, on the P8 Aisle Stand (Figure 501).
- (h) Make sure that the position indication light for the right spar valve shows these effects:
 - 1) The light comes on bright to show a change in the valve position.
 - 2) The light stays on dim to show that the spar valve is closed.
- (i) Examine the position of the manual override lever on the right spar valve to make sure the valve is closed (Figure 505).



DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

- (j) Push the R FIRE HANDLE to the NORMAL position, on the P8 Aisle Stand.
- (k) Make sure that the position indication light for the right spar valve shows these effects:
 - 1) The light comes on bright to show a change in the valve position.
 - 2) The light goes off to show that the spar valve is open.
- (l) Put the Engine 2 Start Lever on the P10 Control Stand to the CUTOFF position.
- (m) Make sure that the position indication light for the right spar valve shows these effects:
 - 1) The light comes on bright to show a change in the valve position.
 - 2) The light stays on dim to show that the spar valve is closed.
- (n) Remove the DO-NOT-OPERATE placards from the left and right engine START switches, on the P5 overhead panel.
- (o) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

- (p) To install the applicable lower leading edge access panels, refer to TASK 57-41-02-400-801.

Close these access panels:

Number Name/Location

521BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station
36.02

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<u>Number</u>	<u>Name/Location</u>
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

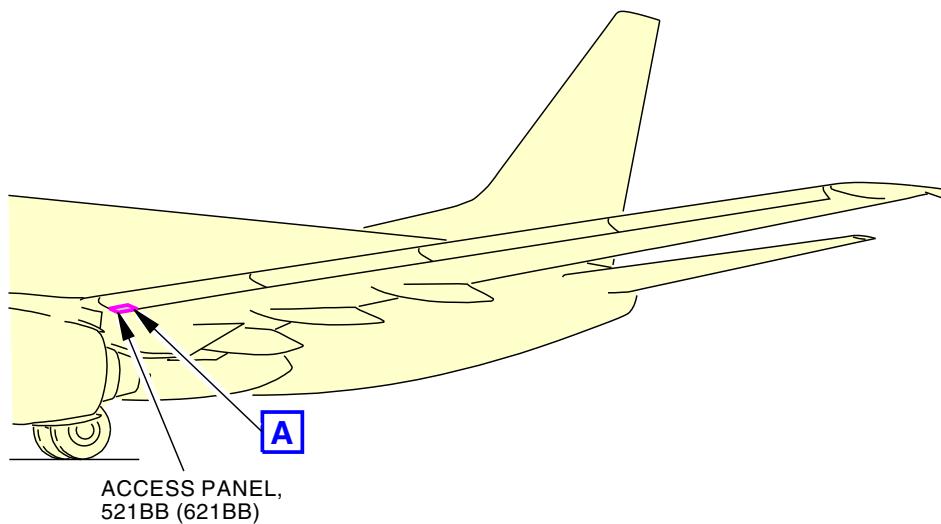
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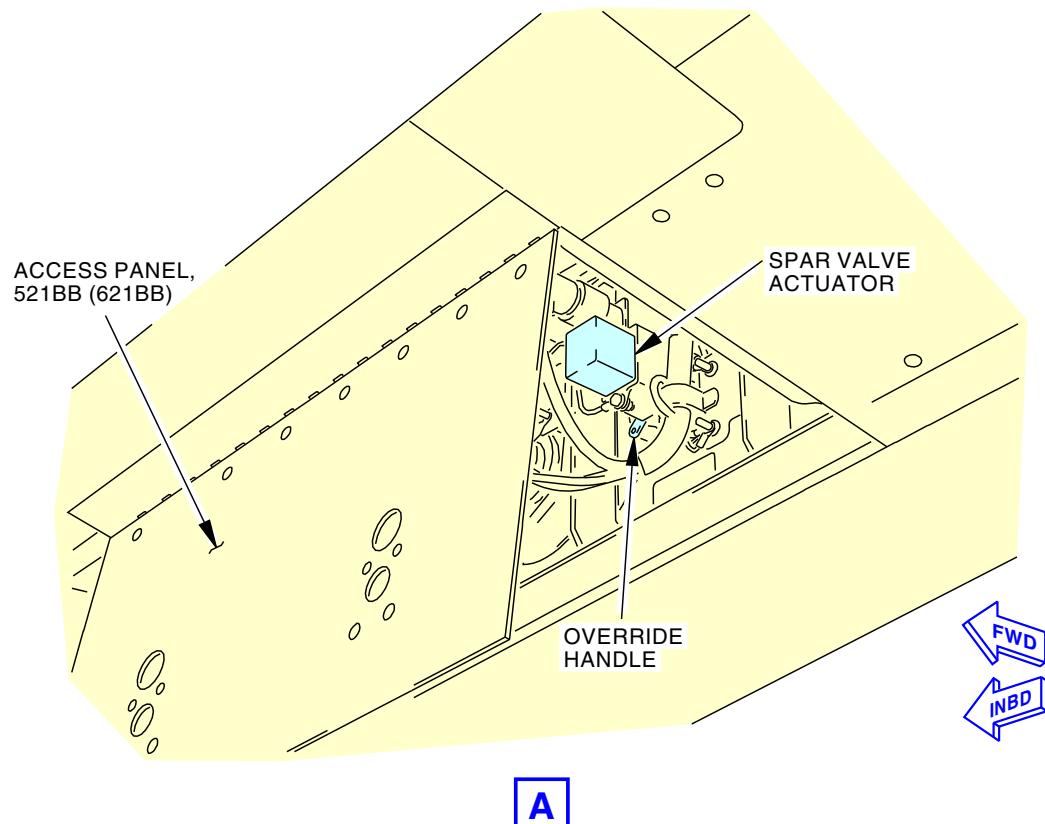
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LEFT WING
(RIGHT WING IS OPPOSITE)



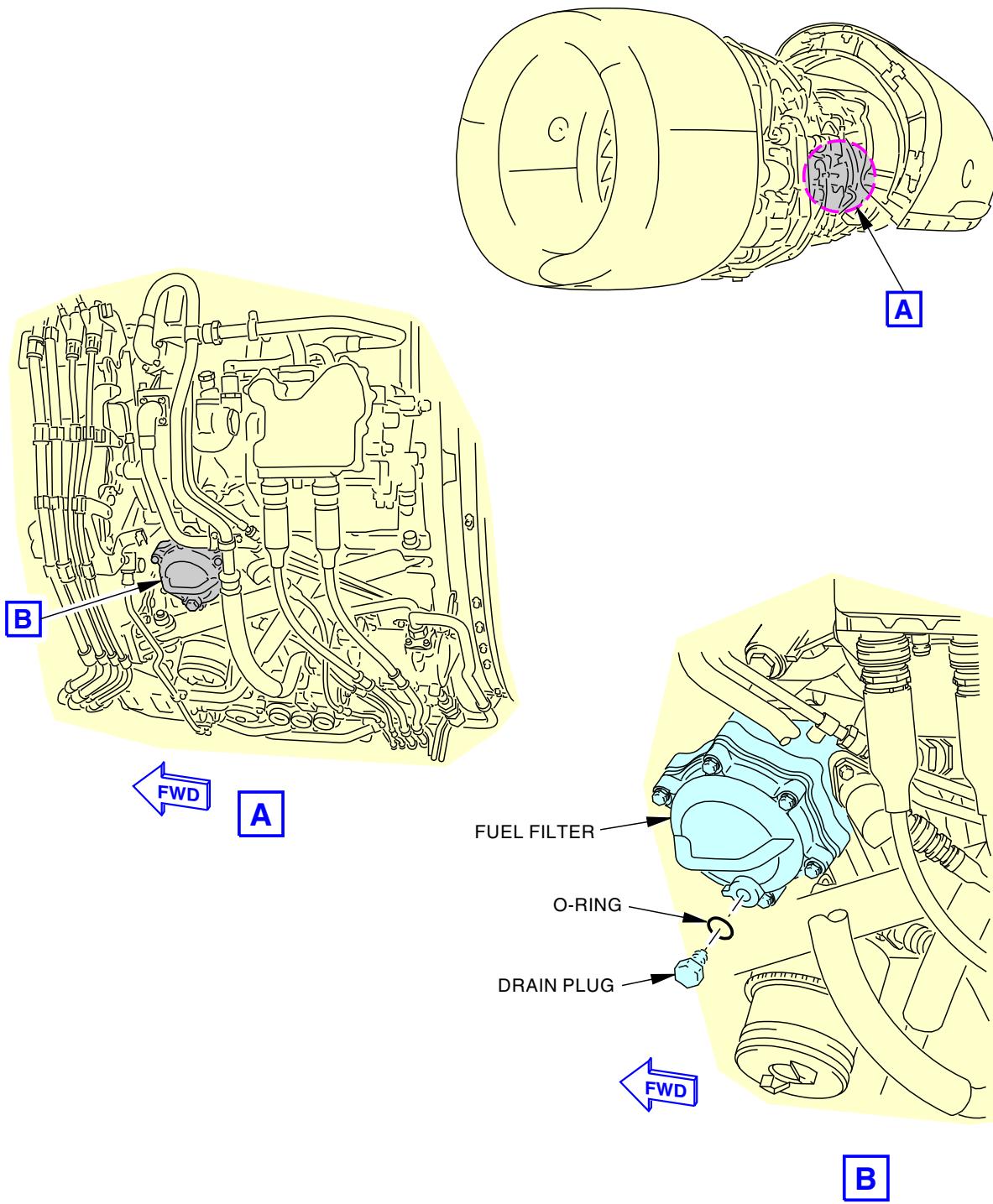
G07833 S0006571929_V2

Spar Valve Actuator Location
Figure 505/28-22-00-990-820

EFFECTIVITY	LOM ALL
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D633A101-LOM



G07835 S0006571930_V2

Fuel Filter Drain Location
Figure 506/28-22-00-990-821

EFFECTIVITY
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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 28-22-00-720-801

5. Emergency Fuel Shutoff Battery - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This operational test gives the steps to make sure that the battery is charged correctly and wiring required for valve operation is OK.

B. References

Reference	Title
WDM 28-21-21	BATTERY AND CONTROL POWER ENGINE SPAR AND APU FUEL VALVES

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Operational Test

SUBTASK 28-22-00-860-027

- (1) Make sure that these switches are in the positions shown (Table 508):

Table 508/28-22-00-993-809 Fuel Shutoff Valve Battery Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
FUEL CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
L ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
R ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
ENGINE START 1 SWITCH	OFF	P5 OVERHEAD PANEL
ENGINE START 2 SWITCH	OFF	P5 OVERHEAD PANEL
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-860-028

- (2) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

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(Continued)

F/O Electrical System Panel, P6-3

Row Col Number Name

B	4	C00359	FUEL SPAR VALVE ENG 1
---	---	--------	-----------------------

SUBTASK 28-22-00-440-001

- (3) Make sure that power is applied to the charger system to charge the battery for a minimum of 60 minutes.

- (a) Use the BAT switch and GRD PWR switch on the P5 panel.

NOTE: The GROUND SERVICE switch on the forward attendant panel will not energize the 28V DC Bus 2 Sec 2 that is necessary to charge the battery.

SUBTASK 28-22-00-860-065

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row Col Number Name

C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

E. Emergency Fuel Shutoff Battery Operational Test

SUBTASK 28-22-00-710-002

- (1) Do these steps to test the emergency fuel shutoff battery operation:

NOTE: This test makes sure that the wiring and the diode R669 operate correctly (WDM 28-21-21). If the diode or wiring are bad the battery can lose its charge without flight deck indication.

NOTE: For this test, it is only necessary to test one spar valve.

- (a) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row Col Number Name

A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row Col Number Name

C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

- (b) Put the engine start lever 1 or engine start lever 2 to the IDLE position.

- (c) Make sure that the indication light for the applicable engine fuel spar valve shows these effects:

- 1) The light goes from dim to bright to show a change in the valve position.
- 2) The light goes off to show that the spar valve is open.

NOTE: You can examine the position of the manual override lever on the spar valve to make sure that the valve is open.

- (d) Put the engine start lever 1 or engine start lever 2 to the CUTOFF position.

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- (e) Make sure that the indication light for the applicable engine fuel spar valve shows these effects:

- 1) The light comes on bright to show a change in the valve position.
- 2) The light stays on dim to show that the spar valve is closed.

NOTE: You can examine the position of the manual override lever on the spar valve to make sure that the valve is closed.

- (f) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 28-22-00-860-182

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

— END OF TASK —

TASK 28-22-00-720-804

6. Engine Fuel Spar Valve Installation - Test

(Figure 501, Figure 504, Figure 506)

A. General

- (1) This task includes the steps to do engine fuel spar valve installation test.
 - (a) This test makes sure that the spar valves close and do not leak.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-22-11 P/B 401	SPAR VALVE - REMOVAL/INSTALLATION
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)



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D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
D00601 [CP2101]	Vaseline - Graphite Mineral	
G02345 [CP8001]	Wire - Safety, 0.032 Inch (0.8 mm) Diameter	AMS 5687
G50065 [CP8006]	Cable, Safety, Stainless Steel, 0.032 inch (0.8 mm) Diameter	M50 TF 9 CL-A

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
413	Engine 1 - Fan Cowl, Left
423	Engine 2 - Fan Cowl, Left

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Prepare for the Test

SUBTASK 28-22-00-860-061

- (1) Make sure that these switches are in the positions shown in Table 509:

Table 509/28-22-00-993-817 Engine Fuel Spar Valve Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
FUEL CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
L ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
R ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-860-185

- (2) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

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(Continued)

F/O Electrical System Panel, P6-3

Row Col Number Name

B 4 C00359 FUEL SPAR VALVE ENG 1

SUBTASK 28-22-00-010-018

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-062



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-22-00-410-011

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-650-006

- (6) Make sure that the fuel tanks have the fuel quantities that follow (Figure 501):

- (a) Make sure that there is more than 1000 lb (454 kg) of fuel in each main fuel tank.

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- (b) If it is necessary to refuel the fuel tanks, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

H. Spar Valve and Adapter/Shuttle Test

SUBTASK 28-22-00-860-063



WARNING

BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT LET ENGINE FUEL STAY ON YOUR SKIN. IF YOU GET FUEL ON YOUR SKIN, REMOVE IT IMMEDIATELY WITH SOAP AND WATER. THE FUEL IS POISONOUS AND CAN BE ABSORBED INTO YOUR BODY.

- (1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 28-22-00-860-064

- (2) Do these steps to do a check of the engine fuel spar valves:

NOTE: This check makes sure the spar valves close correctly.

- (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below each fuel pump.
(b) Make sure that the Engine 1 Start Lever and Engine 2 Start Lever, on the P10 Control Stand, are in the CUTOFF position.

NOTE: This step makes sure the spar valves are commanded closed.

- (c) Do these steps to remove the fuel filter drain plug and drain the fuel supply line (Figure 506):
1) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel filter drain plug.
2) Remove the drain plug and let the fuel drain.
3) Remove and discard the O-ring from the drain plug.
4) Let the fuel drain completely.
5) If the fuel continues to drain after 5 gal (19 l), do these steps:
a) Install the drain plug to stop the fuel flow.

NOTE: The engine fuel spar valve can still be open.

- b) Replace the engine fuel spar valve (PAGEBLOCK 28-22-11/401).

- (d) Monitor the fuel leakage from the inlet fuel line until the drops per minute is constant.
(e) Make a written record of the drops per minute.



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (f) To operate any of the fuel pumps, stay in the flight compartment to continuously monitor the fuel quantity and low pressure indication in the applicable tank.
1) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

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- (g) Set these pump switches, on the P5 Overhead Panel, to the ON position:
 - 1) FUEL PUMP TANK 1 - AFT
 - 2) FUEL PUMP TANK 2 - AFT.
- (h) Make sure that the rate of fuel drops per minute, that leak from the left and right fuel inlet lines, does not increase.
- (i) Set these pump switches, on the P5 Overhead Panel, to the OFF position:
 - 1) FUEL PUMP TANK 1 - AFT
 - 2) FUEL PUMP TANK 2 - AFT.
- (j) Do these steps to install the fuel filter drain plug (Figure 506):
 - 1) Lubricate a new O-ring with grease, D00504, and install it on the drain plug.
 - 2) Lubricate the threads of the drain plug with graphite mineral vaseline, D00601 [CP2101].
 - 3) Install the drain plug.
 - a) Tighten the drain plug to 50 ± 5 in-lb (6 ± 1 N·m).
 - 4) Install the safety wire, G02345 [CP8001], or cable, G50065 [CP8006], on the drain plug.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-700-002

- (1) Do a leak check of the low pressure fuel pump (TASK 71-00-00-700-801-F00).

SUBTASK 28-22-00-940-001

- (2) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———— END OF TASK ————

TASK 28-22-00-720-802

7. Fuel Scavenge System - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The fuel scavenge system has a motive flow inlet in the center tank, a jet pump driven by the left forward boost pump, and a float valve in the No. 1 tank.
- (2) This procedure makes sure the float valve opens and closes correctly. It also makes sure that the fuel scavenge system moves fuel from the center tank to the No. 1 tank.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

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Zone Area

212 Flight Compartment - Right

D. Access Panels

Number Name/Location

117A Electronic Equipment Access Door

E. Prepare for the Test

SUBTASK 28-22-00-860-031

- (1) Make sure that the switches are in the positions shown (Table 510) (Figure 501):

Table 510/28-22-00-993-810 Fuel Scavenge System Test

SWITCH/CONTROL	POSITION	LOCATION
APU FIRE HANDLE	NORMAL	P8 AISLE STAND
CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
L ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
R ENG FIRE HANDLE	NORMAL	P8 AISLE STAND
ENG 1 START LEVER	CUTOFF	P10 CONTROL STAND
ENG 2 START LEVER	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-010-019

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-032



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-410-012

- (4) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-033

- (5) Make sure that electrical power is available, do this task: Supply Electrical Power,
TASK 24-22-00-860-811.

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SUBTASK 28-22-00-650-003

- (6) Make sure that the fuel tanks have the fuel quantities as follows (Figure 501):
- (a) Make sure that there is between 100 lb (45 kg) - 4100 lb (1860 kg) of fuel in the No. 1 fuel tank.
NOTE: This makes sure that the fuel level is below the fuel scavenge float valve and above the forward boost pump inlet.
 - (b) Make sure that there is between 500 lb (227 kg) - 6800 lb (3084 kg) of fuel in the center fuel tank.
NOTE: This step makes sure there is sufficient fuel in the center tank to scavenge. This step also makes sure that the scavenge fuel flow rate is not increased because of the head pressure of a large quantity of fuel in the center tank.
 - (c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.
 - (d) To defuel the fuel tanks (if it is necessary), do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

F. Test of the Fuel Scavenge System

SUBTASK 28-22-00-860-082



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-00-860-034

- (2) Do these steps to operate the fuel scavenge system:
 - (a) On the P5 Overhead Panel, make sure that the LOW PRESSURE light for the FUEL PUMP TANK 1 - FWD switch is on.
 - (b) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the ON position (Figure 501).
 - (c) Make sure that the LOW PRESSURE light for the FUEL PUMP TANK 1 - FWD switch goes off within 90 seconds after you set the FUEL PUMP TANK 1 - FWD switch to the ON position.
 - (d) Operate the pump for a maximum of 30 minutes to get a minimum fuel transfer of 110 lb (50 kg).
 - (e) Make sure that the No. 1 tank fuel quantity increases by a minimum of 110 lb (50 kg) within 30 minutes.
 - (f) Make sure that the center tank fuel quantity decreases by a minimum of 110 lb (50 kg) within 30 minutes.

SUBTASK 28-22-00-860-035

- (3) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the OFF position.

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SUBTASK 28-22-00-650-004

- (4) Refuel the No. 1 fuel tank with 6000 lb (2722 kg) of fuel (TASK 12-11-00-650-802).

NOTE: This step closes the fuel scavenge float valve.

SUBTASK 28-22-00-860-036

- (5) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-860-037

- (6) Let the pumps operate for 30 minutes.

- (a) Make sure that the No. 1 tank fuel quantity does not increase.
(b) Make sure that the center tank fuel quantity does not decrease.

SUBTASK 28-22-00-860-038

- (7) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to the OFF position.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-650-005

- (1) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

————— END OF TASK ————

TASK 28-22-00-720-803

8. Fuel Boost Pump Output Pressure Test

A. General

- (1) This procedure does a check of the output pressure of each of the boost pumps for the center tank, the No. 1 tank, and the No. 2 tank. The boost pumps for the center tank are also called "override pumps". The output pressure is measured at the fuel filter drain of one of the engines. If a pump does not supply a minimum output pressure, that pump could have a problem. Also, if one of the No. 1 or No. 2 tank boost pumps has more than a maximum pressure, that pump could have a problem. This procedure also makes sure that the spar valves close and do not leak.

B. References

Reference	Title
28-22-11 P/B 401	SPAR VALVE - REMOVAL/INSTALLATION
71-00-00-700-801-F00	Test 3A - Idle-Power Leak Check (P/B 501)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-11-02-000-801-F00	Fuel Filter - Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1224	Hose - Fluid Drain, No.6 Braided Hose with 0.5625-18 Threaded Nuts (For Fluid Drain Tap Connections)
STD-11739	Gauge - Pressure - 0-50 psig +/- 1% accuracy with hose and fittings

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
D00601 [CP2101]	Vaseline - Graphite Mineral	

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E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Test Preparation

SUBTASK 28-22-00-530-001

- (1) Prepare the pressure gauge, STD-11739, the shutoff valve, and the No. 6 braided fluid drain hose, STD-1224, for the test (Figure 507).

SUBTASK 28-22-00-860-052

- (2) Make sure that the APU is not operating.

SUBTASK 28-22-00-860-053

- (3) Make sure that there is a minimum of 1000 lb (454 kg) of fuel in the No. 1 tank, a minimum of 1000 lb (454 kg) of fuel in the No. 2 tank, and a minimum of 15,000 lb (6804 kg) of fuel in the center tank.

SUBTASK 28-22-00-860-054

- (4) Make sure that the engine start switches and the boost pump switches are in the OFF position.

LOM 429-432

- (a) For the engine start switches, the AUTO position is OFF.

LOM ALL

SUBTASK 28-22-00-860-148

- (5) Make sure that the APU is commanded off and the engine start levers are in the CUTOFF position.

SUBTASK 28-22-00-860-135

- (6) Make sure that the fuel crossfeed valve switch, on the P5 Overhead Panel, is in the CLOSED position.

SUBTASK 28-22-00-860-186

- (7) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-00-010-020

- (8) To get access to the P91 and P92 panel, open this access panel:

Number **Name/Location**

117A	Electronic Equipment Access Door
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SUBTASK 28-22-00-860-136



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (9) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-22-00-410-013

- (10) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

H. Test Procedure

SUBTASK 28-22-00-010-006

- (1) Open the left fan cowl at one of the engines.

SUBTASK 28-22-00-020-001

- (2) Do these steps to remove the fuel filter drain plug and drain the fuel supply line (Figure 506):
(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the engine fuel filter housing drain plug.
(b) Remove the drain plug from the fuel filter housing (TASK 73-11-02-000-801-F00).
1) Discard the O-ring.

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- (c) Let the fuel drain completely.

NOTE: If the fuel continues to drain after approximately 5 gal (19 l) has drained, re-install the drain plug to stop the fuel flow. It is possible that the engine fuel spar valve is open because of a damaged adapter shaft or valve body. Refer to SPAR VALVE - REMOVAL/INSTALLATION, PAGEBLOCK 28-22-11/401, to replace the adapter shaft or valve body before you continue with this task.

- (d) Monitor the fuel leakage from the fuel inlet line until the drops per minute is constant.
(e) Make a written record of the drops per minute.

SUBTASK 28-22-00-860-134

- (3) Do these steps to do a check of the engine fuel spar valve:

NOTE: This check makes sure the spar valve closes correctly.



WARNING
DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
1) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes ON and stays ON.
(b) Set the applicable pump switch, on the P5 Overhead Panel, to the ON position.
1) FUEL PUMP TANK 1 - AFT
2) FUEL PUMP TANK 2 - AFT
(c) Make sure that the rate of fuel drops per minute, that leak from the fuel inlet line, does not increase.

NOTE: If the rate of fuel drops per minute increases from the fuel inlet line, then it is possible that the engine fuel spar valve is open because of a damaged adapter shaft or valve body. Refer to SPAR VALVE - REMOVAL/INSTALLATION, PAGEBLOCK 28-22-11/401, to replace the applicable adapter shaft or valve body before you continue with this task.

- (d) Set the applicable pump switch, on the P5 Overhead Panel, to the OFF position.
1) FUEL PUMP TANK 1 - AFT
2) FUEL PUMP TANK 2 - AFT

SUBTASK 28-22-00-480-007

- (4) Attach the No. 6 braided fluid drain hose, STD-1224, at the fuel filter housing.

NOTE: Use a .5625-18 UNJF or .5625-18 UNF fitting.

SUBTASK 28-22-00-860-056

- (5) Open the airplane fuel crossfeed valve.

SUBTASK 28-22-00-860-149

- (6) Set the applicable engine start lever on the control stand to the IDLE position.

SUBTASK 28-22-00-720-002

- (7) Do these steps for each of the fuel boost pumps in the main tanks and override pumps in the center tank (six pump locations):

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- (a) Make sure that only one boost pump or override pump is turned ON each time you do these steps.
NOTE: Do not try to test more than one boost pump at a time.
- (b) Open the bleed valve on the pressure gauge, STD-11739, until fuel comes out of the drain valve.
- (c) Close the bleed valve.
- (d) Record the pressure shown on the pressure gage as the "Pump OFF" pressure.



DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - 1) Immediately set the applicable fuel pump switch to OFF if the LOW PRESSURE light comes ON and stays ON.
- (f) Push the applicable boost pump switch to the ON position.
- (g) Open the bleed valve on the pressure gage hose and drain fuel for approximately 10 seconds.
- (h) Close the bleed valve.
- (i) After approximately 20 seconds, examine the gage to see if the pressure has become stable.
- (j) Record the pressure shown on the pressure gage as the "Pump ON" pressure.
- (k) Push the applicable boost pump switch to the OFF position.
- (l) Open the bleed valve on the pressure gage hose to release the pressure in the fuel line.

I. Calculate the Boost Pump Output Pressure

SUBTASK 28-22-00-970-002

- (1) To find the output pressure for one of the boost pumps or override pumps, subtract the "Pump OFF" pressure from the "Pump ON" pressure that you measured for that pump.

SUBTASK 28-22-00-970-003



MAKE SURE THAT YOU REPLACE A FUEL BOOST PUMP OR AN OVERRIDE PUMP WITH LOW OUTPUT PRESSURE. LOW BOOST PUMP PRESSURE CAN CAUSE PROBLEMS WITH THE ENGINE IN-FLIGHT. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

- (2) Do these steps for a main tank (No. 1 or No. 2 tank) boost pump:
 - (a) If the difference between the "Pump ON" pressure and the "Pump OFF" pressure is less than 12 psig (83 kPa), then replace that main tank boost pump.
 - (b) If the difference between the "Pump ON" pressure and the "Pump OFF" pressure is more than 24 psig (165 kPa), then replace that main tank boost pump.

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SUBTASK 28-22-00-970-004



WARNING

MAKE SURE THAT YOU REPLACE A FUEL BOOST PUMP OR AN OVERRIDE PUMP WITH LOW OUTPUT PRESSURE. LOW BOOST PUMP PRESSURE CAN CAUSE PROBLEMS WITH THE ENGINE IN-FLIGHT. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

- (3) Do this step for an override pump (center tank boost pump):

- (a) If the difference between the "Pump ON" pressure and the "Pump OFF" pressure is less than 28 psig (193 kPa), then replace that override pump (center tank boost pump).

J. Put the Airplane Back To Its Usual Condition

SUBTASK 28-22-00-860-058

- (1) When you have done the test on all six boost pumps (including the two override pumps for the center tank), make sure that all six fuel pump switches are set to OFF.

SUBTASK 28-22-00-860-150

- (2) Set the applicable engine start lever on the control stand to the CUTOFF position.

SUBTASK 28-22-00-860-060

- (3) Close the airplane fuel crossfeed valve.

SUBTASK 28-22-00-080-005

- (4) Remove the pressure hose fitting from the engine fuel filter housing.

NOTE: Fuel will drain from the opening. Make sure that the drain plug is prepared for installation to keep fuel leakage to a minimum.

SUBTASK 28-22-00-420-001

- (5) Do these steps to install the fuel filter drain plug (Figure 506):

- (a) Lubricate a new o-ring with grease, D00504, and install it on the drain plug.
(b) Lubricate the threads of the drain plug with graphite mineral vaseline, D00601 [CP2101].
(c) Install the drain plug.
(d) Tighten the drain plug to 50 ± 5 in-lb (6 ± 1 N·m).
(e) Attach a lockwire to the drain plug.

SUBTASK 28-22-00-790-001

- (6) Do this task: Test 3A - Idle-Power Leak Check, TASK 71-00-00-700-801-F00.

SUBTASK 28-22-00-940-002

- (7) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

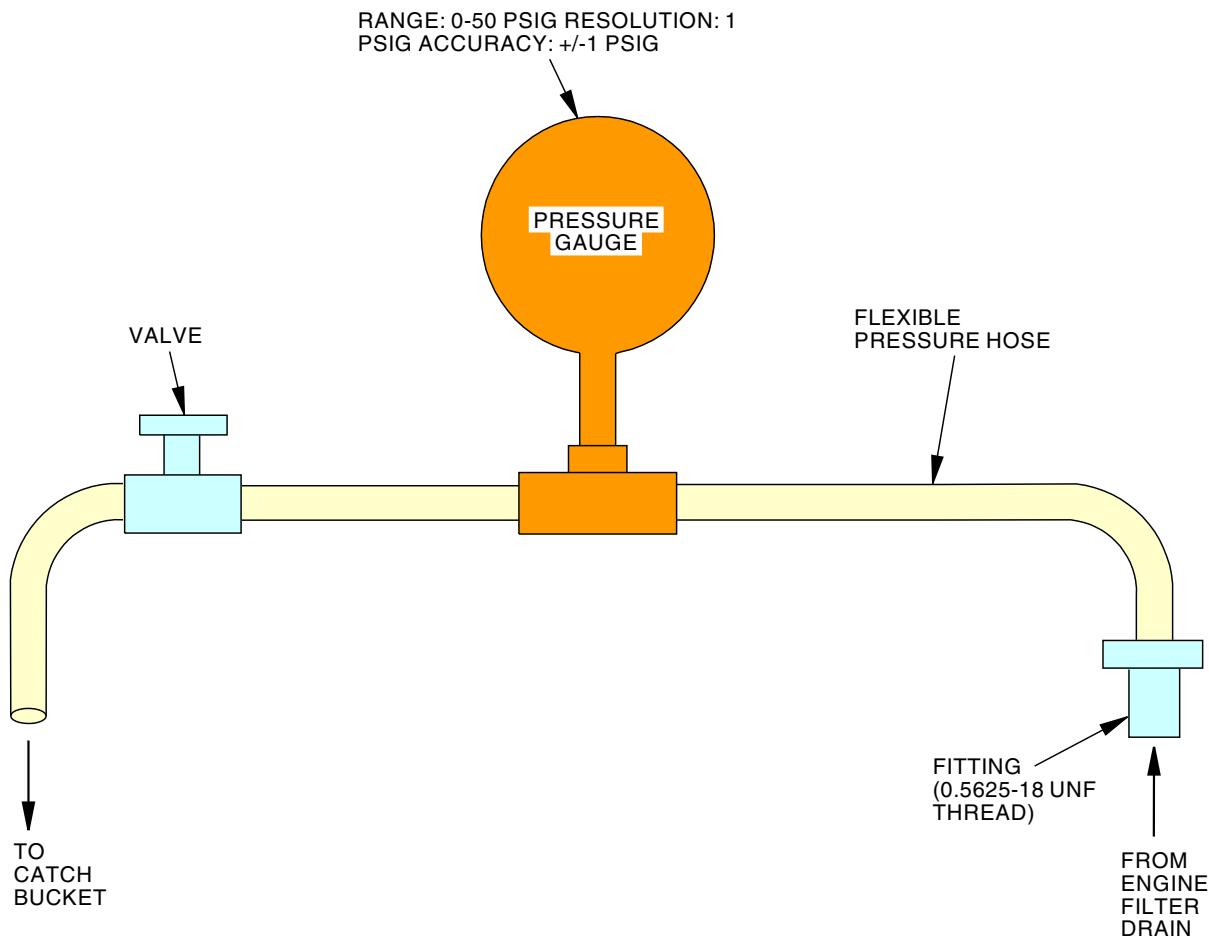
———— END OF TASK ————

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Fuel Boost Pump Output Pressure Test - Required Equipment
Figure 507/28-22-00-990-825

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-22-00-720-805

9. Center Tank Boost Pump Auto Shutoff Functional Test

(Figure 501, Figure 508)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

- (2) If it is not possible to do the Auto Shutoff and/or Master Caution Functional Test with APU power, do these procedures:
- (a) Alternative Auto Shutoff Functional Test for the Left Center Boost Pump
 - (b) Alternative Auto Shutoff Functional Test for the Right Center Boost Pump
 - (c) Alternative Master Caution Functional Test for the Center Tank Boost Pumps Auto Shutoff.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-813	Supply External Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Tools/Equipment

Reference	Description
STD-836	Stopwatch

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Functional Test

SUBTASK 28-22-00-860-187

- (1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	12	C00132	MASTER CAUTION ANNUNCIATOR BUS 1
B	13	C00131	MASTER CAUTION ANNUNCIATOR BAT
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC

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(Continued)

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-22-00-010-022

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-865-001



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-040-001

- (4) If the Mode Select Unit (MSU) 'ON DC' light is on, do this step:

- (a) Make sure that the MSU switches for the left and right Inertial Reference System (IRS) are set to the OFF position.

NOTE: This step makes sure that the crew call horn will not come on when the airplane is on battery power.

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SUBTASK 28-22-00-860-085

- (5) Make sure that the FUEL PUMP CTR TANK - LEFT and FUEL PUMP CTR TANK - RIGHT switches, on the P5 Overhead Panel, are in the OFF position.

NOTE: This will reset the auto shutoff circuit.

SUBTASK 28-22-00-651-001

- (6) Make sure that there is a minimum of 2000 lb (907 kg) of fuel in the center fuel tank.
(a) If it is necessary, refuel the fuel tank, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

G. Auto Shutoff Functional Test for the Left Center Boost Pump

NOTE: This test requires APU power. If you do this test for the left center boost pump, you do not have to do the Alternative Auto Shutoff Functional Test for the Left Center Boost Pump.

NOTE: The Crew Call Horn may trigger when the battery charger is de-energized.

SUBTASK 28-22-00-860-131

- (1) If the APU is not operating, do this task: APU Starting and Operation, TASK 49-11-00-860-801.

SUBTASK 28-22-00-720-032

- (2) Put the GRD PWR switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-033

- (3) Put the APU GEN (left) switch, on the P5 Overhead Panel, to the ON position.
(a) Make sure that the APU GEN (right) switch is in the OFF position.

SUBTASK 28-22-00-720-034

- (4) Put the BUS TRANS switch, on the P5 Overhead Panel, to the OFF position.
(a) Make sure that the 1 TRANSFER BUS OFF light is off.
(b) Make sure that the 2 TRANSFER BUS OFF light is on.

SUBTASK 28-22-00-720-003

► 28-AWL-19: ALI

- (5) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-005

- (6) On the P61-8 Fuel Test Panel, do these steps:

- (a) Lift the switch guard.
(b) Push and hold the left toggle switch to the L FUEL TEST AUTO SHUTOFF position for 5 seconds and then release the toggle switch.
(c) Make sure that the LOW PRESSURE light stays off for the left center fuel boost pump.

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SUBTASK 28-22-00-720-006

- (7) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, stays off.

SUBTASK 28-22-00-720-007

► 28-AWL-19: ALI

- (8) Start a stopwatch, STD-836, as you push and hold the test switch, S1, on the P61-8 panel, to the L AUTO SHUTOFF position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-008

► 28-AWL-19: ALI

- (9) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch comes on, stop the stopwatch, STD-836, and release the test switch, S1, on the P61-8 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the stopwatch, STD-836, shows 15 ± 2 seconds.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-009

► 28-AWL-19: ALI

- (10) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, stays on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-280-003

► 28-AWL-19: ALI

- (11) Listen and make sure that the left center boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-011

- (12) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-036

- (13) Put the APU GEN (right) switch, on the P5 Overhead Panel, to the ON position.

- (a) Make sure that the 2 TRANSFER BUS OFF light is off.
(b) Make sure that the 1 TRANSFER BUS OFF light is off.

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SUBTASK 28-22-00-720-035

- (14) Put the BUS TRANS switch, on the P5 Overhead Panel, to the AUTO position.
 - (a) Make sure that the 2 TRANSFER BUS OFF light is off.
 - (b) Make sure that the 1 TRANSFER BUS OFF light is off.

SUBTASK 28-22-00-720-052

- (15) Put the APU GEN (right) switch, on the P5 Overhead Position, to the OFF position.

SUBTASK 28-22-00-720-053

- (16) Put the APU GEN (left) switch, on the P5 Overhead Position, to the OFF position.

SUBTASK 28-22-00-860-178

- (17) On the P61-8 Fuel Test Panel, close the guard of the test switch to the L/R AUTO SHUTOFF position.

H. Alternative Auto Shutoff Functional Test for the Left Center Boost Pump

NOTE: This test requires ground power. If you do this test for the left center boost pump, you do not have to do the Auto Shutoff Functional Test for the Left Center Boost Pump.

SUBTASK 28-22-00-860-151

- (1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 28-22-00-720-037

- (2) Put the GRD PWR switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-860-125



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
F	5	C03002	XFR BUS 1 SECT 2
F	6	C00815	MAIN BUS 1

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SUBTASK 28-22-00-860-126



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

SUBTASK 28-22-00-720-057

► 28-AWL-19: ALI

- (5) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-059

- (6) On the P61-8 Fuel Test Panel, do these steps:

(a) Lift the switch guard.

(b) Push and hold the left toggle switch to the L FUEL TEST AUTO SHUTOFF position for 5 seconds and then release the toggle switch.

(c) Make sure that the LOW PRESSURE light stays off for the left center fuel boost pump.

SUBTASK 28-22-00-720-060

- (7) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, stays off.

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SUBTASK 28-22-00-720-061

► 28-AWL-19: ALI

- (8) Start a stopwatch, STD-836, as you push and hold the test switch, S1, on the P61-8 panel, to the L AUTO SHUTOFF position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-062

► 28-AWL-19: ALI

- (9) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch comes on, stop the stopwatch, STD-836, and release the test switch, S1, on the P61-8 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the stopwatch, STD-836, shows 15 ± 2 seconds.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-063

► 28-AWL-19: ALI

- (10) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, stays on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-280-006

► 28-AWL-19: ALI

- (11) Listen and make sure that the left center boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-065

- (12) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-038

- (13) Put the GRD PWR switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-860-181

- (14) On the P61-8 Fuel Test Panel, close the guard of the test switch to the L/R AUTO SHUTOFF position.

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SUBTASK 28-22-00-860-127



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (15) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

I. Auto Shutoff Functional Test for the Right Center Boost Pump

NOTE: This test requires APU power. If you do this test for the right center boost pump, you do not have to do the Alternative Auto Shutoff Functional Test for the Right Center Boost Pump.

SUBTASK 28-22-00-860-132

- (1) If the APU is not operating, do this task: APU Starting and Operation, TASK 49-11-00-860-801.

SUBTASK 28-22-00-720-084

- (2) Put the GRD PWR switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-039

- (3) Put the APU GEN (right) switch, on the P5 Overhead Panel, to the ON position.

- (a) Make sure that the APU GEN (left) switch is in the OFF position.

SUBTASK 28-22-00-720-040

- (4) Put the BUS TRANS switch, on the P5 Overhead Panel, to the OFF position.

- (a) Make sure that the 1 TRANSFER BUS OFF light is on.

- (b) Make sure that the 2 TRANSFER BUS OFF light is off.

SUBTASK 28-22-00-720-012

► 28-AWL-19: ALI

- (5) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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► 28-AWL-19: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the right fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-014

- (6) On the P61-8 Fuel Test Panel, do these steps:

- Lift the right switch guard.
- Push and hold the right toggle switch to the R FUEL TEST AUTO SHUTOFF position for 5 seconds and then release the toggle switch.
- Make sure that the LOW PRESSURE light stays off for the right center fuel boost pump.

SUBTASK 28-22-00-720-015

- (7) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, stays off.

SUBTASK 28-22-00-720-016

► 28-AWL-19: ALI

- (8) Start a stopwatch, STD-836, as you push and hold the test switch, S2, on the P61-8 panel, in the R AUTO SHUTOFF position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-017

► 28-AWL-19: ALI

- (9) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch comes on, stop the stopwatch, STD-836, and release the test switch, S2, on the P61-8 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the stopwatch, STD-836, shows 15 ± 2 seconds.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-018

► 28-AWL-19: ALI

- (10) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, stays on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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SUBTASK 28-22-00-280-004

28-AWL-19: ALI

- (11) Listen and make sure that the right center boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-020

- (12) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-054

- (13) Put the APU GEN (left) switch, on the P5 Overhead Panel, to the ON position.

- Make sure that the 2 TRANSFER BUS OFF light is off.
- Make sure that the 1 TRANSFER BUS OFF light is off.

SUBTASK 28-22-00-720-041

- (14) Put the BUS TRANS switch, on the P5 Overhead Panel, to the AUTO position.

- Make sure that the 1 TRANS BUS OFF light is off.
- Make sure that the 2 TRANS BUS OFF light is off.

SUBTASK 28-22-00-720-055

- (15) Put the APU GEN (right) switch, on the P5 Overhead Position, to the OFF position.

SUBTASK 28-22-00-720-056

- (16) Put the APU GEN (left) switch, on the P5 Overhead Position, to the OFF position.

SUBTASK 28-22-00-860-179

- (17) On the P61-8 Fuel Test Panel, close the guard of the test switch to the L/R AUTO SHUTOFF position.

J. Alternative Auto Shutoff Functional Test for the Right Center Boost Pump

NOTE: This test requires ground power. If you do this test for the right center boost pump, you do not have to do the Auto Shutoff Functional Test for the Right Center Boost Pump.

SUBTASK 28-22-00-860-152

- (1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 28-22-00-720-043

- (2) Put the GRD PWR switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-860-128



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

SUBTASK 28-22-00-860-129



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03002	XFR BUS 1 SECT 2
F	6	C00815	MAIN BUS 1

SUBTASK 28-22-00-720-066

► 28-AWL-19: ALI

- (5) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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► 28-AWL-19: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the right center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-068

- (6) On the P61-8 Fuel Test Panel, do these steps:

- Lift the right switch guard.
- Push and hold the right toggle switch to the R FUEL TEST AUTO SHUTOFF position for 5 seconds and then release the toggle switch.
- Make sure that the LOW PRESSURE light stays off for the right center fuel boost pump.

SUBTASK 28-22-00-720-069

- (7) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, stays off.

SUBTASK 28-22-00-720-070

► 28-AWL-19: ALI

- (8) Start a stopwatch, STD-836, as you push and hold the test switch, S2, on the P61-8 panel, in the R AUTO SHUTOFF position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-071

► 28-AWL-19: ALI

- (9) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch comes on, stop the stopwatch, STD-836, and release the test switch, S2, on the P61-8 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

► 28-AWL-19: ALI

- (a) Make sure that the stopwatch, STD-836, shows 15 ± 2 seconds.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-072

► 28-AWL-19: ALI

- (10) Make sure that the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, stays on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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SUBTASK 28-22-00-280-007

28-AWL-19: ALI

- (11) Listen and make sure that the right center boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-00-720-074

- (12) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-044

- (13) Put the GRD PWR switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-860-180

- (14) On the P61-8 Fuel Test Panel, close the guard of the test switch to the L/R AUTO SHUTOFF position.

SUBTASK 28-22-00-860-130



WARNING
WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING
DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (15) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
F	5	C03002	XFR BUS 1 SECT 2
F	6	C00815	MAIN BUS 1

K. Master Caution Functional Test for the Center Tank Boost Pumps Auto Shutoff

NOTE: This test requires APU power. If you do this test for the center boost pumps, you do not have to do the Alternative Master Caution Functional Test for the Center Tank Boost Pumps Auto Shutoff.

SUBTASK 28-22-00-720-045

- (1) Put the APU GEN (left) switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-720-046

- (2) Put the APU GEN (right) switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-720-047

- (3) Put the BUS TRANS switch, on the P5 Overhead Panel, to the OFF position.

- (a) Make sure that the 1 TRANSFER BUS OFF light is off.

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- (b) Make sure that the 2 TRANSFER BUS OFF light is off.

SUBTASK 28-22-00-720-021

- (4) Put the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-720-022

- (5) Make sure that the amber LOW PRESSURE lights go on briefly and then off for the FUEL PUMP CTR TANK - LEFT and RIGHT switches.

SUBTASK 28-22-00-720-026

- (6) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.

- (a) Make sure that the two MASTER CAUTION lights (right and left) are off.

- (b) Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-023

- (7) For the left center boost pump, do these steps:

- (a) Set the stopwatch, STD-836, to zero.

- (b) Push and hold the test switch, S1, on the P61-8 Fuel Test Panel, to the L AUTO SHUTOFF position.

- (c) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch comes on, start the stopwatch, STD-836, and release the test switch, S1, on the P61-8 panel.

- (d) When the MASTER CAUTION and FUEL annunciator lights, on the MASTER CAUTION panel, come on, stop the stopwatch, STD-836.

- (e) Make sure that the stopwatch, STD-836, shows 10 ± 2 seconds.

- (f) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the OFF position and then to the ON position.

- (g) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, are off.

- (h) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.

- 1) Make sure that the two MASTER CAUTION lights (right and left) are off.

- 2) Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-024

- (8) For the right center boost pump, do these steps:

- (a) Set the stopwatch, STD-836, to zero.

- (b) Push and hold the test switch, S2, on the P61-8 Fuel Test Panel, to the R AUTO SHUTOFF position.

- (c) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch comes on, start the stopwatch, STD-836, and release the test switch, S2, on the P61-8 panel.

- (d) When the MASTER CAUTION and FUEL annunciator lights, on the MASTER CAUTION panel, come on, stop the stopwatch, STD-836.

- (e) Make sure that the stopwatch, STD-836, shows 10 ± 2 seconds.

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- (f) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the OFF position and then to the ON position.
- (g) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, are off.
- (h) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.
 - 1) Make sure that the two MASTER CAUTION lights (right and left) are off.
 - 2) Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-025

- (9) Put the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-280-005

- (10) Listen and make sure that the left and right center boost pumps do not operate.

SUBTASK 28-22-00-720-048

- (11) Put the BUS TRANS switch, on the P5 Overhead Panel, to the AUTO position.
 - (a) Make sure that the 1 TRANS BUS OFF light is off.
 - (b) Make sure that the 2 TRANS BUS OFF light is off.

SUBTASK 28-22-00-720-049

- (12) Put the APU GEN (left) switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-050

- (13) Put the APU GEN (right) switch, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-051

- (14) Put the GRD PWR switch, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-860-114

- (15) If the APU is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

L. Alternative Master Caution Functional Test for the Center Tank Boost Pumps Auto Shutoff

NOTE: This test requires ground power. If you do this test for the center tank boost pumps, you do not have to do the Master Caution Functional Test for the Center Tank Boost Pumps Auto Shutoff.

SUBTASK 28-22-00-860-153

- (1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 28-22-00-720-076

- (2) Make sure that the GRD PWR switch, on the P5 Overhead Panel, is in the ON position.

SUBTASK 28-22-00-860-133



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03002	XFR BUS 1 SECT 2
F	6	C00815	MAIN BUS 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

SUBTASK 28-22-00-410-014

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 28-22-00-720-077

- (5) Put the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, to the ON position.

SUBTASK 28-22-00-720-078

- (6) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, are off.

SUBTASK 28-22-00-720-079

- (7) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.

- Make sure that the two MASTER CAUTION lights (right and left) are off.
- Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-080

- (8) For the left center boost pump, do these steps:

- Set the stopwatch, STD-836, to zero.
- Push and hold the test switch, S1, on the P61-8 Fuel Test Panel, to the LAUTO SHUTOFF position.
- When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, comes on (in approximately 15 seconds), start the stopwatch, STD-836, and release the test switch, S1, on the P61-8 panel.
- When the MASTER CAUTION and FUEL annunciator lights, on the MASTER CAUTION panel, come on, stop the stopwatch, STD-836.
- Make sure that the stopwatch, STD-836, shows 10 ± 2 seconds.

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- (f) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the OFF position and then to the ON position.
- (g) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, are off.
- (h) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.
 - 1) Make sure that the two MASTER CAUTION lights (right and left) are off.
 - 2) Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-081

- (9) For the right center boost pump, do these steps:
 - (a) Set the stopwatch, STD-836, to zero.
 - (b) Push and hold the test switch, S2, on the P61-8 Fuel Test Panel, to the R AUTO SHUTOFF position.
 - (c) When the amber LOW PRESSURE light for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, comes on (in approximately 15 seconds), start the stopwatch, STD-836, and release the test switch, S2, on the P61-8 panel.
 - (d) When the MASTER CAUTION and FUEL annunciator lights, on the MASTER CAUTION panel, come on, stop the stopwatch, STD-836.
 - (e) Make sure that the stopwatch, STD-836, shows 10 ± 2 seconds.
 - (f) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 Overhead Panel, to the OFF position and then to the ON position.
 - (g) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, are off.
 - (h) Push the MASTER CAUTION light on the right Master Caution panel to reset the Master Caution panel.
 - 1) Make sure that the two MASTER CAUTION lights (right and left) are off.
 - 2) Make sure that the FUEL annunciator light on the left Master Caution panel is off.

SUBTASK 28-22-00-720-082

- (10) Put the FUEL PUMP CTR TANK - LEFT and RIGHT switches, on the P5 Overhead Panel, to the OFF position.

SUBTASK 28-22-00-720-083

- (11) Listen and make sure that the left and right center boost pumps do not operate.

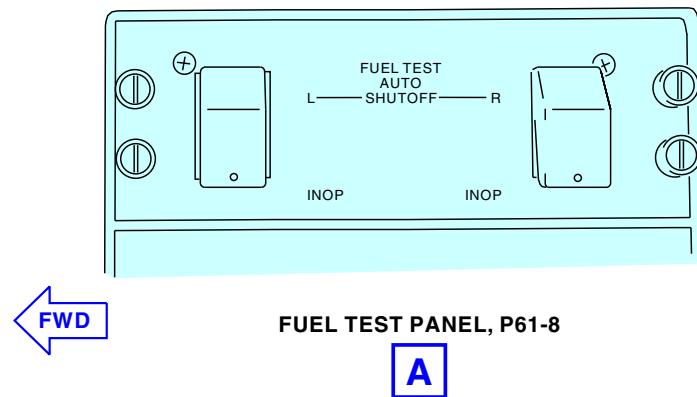
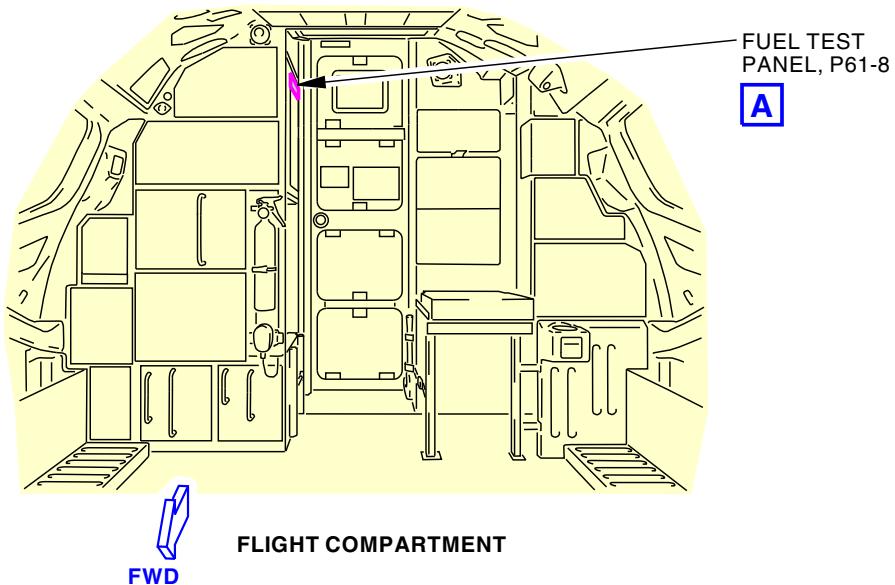
———— END OF TASK ————

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Fuel Test Panel, P61-8
Figure 508/28-22-00-990-822

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TASK 28-22-00-710-802

10. Engine Fuel Suction Feed - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-805-F00	Engine Ground Safety Precautions (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)
FIM 28-22 TASK 819	Engine Fuel Suction Feed Operational Test Failed - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 28-22-00-710-011

- (1) For the Engine No. 1, do these steps:

28-AWL-101: ALI

- (a) Make sure that these quantities of fuel are in the fuel tanks:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

Table 511/28-22-00-993-824

Tank	Fuel Quantity
Center Tank	0 lb (0 kg) - 3000 lb (1360 kg)
Main Tank No. 1	1870 lb (850 kg) - 2080 lb (940 kg)

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: Unwanted fuel can be transferred to Main Tank No. 2.

- 1) To add fuel to one or more tanks, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.
- 2) To remove fuel from one or more tanks, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

28-AWL-101: ALI

- (b) Put the CROSSFEED valve switch, on the P5 Overhead Panel, to the closed position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

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WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - 1) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.
- (d) Put these switches on the P5 Overhead Fuel Panel to the ON position:
 - 1) FUEL PUMP TANK 1 - AFT
 - 2) FUEL PUMP TANK 1 - FWD



WARNING

OBSERVE PROPER SAFETY PRECAUTIONS AROUND RUNNING ENGINE. WEAR EAR PROTECTORS AND STAY CLEAR OF ENGINE HAZARD AREAS. SEE "ENGINE GROUND SAFETY PRECAUTIONS" FOR ENGINE HAZARD DESCRIPTION.

- (e) Do these steps to do the test:
 - 1) Obey all the safety precautions around the running engines (TASK 71-00-00-800-805-F00).
 - 2) Start the Engine No. 1 (TASK 71-00-00-800-807-F00).
 - a) If you use the APU to start the engine, make sure that the fuel tank quantities align with Table 511.
 - 3) Set the electrical power source to the engine generators.

28-AWL-101: ALI

- 4) Put the APU master switch on the P5 Forward Overhead Panel to the OFF position.
NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

- 5) Let the engine operate at idle power, with the boost pumps ON for a minimum of two minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: It is recommended to operate the engines for five minutes.

- 6) Make a record of the initial engine parameters (N1, N2, and fuel flow).
 - a) Initial Values: N1 _____ N2 _____ Fuel Flow _____
NOTE: Record the initial values after you operate the engine at idle power for a minimum of two minutes.

28-AWL-101: ALI

- 7) Put these switches on the P5 Overhead Panel to the OFF position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

- a) FUEL PUMP TANK 1 - AFT

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

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► 28-AWL-101: ALI

- b) FUEL PUMP TANK 1 - FWD

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

► 28-AWL-101: ALI

- 8) Make sure that the Engine No. 1 continues to operate for a minimum of 5 minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

- 9) Make a record of the final engine parameters (N1, N2, and fuel flow).

- a) Final Values: N1 _____ N2 _____ Fuel Flow _____

NOTE: Record the final values after you operate the engine for a minimum of five minutes.

► 28-AWL-101: ALI

- 10) Make sure that the final engine parameters did not decay compared to the initial engine parameters.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: This also means that the variation in the final engine parameters is almost the same as the variation in the initial engine parameters.

- (f) Put these switches on the P5 Overhead Fuel Panel to the ON position:

- 1) FUEL PUMP TANK 1 - AFT

- 2) FUEL PUMP TANK 1 - FWD

- (g) Shut down the Engine No. 1 (TASK 71-00-00-700-819-F00).

- (h) If the engine parameters decayed and the test failed, do this task: FIM 28-22 TASK 819, and then do this task again.

SUBTASK 28-22-00-710-013

- (2) For the Engine No. 2, do these steps:

► 28-AWL-101: ALI

- (a) Make sure that these quantities of fuel are in the fuel tanks:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

Table 512/28-22-00-993-827

Tank	Fuel Quantity
Center Tank	0 lb (0 kg) - 3000 lb (1360 kg)
Main Tank No. 2	1870 lb (850 kg) - 2080 lb (940 kg)

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: Unwanted fuel can be transferred to Main Tank No. 1.

- 1) To add fuel to one or more tanks, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

- 2) To remove fuel from one or more tanks, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

► 28-AWL-101: ALI

- (b) Put the CROSSFEED valve switch, on the P5 Overhead Panel, to the closed position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

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WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - 1) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.
- (d) Put these switches on the P5 Overhead Fuel Panel to the ON position:
 - 1) FUEL PUMP TANK 2 - AFT
 - 2) FUEL PUMP TANK 2 - FWD



WARNING

OBSERVE PROPER SAFETY PRECAUTIONS AROUND RUNNING ENGINE. WEAR EAR PROTECTORS AND STAY CLEAR OF ENGINE HAZARD AREAS. SEE "ENGINE GROUND SAFETY PRECAUTIONS" FOR ENGINE HAZARD DESCRIPTION.

- (e) Do these steps to do the test:
 - 1) Obey all the safety precautions around the running engines (TASK 71-00-00-800-805-F00).
 - 2) Start the Engine No. 2 (TASK 71-00-00-800-807-F00).
 - a) If you use the APU to start the engine, make sure that the fuel tank quantities align with Table 512.
 - 3) Set the electrical power source to the engine generators.



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- 4) Put the APU master switch on the P5 Forward Overhead Panel to the OFF position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.



28-AWL-101: ALI

- 5) Let the engine operate at idle power, with the boost pumps ON for a minimum of two minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: It is recommended to operate the engines for five minutes.

- 6) Make a record of the initial engine parameters (N1, N2, and fuel flow).

- a) Initial Values: N1 _____ N2 _____ Fuel Flow _____

NOTE: Record the initial values after you operate the engine at idle power for a minimum of two minutes.



28-AWL-101: ALI

- 7) Put these switches on the P5 Overhead Panel to the OFF position:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.



- a) FUEL PUMP TANK 2 - AFT

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

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- b) FUEL PUMP TANK 2 - FWD

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

- 8) Make sure that the Engine No. 2 continues to operate for a minimum of 5 minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

- 9) Make a record of the final engine parameters (N1, N2, and fuel flow).

- a) Final Values: N1 _____ N2 _____ Fuel Flow _____

NOTE: Record the final values after you operate the engine for a minimum of five minutes.

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- 10) Make sure that the final engine parameters did not decay compared to the initial engine parameters.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: This also means that the variation in the final engine parameters is almost the same as the variation in the initial engine parameters.

- (f) Put these switches on the P5 Overhead Fuel Panel to the ON position:

- 1) FUEL PUMP TANK 2 - AFT
- 2) FUEL PUMP TANK 2 - FWD

- (g) Shut down the Engine No. 2 (TASK 71-00-00-700-819-F00).

- (h) If the engine parameters decayed and the test failed, do this task: FIM 28-22 TASK 819, and then do this task again.

— END OF TASK —

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248

TASK 28-22-00-720-806

11. Center Tank Fuel Boost Pump Power Failed On - Functional Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

- (2) Make sure maintenance personnel follow precautions in SWPM 20-00-08 during test.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
SWPM 20-00-08	Protection During Maintenance

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(Continued)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1322	Multimeter (Analog / Digital with sufficient internal voltage to measure long cable distances) Part #: 117 Supplier: 89536 Part #: 260-8XPI Supplier: 55026 Part #: FLUKE 289 Supplier: 89536 Opt Part #: MODEL 8 MK7 Supplier: 00426
COM-14383	Probe - Multimeter, Insulated, Slim Reach Part #: TP38 Supplier: 3S701

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Test



MAKE SURE THAT YOU ARE CAREFUL WHEN YOU MEASURE VOLTAGE.
ELECTRICAL POWER CAN CAUSE INJURIES.

WARNING

SUBTASK 28-22-00-760-059

- (1) If necessary, supply electrical power (TASK 24-22-00-860-811).

SUBTASK 28-22-00-860-091

- (2) Make sure the fuel tanks contain the subsequent quantities of fuel:

Tank	Fuel Quantity
Center Tank	Minimum of 3000 lbs (1364 kgs)
No. 1 Tank	0-7000 lbs (0-3182 kgs)
No. 2 Tank	0-7000 lbs (0-3182 kgs)

- (a) If it is necessary to refuel the fuel tanks, do this task: TASK 12-11-00-650-802.

SUBTASK 28-22-00-860-092

- (3) Make sure the boost pump switches are in the OFF position (Table 513):

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LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248
(Continued)

Table 513/28-22-00-993-821

SWITCH/CONTROL	POSITION	LOCATION
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL

SUBTASK 28-22-00-860-188

- (4) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

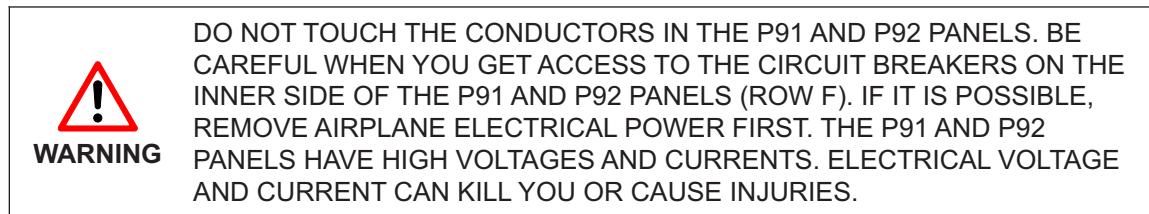
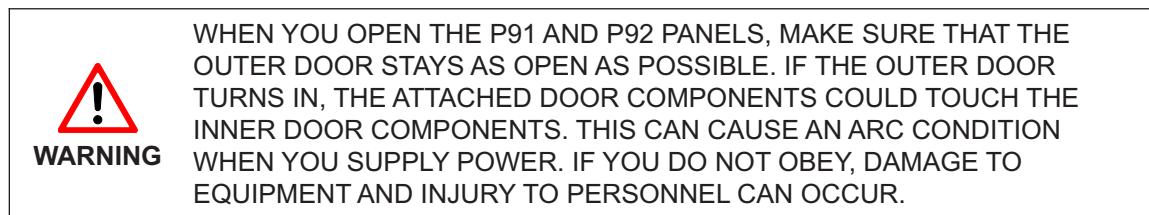
SUBTASK 28-22-00-010-024

- (5) Open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-094



- (6) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 1, P91

Row Col Number Name

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 406; LOM 404 POST SB 737-28A1248

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248

SUBTASK 28-22-00-865-004



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (7) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 406; LOM 404 POST SB 737-28A1248

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248

SUBTASK 28-22-00-010-011

- (8) Get access to the secondary relay terminals, R962 and R963 (Figure 509).

- To get access to relay terminal R962, remove the floor panel at station 371 LBL 35.
- To get access to relay terminal R963, remove the floor panel at station 361 RBL 36.

G. Functional Test of the Left Center Tank Secondary Relay

NOTE: An analog multimeter is more beneficial to use over a digital multimeter due to the fact that the measurements can fail using a digital multimeter, but still pass using an analog one.

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**LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248
(Continued)**

SUBTASK 28-22-00-860-175



WARNING

MAKE SURE THAT YOU ARE CAREFUL WHEN YOU MEASURE VOLTAGE.
ELECTRICAL POWER CAN CAUSE INJURIES.

- (1) Put the GRD PWR switch on the P5 Overhead Panel to the ON position.

SUBTASK 28-22-00-860-116



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Make sure that this circuit breaker is closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03002	XFR BUS 1 SECT 2

SUBTASK 28-22-00-860-117



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

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(Continued)

SUBTASK 28-22-00-860-095

- (4) Put the FUEL PUMP CTR TANK - LEFT switch to the ON position.

SUBTASK 28-22-00-210-010

- (5) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

SUBTASK 28-22-00-760-018

- (6) Measure the voltage between the secondary relay R962 terminals A1, A2, B1, B2, C1, C2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383.
(a) Make sure the voltage is 105 - 125 volts AC.

SUBTASK 28-22-00-860-103

- (7) Put the FUEL PUMP CTR TANK - LEFT switch to the OFF position.

SUBTASK 28-22-00-760-019

- (8) Measure the voltage between the secondary relay, R962, terminals A1, A2, B1, B2, C1, C2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383, to minimize AC voltage noise pickup.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Make sure the voltage is less than 10 volts AC.

SUBTASK 28-22-00-760-020

- (9) Measure the voltage between each secondary relay R962 terminals X1, X2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383.

NOTE: Do not use the Lo-Z function to measure the voltage in this step. The Lo-Z's low input impedance can load down the open relay coil giving an erroneous reading or can energize the relay.

- (a) Make sure the voltage is 105 -125 volts AC.

SUBTASK 28-22-00-860-104

28-AWL-23: ALI

- (10) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 Overhead Panel, to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

28-AWL-23: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

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LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248
(Continued)

SUBTASK 28-22-00-860-137

28-AWL-23: ALI

- (11) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row Col Number Name

D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC
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NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-028

28-AWL-23: ALI

- (12) Measure the voltage between the secondary relay R962 terminals A2, B2, C2, and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

28-AWL-23: ALI

- (b) Make sure the voltage is 107 - 120 volts AC.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-029

28-AWL-23: ALI

- (13) Measure the voltage between each secondary relay R962 terminals A1, B1, C1 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

28-AWL-23: ALI

- (b) Make sure the voltage is 10 volts AC or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

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(Continued)**

SUBTASK 28-22-00-760-034

- (14) Measure the voltage between each secondary relay R962 terminals X1, X2 and the case ground.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- | (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.
(b) Make sure the voltage is 10 volts AC or less.

SUBTASK 28-22-00-860-138

- (15) Put the FUEL PUMP CTR TANK - LEFT switch to the OFF position.

SUBTASK 28-22-00-860-139

- (16) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

SUBTASK 28-22-00-860-140

► 28-AWL-23: ALI

- (17) Put the FUEL PUMP CTR TANK - LEFT switch to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

► 28-AWL-23: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALI.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-030

- | (18) Measure the voltage between each secondary relay R962 terminals X1, X2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383.

- (a) Make sure the voltage is 105 - 125 volts AC on terminal X1.

- (b) Make sure the voltage is less than 10 volts AC on terminal X2.

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(Continued)

SUBTASK 28-22-00-710-004

► 28-AWL-23: ALI

- (19) Push and hold the L FUEL TEST AUTO SHUTOFF test switch on the P61-8 panel until the amber LOW PRESSURE light for the left center fuel boost pump comes on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: The LOW PRESSURE light for the left center fuel boost pump comes on after approximately 15 seconds.

SUBTASK 28-22-00-710-005

► 28-AWL-23: ALI

- (20) Release the L FUEL TEST AUTO SHUTOFF test switch.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-021

- (21) Measure the voltage between the secondary relay R962 terminals A1, B1, C1 and the case ground with a multimeter, COM-1322, equipped with insulated probes, COM-14383.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Make sure the voltage is 10 volts AC or less.

SUBTASK 28-22-00-760-035

► 28-AWL-23: ALI

- (22) Measure the voltage between the secondary relay R962 terminals A2, B2, C2 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322, equipped with insulated probes, COM-14383.

► 28-AWL-23: ALI

- (b) Make sure the voltage is 10 volts AC or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

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(Continued)

SUBTASK 28-22-00-760-022

28-AWL-23: ALI

- (23) Measure the voltage between each secondary relay R962 terminals X1, X2 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: Do not use the Lo-Z function to measure the voltage in this step. The Lo-Z's low input impedance can load down the open relay coil giving an erroneous reading or can energizing the relay.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

28-AWL-23: ALI

- (b) Make sure the voltage is 107 - 120 volts AC.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-860-096

- (24) Put the FUEL PUMP CTR TANK - LEFT switch to the OFF position.

SUBTASK 28-22-00-860-097

- (25) Put the FUEL PUMP CTR TANK - LEFT switch to the ON position.

SUBTASK 28-22-00-210-011

- (26) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the left center fuel boost pump.

SUBTASK 28-22-00-860-098

- (27) Put the FUEL PUMP CTR TANK - LEFT switch to the OFF position.

SUBTASK 28-22-00-860-118

- (28) Put the GRD PWR switch on the P5 Overhead Panel to the OFF position.

SUBTASK 28-22-00-860-120



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (29) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

H. Functional Test of the Right Center Tank Secondary Relay

SUBTASK 28-22-00-860-174



WARNING

MAKE SURE THAT YOU ARE CAREFUL WHEN YOU MEASURE VOLTAGE. ELECTRICAL POWER CAN CAUSE INJURIES.

- (1) Put the GRD PWR switch on the P5 Overhead Panel to the ON position.

SUBTASK 28-22-00-860-121



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03012	XFR BUS 2 SECT 2
F	6	C00817	MAIN BUS 2

EFFECTIVITY
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LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248
(Continued)

SUBTASK 28-22-00-860-122



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	5	C03002	XFR BUS 1 SECT 2

SUBTASK 28-22-00-860-105

- (4) Put the FUEL PUMP CTR TANK - RIGHT switch to the ON position.

SUBTASK 28-22-00-210-015

- (5) Make sure that the amber LOW PRESSURE light goes on and then off for the right center fuel boost pump.

SUBTASK 28-22-00-760-023

- (6) Measure the voltage between the secondary relay R963 terminals A1, A2, B1, B2, C1, C2 and the case ground with a multimeter, COM-1322, equipped with insulated probes, COM-14383.
(a) Make sure the voltage is 105 - 125 volts AC.

SUBTASK 28-22-00-860-106

- (7) Put the FUEL PUMP CTR TANK - RIGHT switch to the OFF position.

SUBTASK 28-22-00-760-024

- (8) Measure the voltage between the secondary relay R963 terminals A1, A2, B1, B2, C1, C2 and the case ground with a multimeter, COM-1322, equipped with insulated probes, COM-14383, to minimize AC voltage noise pickup in this open circuit test.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Make sure the voltage is less than 10 volts AC.

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LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404 POST SB 737-28A1248
(Continued)

SUBTASK 28-22-00-760-025

- (9) Measure the voltage between each secondary R963 relay terminals X1, X2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383:

NOTE: Do not use the Lo-Z function to measure the voltage in this step. The Lo-Z's low input impedance can load down the open relay coil giving an erroneous reading or can energize the relay.

- (a) Make sure the voltage is 105 - 125 volts AC.

SUBTASK 28-22-00-860-107

► 28-AWL-23: ALI

- (10) Put the FUEL PUMP CTR TANK - RIGHT switch to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

► 28-AWL-23: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the right center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-860-141

► 28-AWL-23: ALI

- (11) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-031

► 28-AWL-23: ALI

- (12) Measure the voltage between the secondary relay R963 terminals A2, B2, C2 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

EFFECTIVITY
LOM ALL

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► 28-AWL-23: ALI

- (b) Make sure the voltage is 107 -120 volts AC.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-032

► 28-AWL-23: ALI

- (13) Measure the voltage between each secondary relay R963 terminals A1, B1, C1 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

► 28-AWL-23: ALI

- (b) Make sure the voltage is 10 volts AC or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-036

- (14) Measure the voltage between each secondary relay R963 terminals X1, X2 and the case ground.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage from AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

- (b) Make sure the voltage is 10 volts AC or less.

SUBTASK 28-22-00-860-142

- (15) Put the FUEL PUMP CTR TANK - RIGHT switch to the OFF position.

SUBTASK 28-22-00-860-143

- (16) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC
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(Continued)

SUBTASK 28-22-00-860-144

► 28-AWL-23: ALI

- (17) Put the FUEL PUMP CTR TANK - RIGHT switch to the ON position.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

► 28-AWL-23: ALI

- (a) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the right center fuel boost pump.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-033

- (18) Measure the voltage between each secondary relay R963 terminals X1, X2 and the case ground with a multimeter, COM-1322 equipped with insulated probes, COM-14383.

(a) Make sure the voltage is 105 -125 volts AC on terminal X1.

(b) Make sure the voltage is less than 10 volts AC on terminal X2.

SUBTASK 28-22-00-720-028

► 28-AWL-23: ALI

- (19) Push and hold the R FUEL TEST AUTO SHUTOFF test switch on the P61-8 panel until the amber LOW PRESSURE light for the right center fuel boost pump comes on.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: The LOW PRESSURE light for the right center fuel boost pump comes on after approximately 15 seconds.

SUBTASK 28-22-00-720-029

► 28-AWL-23: ALI

- (20) Release the R FUEL TEST AUTO SHUTOFF test switch.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

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(Continued)

SUBTASK 28-22-00-760-026

28-AWL-23: ALI

- (21) Measure the voltage between the secondary relay R963 terminals A2, B2, C2 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

28-AWL-23: ALI

- (b) Make sure the voltage is 10 volts AC or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

SUBTASK 28-22-00-760-037

- (22) Measure the voltage between the secondary relay R963 terminals A1, B1, C1 and the case ground.

NOTE: To get the lowest AC voltage reading, set the multimeter, COM-1322 to the lowest AC voltage range possible and still have the reading within range of full scale. Use the Lo-Z setting, which reduces the voltage AC coupling by loading down the open circuit.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

- (b) Make sure the voltage is 10 volts AC or less.

SUBTASK 28-22-00-760-027

28-AWL-23: ALI

- (23) Measure the voltage between each secondary relay R963 terminals X1, X2 and the case ground.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

NOTE: Do not use the Lo-Z function to measure the voltage in this step. The Lo-Z's low input impedance can load down the open relay coil giving an erroneous reading or can energize the relay.

- (a) Use a multimeter, COM-1322 equipped with insulated probes, COM-14383.

28-AWL-23: ALI

- (b) Make sure the voltage is 107 - 120 volts AC.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on ALIs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-23.

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(Continued)**

SUBTASK 28-22-00-860-108

- (24) Put the FUEL PUMP CTR TANK - RIGHT switch to the OFF position.

SUBTASK 28-22-00-860-109

- (25) Put the FUEL PUMP CTR TANK - RIGHT switch to the ON position.

SUBTASK 28-22-00-210-017

- (26) Make sure that the amber LOW PRESSURE light goes on briefly and then off for the right center fuel boost pump.

SUBTASK 28-22-00-860-110

- (27) Put the FUEL PUMP CTR TANK - RIGHT switch to the OFF position.

SUBTASK 28-22-00-860-176



WARNING

MAKE SURE THAT YOU ARE CAREFUL WHEN YOU MEASURE VOLTAGE.
ELECTRICAL POWER CAN CAUSE INJURIES.

- (28) Put the GRD PWR switch on the P5 Overhead Panel to the OFF position.

SUBTASK 28-22-00-860-124



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (29) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
F	5	C03002	XFR BUS 1 SECT 2

I. Put the Airplane Back to Its Usual Position

SUBTASK 28-22-00-410-006

- (1) Install the applicable floor panel at station 371 LBL 35 and station 361 RBL 36.

SUBTASK 28-22-00-410-005

- (2) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

EFFECTIVITY
LOM ALL

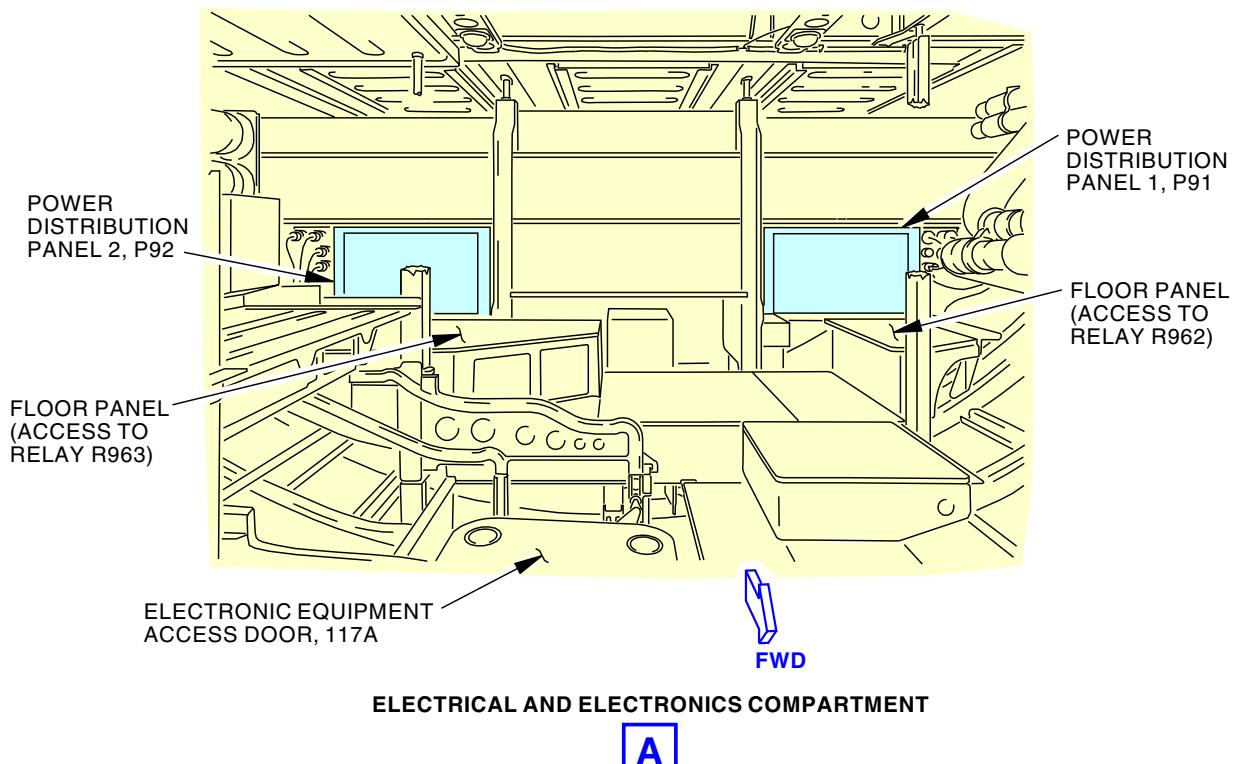
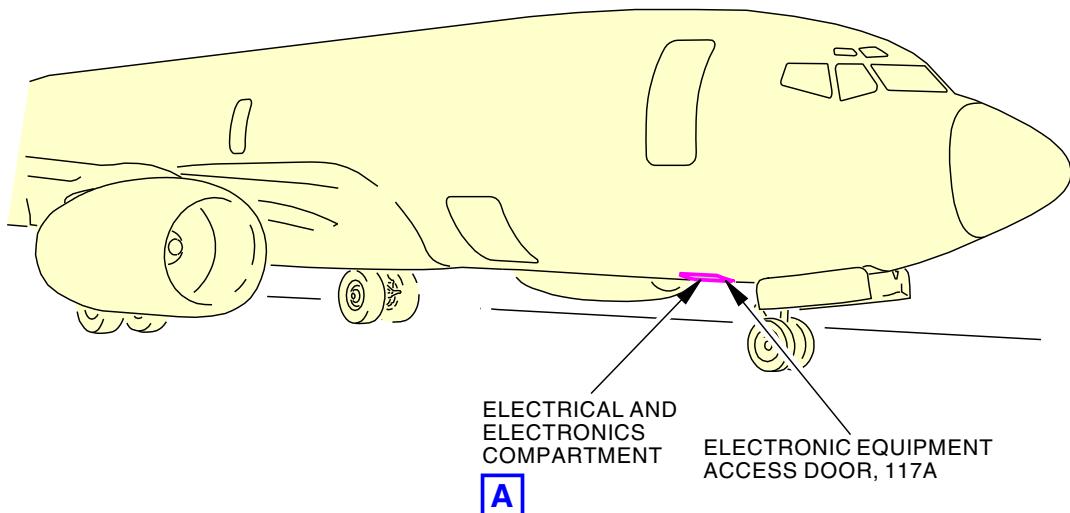
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Center Tank Power Failed On Functional Test
Figure 509/28-22-00-990-823

EFFECTIVITY
LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434,
437-447, 450-999; LOM 404 POST SB 737-28A1248

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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(Continued)

TASK 28-22-00-710-803

12. Pump Reversal - Operational Test

A. General

- (1) Do this test after the left secondary relay, R962, or the right secondary relay, R963, has been removed and replaced.

B. References

Reference	Title
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
WDM 28-23-11	Wiring Diagram Manual

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Pump Reversal Operational Test

SUBTASK 28-22-00-010-012

- (1) Get access to the flight compartment.

SUBTASK 28-22-00-865-005

- (2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	2	C01372	DISPLAY CTR UPR
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	9	C01362	DISPLAY DEU 2 HOLDUP
D	10	C01361	DISPLAY DEU 1 HOLDUP
D	11	C01360	DISPLAY DEU 2 PRI
E	12	C01373	DISPLAY CTR LWR

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-22-00-710-008

- (3) Do these steps to test the left center tank fuel pump to make sure there is enough pump pressure:

- (a) Make a written record of the initial quantity of fuel in the center tank.
- (b) Prepare to transfer fuel from the center tank to the No. 1 tank with the left center tank fuel pump (Tank to Tank Fuel Transfer, TASK 28-26-00-650-802).

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(Continued)

- (c) Put the CTR Tank Left Fuel Pump Switch to the ON position.
 - 1) Keep the CTR Tank Left Fuel Pump Switch in the ON position for two minutes.
- (d) After two minutes, put the CTR Tank Left Fuel Pump Switch to the OFF position.
- (e) Make a written record of the final quantity of fuel in the center tank.
- (f) Calculate the quantity of fuel that was transferred from the center tank to the No. 1 tank.
 - 1) Subtract the initial fuel quantity from the final fuel quantity.
- (g) Make sure the difference is 400 lb (181 kg) or more.
- (h) If the difference is less than 400 lb (181 kg), make sure the wiring to the R962 relay is connected correctly (WDM 28-23-11).

SUBTASK 28-22-00-710-009

- (4) Do these steps to do a test of the right center tank fuel pump to make sure there is enough pump pressure:
 - (a) Make a written record of the initial quantity of fuel in the center tank.
 - (b) Prepare to transfer fuel from the center tank to the No. 2 tank with the right center tank fuel pump (Tank to Tank Fuel Transfer, TASK 28-26-00-650-802).
 - (c) Put the CTR Tank Right Fuel Pump Switch to the ON position.
 - 1) Keep the CTR Tank Right Fuel Pump Switch in the ON position for two minutes.
 - (d) After two minutes, put the CTR Tank Right Fuel Pump Switch to the OFF position.
 - (e) Make a written record of the final quantity of fuel in the center tank.
 - (f) Calculate the quantity of fuel that was transferred from the center tank to the No. 2 tank.
 - 1) Subtract the initial fuel quantity from the final fuel quantity.
 - (g) Make sure the difference is 400 lb (181 kg) or more.
 - (h) If the difference is less than 400 lb (181 kg), make sure the wiring to the R963 relay is connected correctly (WDM 28-23-11).

LOM ALL

———— END OF TASK ————

TASK 28-22-00-760-802

13. Fuel Boost Pump - Insulation Resistance Test

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.
- (2) This task does an insulation resistance test of the fuel boost pump(s).
- (3) If this task is done because a circuit breaker or GFI has opened for a fuel boost pump, you must complete and pass this test before you reset the circuit breaker or GFI.

EFFECTIVITY
LOM ALL

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- (4) When you use the megohmmeter, COM-10724, it is recommended that the megohmmeter be insulated from any metal work stands. It is also recommended that protective clothing (rubber gloves, insulated shoes, etc.) be worn when you make these measurements. The megohmmeter should be plugged into a grounded receptacle to reduce the possibility of electrical shock.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-41-000-801	Motor Impeller Removal (P/B 401)
28-22-41-400-801	Motor Impeller Installation (P/B 401)
28-22-41-710-801	Fuel Boost Pump Operational Test (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-60-01	Cleaning of Electrical Connectors

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-10724	Megohmmeter (10-50 VDC, 50-100 VDC, 100-500 VDC, 500-1090 VDC, 50 k Ohms - 200 T Ohms, +/-3% Basic Accuracy) Part #: 1864-9700 Supplier: 62015

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

EFFECTIVITY
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F. Prepare for the Insulation Resistance Test

SUBTASK 28-22-00-860-154

- (1) Do these steps if they were not done before:



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) For the forward fuel boost pumps, do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.



WARNING

MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) For the forward fuel boost pumps, do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (c) For the center tank fuel boost pumps, make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-00-010-023

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-155



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure the circuit breaker(s) for the applicable pump(s) are open and install safety tag(s):

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-650-010

- (4) Refuel the center or the No. 1 or No. 2 fuel tank, as applicable (TASK 12-11-00-650-802).

NOTE: This step makes sure the fuel pump housing is covered in each case. This makes sure that the fuel pump is not exposed to air during the electrical test.

NOTE: These fuel requirements are only necessary for fuel pumps that are being tested on the airplane.

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- (a) For the forward fuel boost pumps, refuel the No. 1 or No. 2 tanks to 300 lb (136 kg) minimum.
- (b) For the aft fuel boost pumps, refuel the No. 1 or No. 2 tanks to 300 lb (136 kg) minimum.
- (c) For the center tank fuel boost pumps, refuel the center fuel tank to 14,000 lb (6350 kg) minimum.

G. Fuel Boost Pump Wire Terminal Assembly Inspection

NOTE: It is necessary to do these procedures at the applicable fuel boost pump: Fuel Boost Pump Wire Terminal Assembly Inspection, Fuel Boost Pump Continuity Check, Initial Insulation Resistance Test, and the Final Insulation Resistance Test.

SUBTASK 28-22-00-010-013

- (1) Go to the applicable fuel boost pump location (TASK 28-22-41-000-801).

NOTE: Do the applicable steps in the task to get access to the fuel boost pump.

SUBTASK 28-22-00-210-020

- (2) Do a visual inspection of the wire terminal assembly.

NOTE: Also do these visual inspections at the airplane side of the wire terminal assembly and repair as necessary.

- (a) Look for these conditions:

- 1) Indication that fuel has leaked from the wire terminal assembly.
- 2) Indication that the terminal assembly or wire insulation is discolored because of too much heat.
 - a) Clean the wire bundle caps (SWPM 20-60-01).
- 3) Indication of damage to the wire terminal assembly, for example:
 - a) bulges
 - b) bent flanges
 - c) broken screws
 - d) medium to heavy corrosion damage

SUBTASK 28-22-00-760-038

- (3) If the visual check shows the fuel boost pump is okay, do this procedure: Fuel Boost Pump Continuity Check.

SUBTASK 28-22-00-760-039

- (4) If the visual check shows that the fuel boost pump is not okay, do these steps:
 - (a) Replace the motor impeller for applicable fuel boost pump (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
 - (b) Do the continuity/resistance checks for the replacement fuel boost pump.
 - 1) Start with this procedure: Fuel Boost Pump Continuity Check.

H. Fuel Boost Pump Continuity Check

SUBTASK 28-22-00-020-003

- (1) Disconnect the electrical connector from the motor impeller of the fuel boost pump.

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-00-760-040



MAKE SURE THAT THE METER USED TO MEASURE BONDING JUMPER
CONTINUITY IS RESISTANT TO EXPLOSION. IF NOT, IT IS POSSIBLE THAT
AN EXPLOSION OR FIRE CAN OCCUR.

- (2) Use an intrinsically safe approved bonding meter, COM-1550, to measure the resistance between pin 4 of the electrical connector and the bonding jumper on the fuel boost pump.

NOTE: The measurement between pin 4 and the bonding jumper is a continuity check, not a bonding resistance check.

SUBTASK 28-22-00-760-041

- (3) If the resistance is more than 5 ohms, do these steps:

- (a) Replace the applicable motor impeller (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
- (b) Do the continuity/resistance checks for the replacement fuel boost pump.
 - 1) Start with this procedure: Fuel Boost Pump Continuity Check.

I. Initial Insulation Resistance Test

SUBTASK 28-22-00-480-010

- (1) Use the instructions given with the megohmmeter, COM-10724, to calibrate the equipment.

28-AWL-18: CDCCL

- (a) Make sure the megohmmeter, COM-10724, has 10 VDC and 500 VDC voltage supply options with a maximum short circuit current of 5 milliamperes.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-760-042

- (2) RESISTANCE TEST WITH THE FUEL BOOST PUMP REMOVED FROM THE AIRPLANE;

Do these steps to do a test of the insulation resistance:

- (a) Remove the motor impeller (TASK 28-22-41-000-801).
- (b) Do this procedure on the removed pumps, within two hours: Final Insulation Resistance Test.

SUBTASK 28-22-00-760-043

- (3) RESISTANCE TEST WITH THE FUEL BOOST PUMP INSTALLED ON THE AIRPLANE;

Do these steps to do a test of the insulation resistance (initial test):

NOTE: These steps are done at 10 VDC to prevent arcing or overheating in a flammable leakage zone when high voltage is applied to a fuel boost pump with low insulation resistance. The results of the 10 VDC test will tell you if it is safe to the 500 VDC test with the fuel boost pump installed.

- (a) Disconnect the electrical connector from the motor impeller.
- (b) Do these steps to connect the megohmmeter, COM-10724, for the 10 VDC test:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

- 1) Connect the megohmmeter, COM-10724, into a grounded receptacle.

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LOM ALL

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- a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the megohmmeter, COM-10724, is grounded.

- 2) Connect the + UNKNOWN probe to the pump connector pin ground (pin 4).
- 3) Connect the - UNKNOWN probe to the pump connector pin 1.
- 4) Set the multiplier dial to the lowest range (100K).

28-AWL-18: CDCCL

- 5) Set the TEST VOLTAGE switches to 10V.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 6) Set the measure switch to the MEASURE position.

- (c) Do these steps to measure the resistance at the fuel boost pump:

- 1) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-18: CDCCL

- 2) Measure the resistance between the case ground (pin 4) and the pump 3 phase power circuit pin (pin 1) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: If the fuel boost pump resistance is very high, the megohmmeter, COM-10724, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms.

- 3) Make a record of the resistance measured between pin 4 and pin 1.

- 4) Set the function switch to the DISCHARGE position.

28-AWL-18: CDCCL

- 5) Do these steps again to measure the resistance between the case ground (pin 4) and the remaining 3 phase power circuit pins on the pump connector (pin 2 and pin 3).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- (d) Do an analysis of the test results:

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► 28-AWL-18: CDCCL

- 1) If each resistance measured between the case ground (pin 4) and the 3 phase power circuit pins on the pump connector (pins 1, 2 and 3) is 1 megohm or more, do this procedure: Final Insulation Resistance Check.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 2) If any resistance measured between pin 4 and pins 1, 2, and 3 is less than 1 megohm, do these steps:
 - a) Replace the motor impeller (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
 - b) Do the continuity/resistance checks again for the replacement fuel boost pump.

<1> Start with this procedure: Fuel Boost Pump Continuity Check.

J. Final Insulation Resistance Test

SUBTASK 28-22-00-760-044

- (1) Do these steps to connect the megohmmeter, COM-10724, for the 500 VDC check:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

NOTE: The megohmmeter, COM-10724, must have a 500 VDC voltage supply option.

- (a) Calibrate the megohmmeter, COM-10724, if it is necessary.
 - 1) Connect the megohmmeter, COM-10724, into a grounded receptacle.
 - a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.
 - NOTE: This makes sure the megohmmeter, COM-10724, is grounded.
 - 2) Connect the + UNKNOWN probe to the pump connector pin ground (pin 4).
 - 3) Connect the - UNKNOWN probe to the pump connector pin 1.
 - 4) Set the multiplier dial to the lowest range (1M).

► 28-AWL-18: CDCCL

- 5) Set the TEST VOLTAGE switches to 500V.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 6) Set the measure switch to the MEASURE position.

SUBTASK 28-22-00-760-045

- (2) Do these steps to measure the resistance at the pump:

- (a) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

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► 28-AWL-18: CDCCL

- (b) Measure the resistance between the case ground (pin 4) and the 3 phase power circuit pin (pin1) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: If the pump resistance is very high, the megohmmeter, COM-10724, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms.

- (c) Make a record of the resistance measured between pin 4 and pin 1.
(d) Set the function switch to the DISCHARGE position.

► 28-AWL-18: CDCCL

- (e) Do these steps again to measure the resistance between the case ground (pin 4) and the remaining 3 phase power circuit pins on the pump connector (pin 2 and pin 3).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-760-046

- (3) Do an analysis of the test results:

► 28-AWL-18: CDCCL

- (a) Make sure each resistance measured between the case ground (pin 4) and the 3 phase power circuit pins on the pump connector (pins 1, 2, and 3) is 5 megohms or more.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 1) If the insulation resistance test is satisfactory, do these steps:
a) If the motor impeller was removed for the test, re-install the motor impeller (TASK 28-22-41-400-801).
b) If the motor impeller was not removed for the test, connect the electrical connector for the motor impeller and do an operational test (TASK 28-22-41-710-801).
- (b) If any resistance measured between pin 4 and pins 1, 2, and 3 is less than 5 megohms, do these steps:
1) Replace the motor impeller (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
2) Do the continuity/resistance checks again for the replacement pump.
a) Start with this procedure: Fuel Boost Pump Continuity Check.

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K. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-860-156



WARNING

REMOVE THE LOCK FROM LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) For the forward fuel boost pumps, do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

SUBTASK 28-22-00-860-157



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) For the forward fuel boost pumps, do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 28-22-00-860-158



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) For the center tank fuel boost pumps, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801

SUBTASK 28-22-00-860-159



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Remove the safety tags(s) and close the circuit breaker(s) for the applicable pump(s):

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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LOM 402, 404, 406 (Continued)

(Continued)

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-410-015

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

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ENGINE FUEL FEED SYSTEM - INSPECTION/CHECK

1. **General**

A. This procedure contains scheduled maintenance task data.

28-CMR-01

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12

TASK 28-22-00-210-801

2. **Fuel Pumps - Visual Inspection**

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task does a visual inspection of the fuel system boost pumps for the No. 1 tank, the No. 2 tank, and the center tank.
- (2) This inspection is necessary for the installation of 60B92404-6 or -7 pumps (No. 1 or No. 2 tank) without fuel pump ground fault interrupters and for 60B89004-10 or -12 pumps (center tank) without fuel pump ground fault interrupters. This inspection is not necessary for 60B92404-8, -10 and subsequent pumps (No. 1 or No. 2 tank) or for 60B89004-14, -16 and subsequent pumps (center tank).

B. **References**

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-22-41-000-801	Motor Impeller Removal (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
51-00-53	CORROSION REMOVAL

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

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LOM ALL

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LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

E. Prepare for the Check

SUBTASK 28-22-00-860-046

- (1) Supply the electrical power if necessary (TASK 24-22-00-860-811).

SUBTASK 28-22-00-860-047



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.

SUBTASK 28-22-00-480-004



WARNING

MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 28-22-00-480-005



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (4) Make sure that the ground lock assemblies are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-00-010-025

- (5) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-048



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

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LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (6) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 404, 406 PRE SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407 PRE SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 404, 406 PRE SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407 PRE SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 404, 406 PRE SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407 PRE SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 404, 406 PRE SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407 PRE SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12

SUBTASK 28-22-00-010-005

- (7) Go out to each fuel pump location.

NOTE: Refer to the table below for pump location (Table 601).

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

Table 601/28-22-00-993-813

Boost Pump Access	Boost Pump Identification
Left inboard rear spar, forward of landing gear door	Left Aft Boost Pump
Left front spar outboard of side-of-body rib	Left Forward Boost Pump
Left rear spar center tank, center section	Left Center Boost Pump
Right inboard rear spar, forward of landing gear door	Right Aft Boost Pump
Right front spar outboard of side-of-body rib	Right Forward Boost Pump
Right rear spar center tank, center section	Right Center Boost Pump

SUBTASK 28-22-00-210-005

- (8) At each pump, do a visual inspection of the wire terminal assembly (Figure 601).
 - (a) Disconnect the electrical connector and look for these conditions on the two sides of the connector:
 - 1) Indication of fuel leakage.
 - 2) Discoloration caused by too much heat.
 - 3) Corrosion
 - a) To remove corrosion, refer to (CORROSION REMOVAL, SUBJECT 51-00-53).
 - 4) Other types of damage.

SUBTASK 28-22-00-210-006

- (9) If the visual check shows that the fuel pump is OK, do this task: Fuel Pumps - Insulation Resistance Check, TASK 28-22-00-200-801.

SUBTASK 28-22-00-210-007

- (10) If the visual check shows that the fuel pump is not OK, do these steps:
 - (a) Replace the applicable fuel pump motor/impeller unit (TASK 28-22-41-000-801).
 - (b) Do this task: Fuel Pumps - Insulation Resistance Check, TASK 28-22-00-200-801.

F. Put the Airplane Back to the Usual Condition

NOTE: Do this procedure only when you have completed the inspection procedure for all pumps.
This equipment is also necessary to do the insulation resistance check.

SUBTASK 28-22-00-080-003

WARNING  REMOVE THE LOCK FROM LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

EFFECTIVITY
LOM ALL

28-22-00



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LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

SUBTASK 28-22-00-860-049



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 28-22-00-080-004



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

SUBTASK 28-22-00-860-050



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 404, 406 PRE SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407 PRE SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 404, 406 PRE SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407 PRE SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406 PRE SB 737-28A1201 (Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 404, 406 PRE SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407 PRE SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 404, 406 PRE SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407 PRE SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

**LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12**

SUBTASK 28-22-00-410-016

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-051

- (6) Remove the electrical power if it is not needed for another task (TASK 24-22-00-860-812).

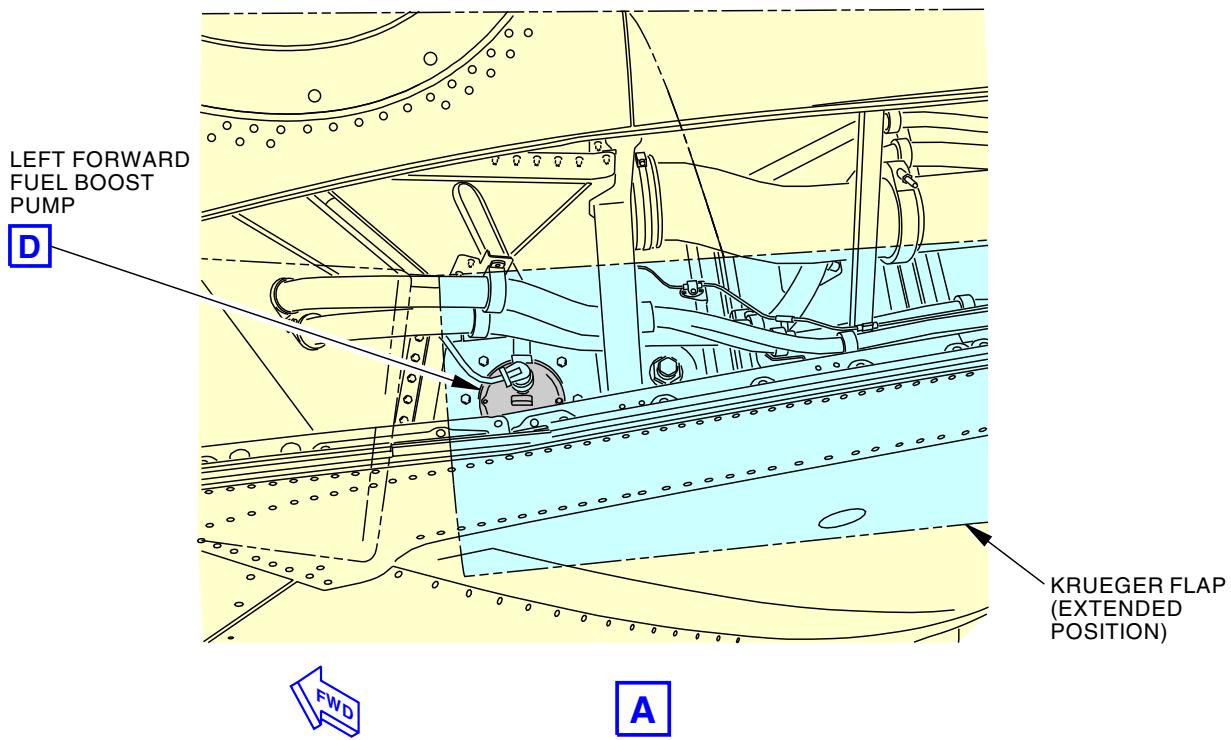
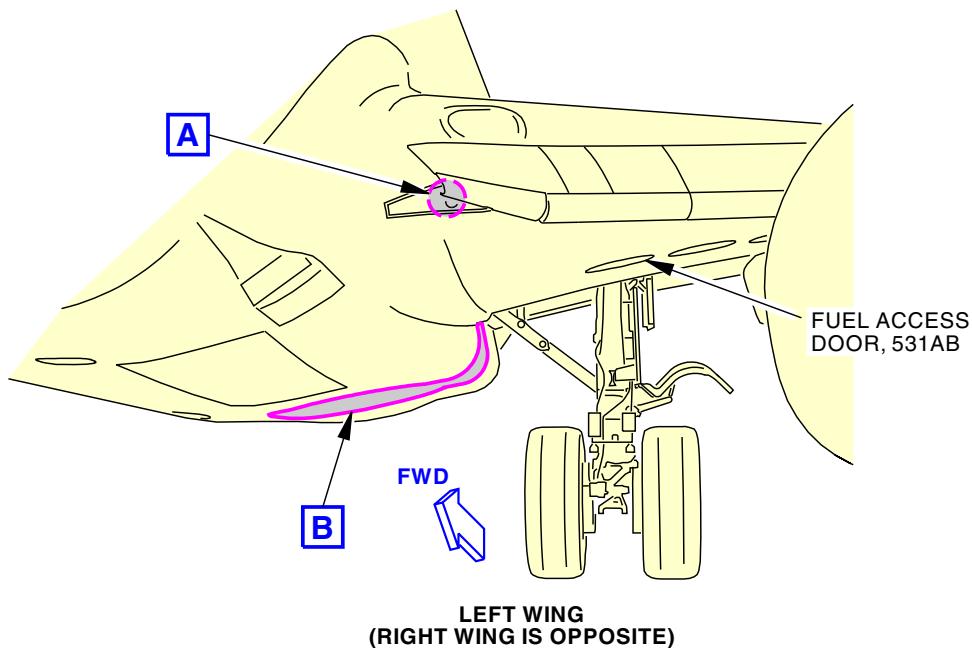
———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G97796 S0006571945_V2

Fuel Boost Pump Inspection
Figure 601/28-22-00-990-811 (Sheet 1 of 4)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

D633A101-LOM

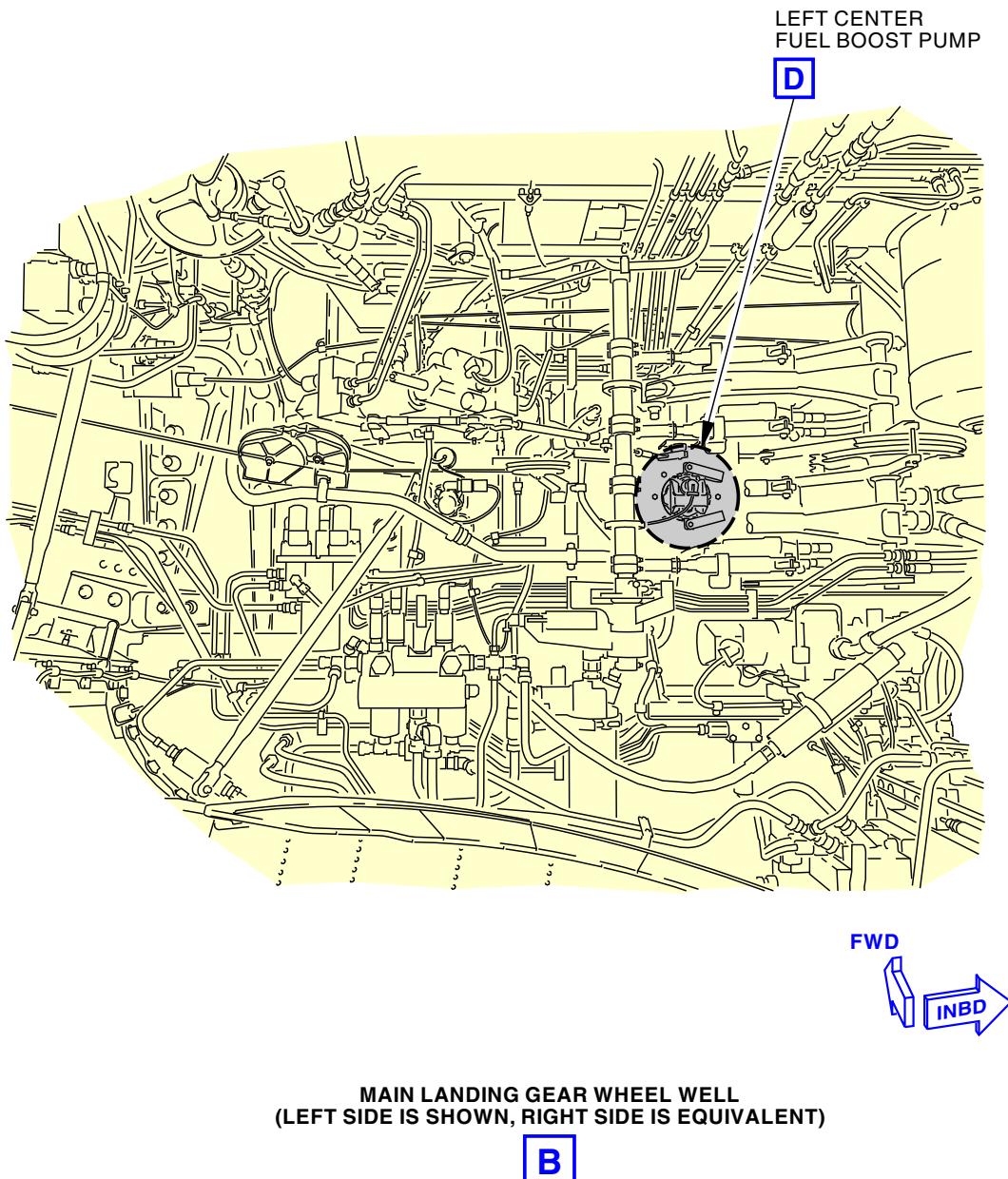
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G97797 S0006571946_V2

Fuel Boost Pump Inspection
Figure 601/28-22-00-990-811 (Sheet 2 of 4)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

28-22-00

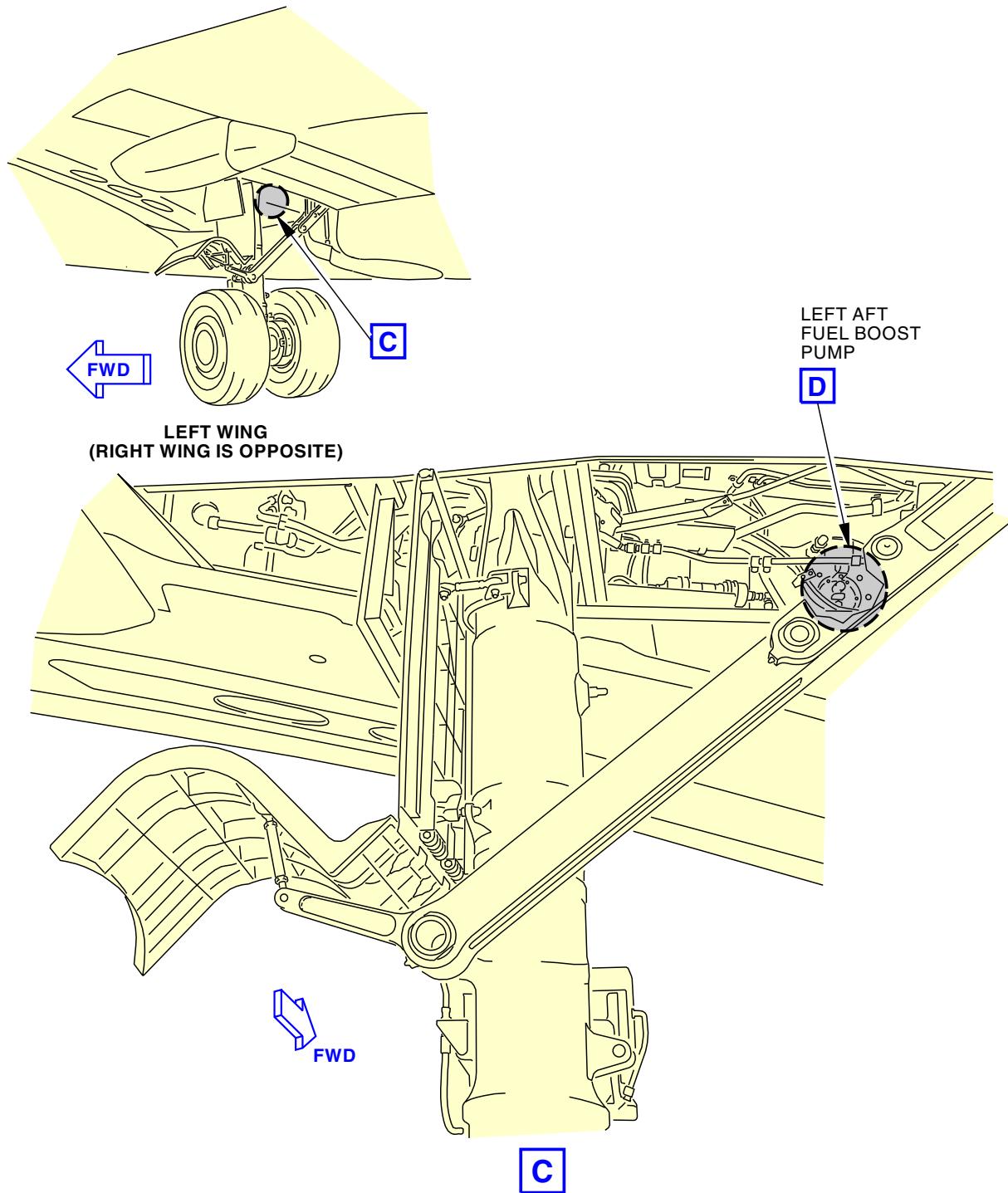
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G97800 S0006571947_V2

Fuel Boost Pump Inspection
Figure 601/28-22-00-990-811 (Sheet 3 of 4)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

28-22-00

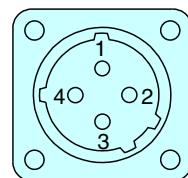
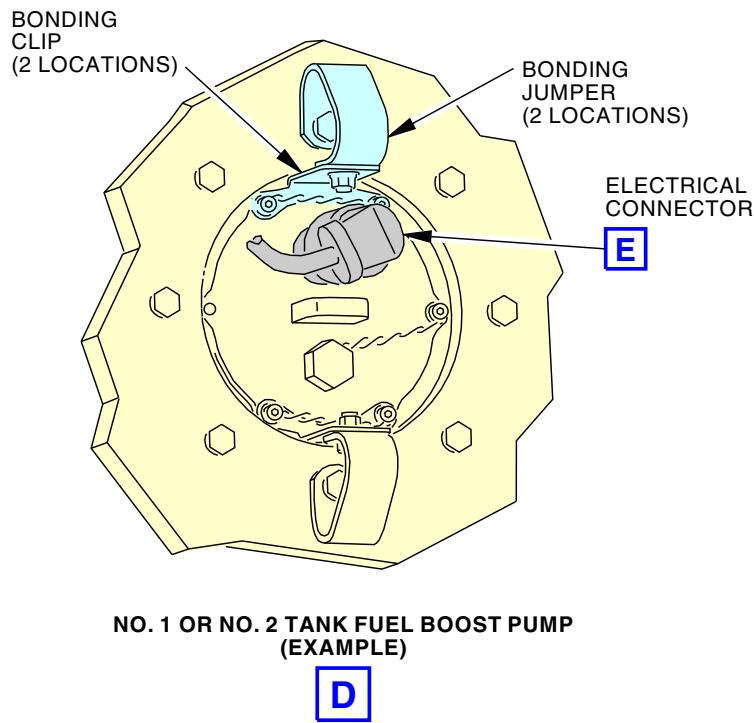
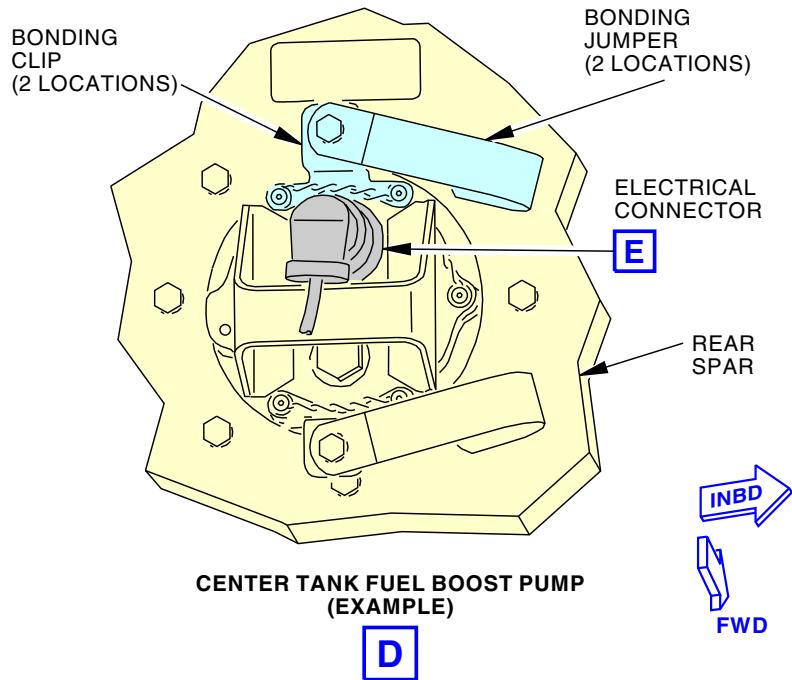
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AIRCRAFT MAINTENANCE MANUAL



G97850 S0006571948_V2

Fuel Boost Pump Inspection
Figure 601/28-22-00-990-811 (Sheet 4 of 4)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

D633A101-LOM

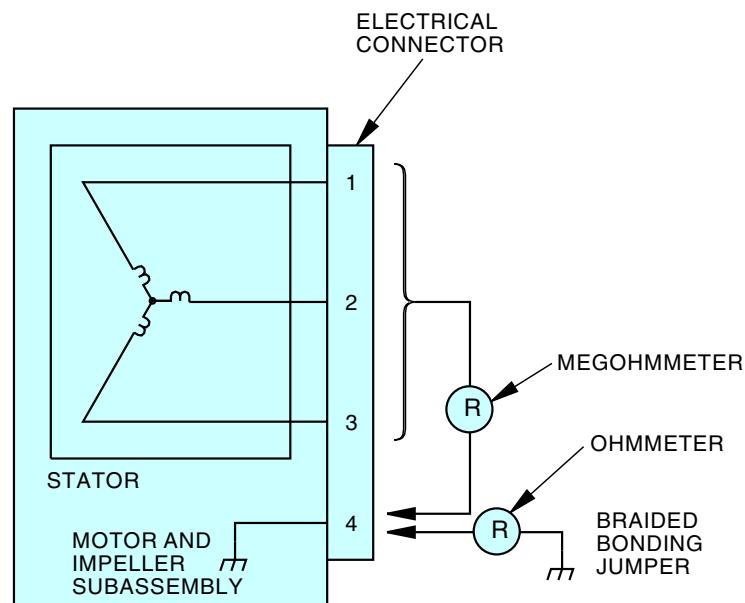
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



L45989 S0006571949_V2

Schematic for Fuel Boost Pump Inspection
Figure 602/28-22-00-990-815

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

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D633A101-LOM

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LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

28-CMR-02

TASK 28-22-00-200-801

3. Fuel Pumps - Insulation Resistance Check

(Figure 601, Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task does an insulation resistance check of the fuel system boost pumps for the No. 1 tank, the No. 2 tank, and the center tank.
- (2) An insulation resistance test is necessary for 60B92404-6 or -7 pumps (No. 1 or No. 2 tank) without fuel pump ground fault interrupters and for 60B89004-10 or -12 pumps (center tank) without fuel pump ground fault interrupters. An insulation resistance test is not necessary for 60B92404-8 or -10 pumps (No. 1 or No. 2 tank) or for 60B89004-14 or -16 pumps (center tank).
- (3) The insulation resistance checks can be done with the fuel pumps installed on the airplane or removed from the airplane. If the fuel pump is removed from the airplane, you must do the insulation resistance check within 2 hours.
- (4) A special megohmmeter is necessary to do the electrical check with the fuel pump installed on the airplane. The megohmmeter must have 10 VDC and 500 VDC voltage supply options with a maximum short circuit current of 5 milliamperes. The model 1864-9700 megohmmeter that is listed in insulation meter, COM-6457, is recommended.

NOTE: Test equipment for the low voltage on-wing safety check (initial check) must be limited to a maximum short circuit power dissipation of 0.05 Watts. Test equipment for the high voltage on-wing check (final check) must be limited to a maximum short circuit power dissipation of 2.5 Watts.

- (5) When you use the insulation meter, COM-6457, it is recommended that the megohmmeter be insulated from any metal work stands. It is also recommended that protective clothing (rubber gloves, insulated shoes, etc.) be worn when you make these measurements. The megohmmeter should be plugged into a grounded receptacle to reduce the possibility of electrical shock.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-22-41-000-801	Motor Impeller Removal (P/B 401)
28-22-41-400-801	Motor Impeller Installation (P/B 401)
28-22-41-710-801	Fuel Boost Pump Operational Test (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

(Continued)

Reference	Title
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-6457	Meter - Insulation (Range: 1-1,000 VDC or equivalent, select meter per test requirements) Part #: 1864-9700 Supplier: 62015 Part #: 1865PLUS Supplier: 62015 Part #: 1865PLUSCE Supplier: 62015 Part #: 2471F Supplier: 21844 Opt Part #: 1865-00-CE Supplier: 62015

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Check

SUBTASK 28-22-00-860-039

- (1) Supply the electrical power if necessary (TASK 24-22-00-860-811).

SUBTASK 28-22-00-860-040

- (2) Do these steps if they were not done before:

EFFECTIVITY
LOM ALL

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LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.



MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (c) Make sure that the ground lock assemblies are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-00-650-008

- (3) Refuel the center or the No. 1 or No. 2 fuel tank, as applicable (TASK 12-11-00-650-802).

NOTE: This step makes sure the fuel pump housing is covered in each case. This makes sure that the fuel pump is not exposed to air during the electrical test.

NOTE: These fuel requirements are only necessary for fuel pumps that are being tested on the airplane.

- For the forward fuel boost pumps, refuel the No. 1 or No. 2 tanks to 300 lb (136 kg) minimum.
- For the aft fuel boost pumps, refuel the No. 1 or No. 2 tanks to 300 lb (136 kg) minimum.
- For the center tank fuel boost pumps, refuel the center fuel tank to 14,000 lb (6350 kg) minimum.

SUBTASK 28-22-00-010-026

- (4) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-00-860-041



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 404, 406 PRE SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407 PRE SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 404, 406 PRE SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407 PRE SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 404, 406 PRE SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407 PRE SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 404, 406 PRE SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407 PRE SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12

G. Fuel Pump Wire Terminal Assembly Inspection

NOTE: It is necessary to do these three procedures at each pump: Fuel Pump Continuity Check, Initial Insulation Resistance Check, and the Final Insulation Resistance Check.

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

SUBTASK 28-22-00-010-003

- (1) Go out to each fuel pump location.

NOTE: Refer to the table below for pump location (Table 602).

Table 602/28-22-00-993-814

Boost Pump Access	Boost Pump Identification
Left inboard rear spar, forward of landing gear door	Left Aft Boost Pump
Left front spar outboard of side-of-body rib	Left Forward Boost Pump
Left rear spar center tank, center section	Left Center Boost Pump
Right inboard rear spar, forward of landing gear door	Right Aft Boost Pump
Right front spar outboard of side-of-body rib	Right Forward Boost Pump
Right rear spar center tank, center section	Right Center Boost Pump

H. Fuel Pump Continuity Check

SUBTASK 28-22-00-010-004

- (1) Disconnect the electrical connector from the pump motor/impeller unit.

SUBTASK 28-22-00-860-042



MAKE SURE THAT THE METER USED TO MEASURE BONDING JUMPER
CONTINUITY IS RESISTANT TO EXPLOSION. IF NOT, IT IS POSSIBLE THAT
AN EXPLOSION OR FIRE CAN OCCUR.

- (2) Use the intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

SUBTASK 28-22-00-760-001

- (3) Measure the resistance between pin 4 of the electrical connector and the braided bonding jumper on the fuel pump (Figure 601).

NOTE: The measurement between pin 4 and the bonding jumper is a continuity check, not a bonding resistance check.

SUBTASK 28-22-00-760-002

- (4) Record the resistance measured between pin 4 and the braided bonding jumper on the data sheet (Figure 603).

SUBTASK 28-22-00-760-003

- (5) If the resistance is less than 2 ohms, do this procedure: Initial Insulation Resistance Check.

SUBTASK 28-22-00-760-004

- (6) If the resistance is more than 2 ohms, do these steps:

- (a) Replace the applicable fuel pump motor/impeller unit (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
- (b) Do the continuity/resistance checks for the replacement fuel pump.
 - 1) Start with this procedure: Fuel Pump Continuity Check.
- (c) Record the continuity/resistance values for the replacement pump on the Fuel Pump Inspection Data Sheet - Replacement Pump (Figure 603).

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

I. Initial Insulation Resistance Check

SUBTASK 28-22-00-480-003

- (1) Use the instructions provided with the insulation meter, COM-6457, to calibrate the equipment.

SUBTASK 28-22-00-760-005

- (2) RESISTANCE CHECK WITH THE FUEL PUMP REMOVED FROM THE AIRPLANE;

Do these steps to check the insulation resistance:

- Remove the fuel pump motor/impeller unit(s) (TASK 28-22-41-000-801).
- Do this procedure on the removed pumps, within two hours: Final Insulation Resistance Check.

SUBTASK 28-22-00-760-006

- (3) RESISTANCE CHECK WITH THE FUEL PUMP INSTALLED ON THE AIRPLANE;

Do these steps to do a check of the insulation resistance (initial check):

NOTE: These steps are done at 10 VDC to prevent arcing or overheating in a flammable leakage zone when high voltage is applied to a pump with low insulation resistance. The results of the 10 VDC check will tell you if it is safe to do the 500 VDC check with the fuel pump installed.

- You must use the model 1864 megohmmeter (or equivalent) that is listed in insulation meter, COM-6457, to do this initial check.

NOTE: The megohmmeter must have 10 VDC and 500 VDC voltage supply options with a maximum short circuit current of 5 milliamperes.

- Use the instructions provided with the model 1864-9700 megohmmeter (or equivalent) that is listed in insulation meter, COM-6457, to calibrate the equipment.
- Disconnect the electrical connector from the pump motor/impeller unit.



USE THE SPECIFIED EQUIPMENT. OTHER EQUIPMENT CAN CAUSE AN EXPLOSION OR FIRE.

WARNING

- Do these steps to connect the model 1864-9700 megohmmeter (or equivalent) that is listed in insulation meter, COM-6457, for the 10 VDC check:

NOTE: Keep the leads that connect to pump connector pins as short as possible (3 feet/1 meter or less) to prevent problems with the resistance measurements.

- Plug the megohmmeter into a grounded receptacle.

- a) Make sure that the ground strap is connected from the grounded receptacle to the +UNKNOWN terminal.

NOTE: This makes sure the megohmmeter is grounded.

- Connect the +UNKNOWN probe to the pump connector pin 4 (ground).

- Connect the -UNKNOWN probe to the pump connector pin 1.

- Set the multiplier dial to the lowest range (100K).

- Set the TEST VOLTAGE switches to 10V.

- Set the measure switch to the MEASURE position.

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

- (e) Do these steps to measure the resistance at the pump:
 - 1) Turn the multiplier switch until the meter reading is less than 5.
NOTE: The resistance is the meter reading multiplied by multiplier switch setting.
 - 2) Measure the resistance between pin 4 and pin 1 on the fuel pump electrical connector (Figure 601).
NOTE: If the pump resistance is very high, the megohmmeter value will increase with time. For any resistance over 100 megohms it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms. Record the measurement on the data sheet as >100 megohms.
 - 3) Record the resistance measured between pin 4 and pin 1 on the Fuel Pump Inspection Data Sheet (Figure 603).
 - 4) Set the function switch to the DISCHARGE position.
 - 5) Do these steps again to measure the resistance between pin 4 and the remaining pins on the fuel pump connector, pins 2 and 3.
- (f) Do an analysis of the test results:
 - 1) If each resistance measured between pin 4 and pins 1, 2 and 3 is more than 1 megohm, do this procedure: Final Insulation Resistance Check.
 - 2) If any resistance measured between pin 4 and pins 1, 2, and 3 is less than or equal to 1 megohm, do these steps:
 - a) Replace the pump motor/impeller unit (TASK 28-22-41-000-801, TASK 28-22-41-400-801).
 - b) Do the continuity/resistance checks again for the replacement fuel pump.
 - c) Start with this procedure: Fuel Pump Continuity Check.
 - d) Record the continuity/resistance values for the replacement pump on the Fuel Pump Inspection Data Sheet (Figure 603).

J. Final Insulation Resistance Check

SUBTASK 28-22-00-760-007

- (1) Do these steps to connect the insulation meter, COM-6457, for the 500 VDC check:

NOTE: Keep the leads that connect to pump connector pins as short as possible (3 feet/1 meter or less) to prevent problems with the resistance measurements.

NOTE: The megohmmeter must have a 500 VDC voltage supply option.

- (a) Calibrate the megohmmeter if it is necessary.
- (b) Connect the megohmmeter into a grounded receptacle.
 - 1) Make sure that the ground strap is connected from the grounded receptacle to the +UNKNOWN terminal.
NOTE: This makes sure the megohmmeter is grounded.
- (c) Connect the +UNKNOWN probe to the pump connector pin 4 (ground).
- (d) Connect the -UNKNOWN probe to the pump connector pin 1.
- (e) Set the multiplier dial to the lowest range (1M).

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

- (f) Set the TEST VOLTAGE switches to 500V.
- (g) Set the measure switch to the MEASURE position.

SUBTASK 28-22-00-760-008

- (2) Do these steps to measure the resistance at the pump:

- (a) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by the multiplier switch setting.

- (b) Measure the resistance between pin 4 and pin 1 on the fuel pump electrical connector (Figure 601).

NOTE: If the pump resistance is very high, the megohmmeter value will increase with time. For any resistance over 100 megohms it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms. Record the measurement on the data sheet as >100 megohms.

- (c) Record the resistance measured between pin 4 and pin 1 on the Fuel Pump Inspection Data Sheet (Figure 603).

- (d) Set the function switch to the DISCHARGE position.

- (e) Do these steps again to measure the resistance between pin 4 and the remaining pins on the fuel pump connector, pins 2 and 3.

- (f) Put the power switch to the OFF position and remove the test probes.

SUBTASK 28-22-00-760-009

- (3) Do an analysis of the test results:

- (a) If each resistance measured between pin 4 and pins 1, 2 and 3 is equal to or more than 5 megohms, then the fuel pump resistance check is satisfactory.

- 1) If the insulation check is satisfactory, do these steps:

- a) If the motor/impeller unit was removed for the test, re-install the motor/impeller unit (TASK 28-22-41-400-801).

- b) If the motor/impeller unit was not removed for the test, connect the electrical connector for the motor/impeller unit and do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.

- (b) If any resistance measured between pin 4 and pins 1, 2, and 3 is below 1 megohm, do these steps:

- 1) Replace the motor/impeller unit (TASK 28-22-41-000-801, TASK 28-22-41-400-801).

- 2) Do the continuity/resistance checks again for the new fuel pump.

- 3) Start with this procedure: Fuel Pump Continuity Check.

- 4) Record the continuity/resistance values for the replacement pump on the Fuel Pump Inspection Data Sheet (Figure 603).

- (c) If any resistance measured between pin 4 and pins 1, 2, and 3 is between 1 and 5 megohm, do these steps:

- 1) It is recommended that the motor/impeller unit be replaced (TASK 28-22-41-000-801, TASK 28-22-41-400-801).

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

- 2) If the motor/impeller unit is not replaced, continue to do the scheduled insulation resistance checks.

SUBTASK 28-22-00-760-010

- (4) Continue to do the visual and insulation resistance checks for the remaining fuel pumps.

K. Put the Airplane Back to the Usual Condition

NOTE: Do this procedure only when you have completed the inspection procedure for all pumps.
This equipment is also necessary to do the visual inspection of the boost pumps.

SUBTASK 28-22-00-080-001



WARNING

REMOVE THE LOCK FROM LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

SUBTASK 28-22-00-860-043



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 28-22-00-080-002



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

SUBTASK 28-22-00-860-044



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-22-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)

(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 404, 406 PRE SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407 PRE SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 404, 406 PRE SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407 PRE SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407 PRE SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 404, 406 PRE SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407 PRE SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 404, 406 PRE SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407 PRE SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406 PRE SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND OVERRIDE PUMPS 60B89004-10, 60B89004-12

SUBTASK 28-22-00-410-017

- (5) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

EFFECTIVITY
LOM ALL

28-22-00



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**LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH BOOST PUMPS 60B92404-6, 60B92404-7 AND
OVERRIDE PUMPS 60B89004-10, 60B89004-12 (Continued)**

SUBTASK 28-22-00-860-045

- (6) Remove the electrical power if it is not needed for another task (TASK 24-22-00-860-812).

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

28-22-00



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737-600/-700/-800/-900 FUEL PUMP INSPECTION DATA SHEET									
AIRPLANE TAIL NUMBER:		HOURS/CYCLES:		RESISTANCE IN MEGOHMS		NEW PUMP (IF NEEDED)			
PUMP NAME	PART NUMBER	SERIAL NUMBER	TSO/TSN OVHL/NEW	10V DC		500V DC		PART NUMBER	SERIAL NUMBER
				PIN 4	PIN 1	PIN 2	PIN 3		
TANK 1 FWD BOOST PUMP									
TANK 1 AFT BOOST PUMP									
TANK 2 FWD BOOST PUMP									
TANK 2 AFT BOOST PUMP									
LEFT CENTER BOOST PUMP									
RIGHT CENTER BOOST PUMP									

G99938 S0006571952_V3

Fuel Pump Inspection Data Sheet
Figure 603/28-22-00-990-812 (Sheet 1 of 2)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

28-22-00

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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PLEASE PROVIDE ADDITIONAL DATA HERE	
SERIAL NUMBER	COMMENTS
PART NUMBER	

G99920 S0006571953_V2

Fuel Pump Inspection Data Sheet
Figure 603/28-22-00-990-812 (Sheet 2 of 2)

EFFECTIVITY
LOM 404, 406, 407 PRE SB 737-28A1201;
AIRPLANES WITH BOOST PUMPS 60B92404-6,
60B92404-7 AND OVERRIDE PUMPS 60B89004-10,
60B89004-12

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LOM ALL

TASK 28-22-00-211-801

4. Fuel Pump Motor-Impeller Inspection

A. General

- (1) This task does an inspection of the stator lead wire bundle for chafing in the fuel pump motor impellers.
- (2) This inspection is necessary for the installation of fuel boost pump motor-impellers prior to part number 60B92404-8 (No. 1 or No. 2 fuel tanks), and prior to part number 60B89004-14 (center tank). This inspection is not necessary for part number 60B92404-8 and subsequent pumps (No. 1 or No. 2 fuel tanks), and part number 60B89004-14 and subsequent pumps (center tank).

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Check

SUBTASK 28-22-00-866-001



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.

SUBTASK 28-22-00-866-002



WARNING

INSTALL THE LOCK ON LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT THE ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.



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SUBTASK 28-22-00-910-001



WARNING MAKE SURE YOU INSTALL THE GROUND LOCK ASSEMBLIES IN ALL

LANDING GEAR. ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN

CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Make sure that the ground lock assemblies are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-00-010-027

- (4) To get access to the P91 and P92 panel, open this access panel:

Number **Name/Location**

117A Electronic Equipment Access Door

SUBTASK 28-22-00-865-002



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row **Col** **Number** **Name**

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row **Col** **Number** **Name**

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-00-010-009

- (6) Go to the six fuel pump locations.

NOTE: Refer to the table below for pump location (Table 603).

Table 603/28-22-00-993-820

Boost Pump Access	Boost Pump Identification
Left inboard rear spar, forward of landing gear door	Left Aft Boost Pump
Left front spar outboard of side-of-body rib	Left Forward Boost Pump
Left rear spar center tank, center section	Left Center Boost Pump
Right inboard rear spar, forward of landing gear door	Right Aft Boost Pump
Right front spar outboard of side-of-body rib	Right Forward Boost Pump
Right rear spar center tank, center section	Right Center Boost Pump

LOM 402, 404 PRE SB 737-28A1197

SUBTASK 28-22-00-200-001

- (7) Inspect the motor-impellers per the instructions in SB 28A1197, Revision 1 or 2.

NOTE: New motor-impellers, part number 60B92404-10 and subsequent (main tanks) and part number 60B89004-16 and subsequent (center tank), are available to replace the earlier models. These units have an internal retainer to prevent chafing of the wire bundle.

NOTE: The letter T will be stamped on the identification plate of the motor impeller after the serial number if the pump has been inspected.

EFFECTIVITY
LOM ALL

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**LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB
737-28A1197**

SUBTASK 28-22-00-210-009

- (8) Make sure that the fuel pump has been inspected for the stator lead (or internal) wire chafing condition.

NOTE: The letter T will be stamped on the identification plate of the motor impeller after the serial number if the pump has been inspected.

LOM ALL

SUBTASK 28-22-00-860-177



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (9) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 402, 404, 406

D	4	C00829	FUEL BOOST PUMP TANK 2 FWD
---	---	--------	----------------------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT
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LOM 402, 404, 406

D	6	C00846	FUEL BOOST PUMP CTR TANK RIGHT
---	---	--------	--------------------------------

LOM ALL

SUBTASK 28-22-00-410-018

- (10) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

117A	Electronic Equipment Access Door
------	----------------------------------

— END OF TASK —

LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279

TASK 28-22-00-200-802

5. Out-of-Tank Wire Bundle (Installed on Fuel Tank) - Inspection

(Figure 604 or Figure 605)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-29.

- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)

EFFECTIVITY
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LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279
(Continued)

(Continued)

Reference	Title
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-12	WIRE HARNESS SUPPORTS
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
511	Left Wing - Leading Edge To Front Spar
512	Left Wing - Krueger Flap No. 2
513	Left Wing - Krueger Flap No. 1
521	Left Wing - Leading Edge to Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
612	Right Wing - Krueger Flap No. 3
613	Right Wing - Krueger Flap No. 4
621	Right Wing - Leading Edge to Front Spar
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
192CL	ECS Access Door
192CR	ECS Access Door
192DR	ECS High Pressure Access Door
511BT	Fairing
611BT	Fairing



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LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279
(Continued)

F. Prepare for the Inspection

SUBTASK 28-22-00-010-015

- (1) To get access to the wire bundles installed on the left and right front spar, do these steps:



WARNING

KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (a) Extend the leading edge flaps and slats (TASK 27-81-00-860-803).



WARNING

MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.
(c) Remove these leading edge gap covers:

Number Name/Location

511BT Fairing
611BT Fairing

SUBTASK 28-22-00-010-016

- (2) To get access to the wire bundles installed in the left Equipment Cooling System (ECS) bay, do these steps:

- (a) Open this access door:

Number Name/Location
192CL ECS Access Door

SUBTASK 28-22-00-010-028



CAUTION

DO NOT OPEN THE ECS ACCESS DOOR 192CR, UNTIL YOU OPEN THE ECS HIGH PRESSURE ACCESS DOOR 192DR. IF YOU DO NOT OBEY, DAMAGE TO THE ECS HIGH PRESSURE ACCESS DOOR 192DR, ITS LATCHES AND HINGES CAN OCCUR.

- (3) To get access to the wire bundles installed in the right ECS bay, do these steps (TASK 06-41-00-800-801):

- (a) Open this access door:

Number Name/Location
192DR ECS High Pressure Access Door

- (b) Open this access door:

Number Name/Location
192CR ECS Access Door

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LOM ALL

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LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279
(Continued)

G. Out-of-Tank Wire Bundle (Installed on Fuel Tank) Inspection

SUBTASK 28-22-00-211-001

► 28-AWL-29: ALI

- (1) Do a detailed inspection on the out-of-tank wire bundles installed on the brackets that are mounted directly on the fuel tanks at locations listed in Table 604 and Table 605.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-29.

Table 604/28-22-00-993-828

Left Wing Front Spar Wire Bundle Number ^{*[1]} , ^{*[2]}	Right Wing Front Spar Wire Bundle Number ^{*[1]} , ^{*[2]}	Front Spar Location (Inboard Front Spar Station (IFSS), Outboard Front Spar Station (OFSS)) ^{*[1]} , ^{*[2]}
W1178, W1180, W1188	W1278, W1280, W1288, W1664	IFSS 137
W1176 (or MW3304), W1182	W1276 (or MW4304), W1282	IFSS 152
W1182	W1282	IFSS 182
W1176 (or MW3304), W1182	W1276 (or MW4304), W1282	IFSS 192
W1140, W1174 (or MW3303), W1178, W1182, W1188, W1662	W1138, W1274 (or MW4303), W1278, W1282, W1288, W1664	IFSS 211
W1140, W1174 (or MW3303), W1178, W1182, W1188, W1662	W1138, W1274 (or MW4303), W1278, W1282, W1288, W1664	IFSS 217
W1140, W1178, W1182, W1188, W1662	W1138, W1278, W1282, W1288, W1664	IFSS 220
W1140, W1178, W1182, W1188, W1662	W1138, W1282, W1288, W1664	OFSS 227
W1188, W1662	----	OFSS 390

*[1] 28-AWL-28: CDCCL

*[2] 28-AWL-29: ALI

NOTE: Refer to the Figure 604 for the spar location.

Table 605/28-22-00-993-829

Left ECS Bay Wire Bundle Number ^{*[1]} , ^{*[2]}	Right ECS Bay Wire Bundle Number ^{*[1]} , ^{*[2]}	Stringer Number Location ^{*[1]} , ^{*[2]}
LOM 406, 407, 411, 412, 415, 416, 420, 422-433; LOM 402, 404 POST SB 737-57A1279		
W5102, W5230	W6128, W6202, W8122	1
W5102, W5230	W6128, W6202	3
W5102, W5230	W6128, W6202	5
W5102, W5230	W6128, W6202	7
W5102, W5230	W6128, W6202	9

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LOM ALL

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LOM 406, 407, 411, 412, 415, 416, 420, 422-433; LOM 402, 404 POST SB 737-57A1279 (Continued)

Table 605/28-22-00-993-829 (Continued)

Left ECS Bay Wire Bundle Number *[1], *[2]	Right ECS Bay Wire Bundle Number *[1], *[2]	Stringer Number Location *[1], *[2]
W5102, W5230	W6128, W6202	10
LOM 434, 437-447, 450-999		
W5102, W5104, W5230	W6128, W6202, W6230, W8122	1
W5102, W5104, W5230	W6128, W6202, W6230	3
W5102, W5104, W5230	W6128, W6202, W6230	5
W5102, W5104, W5230	W6128, W6202, W6230	7
W5102, W5104, W5230	W6128, W6202, W6230	9
W5102, W5104, W5230	W6128, W6202, W6230	10
LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279		

*[1] 28-AWL-28: CDCCL

*[2] 28-AWL-29: ALI

LOM 402, 404 POST SB 737-57A1279

SUBTASK 28-22-00-211-004

► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

- (2) For the wire bundles installed on the brackets directly on the wing front spar and in the ECS bay listed in Table 604 and Table 605 for the wire bundle number and location, do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

- (a) Make sure the Teflon sleeving is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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28-AWL-29: ALI

28-AWL-28: CDCCL

- 1) TFE-2X is installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- 2) Attached (secured) within the full cushion clamp,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- 3) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- (b) Make sure the full cushion clamp is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

- 1) Installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

LOM 406

SUBTASK 28-22-00-211-005

► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

LOM 406 POST SB 737-57A1279

- (3) The wire bundles installed on the brackets directly on the wing front spar listed in Table 604 for the wire bundle number and location, do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► **28-AWL-29: ALI**

► **28-AWL-28: CDCCL**

- (a) Make sure the Teflon sleeving is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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28-AWL-29: ALI

28-AWL-28: CDCCL

- 1) TFE-2X is installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- 2) Attached (secured) within the full cushion clamp,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- 3) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- (b) Make sure the full cushion clamp is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 1) Installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

LOM 406 POST SB 737-28-1312

- (4) The wire bundles installed on brackets directly on fuel tank on stringers in the ECS bays listed in Table 605, do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-28: CDCCL

► 28-AWL-29: ALI

- (a) Make sure the wire bundle is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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28-AWL-28: CDCCL

28-AWL-29: ALI

- 1) Installed with full cushion clamp,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-28: CDCCL

28-AWL-29: ALI

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- (b) Make sure the full cushion clamp is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-29: ALI

28-AWL-28: CDCCL

- 1) Installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-28: CDCCL

LOM 406

- (5) If any of the brackets installed (mounted) on the stringers in the left and right ECS bays listed in Table 605 are removed and re-installed or replaced, do these steps:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

► 28-AWL-28: CDCCL

- (a) Make sure a fay sealed fay surface bond is installed between the mating surfaces of the brackets and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

► 28-AWL-28: CDCCL

- (b) Measure the electrical bonding resistance between the brackets and the structure (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-28: CDCCL

- 2) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 28-22-00-211-006

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- (6) For the wire bundles on brackets installed directly on the wing front spar listed in Table 604, do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- (a) Make sure the full cushion clamp is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 1) Installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

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► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- (7) For the wire bundles on brackets installed directly on fuel tank on stringers in the ECS bays listed in Table 605, do these steps:

LOM 407, 412, 415, 416, 420, 423-430 PRE SB 737-28-1312

NOTE: Not applicable to the wire bundle in the left ECS bay

NOTE: Not applicable to the wire bundle in the right ECS bay.

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- (a) Make sure the full cushion clamp is:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

► 28-AWL-29: ALI

► 28-AWL-28: CDCCL

- 1) Installed around the wire bundle,

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

EFFECTIVITY
LOM ALL

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28-AWL-29: ALI

28-AWL-28: CDCCL

- 2) Not damaged.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-28 and 28-AWL-29.

28-AWL-28: CDCCL

- (8) If any of the brackets in the front spar or ECS bays located in Table 604 or Table 605 are removed and reinstalled or replaced, do these steps:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

28-AWL-28: CDCCL

- (a) Make sure a fay sealed fay surface bond is installed between the mating surfaces of the bracket and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

28-AWL-28: CDCCL

- (b) Measure the electrical bonding resistance between the brackets and the structure (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-28: CDCCL

- 2) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

**LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB
737-57A1279**

SUBTASK 28-22-00-960-001

- (9) If you found a problem, replace the full cushion clamp and Teflon sleeving, if applicable (SWPM 20-10-11 and SWPM 20-10-12).

EFFECTIVITY
LOM ALL

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LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-57A1279
(Continued)

SUBTASK 28-22-00-300-001

- (10) All repairs and alterations that involve fuel tank penetration require compliance with AWL 28-AWL-12.

H. Put the Airplane Back to Its Usual Position

SUBTASK 28-22-00-410-008

- (1) If the wire bundles in the left ECS were removed, do these steps:

- (a) Close this access door:

<u>Number</u>	<u>Name/Location</u>
192CL	ECS Access Door

SUBTASK 28-22-00-410-019

- (2) If the wire bundles in the right ECS were removed, do these steps (TASK 06-41-00-800-801):

- (a) Close this access door:

<u>Number</u>	<u>Name/Location</u>
192CR	ECS Access Door

- (b) Close this access door:

<u>Number</u>	<u>Name/Location</u>
192DR	ECS High Pressure Access Door

NOTE: The ECS high pressure access door, 192DR, will not latch in its position if the ECS access door, 192CR, is not closed.

SUBTASK 28-22-00-860-170

- (3) Install the leading edge gap cover(s), if applicable:

<u>Number</u>	<u>Name/Location</u>
511BT	Fairing
611BT	Fairing

SUBTASK 28-22-00-860-171



WARNING REMOVE THE LOCK FROM LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801, if applicable.

SUBTASK 28-22-00-860-172



WARNING KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (5) Retract the leading edge flaps, if applicable (TASK 27-81-00-860-804).

— END OF TASK —

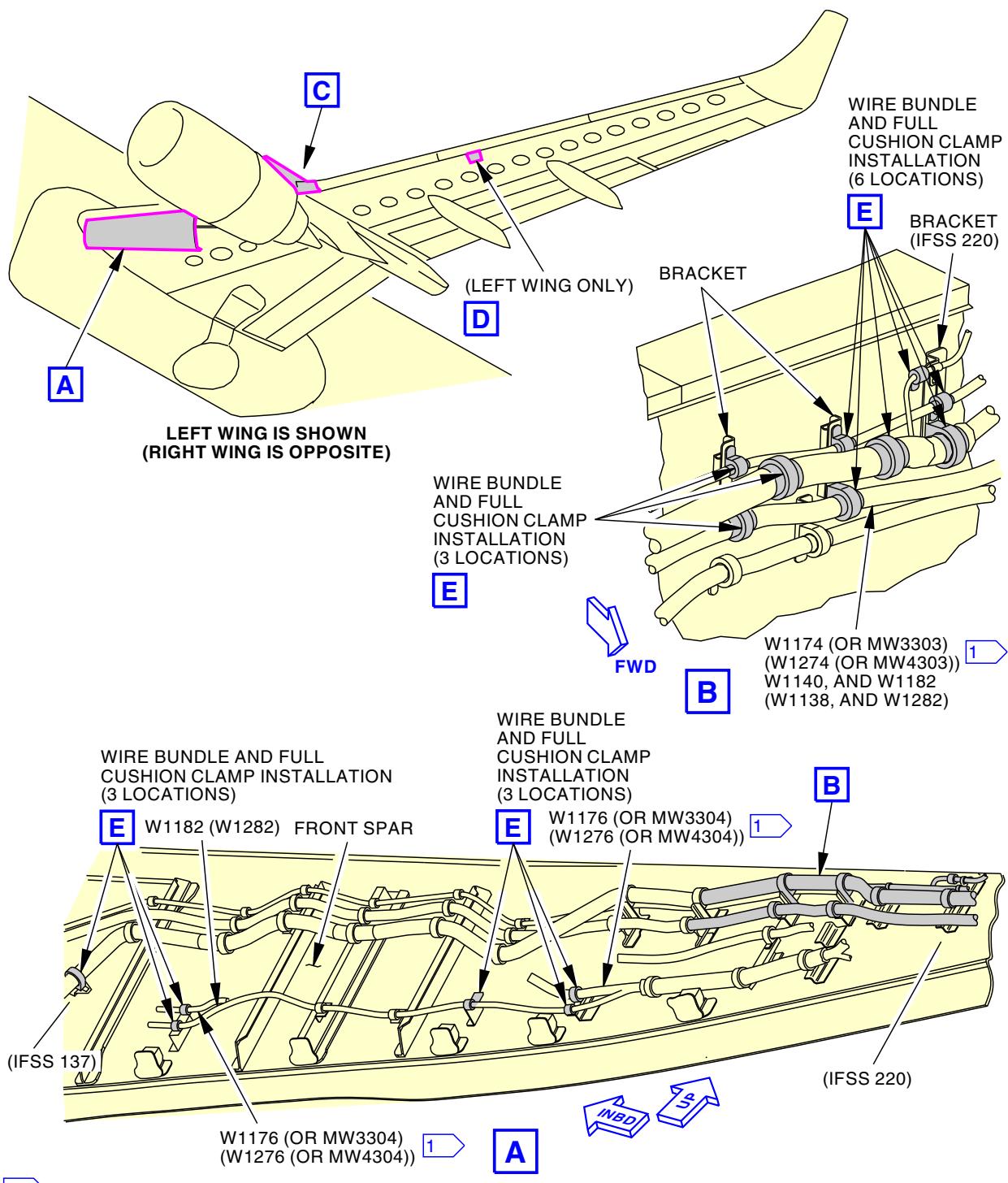
EFFECTIVITY
LOM ALL

28-22-00



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1 ➤ BOEING OR SUPPLIER WIRE BUNDLE

2404651 S0000555966_V3

**Out-of-Tank Wire Bundle - Front Spar
Figure 604/28-22-00-990-829 (Sheet 1 of 4)**

EFFECTIVITY
**LOM 406, 407, 411, 412, 415, 416, 420, 422-434,
437-447, 450-999; LOM 402, 404 POST SB
737-57A1279**

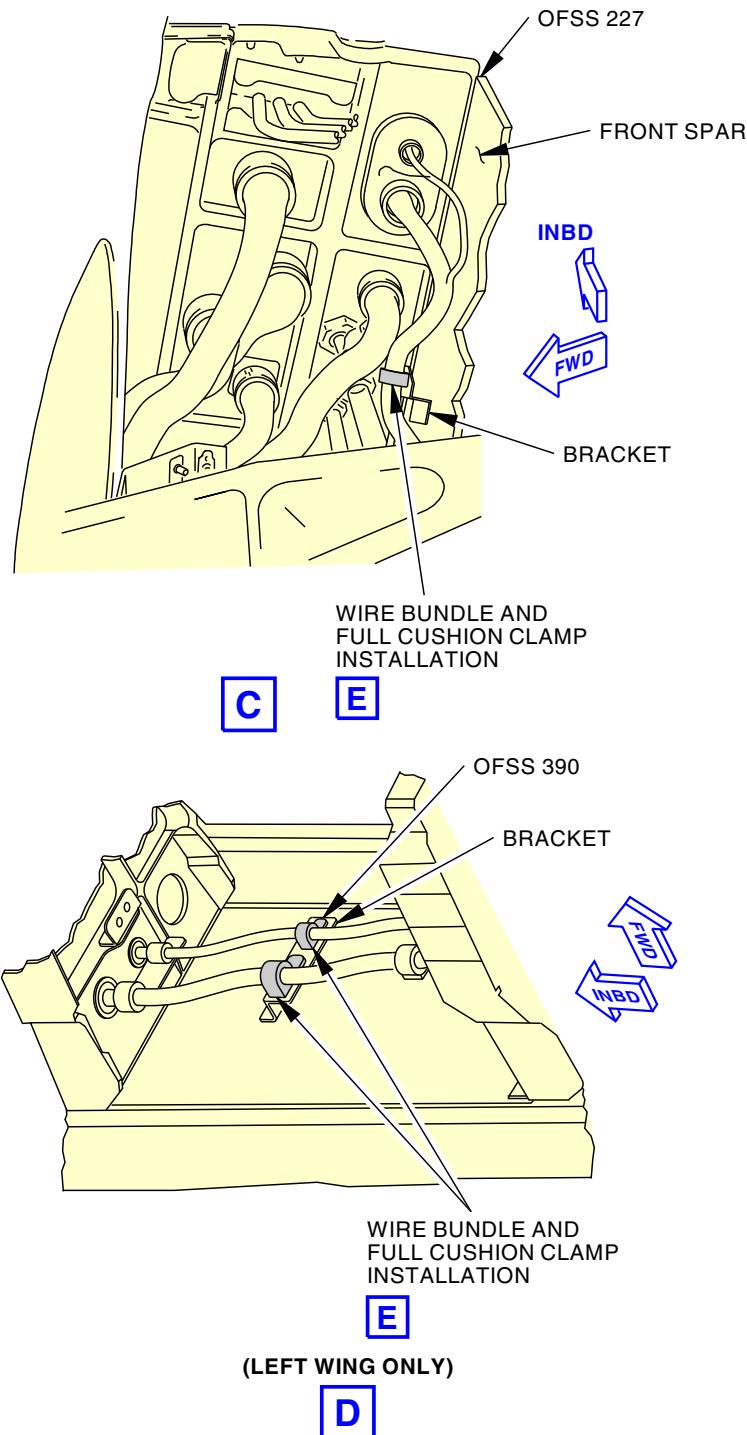
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2404910 S0000555967_V3

Out-of-Tank Wire Bundle - Front Spar
Figure 604/28-22-00-990-829 (Sheet 2 of 4)

EFFECTIVITY
LOM 406, 407, 411, 412, 415, 416, 420, 422-434,
437-447, 450-999; LOM 402, 404 POST SB
737-57A1279

28-22-00

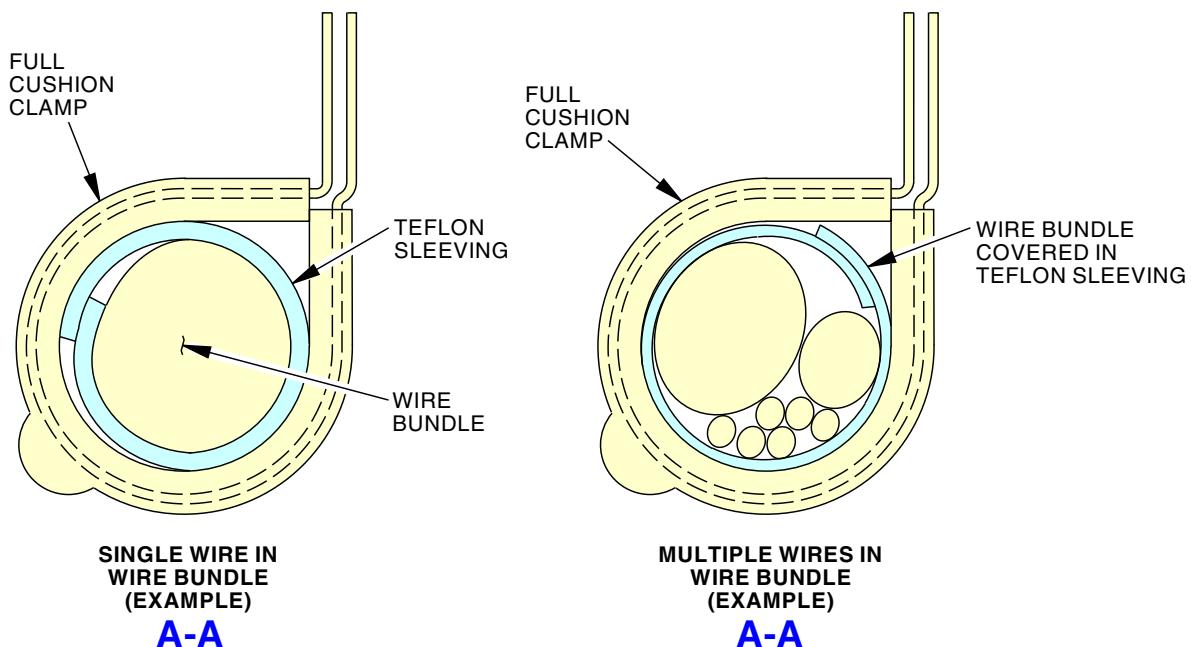
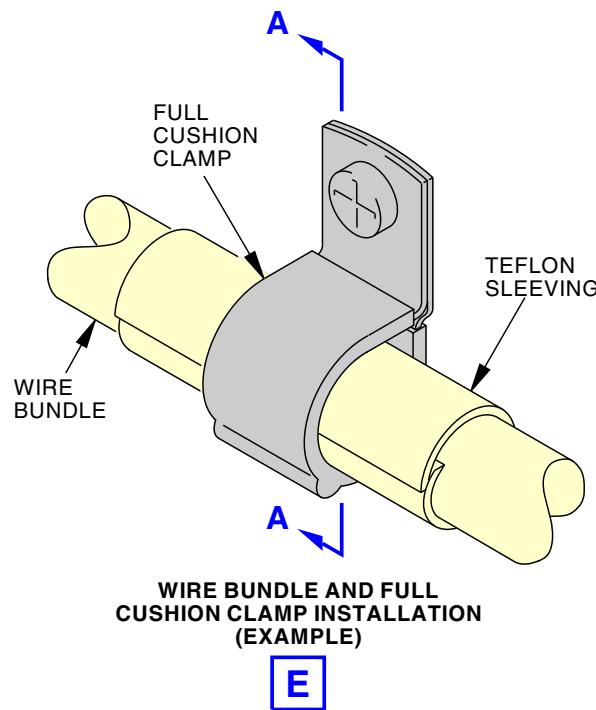
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2442787 S0000567500_V3

Out-of-Tank Wire Bundle - Front Spar
Figure 604/28-22-00-990-829 (Sheet 3 of 4)

EFFECTIVITY
LOM 406; LOM 402, 404 POST SB 737-57A1279

28-22-00

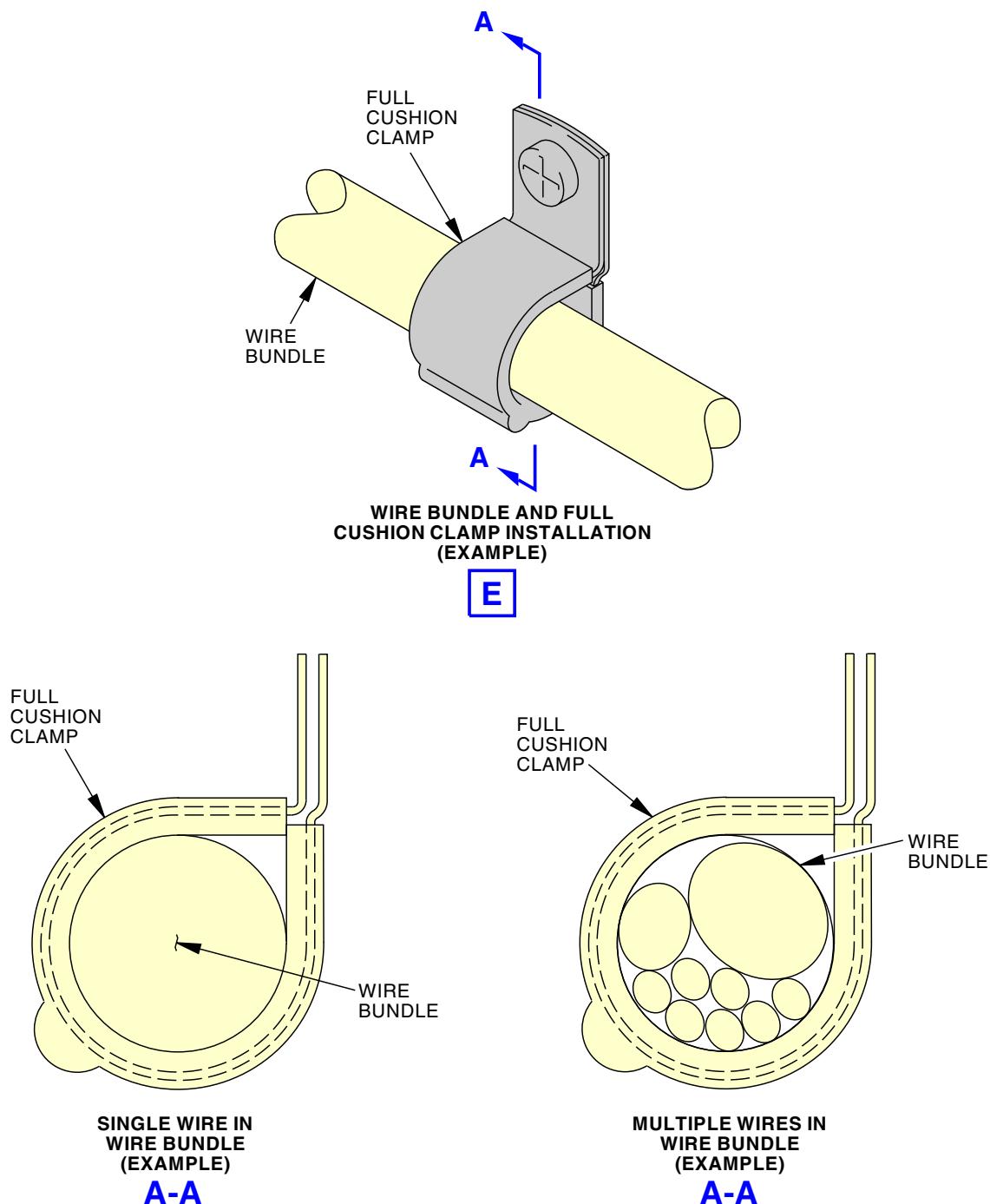
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2442817 S0000567512_V3

Out-of-Tank Wire Bundle - Front Spar
Figure 604/28-22-00-990-829 (Sheet 4 of 4)

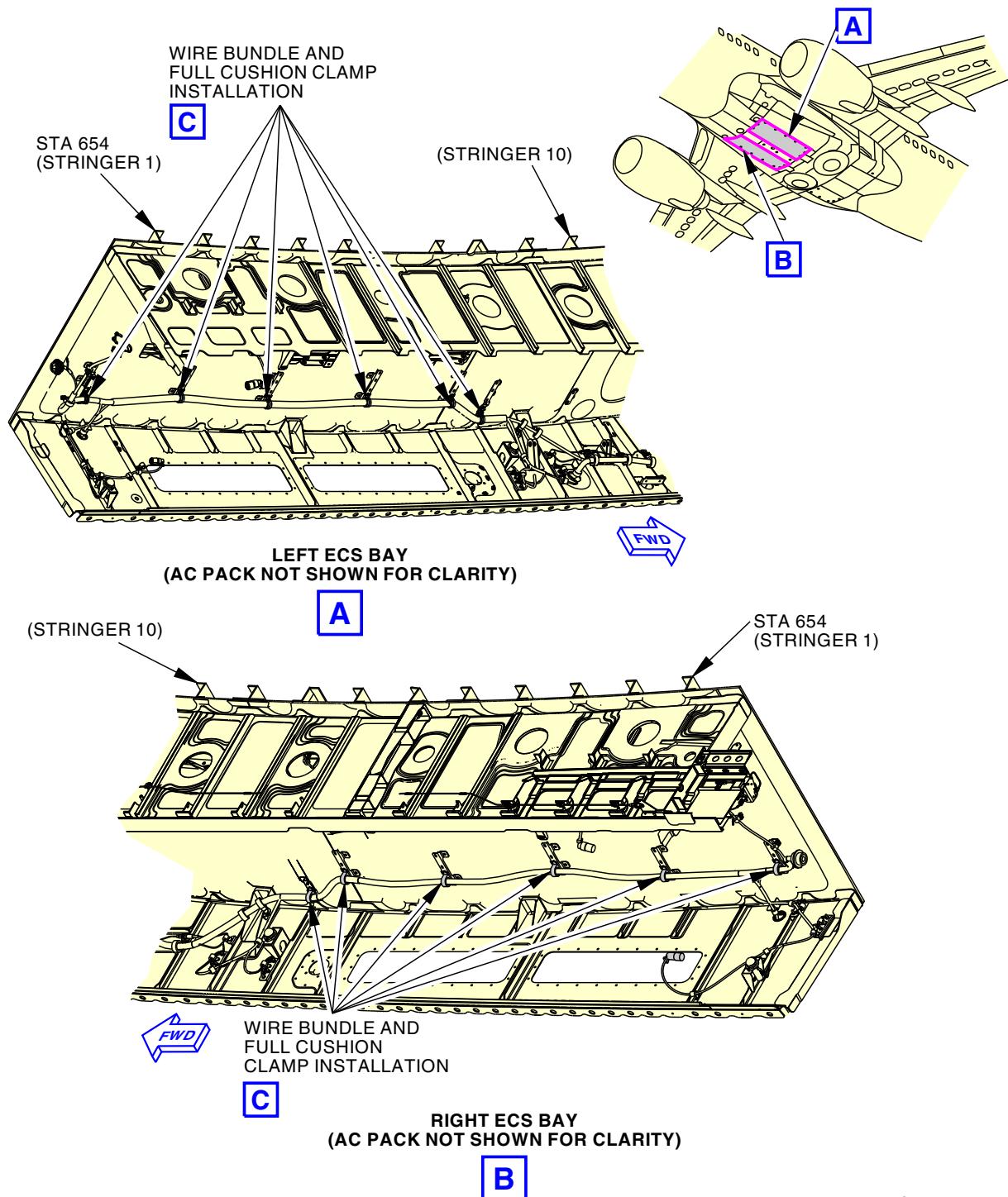
EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999

28-22-00

D633A101-LOM

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2443050 S0000567531_V3

Out-of-tank Wire Bundle - Ecs Bay
Figure 605/28-22-00-990-828 (Sheet 1 of 3)

EFFECTIVITY
 LOM 406, 407, 411, 412, 415, 416, 420, 422-434,
 437-447, 450-999; LOM 402, 404 POST SB
 737-57A1279

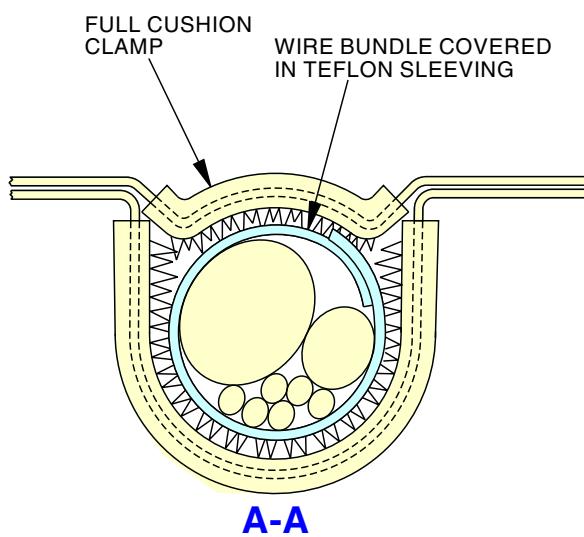
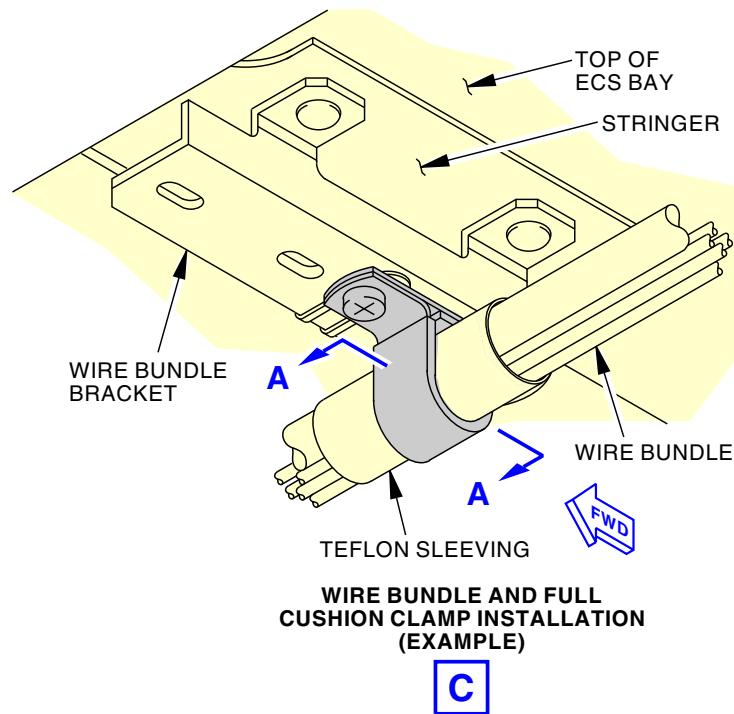
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2404760 S0000555968_V3

Out-of-tank Wire Bundle - Ecs Bay
Figure 605/28-22-00-990-828 (Sheet 2 of 3)

EFFECTIVITY
LOM 402, 404 POST SB 737-57A1279

28-22-00

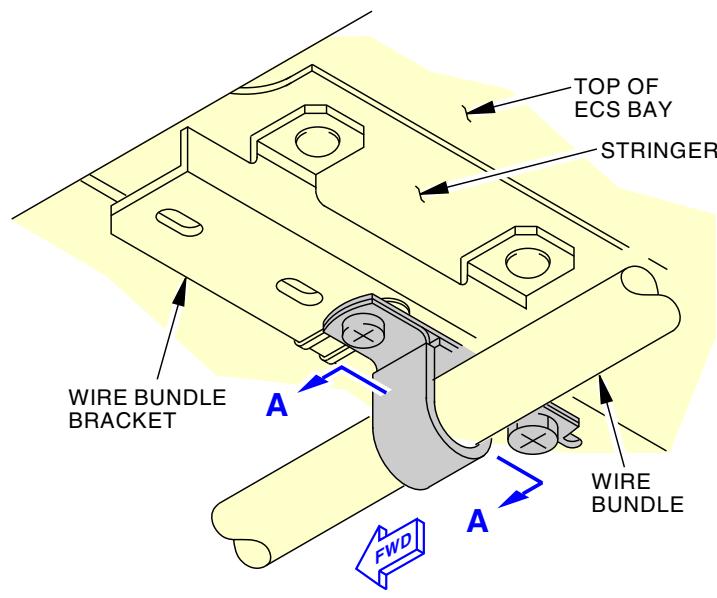
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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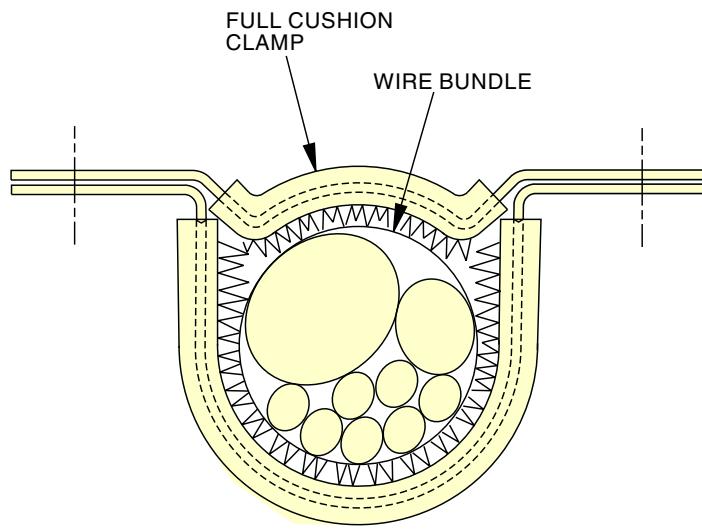


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WIRE BUNDLE AND FULL
CUSHION CLAMP INSTALLATION
(EXAMPLE)

C



A-A

2404926 S0000555969_V2

Out-of-tank Wire Bundle - Ecs Bay
Figure 605/28-22-00-990-828 (Sheet 3 of 3)

EFFECTIVITY
LOM 406, 407, 411, 412, 415, 416, 420, 422-434,
437-447, 450-999

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SPAR VALVE - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a task to functionally check the spar valve actuator electrical bonding path.

TASK 28-22-11-720-801

2. Spar Valve Actuator - Functional Check

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-11-300-801	Rework the Electrical Faying Surface Bonds for the Spar Valve (P/B 401)
28-41-42-700-801	FQIS Shield Ground Terminal - Test (P/B 501)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A50337	Sealant - Fuel Tank	BMS5-45 Class B

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Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

F. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

G. Prepare for the Procedure

SUBTASK 28-22-11-865-010

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-865-011

- (2) For the left spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-865-012

- (3) For the right spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

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SUBTASK 28-22-11-010-043

- (4) Open the applicable access panel(s):

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

H. Procedure

SUBTASK 28-22-11-010-039

- (1) Get access to the applicable spar valve actuator on the front spar of the No. 1 or No. 2 tank.

SUBTASK 28-22-11-010-040

- (2) Disconnect the electrical connector from the actuator.

SUBTASK 28-22-11-010-041

- (3) Remove the screw and two washers to disconnect the bonding jumper from the actuator.

SUBTASK 28-22-11-765-016

28-AWL-24: ALI

- (4) Measure the electrical bonding resistance between the electrical connector flange of the actuator and the front spar (SWPM 20-20-00).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

28-AWL-24: ALI

- (a) Do this measurement with the bonding jumper and the electrical connector disconnected.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- (b) Make sure the bonding jumper does not touch the actuator during the bonding measurement.

- (c) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-24: ALI

- (d) Make sure the bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

SUBTASK 28-22-11-420-041

- (5) Do these steps to install the bonding jumper to the actuator:

- (a) Clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

- 1) Rub dry with a clean, dry cotton wiper, G00034.

- 2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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- (b) Install the screw, two washers, and bonding jumper to the actuator.
- (c) Tighten the screw to 35 in-lb (4 N·m).

► 28-AWL-24: ALI

- (d) Install a fillet sealed fay surface bond between the actuator and the terminal of the bonding jumper (SWPM 20-20-00).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

SUBTASK 28-22-11-765-017

► 28-AWL-24: ALI

- (6) Measure the electrical bonding resistance between the upper housing of the actuator and the attached terminal of the bonding jumper (SWPM 20-20-00 and SWPM 20-20-10) (Figure 201).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- (a) Do not touch the screw when you make the bonding measurement.
- (b) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-24: ALI

- (c) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- 1) If the electrical bonding resistance is more than 0.0010 ohm (1.0 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-765-018

► 28-AWL-24: ALI

- (7) With the electrical connector disconnected, measure the electrical bonding resistance between the outermost FQIS shield ground terminal and the front spar (SWPM 20-20-00 and SWPM 20-20-10).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- (a) Do not touch the FQIS shield ground terminal stud when you make the bonding measurement.
- (b) Use an intrinsically safe approved bonding meter, COM-1550.

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► 28-AWL-24: ALI

- (c) Make sure the electrical bonding resistance is 0.0140 ohm (14.0 milliohms) or less.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- 1) If the electrical bonding resistance is more than 0.0140 ohm (14.0 milliohms), then do this task: FQIS Shield Ground Terminal - Test, TASK 28-41-42-700-801.

- (d) Apply a cap seal of sealant, A50337 (BMS 5-45 Class B), over the FQIS shield ground terminal.

SUBTASK 28-22-11-390-004

► 28-AWL-24: ALI

- (8) Apply a cap seal over the screw and the terminal lug of the bonding jumper attached to the actuator.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-24.

- (a) Use sealant, A50337 (BMS 5-45 Class B), to apply the cap seal.

SUBTASK 28-22-11-916-008

- (9) Apply protective finishes to the bare metal areas of the front spar (TASK 28-11-00-600-801).

NOTE: Re-apply the protective coating to the front spar where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-11-916-009

- (10) Apply chemical conversion coating, to all bare metal areas of the actuator (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the actuator where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-22-11-860-048

- (11) Connect the electrical connector to the actuator.

I. Spar Valve Operational Test

NOTE: This test checks the left and right engine fuel spar valves indication and electrical control.

SUBTASK 28-22-11-710-011

- (1) For the applicable spar valve, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.

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J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-11-410-014

- (1) Close the applicable access panel(s):

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-22-11-865-013

- (2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-865-014

- (3) For the left actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-865-015

- (4) For the right actuator,

Remove the safety tag and close this circuit breaker:

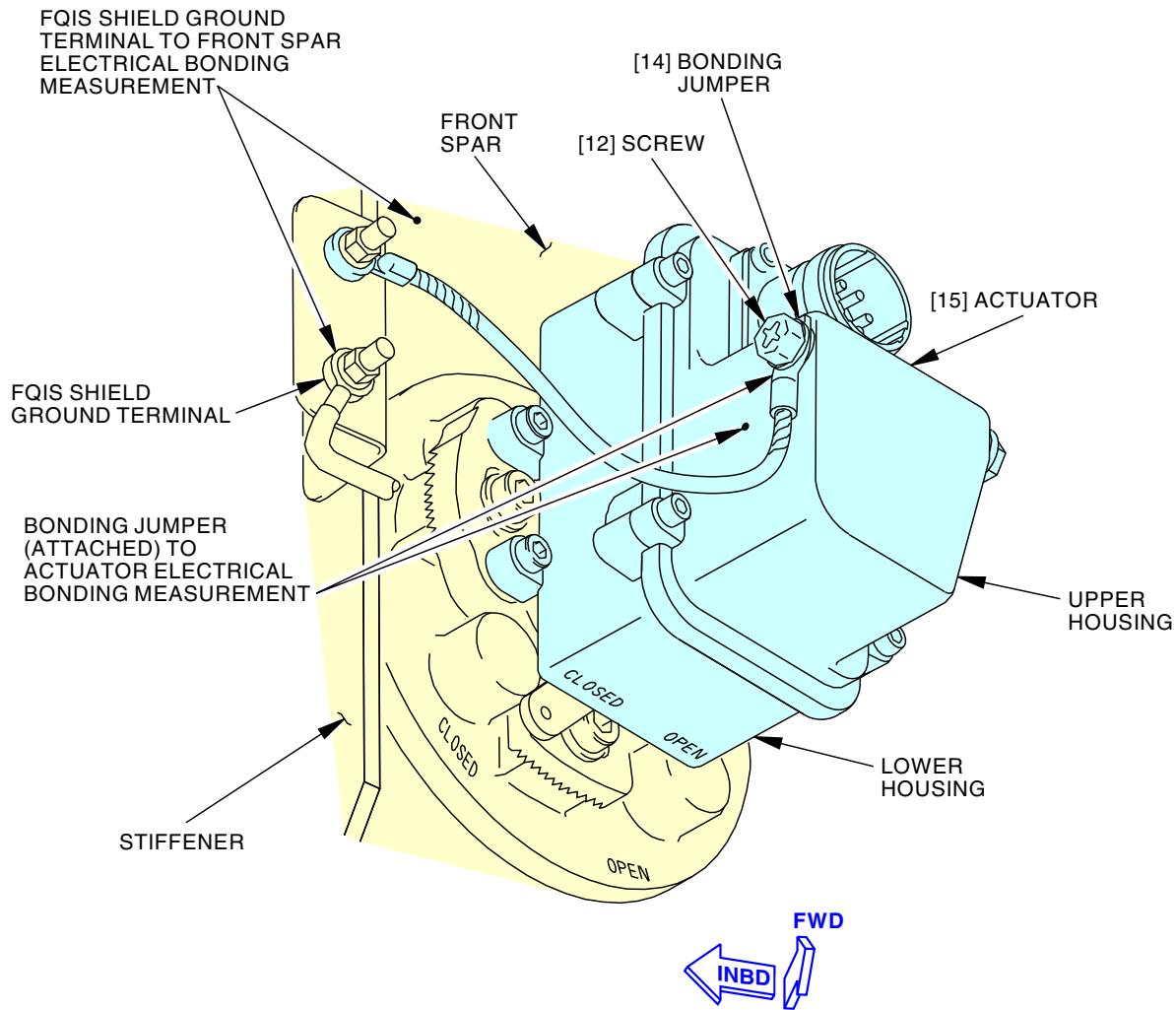
F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

———— END OF TASK ————

EFFECTIVITY
LOM 402, 404, 406 POST SB 737-28A1207

28-22-11



ELECTRICAL BONDING MEASUREMENT
(BONDING JUMPER CONNECTED)

D

U49636 S0000201338_V6

Spar Valve Actuator Functional Check
Figure 201/28-22-11-990-809

EFFECTIVITY
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SPAR VALVE - REMOVAL/INSTALLATION

1. General

- A. The spar valve contains three parts: the actuator, the valve adapter, and the valve body.
- B. It is not necessary to defuel the fuel tank to remove the actuator. It is necessary to defuel the fuel tank to remove the valve adapter or valve body.
- C. This procedure contains these tasks:
 - (1) Remove the Actuator of the Spar Valve
 - (2) Install the Actuator of the Spar Valve
 - (3) Remove the Valve Adapter of the Spar Valve
 - (4) Install the Valve Adapter of the Spar Valve
 - (5) Remove the Valve Body of the Spar Valve
 - (6) Install the Valve Body of the Spar Valve

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

- (7) Rework the Electrical Faying Surface Bonds for the Spar Valve

**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017**

TASK 28-22-11-000-801

2. Actuator of the Spar Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Actuator of the Spar Valve.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Flaps and Slats Deactivation (P/B 201)

C. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

E. Prepare for the Removal

SUBTASK 28-22-11-860-031



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE LEADING EDGE FLAPS AND SLATS. THE FLAPS AND SLATS MOVE QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Leading Edge Flaps and Slats Deactivation, TASK 27-81-00-040-801.

EFFECTIVITY
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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

SUBTASK 28-22-11-860-009

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-860-001

- (3) For the left spar valve actuator,

Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-860-002

- (4) For the right spar valve actuator,

Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-010-001

- (5) Open the applicable access panel(s):

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

F. Actuator of the Spar Valve Removal

SUBTASK 28-22-11-860-012

- (1) Move the manual override lever [1] to the fully CLOSED position.

SUBTASK 28-22-11-010-010

- (2) Disconnect the electrical connector [5] from the actuator [4].

SUBTASK 28-22-11-010-011

- (3) Remove the old sealant from the bonding jumper [8], fasteners and bonding jumper tab.

SUBTASK 28-22-11-010-012

- (4) Remove the screw [6], three washers [7], nut [9], and bonding jumper [8] from the bonding jumper tab on the actuator [4].

SUBTASK 28-22-11-010-013

- (5) Remove the lockwire from the actuator mounting screws [3].

SUBTASK 28-22-11-010-014

- (6) Remove the actuator mounting screws [3] and the washers [2] (four locations).



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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

SUBTASK 28-22-11-010-015

- (7) Remove the actuator [4].

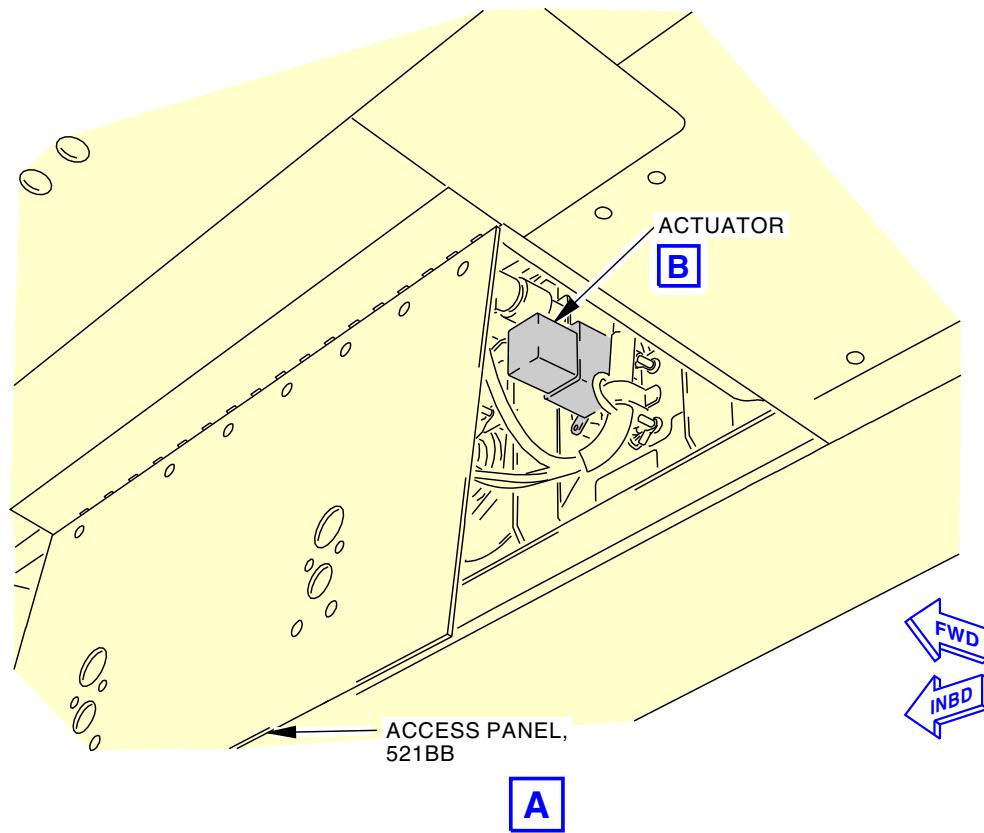
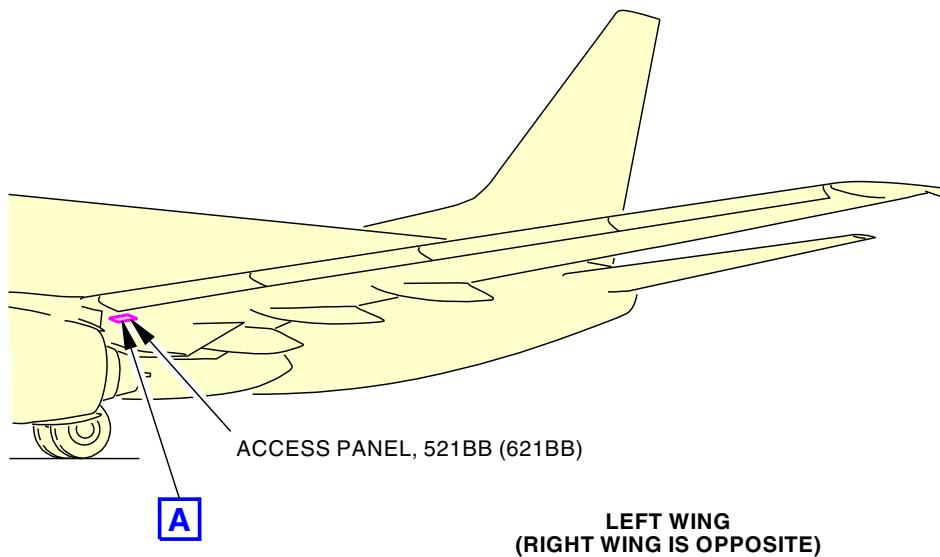
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— EFFECTIVITY —
LOM ALL

28-22-11



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F86730 S0006571959_V3

Spar Valve Actuator Installation
Figure 401/28-22-11-990-804 (Sheet 1 of 2)

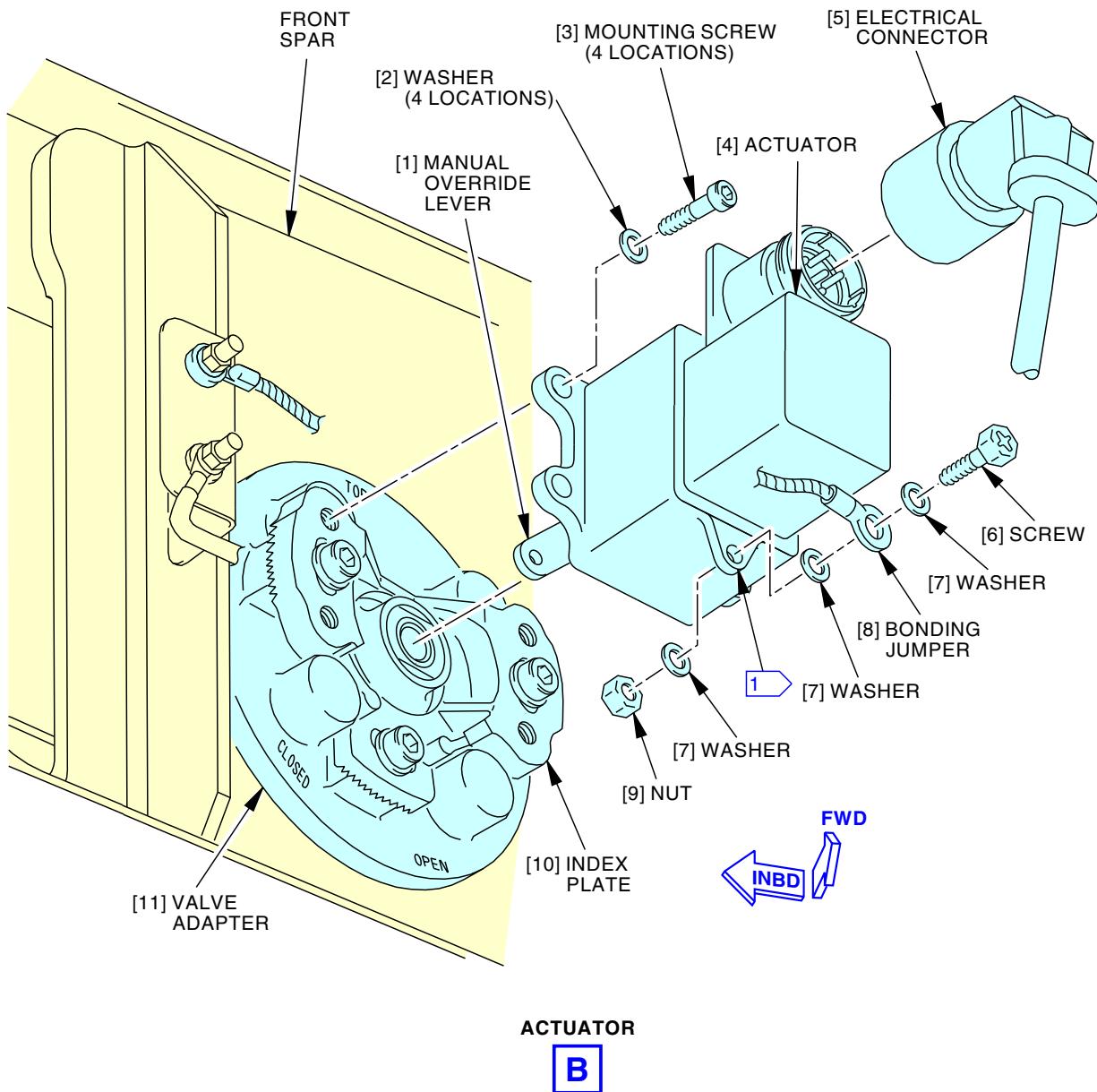
EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

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- 1** PREPARE THE FAYING SURFACE OF THE BONDING JUMPER AND BONDING JUMPER TAB FOR AN ELECTRICAL SURFACE BOND. APPLY A FILLET SEAL TO THE BONDING JUMPER TERMINAL (SWPM 20-20-00).

F87134 S0006571960_V3

Spar Valve Actuator Installation
Figure 401/28-22-11-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

TASK 28-22-11-400-801

3. Actuator of the Spar Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Actuator of the Spar Valve.

B. References

Reference	Title
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Flaps and Slats - Activation (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

EFFECTIVITY	
LOM ALL	

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

E. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

F. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

G. Install the Spar Valve Actuator (View B)

SUBTASK 28-22-11-110-001

- (1) Remove the old sealant from these components (TASK 20-30-92-910-801):
 - (a) actuator [4] (if re-used)
 - (b) bonding jumper [8], screw [6], washers [7], nut [9].



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- (c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-11-980-002

- (2) Move the manual override lever [1] of the actuator to the CLOSED position.

SUBTASK 28-22-11-820-001

- (3) Align the actuator output shaft with the adapter shaft.

SUBTASK 28-22-11-210-001

- (4) Make sure that the two spaces for teeth on the adapter shaft align with the actuator output shaft.

SUBTASK 28-22-11-420-001

- (5) Put the actuator output shaft into the adapter shaft.

NOTE: The mounting feet on the actuator automatically align with the mounting points on the index plate.

SUBTASK 28-22-11-420-002

- (6) Install the four actuator mounting screws [3] and washers [2].

SUBTASK 28-22-11-430-004

- (7) Tighten the actuator mounting screws [3] to 20 in-lb (2.3 N·m).

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

SUBTASK 28-22-11-420-003

- (8) Install the lockwire on the actuator mounting screws [3].

SUBTASK 28-22-11-765-004

- (9) Do these steps to prepare the bonding jumper [8] and fasteners for an electrical faying surface bond (SWPM 20-20-00 and SWPM 20-20-10):



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- (a) Final clean the contact surfaces of the actuator [4], bonding jumper [8], and the fasteners with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-11-420-004

- (10) Install the screw [6], three washers [7], bonding jumper [8], and nut [9] to the actuator [4].
- (a) Tighten the screw [6] to 35 in-lb (4 N·m).

SUBTASK 28-22-11-220-001

- (11) Make sure that the bonding resistance between the actuator [4] and the front spar is 0.010 ohm (10 milliohms) or less (SWPM 20-20-00).

SUBTASK 28-22-11-430-001

- (12) Apply a cap seal of BMS5-142 sealant, A02315, on the bonding jumper to fully cover the bonding jumper terminal with sealant.

SUBTASK 28-22-11-916-003

- (13) Do this task to apply protective finishes to the bare metal areas of the front spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coating to the front spar where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:
- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
 - 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-11-916-004

- (14) Apply chemical conversion coating to all bare areas of the actuator [4] (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the actuator [4] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper tab that are not covered with sealant.

EFFECTIVITY
LOM ALL

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

SUBTASK 28-22-11-860-017

- (15) Connect the electrical connector [5] to the actuator [4].

H. Spar Valve Actuator Operational Test

SUBTASK 28-22-11-860-018

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-860-003

- (2) For the left actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-860-004

- (3) For the right actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-860-005

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-22-11-710-001

- (5) For the actuator that you installed, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-11-410-003

- (1) Close the applicable access panel(s):

<u>Number</u>	<u>Name/Location</u>
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-22-11-860-033

- (2) Do this task: Leading Edge Flaps and Slats - Activation, TASK 27-81-00-440-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017

TASK 28-22-11-000-804

4. Actuator of the Spar Valve Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the Actuator of the Spar Valve.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Flaps and Slats Deactivation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975

D. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

E. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

EFFECTIVITY
LOM ALL

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

Number Name/Location

621BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

F. Prepare for the Removal

SUBTASK 28-22-11-860-032



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE LEADING EDGE FLAPS AND SLATS. THE FLAPS AND SLATS MOVE QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Leading Edge Flaps and Slats Deactivation, TASK 27-81-00-040-801.

SUBTASK 28-22-11-862-001

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row Col Number Name

B 5 C00540 FUEL SPAR VALVE IND

SUBTASK 28-22-11-862-002

- (3) For the left spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row Col Number Name

B 4 C00359 FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-862-003

- (4) For the right spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row Col Number Name

B 3 C00360 FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-010-009

- (5) Open the applicable access panel(s):

Number Name/Location

521BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station
36.02
621BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station
36.02

G. Actuator of the Spar Valve Removal

SUBTASK 28-22-11-010-016

- (1) Move the manual override lever [1] to the fully CLOSED position.

SUBTASK 28-22-11-010-017

- (2) Disconnect the electrical connector [5] from the actuator [15].

EFFECTIVITY
LOM ALL

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

SUBTASK 28-22-11-010-018

- (3) Remove the sealant from the bonding jumper [14] and fasteners at the actuator attachment location.
 - (a) Use sealant removal tool, COM-2481, or equivalent.

SUBTASK 28-22-11-010-019

- (4) Remove the screw [12], two washers [13], and bonding jumper [14] from the actuator [15].

SUBTASK 28-22-11-010-020

- (5) Remove the actuator mounting screws [3] and the washers [2] (four locations).

SUBTASK 28-22-11-010-021

- (6) Carefully disassemble the actuator [15] from the index plate [10].

NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-22-11-010-022

- (7) Remove the actuator [15].

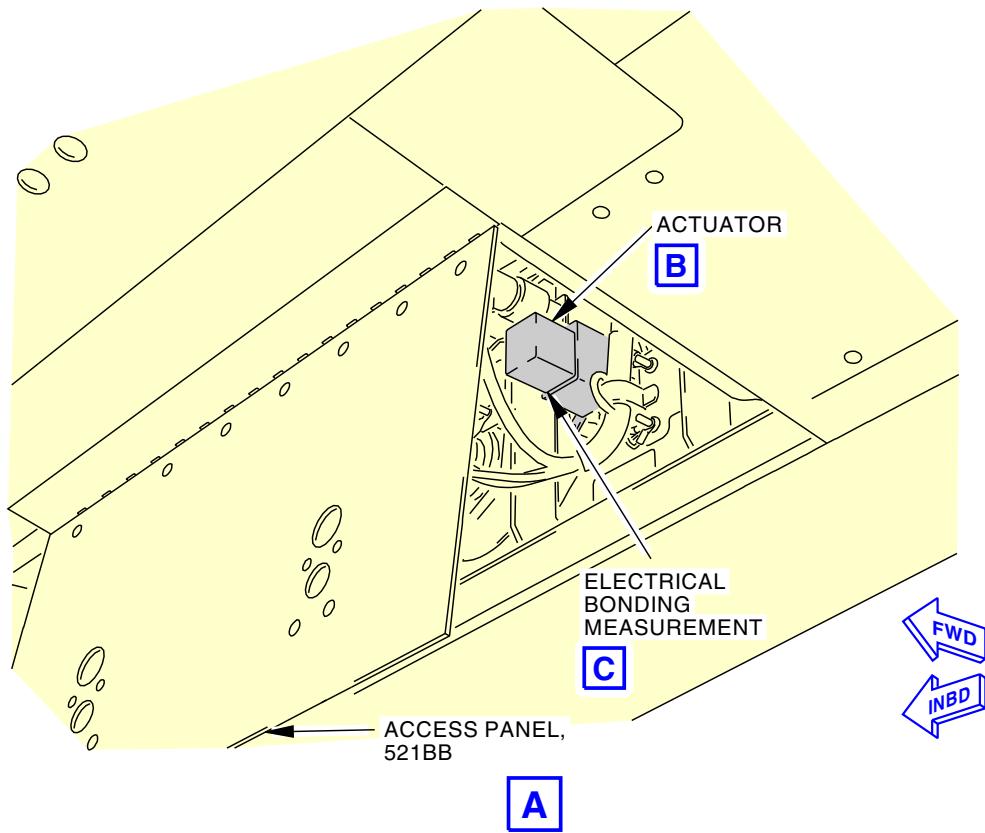
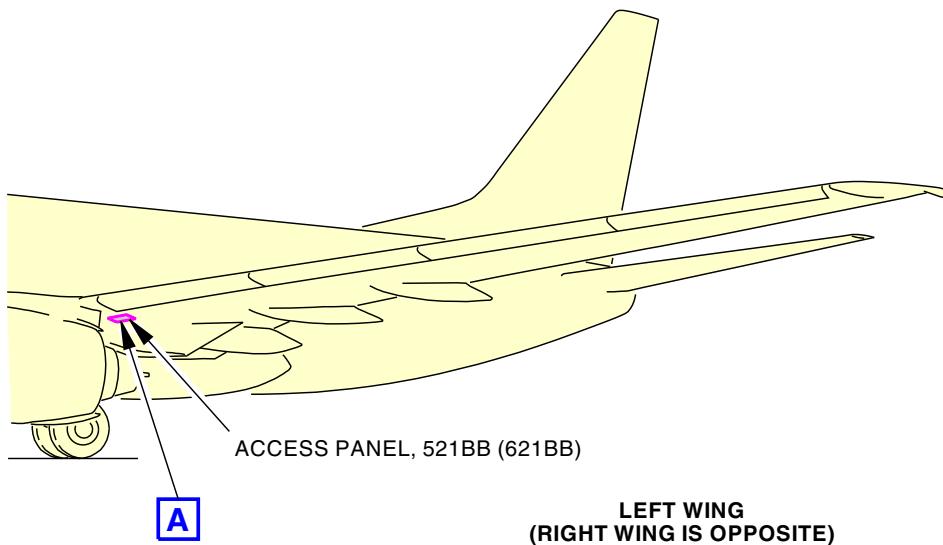
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EFFECTIVITY
LOM ALL

28-22-11



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AIRCRAFT MAINTENANCE MANUAL



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Spar Valve Actuator Installation
Figure 402/28-22-11-990-806 (Sheet 1 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

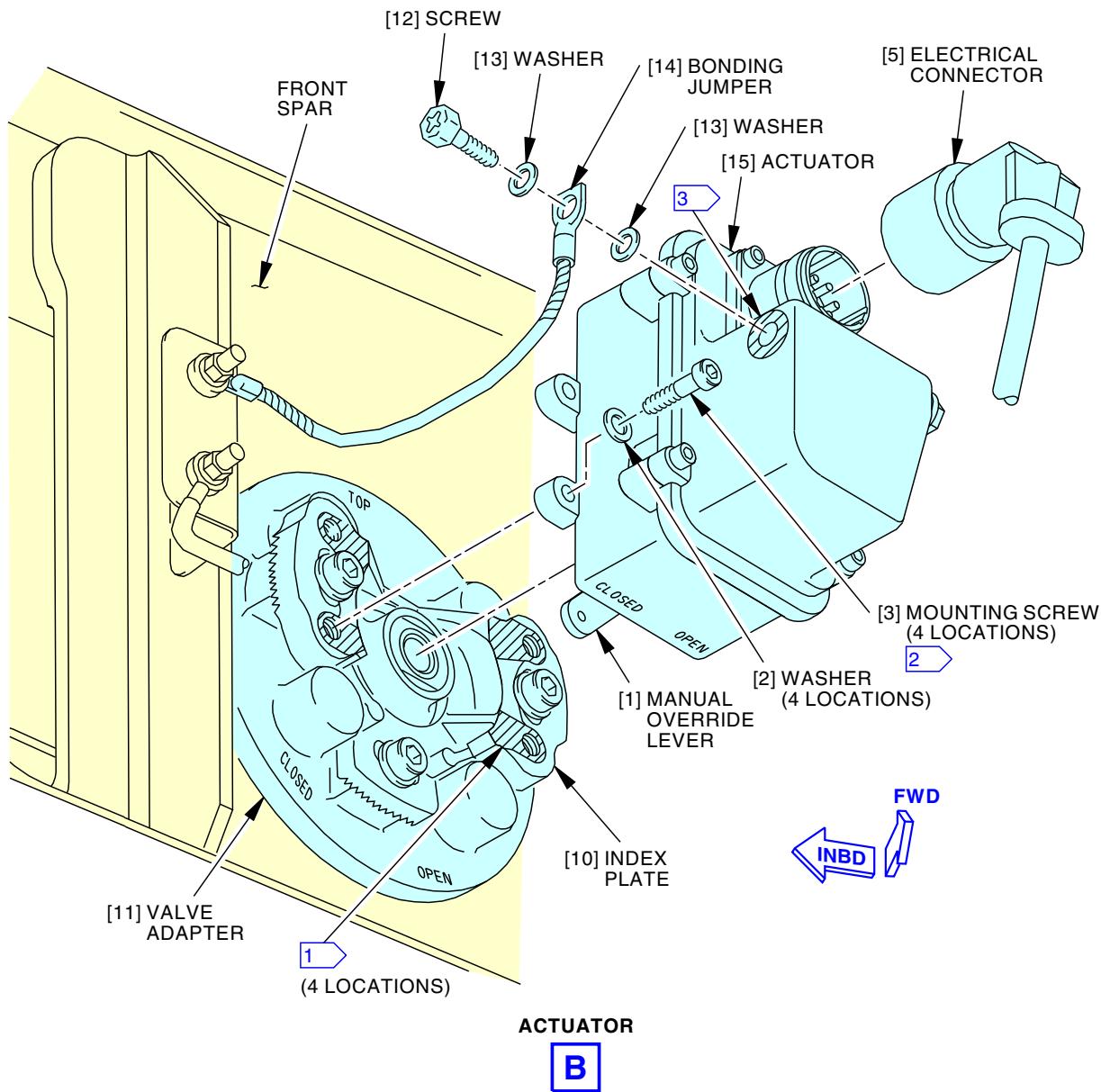
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- [1] PREPARE AND INSTALL THE CONTACT SURFACES OF THE INDEX PLATE AND ACTUATOR FEET (4 LOCATIONS) WITH A FAY SEALED FAY SURFACE BOND (SWPM 20-20-00)
- [2] APPLY SEALANT TO THE SHANK AND THREADS OF THE MOUNTING SCREWS.
- [3] CLEAN THE CONTACT SURFACES OF THE ACTUATOR AND BONDING JUMPER. AFTER ELECTRICAL BONDING MEASUREMENT, APPLY A CAP SEAL TO THE BONDING JUMPER SCREW.

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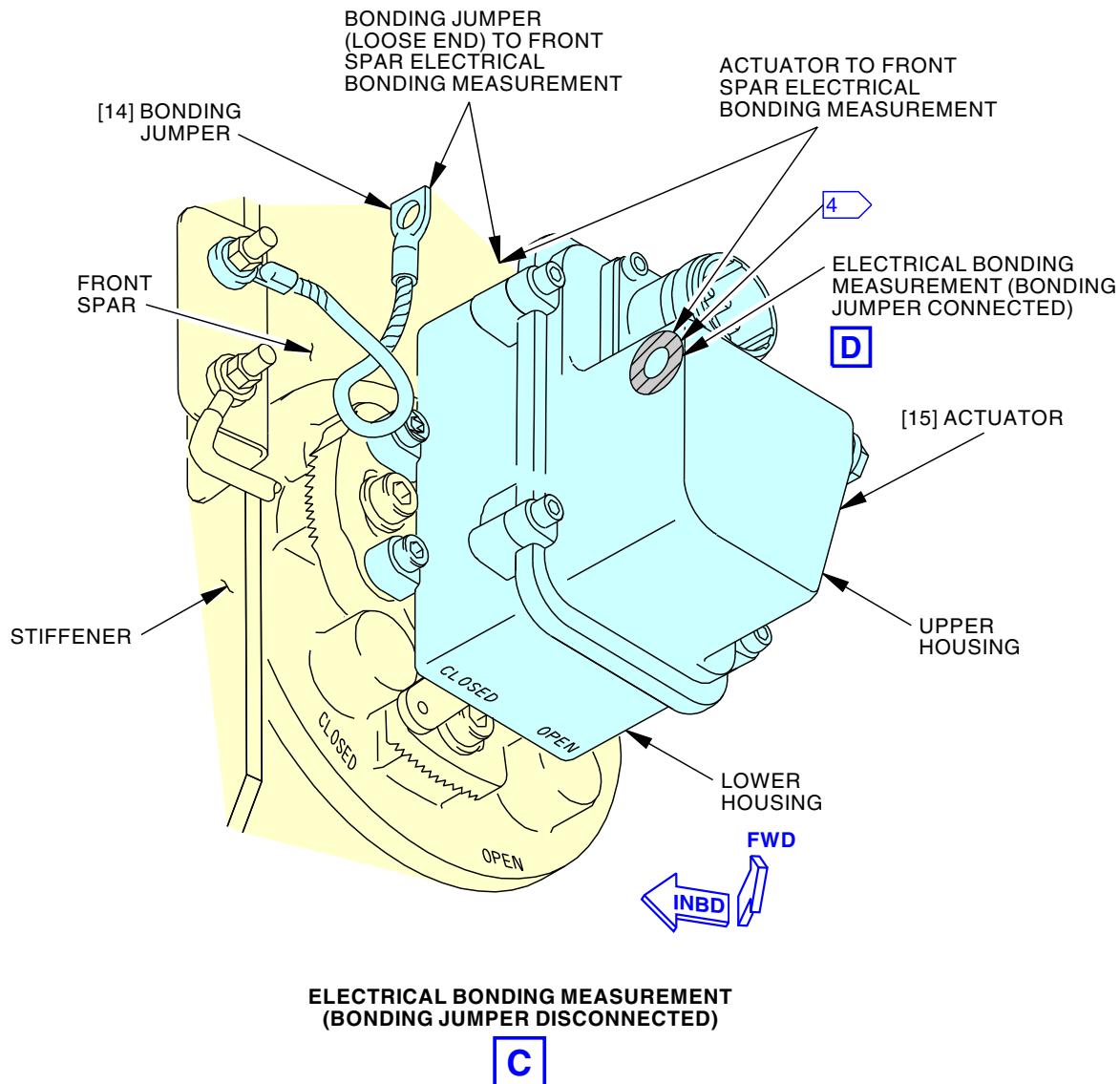
Spar Valve Actuator Installation
Figure 402/28-22-11-990-806 (Sheet 2 of 4)

EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

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4 BARE METAL CONTACT SURFACE OF THE ACTUATOR AT
THE BONDING JUMPER INSTALLATION.

U47306 S0000197835_V4

Spar Valve Actuator Installation
Figure 402/28-22-11-990-806 (Sheet 3 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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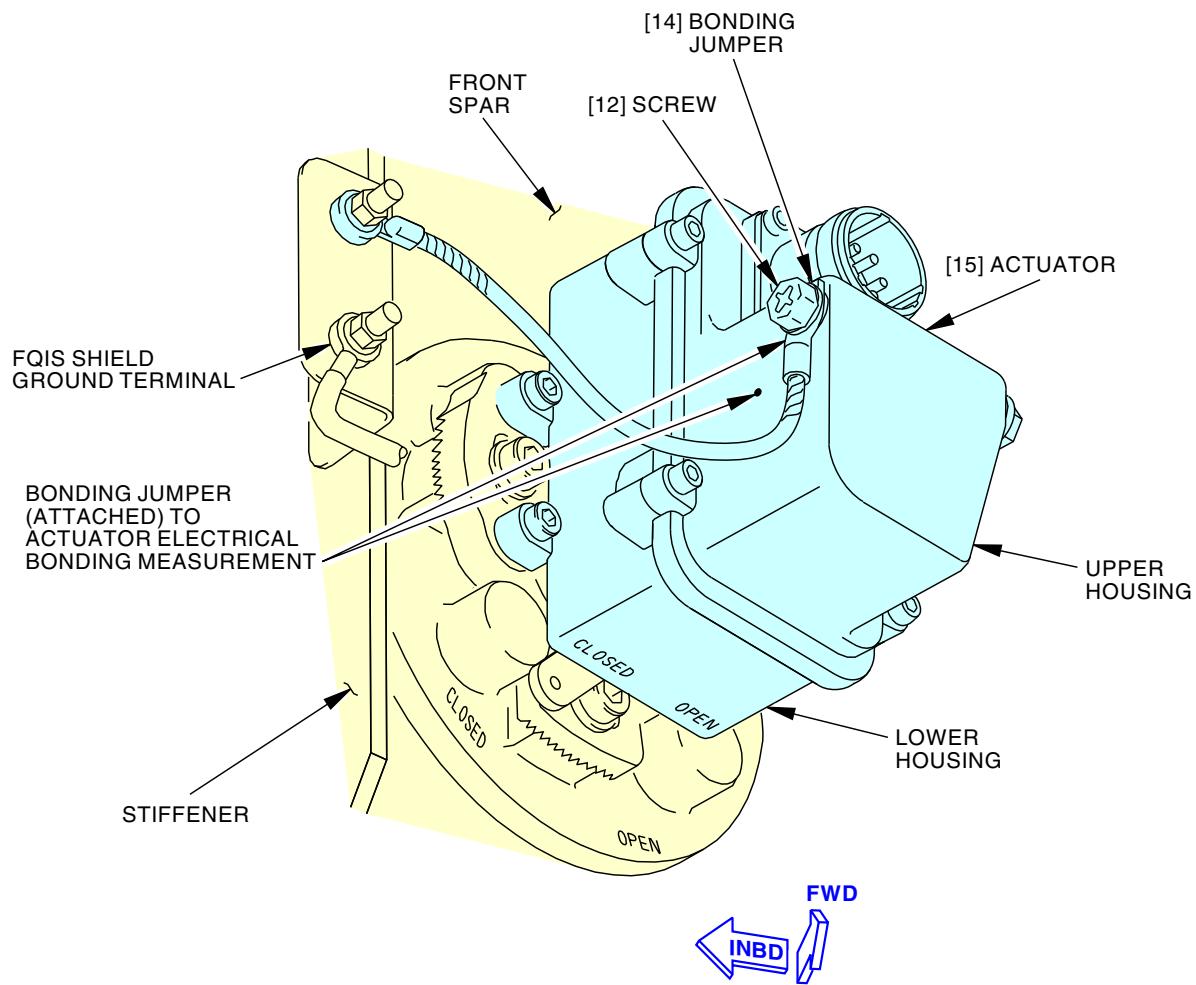
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Spar Valve Actuator Installation
Figure 402/28-22-11-990-806 (Sheet 4 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

TASK 28-22-11-400-804

5. Actuator of the Spar Valve Installation

(Figure 402)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
27-81-00-440-801	Leading Edge Flaps and Slats - Activation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-41-42-700-801	FQIS Shield Ground Terminal - Test (P/B 501)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

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(Continued)

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II

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(Continued)

Reference	Description	Specification
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

F. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

G. Procedure (View B)

SUBTASK 28-22-11-140-001

- (1) Remove the old sealant and clean the actuator [15], index plate [10], and the fasteners (if reused).
 - (a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the index plate [10] and the actuator [15].



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-11-420-020

- (2) Do these steps to prepare the actuator [15] and the index plate [10] for a fay sealed fay surface bond (SWPM 20-20-00, SWPM 20-20-10):

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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-21: CDCCL

- (d) Apply a thin continuous layer of sealant to the mating surfaces between the actuator [15] and the index plate [10] to install a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296 for the surface seal that is outside the tank.
- 2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.
- (e) Apply sealant to the shank and the threads of the four actuator mounting screws [3].
 - 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296 for the wet installation of the actuator mounting screws [3].
 - 2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-11-420-021

- (3) Do these steps to install the actuator [15] to the index plate [10]:
 - (a) Make sure the manual override lever [1] on the actuator is in the CLOSED position.
 - (b) Align the actuator output shaft with the valve adapter [11].
 - (c) Make sure the two spaces for teeth on the valve adapter [11] align with the actuator output shaft.
 - (d) Put the actuator output shaft into the valve adapter.

NOTE: The mounting feet on the actuator automatically align with the mounting points on the index plate.
 - (e) Install the four actuator mounting screws [3] and the washers [2].

NOTE: Lockwire is not necessary for the actuator mounting screws [3].
 - (f) Tighten the actuator mounting screws [3] to 20 in-lb (2.3 N·m).

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- (g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.
- (h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.
- (i) Shape the squeezed out sealant into a fillet seal.
- (j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-11-765-002

► 28-AWL-21: CDCCL

- (4) Measure the electrical bonding resistance between the upper housing of the actuator [15] and the front spar (SWPM 20-20-10) (View C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (a) Do this measurement with the bonding jumper [14] and the electrical connector [5] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (b) Make sure the bonding jumper [14] does not touch the actuator [15] during the bonding measurement.
- (c) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (d) If the actuator [15], index plate [10] and valve adapter [11] (plate) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

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► 28-AWL-21: CDCCL

- (e) If the actuator [15] and index plate [10] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

► 28-AWL-21: CDCCL

- (f) If only the actuator [15] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-390-005

► 28-AWL-21: CDCCL

- (5) If the terminal of the bonding jumper [14] is disconnected from the stiffener, install the bonding jumper [14] with a fillet sealed fay surface bond between the stiffener and the terminal of the bonding jumper [14] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (a) If the terminal of the bonding jumper [14] is disconnected from the stiffener, apply a fillet seal to the terminal of the bonding jumper [14] at the stiffener (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

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LOM 402, 404, 406 POST SB 737-28A1207; SPAR VALVE ACTUATORS WITH MEASURED BONDING RESISTANCE BETWEEN TERMINAL AND STIFFENER

SUBTASK 28-22-11-765-014

► 28-AWL-21: CDCCL

- (6) If the terminal of the bonding jumper [14] is disconnected from the stiffener and prior to attaching the bonding jumper [14] to the actuator [15], measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the stiffener (SWPM 20-20-10) (View C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-760-007

► 28-AWL-21: CDCCL

- (7) If the terminal of the bonding jumper [14] is not disconnected from the stiffener and prior to attaching the bonding jumper [14] to the actuator [15], measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the stiffener (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; SPAR VALVE ACTUATORS WITH MEASURED BONDING RESISTANCE BETWEEN TERMINAL AND FRONT SPAR

SUBTASK 28-22-11-760-008

► 28-AWL-21: CDCCL

- (8) If the terminal of the bonding jumper [14] is disconnected from the stiffener and prior to attaching the bonding jumper [14] to the actuator [15], measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the front spar (SWPM 20-20-10) (View C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-765-013

► 28-AWL-21: CDCCL

- (9) If the terminal of the bonding jumper [14] is not disconnected from the stiffener and prior to attaching the bonding jumper [14] to the actuator [15], measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the front spar (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

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SUBTASK 28-22-11-420-023

- (10) Do these steps to install the bonding jumper [14] to the actuator [15]:
- Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - Rub dry with a clean, dry cotton wiper, G00034.
 - Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

► 28-AWL-21: CDCCL

- (b) Install the screw [12] and two washers [13] to attach the bonding jumper [14] to the actuator [15] with a sealed fay surface bond between the actuator [15] and the terminal of the bonding jumper [14] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (c) Tighten the screw [12] to 35 in-lb (4 N·m).

SUBTASK 28-22-11-765-012

► 28-AWL-21: CDCCL

- (11) With the electrical connector [5] disconnected, measure the electrical bonding resistance between the upper housing of the actuator [15] and the attached terminal of the bonding jumper [14] (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- Do not touch the screw [12] when you make the bonding measurement.
- Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (c) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- If the electrical bonding resistance is more than 0.0010 ohm (1.0 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

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SUBTASK 28-22-11-765-015

► 28-AWL-21: CDCCL

- (12) Measure the electrical bonding resistance between the FQIS outermost shield ground terminal on the stiffener and the front spar (SWPM 20-20-00, SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (a) Do this measurement with the electrical connector [5] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (b) Do not touch the FQIS shield ground terminal stud when you make the bonding measurement.

- (c) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (d) Make sure the electrical bonding resistance is 0.0070 ohm (7.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the bonding resistance is more than 0.0070 ohm (7.0 milliohms), then do this task: FQIS Shield Ground Terminal - Test, TASK 28-41-42-700-801.

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SUBTASK 28-22-11-390-006

► 28-AWL-21: CDCCL

- (13) Apply a filleted cap seal over the screw [12] and the terminal lug of the bonding jumper [14] attached to the actuator [15].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296 to apply the cap seal.

SUBTASK 28-22-11-916-002

- (14) Do this task to apply protective finishes to the bare metal areas of the front spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coating to the front spar where the electrical bonding probe removed the finishes.

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (a) These are the protective finishes:
 - 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
 - 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-11-916-001

- (15) Apply chemical conversion coating to all bare areas of the actuator [15]
(TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the actuator [15] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-22-11-430-003

- (16) Connect the electrical connector [5] to the actuator [15].

H. Spar Valve Actuator Operational Test

SUBTASK 28-22-11-865-001

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-865-002

- (2) For the left actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-865-003

- (3) For the right actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-710-005

- (4) For the actuator that you installed, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.

I. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-11-410-006

- (1) Close the applicable access panel(s):

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
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EFFECTIVITY
LOM ALL

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**737-600/700/800/900
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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

<u>Number</u>	<u>Name/Location</u>
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-22-11-860-034

- (2) Do this task: Leading Edge Flaps and Slats - Activation, TASK 27-81-00-440-801.

———— END OF TASK ————

**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017**

TASK 28-22-11-000-802

6. Valve Adapter of the Spar Valve Removal

(Figure 403)

A. General

- (1) This task gives instructions to remove the Valve Adapter of the Spar Valve.
- (2) The valve adapter and shaft assembly (valve adapter) is used to connect the actuator to the spar valve body. The valve adapter consists of these components:
 - (a) Index plate
 - (b) Adapter plate
 - (c) Adapter shaft (with U-joint connection).

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.



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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL

**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2

D. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265



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737-600/700/800/900 AIRCRAFT MAINTENANCE MANUAL

LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

F. Prepare for the Removal

SUBTASK 28-22-11-650-005

- (1) Defuel the applicable main fuel tank (TASK 28-26-00-650-801) or transfer fuel out of the applicable tank (TASK 28-26-00-650-802).

SUBTASK 28-22-11-860-018



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

SUBTASK 28-22-11-650-006

- (3) Drain and purge the applicable main fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-11-010-024

- (4) Remove the applicable access panel(s):

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801.

SUBTASK 28-22-11-010-025

- (5) Remove the applicable access panel(s):

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

632BB Main Tank Access Door - Wing Station 265

Main Tank Access Door Removal, TASK 28-11-11-000-801.

G. Valve Adapter of the Spar Valve Removal

SUBTASK 28-22-11-010-026

- (1) Do these steps on the outside of the fuel tank:

(a) For the applicable left or right spar valve actuator, do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-801.

(b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate (View A-A).

1) Use sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.

SUBTASK 28-22-11-010-027



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Go inside the applicable main tank and do these steps (TASK 28-11-00-910-802):

(a) Go to the valve adapter [11] (View B).

EFFECTIVITY
LOM ALL

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

- (b) Remove the old sealant from the four bolts [21] (View A-A).
- (c) Remove the bolts [21] and the washers [22] (four locations) to disconnect the valve adapter [11].
- (d) Disengage the adapter shaft from the spar valve body [20] (View C).

SUBTASK 28-22-11-010-028

- (3) Go out of the tank and remove the valve adapter [11].

———— END OF TASK ————

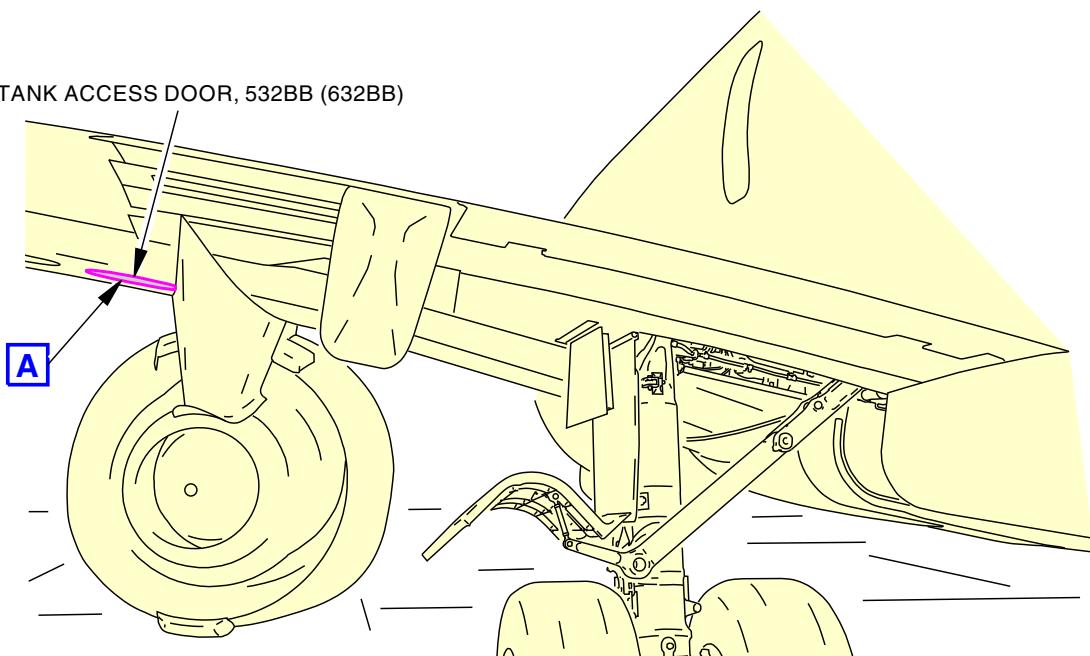
EFFECTIVITY
LOM ALL

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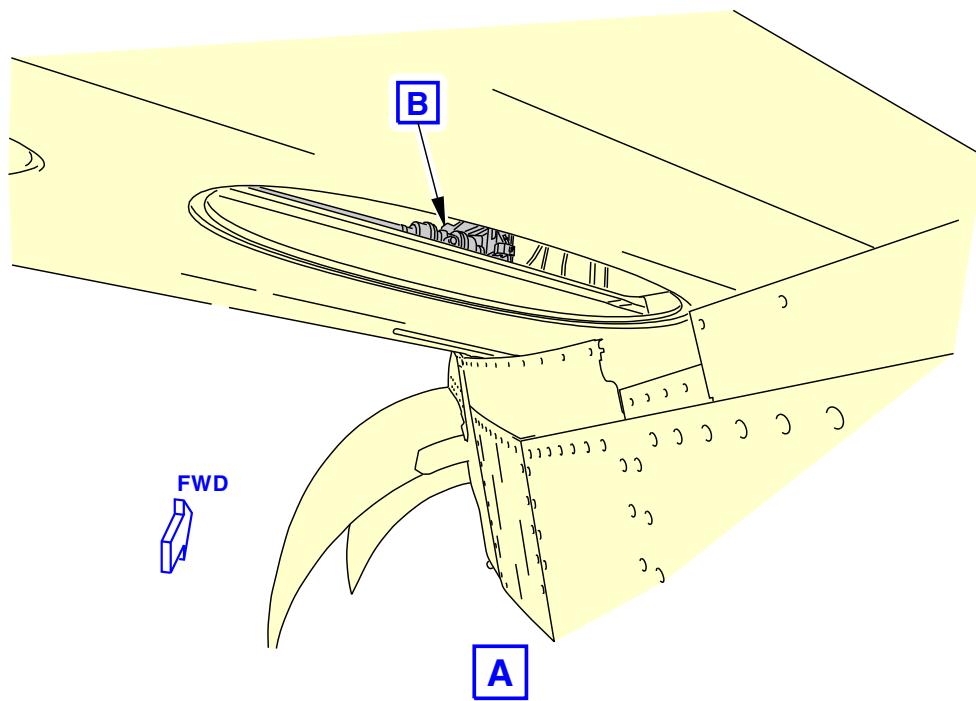
BOEING

**737-600/700/800/900
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MAIN TANK ACCESS DOOR, 532BB (632BB)



**LEFT WING
(RIGHT WING IS OPPOSITE)**



F84586 S0006571963_V2

**Spar Valve Adapter Installation
Figure 403/28-22-11-990-805 (Sheet 1 of 4)**

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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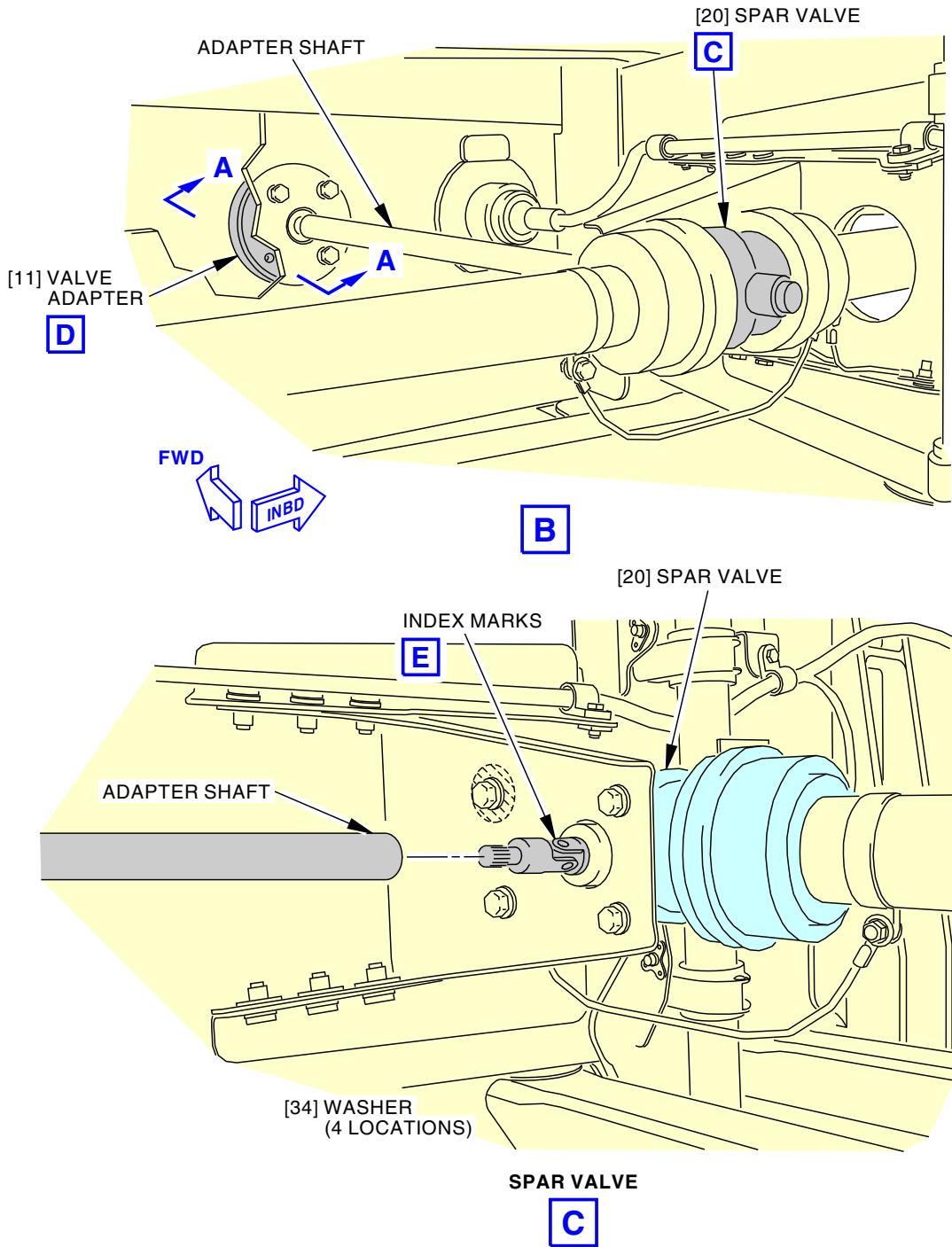
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U40326 S0000195257_V3

Spar Valve Adapter Installation
Figure 403/28-22-11-990-805 (Sheet 2 of 4)

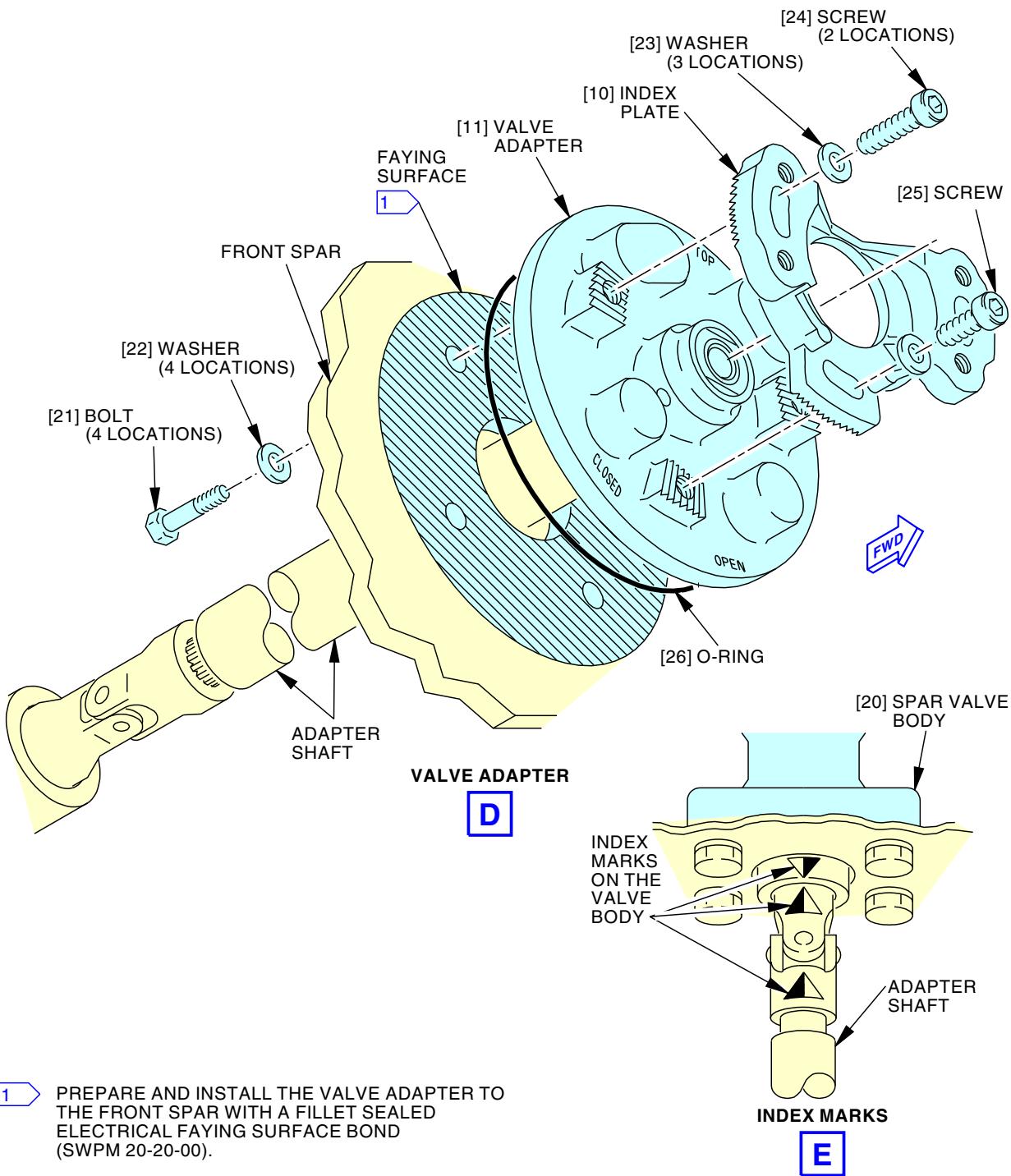
EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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U40360 S0000195258_V3

Spar Valve Adapter Installation

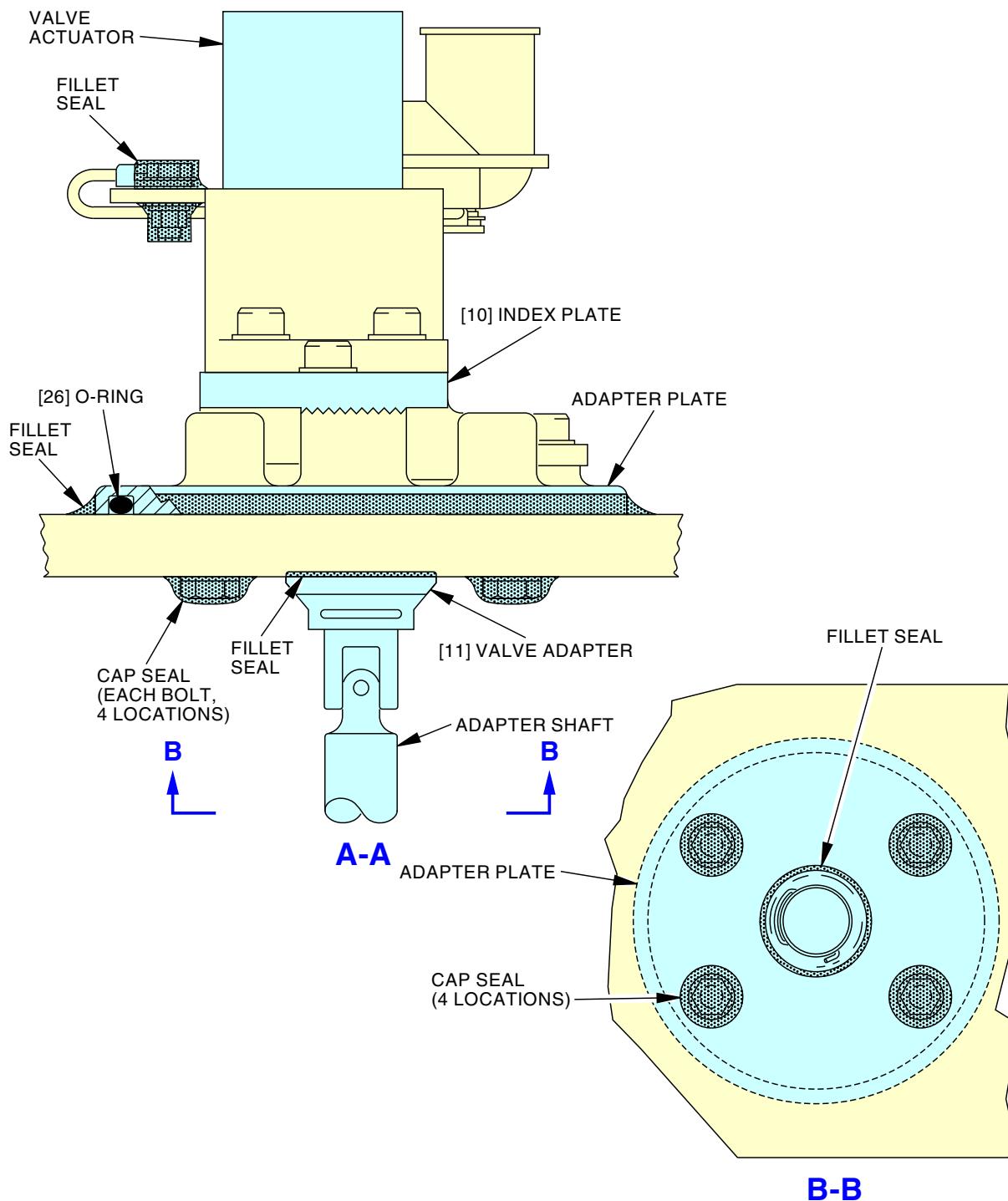
Figure 403/28-22-11-990-805 (Sheet 3 of 4)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

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U40531 S0000195259_V3

Spar Valve Adapter Installation
Figure 403/28-22-11-990-805 (Sheet 4 of 4)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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D633A101-LOM

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

TASK 28-22-11-400-802

7. Valve Adapter of the Spar Valve Installation

(Figure 403)

A. General

- (1) This task contains these procedures:
 - (a) Install the Valve Adapter
 - (b) Install the Index Plate
 - (c) Spar Valve Operational Tests
 - (d) Put the Airplane Back to the Usual Condition

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-00-720-804	Engine Fuel Spar Valve Installation - Test (P/B 501)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

EFFECTIVITY
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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3

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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Reference	Description	Specification
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
532BB	Main Tank Access Door - Wing Station 265
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
632BB	Main Tank Access Door - Wing Station 265

G. Valve Adapter of the Spar Valve Installation

SUBTASK 28-22-11-110-005

- (1) Remove the old sealant and clean the front spar contact area, valve adapter [11], and the fasteners (if re-used).
 - (a) To remove the sealant from the front spar use a sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.



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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
- 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-11-110-002

- (2) Do these steps to prepare the valve adapter [11] and the front spar for a fillet sealed electrical faying surface bond (View D):



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces of the valve adapter [11] and the front spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-11-420-024

- (3) On the outside of the airplane, do these steps:
- (a) Put a thin layer of petrolatum grease, D00504, on the new O-ring [26].
 - (b) Put the O-ring [26] in the O-ring groove of the valve adapter [11].
 - (c) Put the adapter shaft attached to the valve adapter [11] through the hole in the front spar.

SUBTASK 28-22-11-420-007



DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Go into the fuel tank to the spar valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-11-420-025

- (5) Do these steps to install the valve adapter [11]:
- (a) Make sure that the index marks on the spar valve body [20] are aligned (View E).
NOTE: A small misalignment of the index marks is satisfactory.

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LOM ALL

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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

- (b) Engage the adapter shaft of the valve adapter [11] with the spar valve body [20] (View C).
- (c) Make sure that the shoulder of the valve adapter [11] does not bind in the opening of the front spar.
- (d) Install the four bolts [21] and washers [22] to attach the valve adapter [11] to the front spar.

SUBTASK 28-22-11-220-002

- (6) Measure the bonding resistance between the adapter plate of the valve adapter [11] and the front spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (a) Make sure that the bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

SUBTASK 28-22-11-390-001

- (7) On the inside of the fuel tank apply sealant, A00767, to these components (View B-B):
 - (a) A cap seal on the four bolts [21] (TASK 51-31-00-390-804).
 - (b) A fillet seal on the periphery of the front spar penetration and the stationary part of the adapter plate.

NOTE: Make sure that the sealant does not touch the adapter shaft or other parts of the valve adapter that rotate.

SUBTASK 28-22-11-390-002

- (8) On the outside of the fuel tank, apply a fillet seal of BMS5-95 sealant, A00247, around the periphery of the valve adapter [11] (TASK 51-31-00-390-804) (View A-A).

SUBTASK 28-22-11-916-005

- (9) Apply protective finishes to the bare metal areas of the front spar (TASK 28-11-00-600-801).

NOTE: Re-apply the protective coating to the front spar at all bare metal areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:
 - 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
 - 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-11-916-006

- (10) Apply chemical conversion coating to all bare metal areas of the valve adapter [11] (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the valve adapter [11] where the electrical bonding probe removed the finish.

SUBTASK 28-22-11-860-013

- (11) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

- (a) Install the applicable access door(s):

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265

Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-22-11-820-014

- (12) Do this task: Spar Valve Alignment, TASK 28-22-11-820-801.

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LOM ALL	

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AIRCRAFT MAINTENANCE MANUAL

LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

H. Install the Index Plate

SUBTASK 28-22-11-820-012

- (1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate [10] and the valve adapter [11] per this task: Spar Valve Alignment, TASK 28-22-11-820-801.

SUBTASK 28-22-11-420-034

- (2) Do these steps to install the index plate [10]:
 - (a) Align the index plate [10] and the valve adapter [11] with the mark that you made during spar valve alignment procedure.
 - (b) Install the shorter index screw [25] and washer [23] in the bottom index location (6 o'clock position).
 - (c) Install the two longer index screws [24] and washers [23] in the top index mounting locations.
 - (d) Tighten the index screws to 22 ± 1 in-lb (2.5 ± 0.1 N·m).
 - (e) Install MS20995NC32 lockwire, G01912, from the two top index screws [24] and the bottom index screw [25] to the index plate [10].

SUBTASK 28-22-11-420-035

- (3) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-801.

I. Spar Valve Operational Tests

NOTE: These tests will make sure that the spar valve electrical operation is correct, that the spar valve plate alignment is correct, and that there are no fuel leaks through the front spar.

SUBTASK 28-22-11-710-006

- (1) For the applicable spar valve, do these tasks:
 - (a) Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.
NOTE: This test is done when you install the valve actuator.
 - (b) Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-804.

SUBTASK 28-22-11-650-009

- (2) Do this leak check if you have replaced the valve adapter [11]:

NOTE: The leak check is only necessary if you have done a fuel tank entry and replaced the valve adapter [11]. It is not necessary if you have replaced or aligned the index plate [10] for adjustment purposes only.

- (a) Refuel the tank that contains the replaced valve adapter [11] to a minimum of 4400.0 lb (1995.8 kg) (TASK 12-11-00-650-802).
NOTE: This is the fuel quantity necessary to make sure that there are no leaks at the front spar.
- (b) Make sure that there are no fuel leaks at the valve adapter [11] installation on the front spar.
- (c) Make sure there are no fuel leaks at the applicable access door(s):

<u>Number</u>	<u>Name/Location</u>
532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265

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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-11-410-007

- (1) Close the applicable access panel(s):

Number

Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-22-11-410-009

- (2) Close the applicable access door(s):

Number

Name/Location

434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2

Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801.

———— END OF TASK ————

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

TASK 28-22-11-000-805

8. Valve Adapter of the Spar Valve Removal

(Figure 404)

A. General

- (1) The valve adapter and shaft assembly (valve adapter) is used to connect the actuator to the spar valve body. The valve adapter consists of these components:
- (a) Index plate
 - (b) Adapter plate
 - (c) Adapter shaft (with U-joint connection).

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
57-41-02-000-801	Leading Edge Access Panel Removal (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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 AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2

D. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
532BB	Main Tank Access Door - Wing Station 265
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Number Name/Location

632BB Main Tank Access Door - Wing Station 265

F. Prepare for the Removal

SUBTASK 28-22-11-650-007

- (1) Defuel the applicable main fuel tank (TASK 28-26-00-650-801) or transfer fuel out of the applicable tank (TASK 28-26-00-650-802).

SUBTASK 28-22-11-860-019



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

SUBTASK 28-22-11-650-008

- (3) Drain and purge the applicable main fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-11-010-029

- (4) Remove the applicable access panel(s):

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801.

SUBTASK 28-22-11-010-030

- (5) Remove the applicable access panel(s):

(TASK 28-11-11-000-801)

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

632BB Main Tank Access Door - Wing Station 265

SUBTASK 28-22-11-010-062

- (6) Open these access panels:

(TASK 57-41-02-000-801)

Number Name/Location

521BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

621BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

G. Valve Adapter of the Spar Valve Removal

SUBTASK 28-22-11-010-031

- (1) Do these steps on the outside of the fuel tank:

- (a) For the applicable left or right spar valve actuator, do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-804.

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate (View A-A).
 - 1) Use sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.

SUBTASK 28-22-11-010-032



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Go inside the applicable main tank and do these steps (TASK 28-11-00-910-802):
 - (a) Go to the valve adapter [11] location (View B).
 - (b) Remove the old sealant from the four bolts [21] and the valve adapter [11] front spar penetration (View A-A).
 - (c) Remove the bolts [21] and the washers [22] (four locations) to disconnect the valve adapter [11].
 - (d) Disengage the adapter shaft from the spar valve body [20] (View C).

SUBTASK 28-22-11-010-033

- (3) Go out of the tank and remove the valve adapter [11].

H. Index Plate Removal

NOTE: Do these steps if you will reuse the valve adapter and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old valve adapter and install a new valve adapter, it is not necessary to disassemble the index plate.

SUBTASK 28-22-11-020-022

- (1) Do these steps to remove the index plate [10] from the valve adapter [11] (View D):
 - (a) Remove the lockwire from screws [24] and screw [25] (3 locations).
 - (b) Remove screws [24], screw [25] and the washers [23].
 - (c) Carefully disassemble the index plate and the adapter plate.

NOTE: The two plates are bonded with faying surface sealant.

———— END OF TASK ————

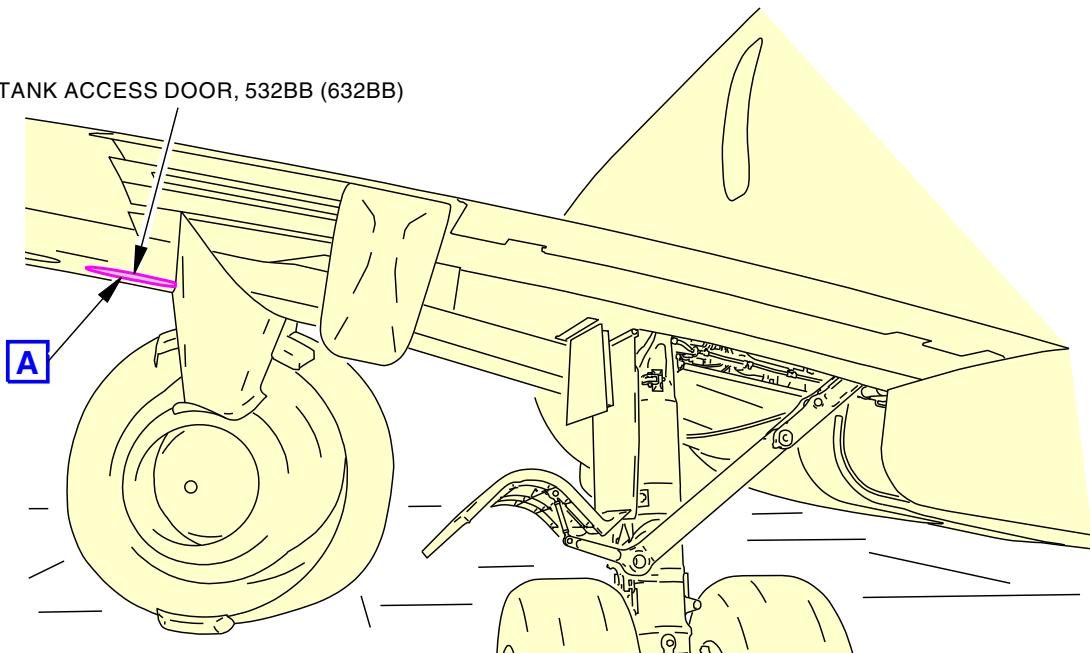
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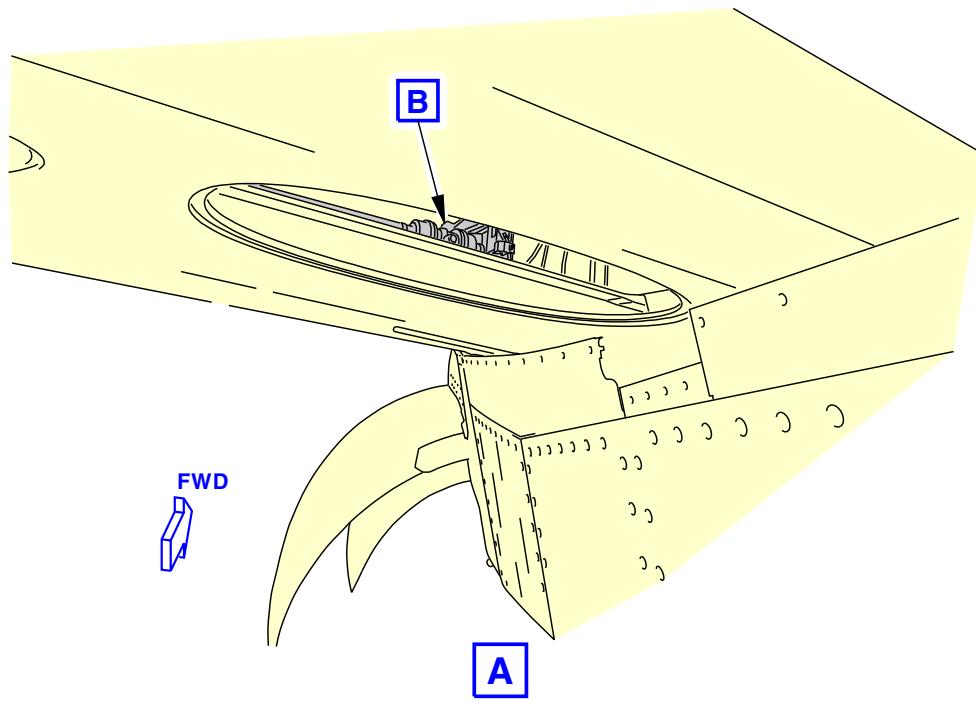


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MAIN TANK ACCESS DOOR, 532BB (632BB)



LEFT WING
(RIGHT WING IS OPPOSITE)



F84586 S0006571963_V2

Spar Valve Adapter Installation
Figure 404/28-22-11-990-808 (Sheet 1 of 5)

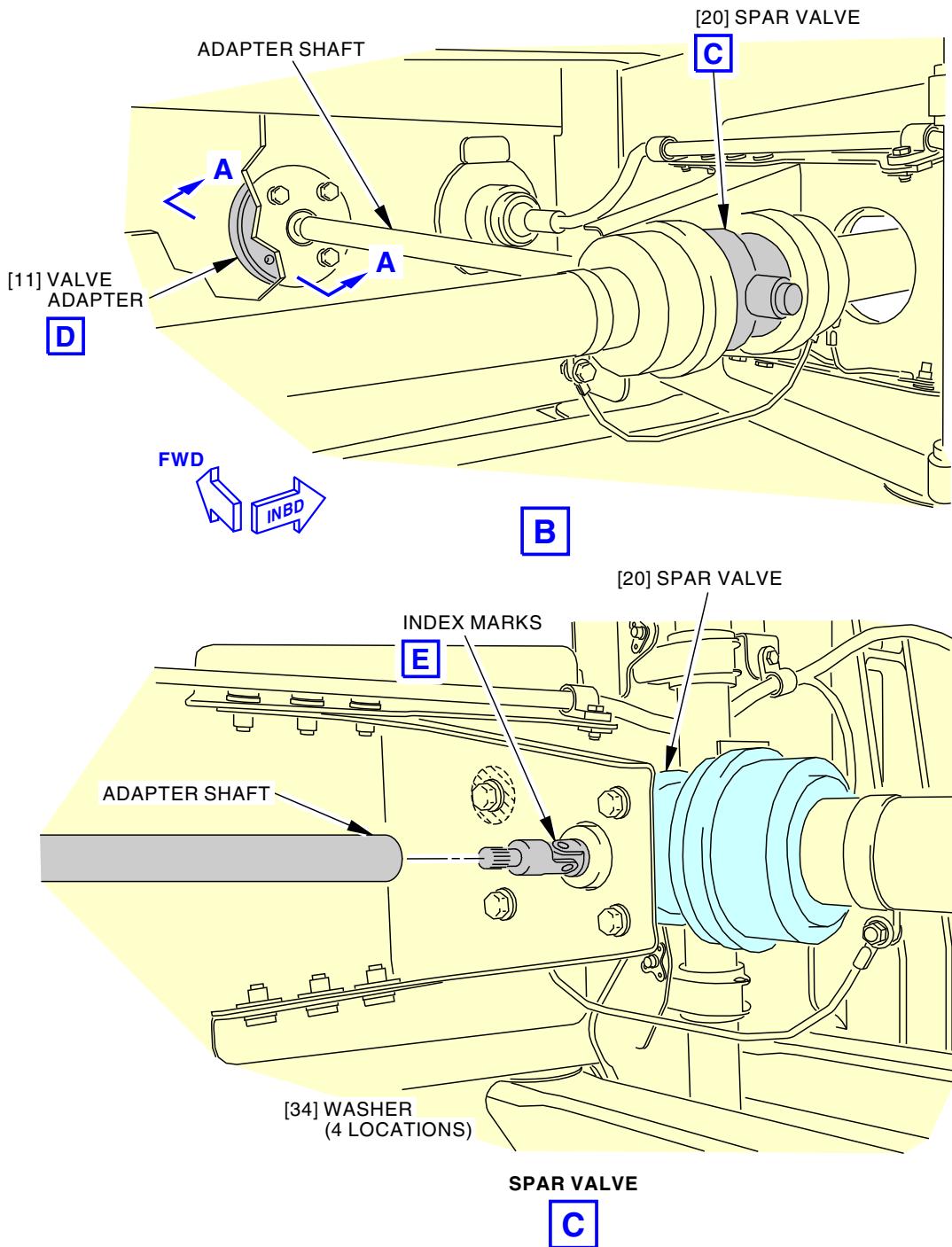
EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
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D633A101-LOM

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U40326 S0000195257_V3

Spar Valve Adapter Installation
Figure 404/28-22-11-990-808 (Sheet 2 of 5)

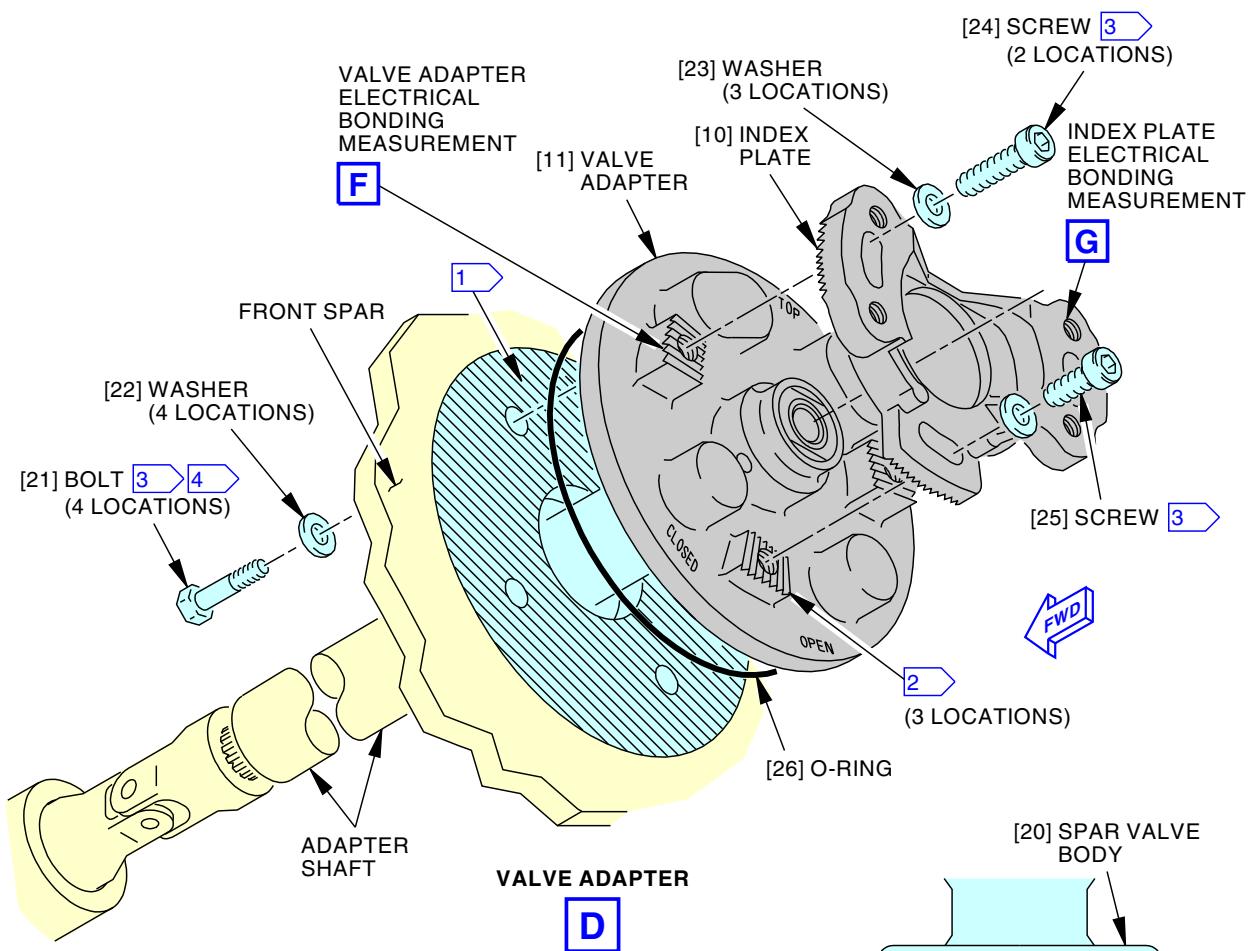
EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

D633A101-LOM

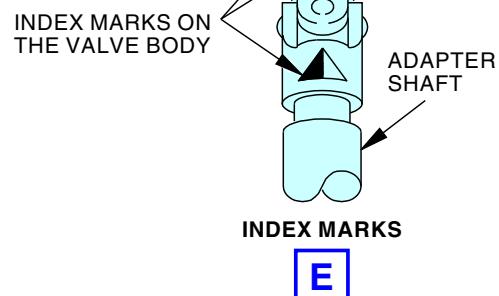
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- [1] PREPARE AND INSTALL THE VALVE ADAPTER TO THE FRONT SPAR WITH A FILLET SEALED FAY SURFACE BOND (SWPM 20-20-00).
- [2] PREPARE AND INSTALL THE SERRATED CONTACT SURFACES OF THE VALVE ADAPTER AND INDEX PLATE WITH A FAY SEAL FAY SURFACE BOND (3 LOCATIONS) (SWPM 20-20-00).
- [3] APPLY SEALANT TO THE SHANK AND THREADS OF THE FASTENERS DURING THE INSTALLATION.
- [4] AFTER INSTALLATION, APPLY A CAP SEAL TO THE HEAD OF THE FASTENERS.



U41033 S0000195421_V5

Spar Valve Adapter Installation
Figure 404/28-22-11-990-808 (Sheet 3 of 5)

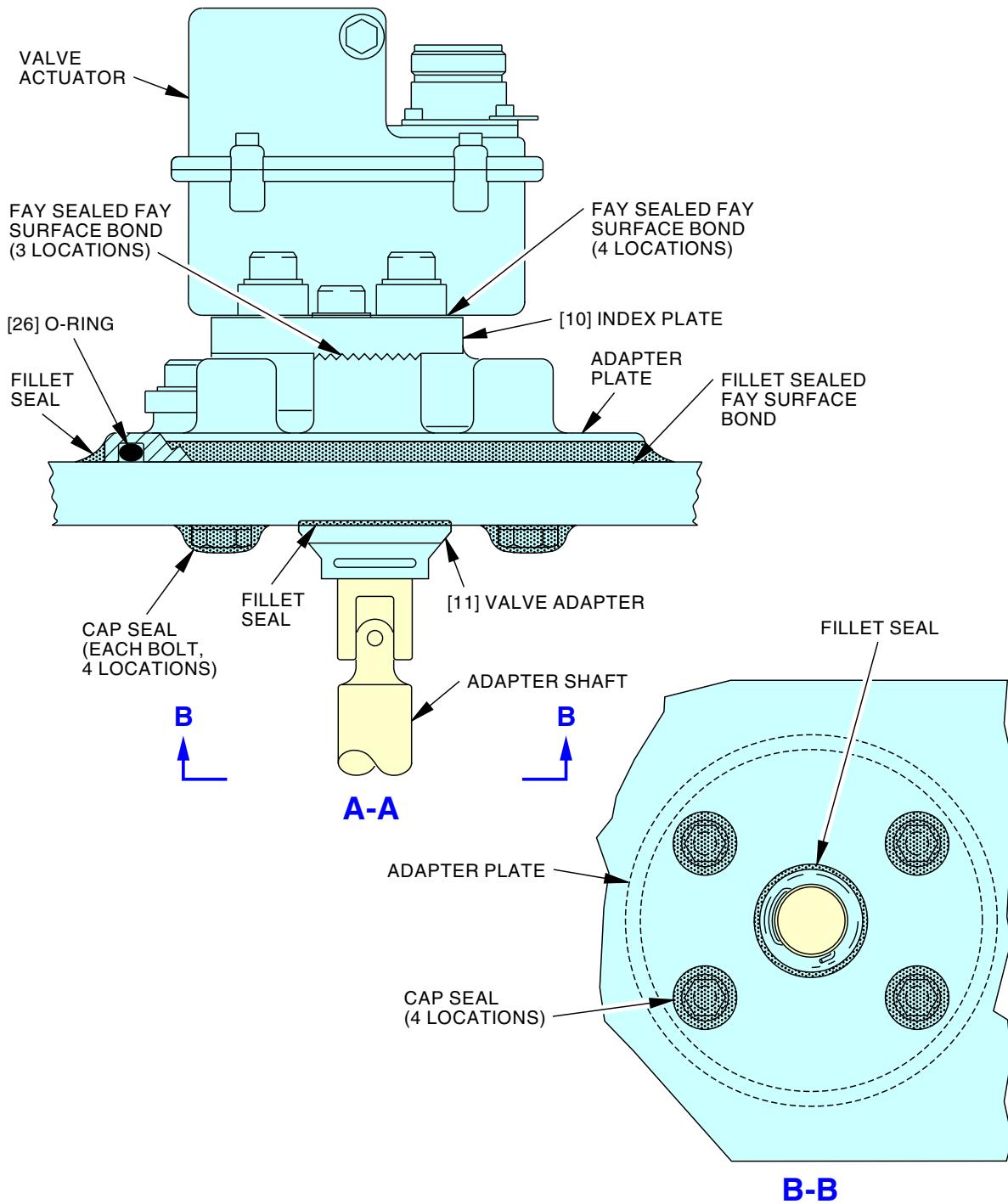
EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
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D633A101-LOM

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U41057 S0000195422_V4

Spar Valve Adapter Installation
Figure 404/28-22-11-990-808 (Sheet 4 of 5)

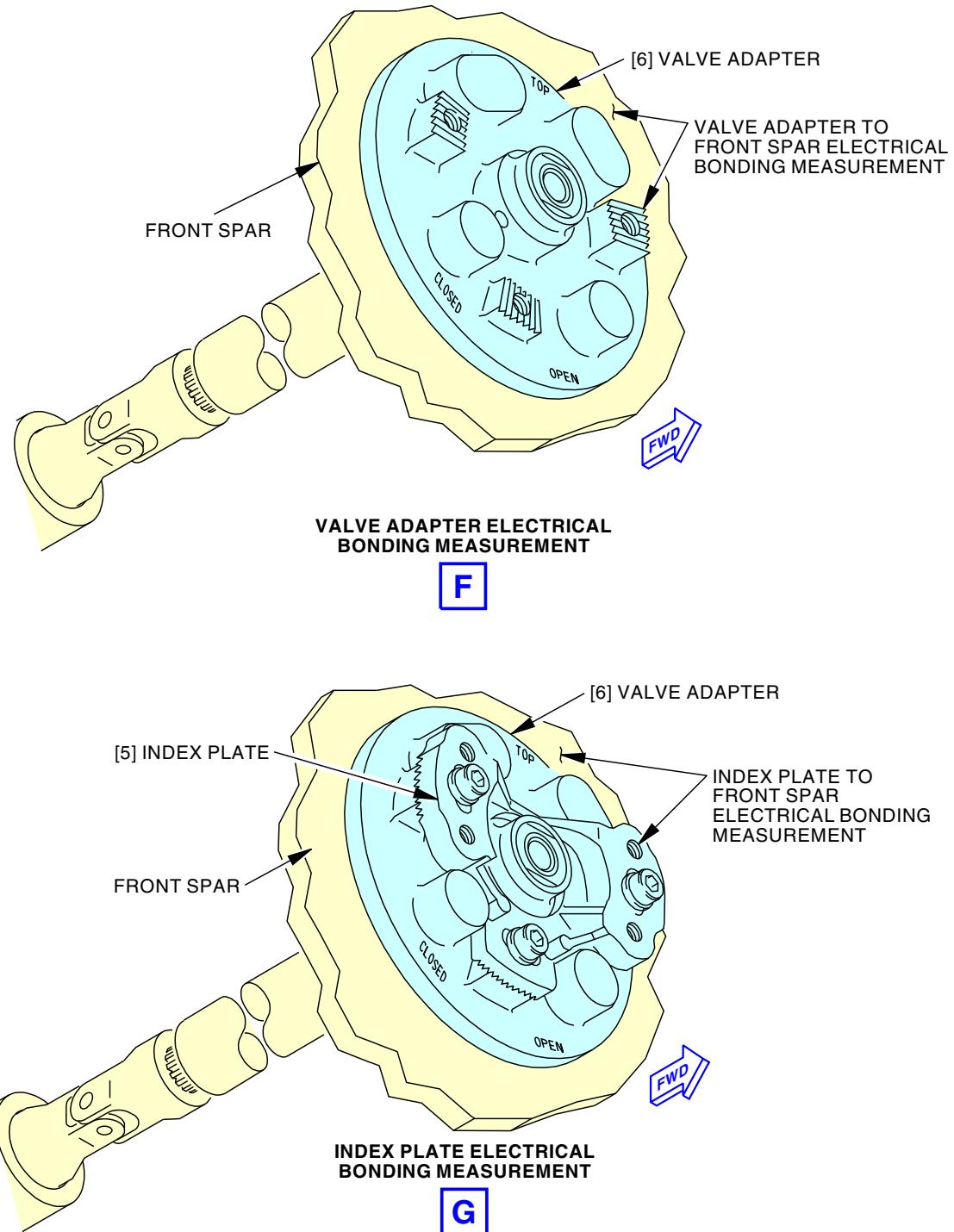
EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

D633A101-LOM

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U47242 S0000197875_V2

Spar Valve Adapter Installation
Figure 404/28-22-11-990-808 (Sheet 5 of 5)

EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

TASK 28-22-11-400-805

9. Valve Adapter of the Spar Valve Installation

(Figure 404)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.
- (2) This task contains these procedures:
 - (a) Install the Valve Adapter
 - (b) Install the Index Plate
 - (c) Spar Valve Operational Tests
 - (d) Put the Airplane Back to the Usual Condition
- (3) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are also acceptable sealants.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-00-720-804	Engine Fuel Spar Valve Installation - Test (P/B 501)
51-31-00-390-804	Fillet Seal Application (P/B 201)
57-41-02-400-801	Leading Edge Access Panel Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B

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 AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

Reference	Description	Specification
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
11	Valve adapter	28-22-00-01-260 28-22-00-03-035 28-22-00-05-035 28-22-00-06-035 28-22-00-08-035 28-22-11-01-040 28-22-11-03-040 28-22-11-04-055 28-22-11-05-060 28-22-11-06-080 28-22-11-08-075	LOM 402, 404, 406, 407 LOM 411, 412, 415, 416, 420 LOM 422-434, 437-447 LOM 450-460 LOM 461-999 LOM 411, 412, 415, 416, 420 LOM 422-434, 437-446 LOM 447 LOM 402, 404, 406, 407 LOM 450-460 LOM 461-999

F. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

Zone	Area
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
532BB	Main Tank Access Door - Wing Station 265
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
632BB	Main Tank Access Door - Wing Station 265

H. Install the Valve Adapter

SUBTASK 28-22-11-120-002

- (1) Remove the old sealant and clean the front spar, valve adapter [11], index plate [10], and the fasteners (if re-used).
 - (a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the front spar.
 - (b) If new, use an abrasive pad to remove the anodized finish from the faying surfaces of the valve adapter [11] and index plate [10] (SWPM 20-20-00).



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- (c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-11-110-003

- (2) Do these steps to prepare the valve adapter [11] and the front spar for a fay sealed fay surface bond (View D):

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- (a) Final clean the contact surfaces of the valve adapter [11] and the front spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-11-760-005

► 28-AWL-21: CDCCL

- (3) Install a fillet sealed fay surface bond between the valve adapter [11] (plate) and the front spar outside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

SUBTASK 28-22-11-430-005

- (4) On the outside of the tank, do these steps:
 - (a) Put a thin layer of petrolatum grease, D00504, on the new O-ring [26].
 - (b) Put the O-ring [26] in the O-ring groove of the valve adapter [11].
 - (c) Put the adapter shaft attached to the valve adapter [11] through the hole in the front spar.
 - (d) Make sure the shoulder of the valve adapter [11] does not bind in the opening of the front spar.

SUBTASK 28-22-11-010-034



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Go into the applicable main tank to the spar valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-11-420-027

- (6) Do these steps to install the valve adapter [11]:

- (a) Make sure that the index marks on the spar valve body [20] are aligned (View E).

NOTE: A small misalignment of the index marks is satisfactory.

- (b) Engage the adapter shaft of the valve adapter [11] with the spar valve body [20] (View C).

- (c) Apply sealant to the shank and the threads of the four bolts [21].

- 1) Use sealant, A50110, for the wet installation of the bolts [21].

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- 2) Make sure the sealant applied to the fasteners is approximately 0.060 in.
(1.524 mm) thick.

- (d) Install the four bolts [21] and washers [22] to attach the valve adapter [11].

SUBTASK 28-22-11-420-028

► 28-AWL-21: CDCCL

- (7) On the inside of the tank, apply a cap seal to each of the four bolts [21] (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use sealant, A50110, Class B, to apply the cap seal.

SUBTASK 28-22-11-420-042

► 28-AWL-21: CDCCL

- (8) On the inside of the tank, apply a fillet seal around the edge of the hole and the stationary part of the valve adapter plate (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Make sure the sealant does not touch the adapter shaft or other parts of the valve adapter that turn.
- (b) Use sealant, A50110, Class B, to apply the fillet seal.

SUBTASK 28-22-11-420-029

► 28-AWL-21: CDCCL

- (9) On the outside of the tank, apply a fillet seal around the periphery of the valve adapter [11] (plate) and the front spar (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use sealant, A50110, Class B, to apply the fillet seal.

SUBTASK 28-22-11-765-005

► 28-AWL-21: CDCCL

- (10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised serrated surfaces of the valve adapter [11] (plate) (bare metal surface) and the front spar (View F) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

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- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-860-015

- (11) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

- (a) Install the applicable access door(s):

Number Name/Location

532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265
(TASK 28-11-11-400-801).	

SUBTASK 28-22-11-820-010

- (12) Do this task: Spar Valve Alignment, TASK 28-22-11-820-801.

I. Install the Index Plate

SUBTASK 28-22-11-820-011

- (1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate and adapter plate per this task: Spar Valve Alignment, TASK 28-22-11-820-801.

SUBTASK 28-22-11-020-021

- (2) Remove the index plate [10] from the valve adapter [11].

SUBTASK 28-22-11-420-030

- (3) Do these steps to prepare the index plate [10] and the valve adapter [11] for a fay sealed electrical faying surface bond (SWPM 20-20-00):

- (a) Protect the alignment reference mark when you clean the index plate [10] and the valve adapter [11] for the electrical bond.



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- (b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
(c) Rub dry with a clean, dry cotton wiper, G00034.
(d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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► 28-AWL-21: CDCCL

- (e) Apply a thin continuous layer of sealant to the serrated surface of the index plate [10] (three locations) to install a fay sealed fay surface bond between the serrated mating surfaces of the index plate [10] and the valve adapter [11] (plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296, for the faying surface seal that is outside the tank.

- 2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

- (f) Apply sealant to the shank and the threads of the two top index screws [24] and the bottom index screw [25].

- 1) Use sealant, A50337 (BMS 5-45 Class B), for the wet installation of the index screws.

- 2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-11-420-039

- (4) Do these steps to install the index plate [10]:

- (a) Align the index plate [10] and the valve adapter [11] with the alignment reference mark that you made during the spar valve alignment procedure.

- (b) Install the two longer index screws [24] and washers [23] in the top index mounting hole positions.

- (c) Install the shorter index screw [25] and washer [23] in the bottom index mounting hole location (6 o'clock position).

- (d) Tighten the index screws to 22 ± 1 in-lb (2.5 ± 0.1 N·m).

- (e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

- (f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

- (g) Shape the squeezed out sealant into a fillet seal (TASK 51-31-00-390-804).

- (h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-11-765-006

- (5) Measure the electrical bonding resistance between one of the actuator feet contact surfaces on the index plate [10] (bare metal surface) and the front spar (View G).

- (a) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

- (b) If you installed the valve adapter [11], make sure the electrical bonding resistance is 0.001 ohm (1.0 milliohm) or less.

- 1) If the electrical bonding resistance is more than 0.001 ohm (1.0 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

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- (c) If you did not install the valve adapter [11], make sure the electrical bonding resistance is 0.002 ohm (2.0 milliohms) or less.
 - 1) If the electrical bonding resistance is more than 0.002 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-760-006

► 28-AWL-21: CDCCL

- (6) Measure the electrical bonding resistance between the index plate [10] and the valve adapter [11] (plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

SUBTASK 28-22-11-420-036

- (7) Install MS20995NC32 lockwire, G01912, from the two top index screws [24] and the bottom index screw [25] to the index plate [10].

SUBTASK 28-22-11-790-002

- (8) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.

SUBTASK 28-22-11-370-004

- (9) Do this task to apply protective finishes to the bare areas of the front spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the front spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

J. Spar Valve Operational Tests

NOTE: These tests will make sure the spar valve electrical operation is correct, the spar valve plate alignment is correct, and that there are no fuel leaks through the front spar.

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SUBTASK 28-22-11-760-003

- (1) For the applicable spar valve, do these tasks:
 - (a) Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.
NOTE: This test is done when you install the valve actuator.
 - (b) Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-804.

SUBTASK 28-22-11-790-006

- (2) Do this leak check if you have replaced the valve adapter [11]:

NOTE: The leak check is only necessary if you have done a fuel tank entry and replaced the valve adapter [11]. It is not necessary if you have replaced or aligned the index plate [10] for adjustment purposes only.

- (a) Refuel the tank that contains the replaced valve adapter [11] to a minimum of 4400 lb (1996 kg) (TASK 12-11-00-650-802).
NOTE: This is the fuel quantity necessary to make sure there are no leaks at the front spar.
- (b) Make sure there are no fuel leaks at the valve adapter [11] installation on the front spar.
- (c) Make sure there are no fuel leaks at the applicable access door(s):

Number Name/Location

532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265

K. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-11-410-010

- (1) Close the applicable access panel(s):

(TASK 57-41-02-400-801)

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-22-11-410-011

- (2) Close the applicable access door(s):

Number Name/Location

434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2

(TASK 06-43-00-800-801)

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———— END OF TASK ————

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TASK 28-22-11-820-801

10. Spar Valve Alignment

(Figure 405)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: 5718A42 Supplier: 3A054 Opt Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment - Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

B. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Prepare for the Procedure

SUBTASK 28-22-11-010-038

- (1) Prepare the valve adapter [11] for the alignment procedure.

LOM 402, 404, 406 PRE SB 737-28A1207

- (a) If not previously removed, do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-801

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207

- (b) If not previously removed, do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-804

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- (c) If not previously removed, remove the index plate [10] from the adapter plate.

D. Spar Valve Alignment

SUBTASK 28-22-11-480-001

- (1) Do these steps to install the alignment tool [64] (valve alignment equipment, SPL-1771) in the valve adapter [11] (View B):
 - (a) Position the index plate and align the serrated surfaces of the index plate and adapter plate.
 - (b) Loosely install the bottom index screw [65] to the index plate [10].
 - (c) Install the alignment tool [64].
 - (d) Put the alignment tool [64] in its position with the two guide pins in the holes left by the two alignment screws [61] that you removed. (scale [62] should be on the top of the tool).
 - (e) Make sure the spline on the tool engages with the spline on the shaft.

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SUBTASK 28-22-11-820-004

- (2) Do these steps to align the valve adapter [11] (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

- (a) Put the tool handle in the extreme counterclockwise position.
- (b) Slowly and smoothly turn the handle to the extreme clockwise position while you note the changes in the torque necessary to turn the handle.
- (c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.
- (d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.
- (e) Put the shaft in the extreme counterclockwise position again.
- (f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.
- (g) Read the scale [62] on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

- (h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-22-11-820-005

- (3) Do these steps to align the valve adapter [11] (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587 is necessary to do this procedure.

- (a) Put the tool handle in the extreme counterclockwise position.
- (b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.
- (c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.
- (d) Turn the tool back to the extreme counterclockwise position.
- (e) Turn the shaft clockwise again at approximately the same rate that you used before.
- (f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.
- (g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

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- (h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-22-11-820-006

- (4) Tighten the lockscrew [63] on the alignment tool [64] to keep the alignment tool [64] in its position on the valve adapter [11].

SUBTASK 28-22-11-820-007

- (5) Turn the index plate [10] until the actuator mounting holes in the index plate are aligned with the two upper holes for the alignment screws [61].

SUBTASK 28-22-11-820-008

- (6) Insert the two alignment screws [61] into the holes for the actuator mounting screws to hold the index plate [10] in alignment with the valve adapter [11] (this is the final adjustment of the position of the index plate).

SUBTASK 28-22-11-420-011

- (7) Tighten the bottom index screw [65].

SUBTASK 28-22-11-020-009

- (8) Carefully disengage the two alignment screws [61].

SUBTASK 28-22-11-080-001

- (9) Loosen the lockscrew [63] and carefully remove the alignment tool [64].

SUBTASK 28-22-11-420-012

- (10) Use a fine point felt pen to apply a reference mark between the index plate [10] and the adapter plate of the valve adapter [11] at one of the serrated attachment points.

LOM 402, 404, 406 PRE SB 737-28A1207

SUBTASK 28-22-11-420-013

- (11) Continue with the index plate installation procedure in this task: Valve Adapter of the Spar Valve Installation, TASK 28-22-11-400-802.

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
737-28A1207**

SUBTASK 28-22-11-420-031

- (12) Continue with the index plate installation procedure in this task: Valve Adapter of the Spar Valve Installation, TASK 28-22-11-400-805.

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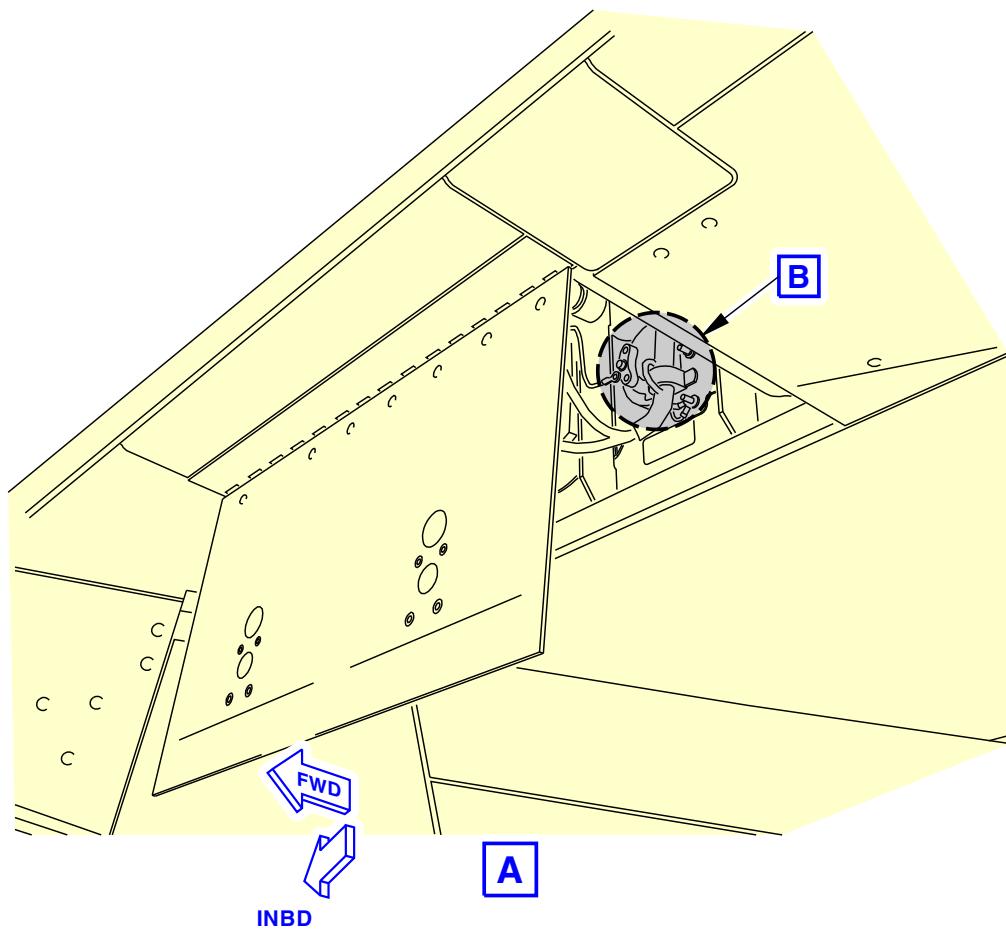
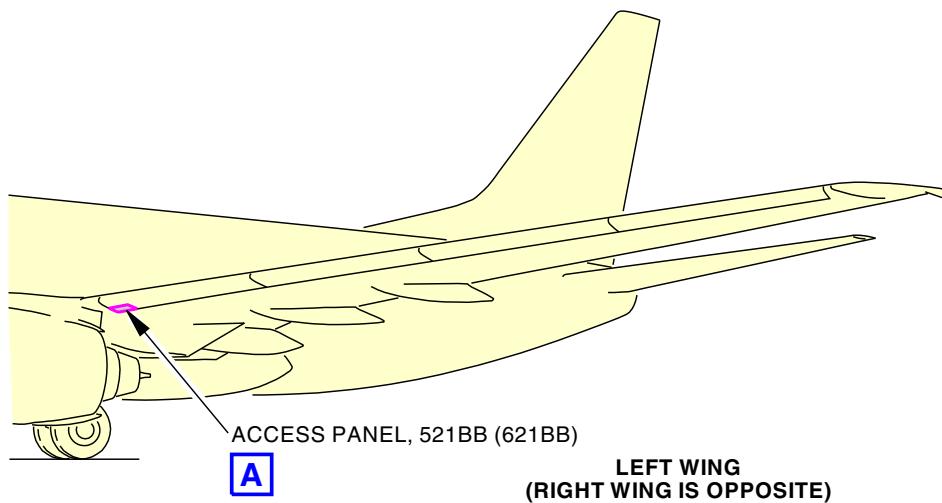
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Spar Valve Alignment
Figure 405/28-22-11-990-803 (Sheet 1 of 2)

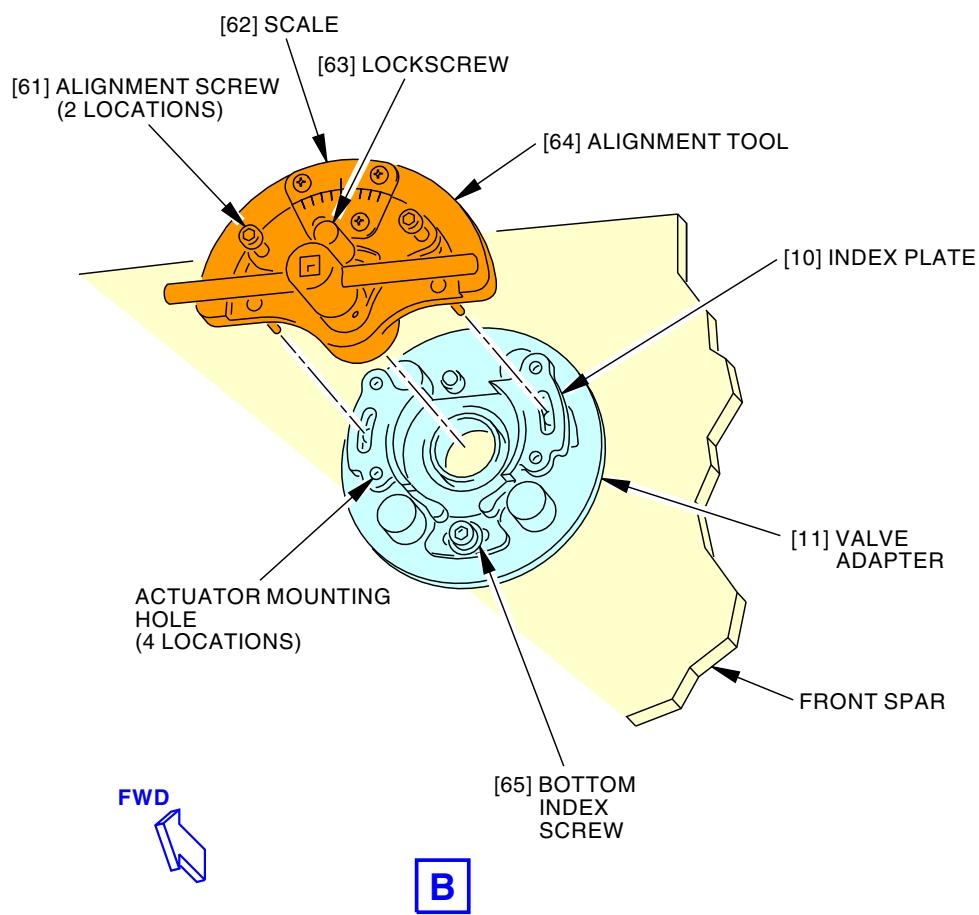
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Spar Valve Alignment
Figure 405/28-22-11-990-803 (Sheet 2 of 2)

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TASK 28-22-11-000-803

11. Valve Body of the Spar Valve Removal

(Figure 406, Figure 407)

A. General

- (1) This task gives instructions to remove the Valve Body of the Spar Valve.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00004	Compound - Antiseize, Graphite-Petrolatum	SAE AMS 2518
D00504	Grease - Petrolatum	VV-P-236
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Location Zones

Zone	Area
413	Engine 1 - Fan Cowl, Left
423	Engine 2 - Fan Cowl, Left
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265



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G. Prepare for the Removal

SUBTASK 28-22-11-860-006

- (1) Set the Engine Start Levers to the CUTOFF position.

SUBTASK 28-22-11-650-003

- (2) Completely defuel the applicable main fuel tank (TASK 28-26-00-650-801) or completely transfer fuel out of the applicable tank (TASK 28-26-00-650-802).

SUBTASK 28-22-11-860-022

- (3) Make sure that the APU start switch is in the OFF position.

SUBTASK 28-22-11-860-023

- (4) Do these steps to make sure that the engine fuel valves are in the correct positions:

NOTE: There are two sets of engine fuel valves. The first set are the high pressure shutoff valves (HPSOV) which are installed on the engines. The second set are the spar valves which are installed in the main fuel tanks. For this test, the applicable HPSOV is closed when the applicable engine fuel spar valve is open.

- (a) Make sure that the Engine Start Levers on the control stand are in the CUTOFF position.
(b) Make sure that the Engine Start Switches on the P5 Overhead Panel are in the OFF position.

LOM 429-432

- 1) The AUTO position is OFF.

LOM ALL

- (c) Put a DO-NOT-OPERATE placard on the left and right engine START switches on the P5 overhead panel.
(d) Open the applicable circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

- (e) On the P5 fuel system panel, make sure that the VALVE OPEN light for the crossfeed valve is off.
(f) Move the applicable Engine Start Lever on the P10 Control Stand to the IDLE position.
NOTE: This opens the applicable fuel spar valve.
(g) On the P5 panel, make sure that the applicable SPAR VALVE CLOSED light is off.

SUBTASK 28-22-11-860-024

- (5) Make sure that the defuel valve is in the closed position.

SUBTASK 28-22-11-010-044

- (6) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

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SUBTASK 28-22-11-860-020



WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU

DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND
DAMAGE TO EQUIPMENT CAN OCCUR.

- (7) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

SUBTASK 28-22-11-650-004

- (8) Drain and purge the applicable main fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-11-860-025



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU DISCONNECT THE FUEL,
HYDRAULIC, AND ELECTRICAL LINES. INJURIES TO PERSONNEL CAN
OCCUR.

- (9) Make sure that electrical power has been removed (TASK 24-22-00-860-812).

SUBTASK 28-22-11-650-010

- (10) Do these steps to drain the fuel supply line (Figure 407):

- (a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel filter drain plug.
- (b) Remove the drain plug and let the fuel drain.
- (c) Remove and discard the o-ring from the drain plug.
- (d) Lubricate a new o-ring with grease, D00504, and install it on the drain plug.
- (e) Lubricate the threads of the drain plug with compound, D00004.
- (f) Install the drain plug.
 - 1) Tighten the drain plug to 50 ± 5 in-lb (6 ± 1 N·m).
- (g) Attach MS20995NC32 lockwire, G01912, to the drain plug.

SUBTASK 28-22-11-860-030

- (11) Manually put the manual override lever on the spar valve actuator to the CLOSED position.

- (a) Put the Engine Start Levers on the P10 Control Stand to the CUTOFF position.

SUBTASK 28-22-11-010-007

- (12) Open the applicable access panel(s):

Number **Name/Location**

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801.

SUBTASK 28-22-11-010-004

- (13) Remove the applicable fuel tank access door(s):

(TASK 28-11-11-000-801)

Number **Name/Location**

532BB Main Tank Access Door - Wing Station 265

632BB Main Tank Access Door - Wing Station 265

Main Tank Access Door Removal, TASK 28-11-11-000-801.

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H. Valve Body of the Spar Valve Removal

SUBTASK 28-22-11-010-005



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Go into the applicable main tank (TASK 28-11-00-910-802).

SUBTASK 28-22-11-020-010

- (2) Disconnect the two flexible full couplings [32] from each side of the spar valve body [20] (TASK 28-22-15-000-801) (View B).

SUBTASK 28-22-11-020-011

- (3) Hold the spar valve body [20] and remove the four screws [33] and washers [34] (View C).

SUBTASK 28-22-11-020-012

- (4) Disengage the spar valve body [20] from the adapter shaft (View C).

- (a) Do not let the adapter shaft fall and cause damage.

NOTE: You can hold the adapter shaft, temporarily attach the adapter shaft to the structure, or put soft material on or below the adapter shaft.

SUBTASK 28-22-11-020-013

- (5) Remove the spar valve body [20].

SUBTASK 28-22-11-480-002

- (6) Put covers on the open ends of the fuel line [31] to keep unwanted materials out.

———— END OF TASK ————

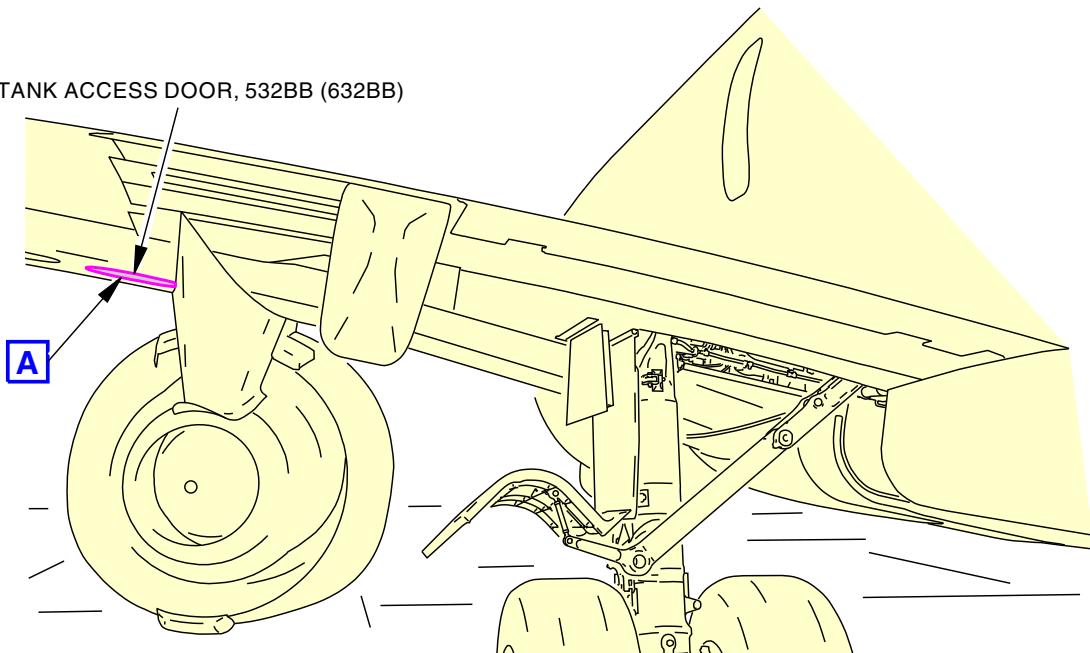
EFFECTIVITY
LOM ALL

28-22-11

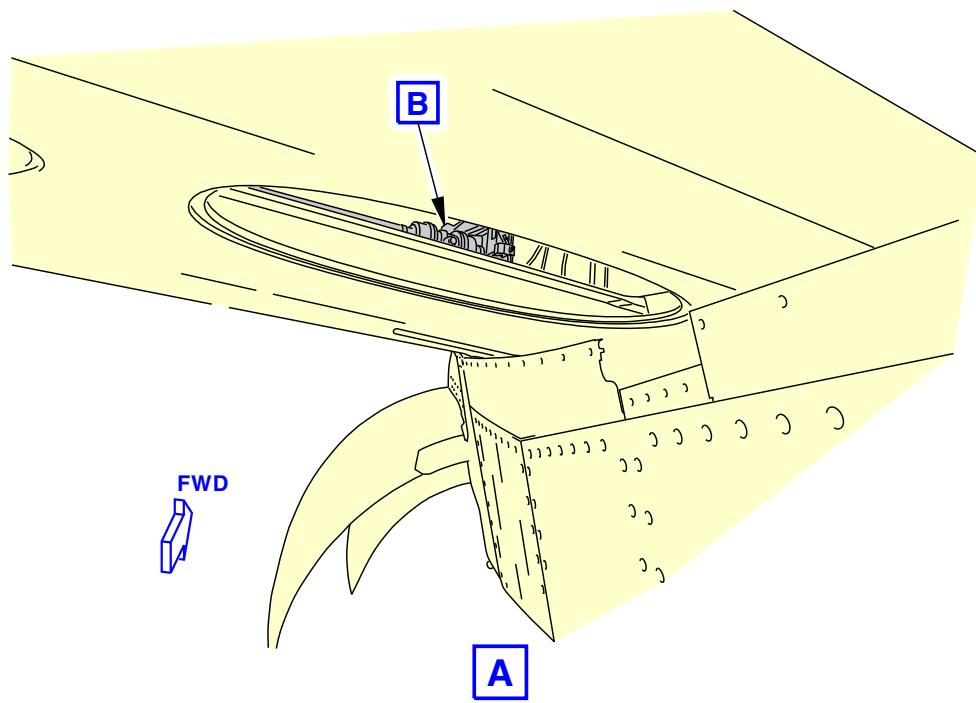


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MAIN TANK ACCESS DOOR, 532BB (632BB)



LEFT WING
(RIGHT WING IS OPPOSITE)



F84586 S0006571963_V2

Spar Valve Body Installation
Figure 406/28-22-11-990-807 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

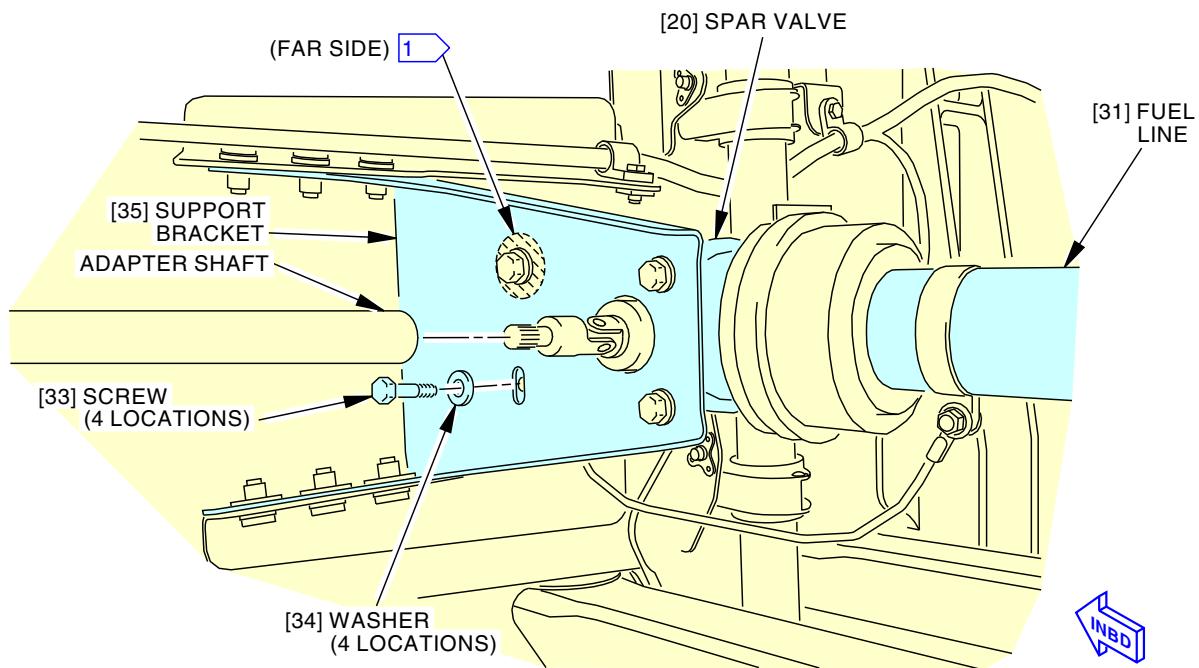
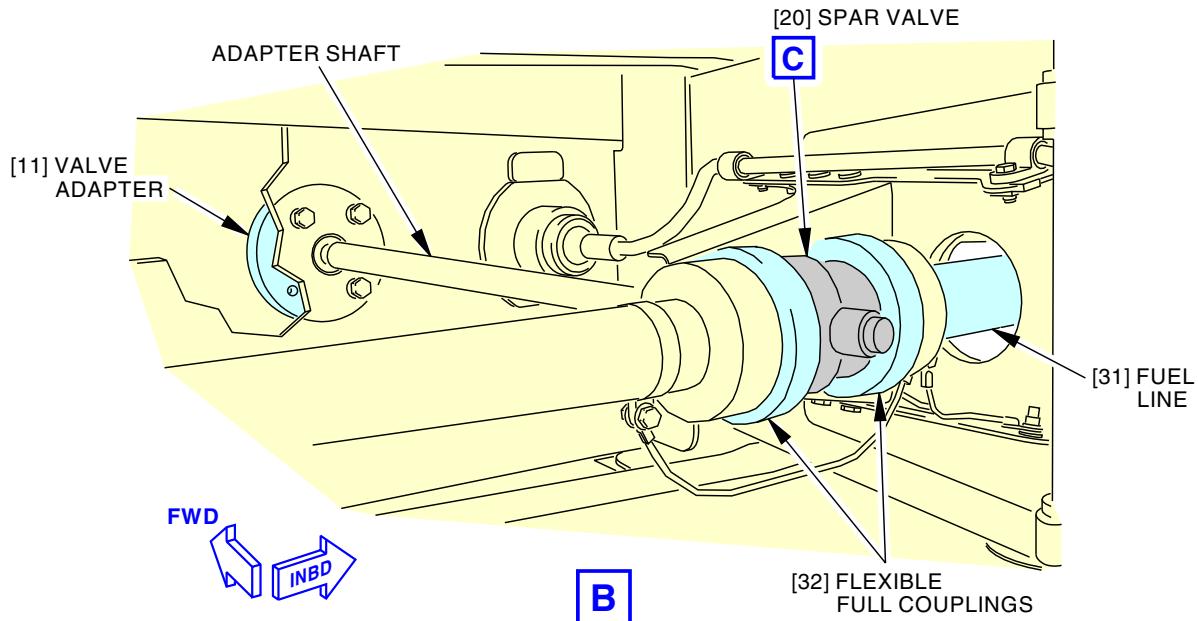
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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- 1** PREPARE THE AREA AROUND THE INBOARD TOP FASTENER HOLE AND THE CONTACT SURFACE OF THE VALVE BODY FOR AN UNSEALED ELECTRICAL FAYING SURFACE BOND (SWPM 20-20-00).

SPAR VALVE

C

F84922 S0006571964_V4

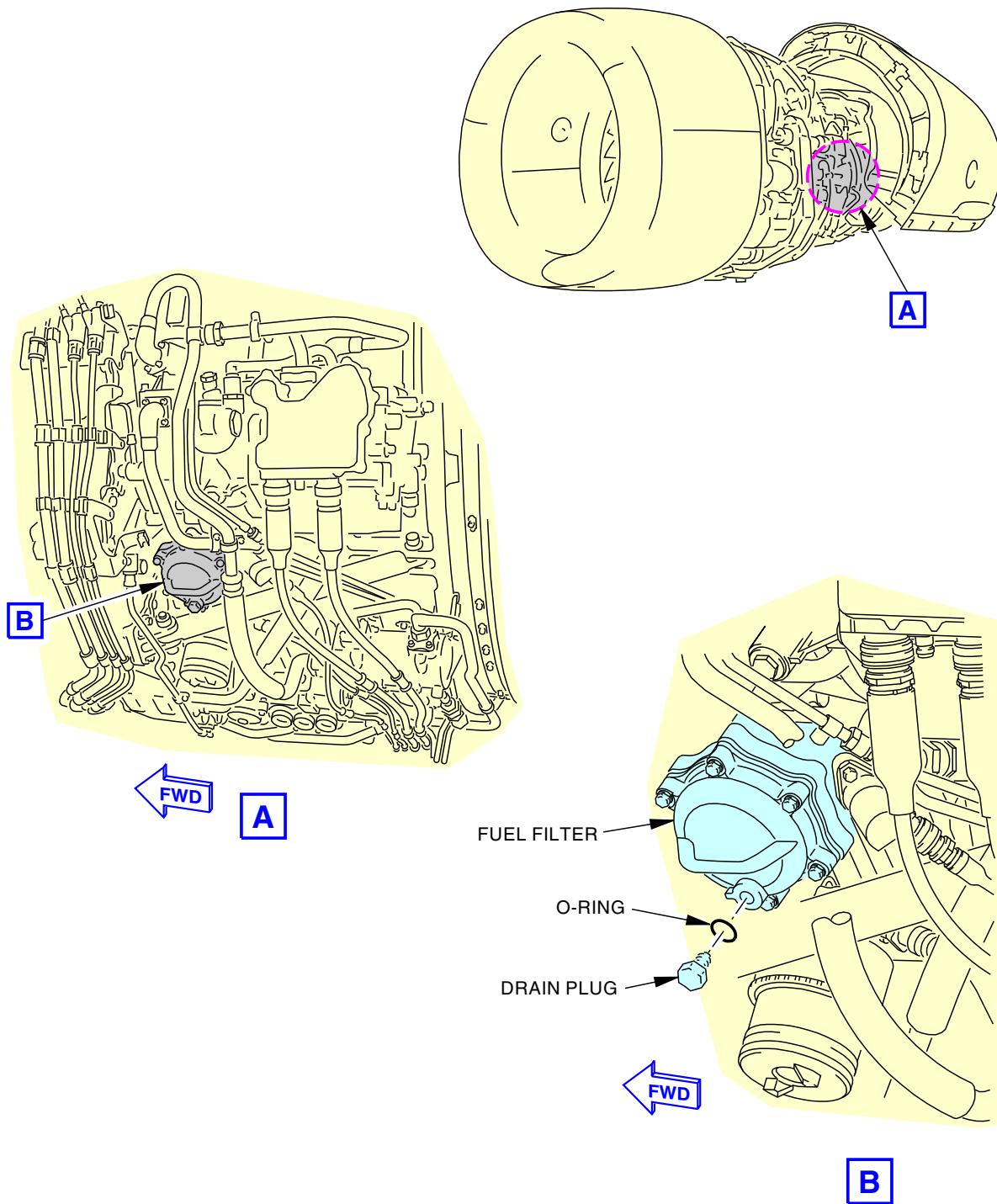
Spar Valve Body Installation
Figure 406/28-22-11-990-807 (Sheet 2 of 2)

EFFECTIVITY
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



G07835 S0006571930_V2

Fuel Filter Drain Location
Figure 407/28-22-11-990-811

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TASK 28-22-11-400-803

12. Valve Body of the Spar Valve Installation

(Figure 406)

A. General

- (1) This task gives instructions to install the Valve Body of the Spar Valve

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-802	Engine Fuel Suction Feed - Operational Test (P/B 501)
28-22-00-720-804	Engine Fuel Spar Valve Installation - Test (P/B 501)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-15-710-801	Engine Fuel Feed Manifold - Leak Test (P/B 601)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

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E. Location Zones

Zone	Area
413	Engine 1 - Fan Cowl, Left
423	Engine 2 - Fan Cowl, Left
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
532BB	Main Tank Access Door - Wing Station 265
632BB	Main Tank Access Door - Wing Station 265

G. Valve Body of the Spar Valve Installation

SUBTASK 28-22-11-860-028

- (1) Make sure that electrical power is removed (TASK 24-22-00-860-812).

SUBTASK 28-22-11-860-029

- (2) Make sure that the manual override lever on the spar valve actuator is in the CLOSED position.

SUBTASK 28-22-11-010-006



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Go into the applicable main tank (TASK 28-11-00-910-802).

SUBTASK 28-22-11-080-002

- (4) Remove the covers from the fuel line [31].

SUBTASK 28-22-11-110-004

- (5) Do these steps to prepare the inboard top fastener hole of the support bracket [35] and the contact surface of the spar valve body [20] for an unsealed electrical faying surface bond (View C):



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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces of the support bracket [35] and the spar valve body [20] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-11-420-032

- (6) Turn the universal joint fitting on the spar valve body [20] until the index marks are aligned.

NOTE: A small misalignment of the index marks is satisfactory.

SUBTASK 28-22-11-420-033

- (7) Put the spar valve body [20] into position.

SUBTASK 28-22-11-210-003

- (8) Make sure that "TOP" shows on the top of the spar valve body [20].

SUBTASK 28-22-11-080-003

- (9) Remove items used for protection of the adapter shaft.
 - (a) Do not let the adapter shaft fall and cause damage.

SUBTASK 28-22-11-420-015

- (10) Engage the universal joint fitting on the spar valve body [20] into the adapter shaft.

SUBTASK 28-22-11-820-009

- (11) Align the spar valve body [20] with the support bracket [35].

SUBTASK 28-22-11-420-016

- (12) Install the four screws [33] and washers [34].

SUBTASK 28-22-11-220-003

- (13) Measure the bonding resistance between the spar valve body [20] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

- (a) Make sure that the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-22-11-420-019

- (14) Connect the two flexible full couplings [32] between the spar valve body [20] and the fuel line [31] (TASK 28-22-15-400-801).

SUBTASK 28-22-11-860-016

- (15) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-22-11-410-002

- (16) Install the applicable No. 1 or No. 2 tank access door(s):

Number **Name/Location**

532BB Main Tank Access Door - Wing Station 265

632BB Main Tank Access Door - Wing Station 265

Main Tank Access Door Installation, TASK 28-11-11-400-801.

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SUBTASK 28-22-11-410-004

- (17) Install the applicable access panel(s):

Number Name/Location

434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2

Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801.

SUBTASK 28-22-11-860-007

- (18) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

- (a) Stay away from the valve actuator until you supply power.

SUBTASK 28-22-11-860-027

- (19) Remove the applicable safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 28-22-11-710-010

- (20) Do one of these tasks:

- (a) Do a test of the engine fuel feed manifold for leakage.

- 1) Do this task: Engine Fuel Feed Manifold - Leak Test, TASK 28-22-15-710-801.
- 2) Remove the DO-NOT-OPERATE placards from the left and right engine START switches on the P5 overhead panel.

- (b) Do an operational test for the engine fuel suction feed system.

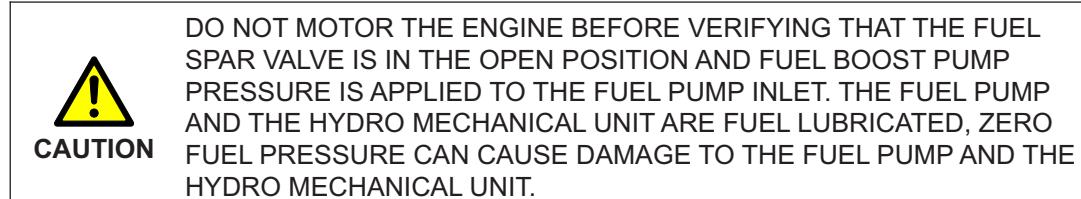
NOTE: If you do this test, you must first do a leak check of the engine fuel spar valve that you replaced.

- 1) Remove the DO-NOT-OPERATE placards from the left and right engine START switches on the P5 overhead panel.
- 2) Do this task: Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-804.
- 3) Do this task: Engine Fuel Suction Feed - Operational Test, TASK 28-22-00-710-802.

SUBTASK 28-22-11-710-004

- (21) Do this test to do a leak check of the engine fuel spar valve that you replaced, if you did a test of the engine fuel feed manifold for leakage:

- (a) Do this task: Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-804.



- (b) If it is necessary on the engine to be dry motored, apply the boost pump pressure to the fuel pump inlet (Dry Motor the Engine, TASK 71-00-00-700-821-F00).

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-11-410-017

- (1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 28-22-11-650-012

- (2) Refuel the applicable fuel tank (if it is necessary) (TASK 12-11-00-650-802).

SUBTASK 28-22-11-860-008

- (3) Remove the electrical power if it is not necessary for other tasks (TASK 24-22-00-860-812).

———— END OF TASK ————

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

TASK 28-22-11-300-801

13. Rework the Electrical Faying Surface Bonds for the Spar Valve

A. General

- (1) This task contains these procedures:

- (a) Rework the Faying Surface Bond - Actuator to Index Plate
- (b) Rework the Faying Surface Bond - Index Plate to Adapter Plate
- (c) Rework the Faying Surface Bond - Adapter Plate to Front Spar
- (d) Rework the Bonding Jumper Bond

- (2) Do this task if the measurement for the electrical bonding resistance is more than the allowed resistance value.

- (3) The motor operated valve uses two electrical bonding paths:

- (a) One bonding path is from the upper housing of the actuator through the bonding jumper to the stiffener.
- (b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the front spar. The bond path is through the bare metal faying surfaces of the actuator (at the mounting feet), index plate, and adapter plate to the bare metal surface of the front spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by an electrical faying surface. You cannot repair or rework the faying surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

- (4) If the electrical bonding resistance is more than the maximum allowed resistance, you must disassemble the components, rework the faying surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the faying surfaces until the electrical resistance between the components is within allowable resistance values.

- (5) Because the build-up of the spar valve includes several faying surface bonds, you may not know which faying surface bond is the cause of the problem. This task will help you isolate the location of the faying surface bond that needs to be reworked. The procedure does a check of the faying surface bond downstream of the bond that is in question.

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Consumable Materials

Reference	Description	Specification
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

E. Rework the Faying Surface Bond - Actuator to Index Plate

(Figure 402),

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the front spar is more than 0.004 ohm (4.0 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.003 ohm (3.0 milliohm).

SUBTASK 28-22-11-010-035

(1) Do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-804.

SUBTASK 28-22-11-765-007

(2) Do these steps to do a check of the index plate to structure bonding path:

NOTE: These steps will tell you if the actuator to index plate faying surface bond is the cause of the problem, or if the index plate to adapter faying surface bond is the cause of the problem.

- (a) Remove the sealant and clean one of the contact surfaces on the index plate [10].
- (b) Measure the bonding resistance between the contact surface on the index plate [10] (bare metal surface) and the front spar (SWPM 20-20-00) (Figure 404, View G).
- (c) Make sure the bonding resistance is 0.002 ohm (2.0 milliohms) or less.
- (d) If the bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Faying Surface Bond - Index Plate to Adapter Plate.

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-11-040-001

- (3) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.

NOTE: This task will rework the faying surface bond and re-install the actuator.

SUBTASK 28-22-11-765-008

- (4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator [15] and the front spar (SWPM 20-20-00, SWPM 20-20-10) (Figure 402, View C).

- (a) Do this measurement with the bonding jumper [14] and the electrical connector [5] disconnected.
(b) Make sure the bonding jumper [14] does not touch the actuator [15] during the bonding measurement.
(c) Make sure the bonding resistance is 0.004 ohm (4.0 milliohms) or less.
NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.003 ohm (3.0 milliohm).
(d) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
(e) If the bonding resistance is satisfactory, then continue with the steps to install the actuator [15] (TASK 28-22-11-400-804).

SUBTASK 28-22-11-710-008

- (5) If you have replaced the valve adapter [11] or adjusted the index plate [10], then continue with the steps in this procedure: Spar Valve Operational Tests (TASK 28-22-11-400-805).

F. Rework the Faying Surface Bond - Index Plate to Adapter Plate

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the front spar is more than 0.002 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-22-11-010-036

- (1) Do this procedure: Remove the Index Plate (TASK 28-22-11-000-805).

SUBTASK 28-22-11-765-009

- (2) Do these steps to check the adapter plate to front spar bonding path:

NOTE: These steps will tell you if the index plate to adapter plate faying surface bond is the cause of the problem, or if the adapter plate to front spar faying surface bond is the cause of the problem.

- (a) Remove the sealant and clean one of the serrated contact surfaces on the valve adapter [11].
(b) Measure the bonding resistance between the serrated contact surface on the valve adapter [11] and the front spar (SWPM 20-20-00) (View F).
(c) Make sure the bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.0005 ohm (0.5 milliohm).

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (d) If the bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Faying Surface Bond - Adapter Plate to Front Spar.
- (e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-11-040-002

- (3) Do these steps to install the index plate [10]:

NOTE: These steps will re-align the spar valve, rework the faying surface, and re-install the index plate.

- (a) Do this task: Spar Valve Alignment, TASK 28-22-11-820-801.
- (b) Do this procedure: Install the Index Plate (TASK 28-22-11-400-805).

SUBTASK 28-22-11-765-010

- (4) During the installation, check the electrical bonding resistance between the index plate [10] and the front spar (SWPM 20-20-00) (View G):
 - (a) Make sure the bonding resistance is 0.002 ohm (2.0 milliohms) or less.
 - (b) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
 - (c) If the bonding resistance is satisfactory, then continue with the procedure to install the index plate [10] (TASK 28-22-11-400-805).

SUBTASK 28-22-11-760-001

- (5) After you install the index plate [10], do this procedure: Spar Valve Operational Tests (TASK 28-22-11-400-805).

G. Rework the Faying Surface Bond - Adapter Plate to Front Spar

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter plate and the front spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-22-11-010-037

- (1) Do this procedure: Remove the Valve Adapter (TASK 28-22-11-000-805).

NOTE: A fuel tank entry is necessary to rework the faying surface of the valve adapter.

SUBTASK 28-22-11-040-003

- (2) Do this procedure: Install the Valve Adapter (TASK 28-22-11-400-805).

NOTE: These steps will rework the faying surface, and re-install the valve adapter.

SUBTASK 28-22-11-765-011

- (3) During the installation, do a check of the electrical bonding resistance between the valve adapter [11] and the front spar (SWPM 20-20-00) (View F).
 - (a) Make sure the bonding resistance is 0.0005 ohm (0.5 milliohm) or less.
 - (b) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
 - (c) If the bonding resistance is satisfactory, then continue with the steps to install the valve adapter [11] (TASK 28-22-11-400-805).

SUBTASK 28-22-11-040-004

- (4) After you install the valve adapter [11], do this procedure: Install the Index Plate (TASK 28-22-11-400-805).

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

H. Rework the Bonding Jumper Bond

(Figure 402)

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
737-28A1207**

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the front spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

SUBTASK 28-22-11-030-003

- (1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-22-11-020-023

- (2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-22-11-420-037

- (3) Do these steps to install the bonding jumper to the structure:



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - 1) Rub dry with a clean, dry cotton wiper, G00034.
 - 2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
- (b) Install the nut, washers, and the bonding jumper to the structure.
- (c) Tighten the nut to 32 ± 3 in-lb (4 ± 1 N·m).

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
737-28A1207**

- (d) Measure the electrical bonding resistance between the loose end of bonding jumper and the front spar (SWPM 20-20-10) (View C).
 - 1) Make sure the bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
737-28A1207; AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

- (e) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
- (f) Apply a cap seal of sealant, A50337 (BMS 5-45 Class B) over the nut and the terminal of the bonding jumper.

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

SUBTASK 28-22-11-420-038

- (4) Continue with this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.

SUBTASK 28-22-11-710-007

- (5) If you have replaced the valve adapter [11] or adjusted the index plate [10], then continue with the steps in this procedure: Spar Valve Operational Tests (TASK 28-22-11-400-805).

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

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SPAR VALVE - INSPECTION/CHECK

1. **General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance of the spar valve actuator.

SFAR 88

TASK 28-22-11-200-801

2. **Spar Valve Actuator - Bonding Resistance Check**

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

E. Prepare for the Procedure

SUBTASK 28-22-11-865-004

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	5	C00540	FUEL SPAR VALVE IND

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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SUBTASK 28-22-11-865-005

- (2) For the left spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-865-006

- (3) For the right spar valve actuator,
Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-010-042

- (4) Open the applicable access panel(s):

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

F. Electrical Bonding Measurement

SUBTASK 28-22-11-710-009

- (1) Move the manual override lever to the fully CLOSED position.

SUBTASK 28-22-11-862-004

- (2) Disconnect the electrical connector from the actuator.

SUBTASK 28-22-11-765-020

- (3) Measure the electrical bonding resistance between the actuator (at the electrical connector flange) and the spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00, SWPM 20-20-10).
(a) Make sure the bonding resistance is 0.005 ohm (5.0 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-11-861-005

- (1) Connect the electrical connector to the actuator.

SUBTASK 28-22-11-410-013

- (2) Close the applicable access panel(s):

Number Name/Location

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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SUBTASK 28-22-11-865-007

- (3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C00540	FUEL SPAR VALVE IND

SUBTASK 28-22-11-865-008

- (4) For the left actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1

SUBTASK 28-22-11-865-009

- (5) For the right actuator,

Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2

SUBTASK 28-22-11-760-009

- (6) Do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test,
TASK 28-22-00-710-801.

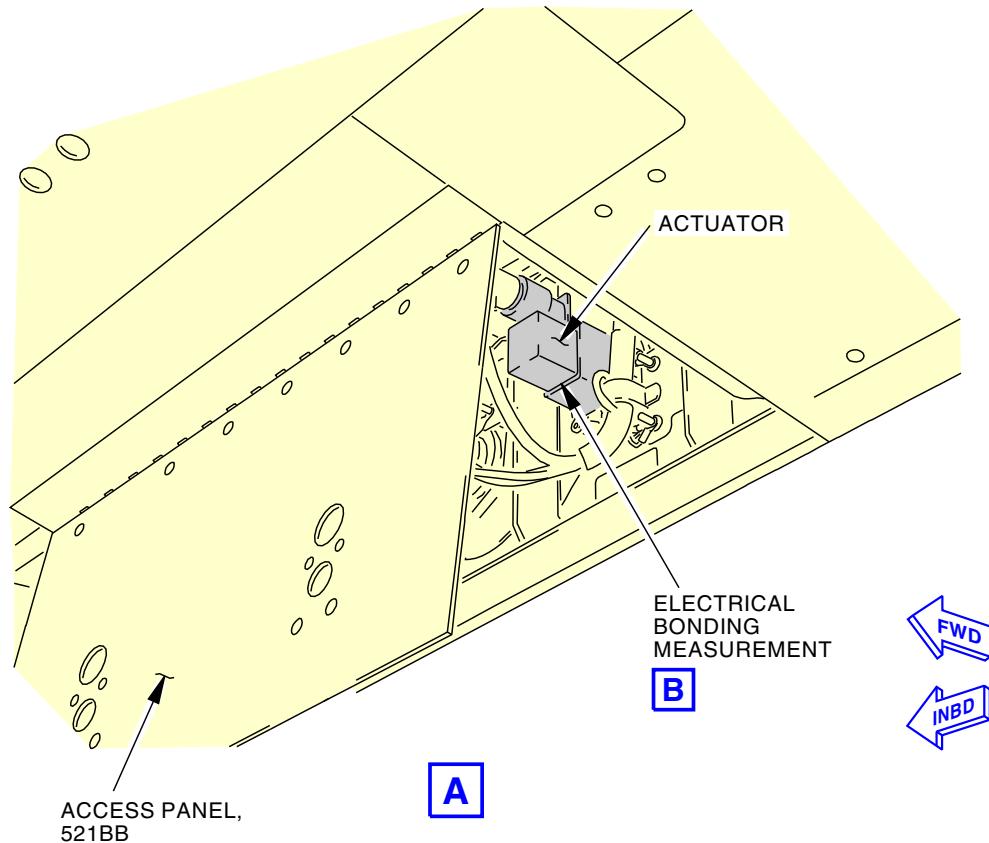
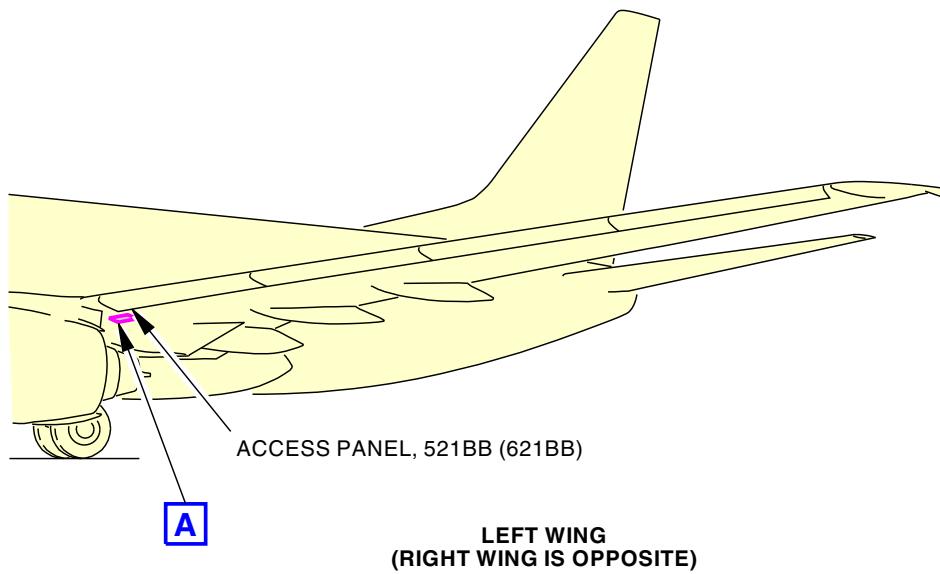
———— END OF TASK ————

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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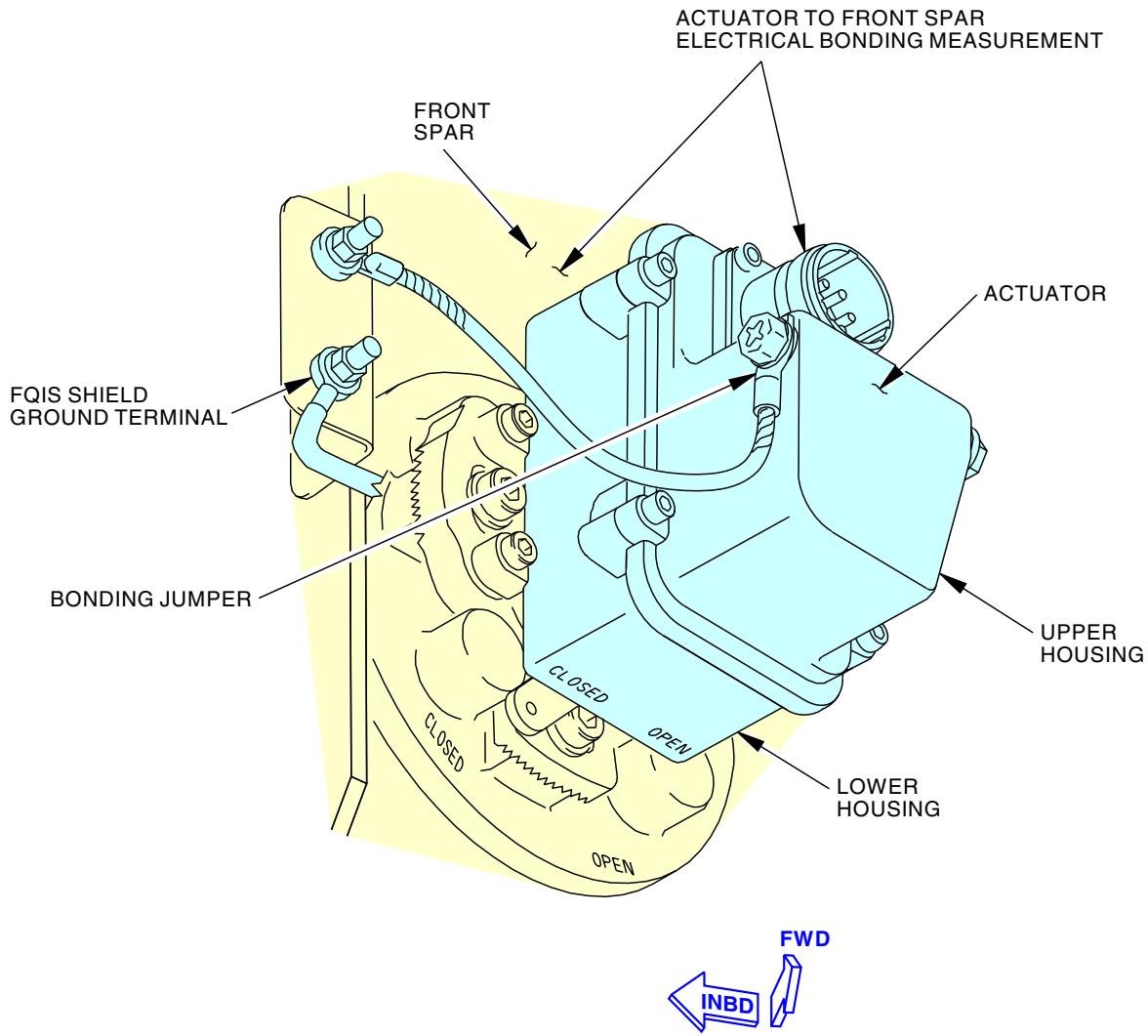
1341498 S0000238412_V2

Spar Valve Actuator - Bonding Resistance Check
Figure 601/28-22-11-990-810 (Sheet 1 of 2)

EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207

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ELECTRICAL BONDING MEASUREMENT
B

1341541 S0000238413_V2

Spar Valve Actuator - Bonding Resistance Check
Figure 601/28-22-11-990-810 (Sheet 2 of 2)

EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207

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WATER SCAVENGE JET PUMP - REMOVAL/INSTALLATION

1. General

- A. There is one water scavenge jet pump in each main fuel tank. There are two water scavenge jet pumps in the center fuel tank.
- B. This procedure has these tasks:
 - (1) Center Tank Water Scavenge Jet Pump Nozzle Assembly Removal
 - (2) Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation
 - (3) No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Removal
 - (4) No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Installation
 - (5) Center Tank Water Scavenge Jet Pump Removal
 - (6) Center Tank Water Scavenge Jet Pump Installation
 - (7) No. 1 or No. 2 Tank Water Scavenge Jet Pump Removal
 - (8) No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation

TASK 28-22-13-000-801

2. Center Tank Water Scavenge Jet Pump Nozzle Assembly Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the center tank water scavenge jet pump nozzle assembly.

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Pump assembly	28-22-52-01A-305	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-155	LOM ALL

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 28-22-13-860-018

- (1) Make sure that the boost pump switches for the center fuel tank are set to the OFF position.





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SUBTASK 28-22-13-010-017

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-860-007



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

F. Center Tank Water Scavenge Jet Pump Nozzle Assembly Removal.

SUBTASK 28-22-13-010-001

- (1) To remove the nozzle assembly [6] of the water scavenge jet pumps, do these steps:

NOTE: The nozzle assembly contains two parts, the jet nozzle and nozzle plug. It is not necessary to separate these parts.

- (a) Get access to the applicable jet pump, found on the rear spar in the main wheel well (Figure 401).
- (b) Remove the lockwire [1] from the nozzle assembly [6].
- (c) Remove the nozzle assembly [6] as a unit from the pump assembly [2].

NOTE: There is an internal check valve in the housing that will prevent a fuel spill.

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(d) Discard the O-ring [7].

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

28-22-13

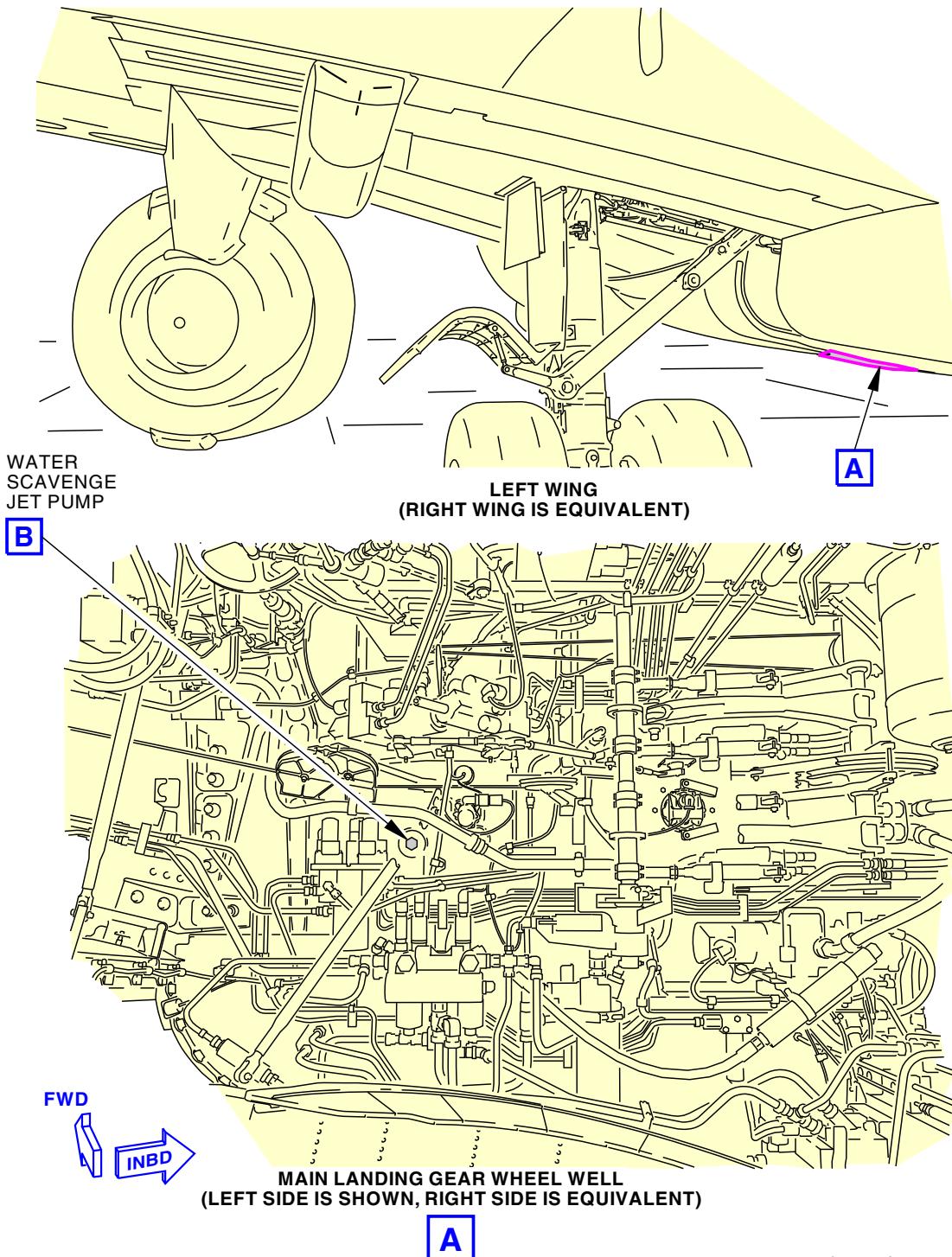
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Center Tank Water Scavenging Jet Pump Nozzle Assembly Installation
Figure 401/28-22-13-990-801 (Sheet 1 of 2)

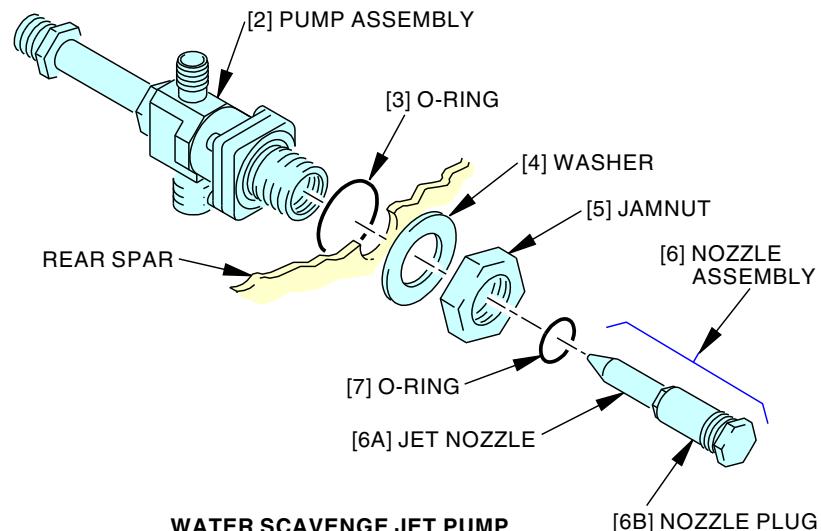
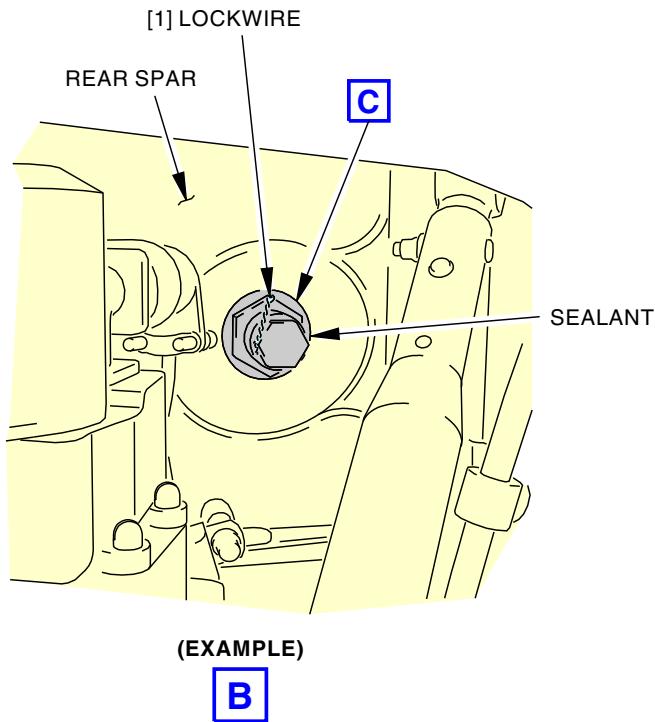
EFFECTIVITY
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C

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Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation
Figure 401/28-22-13-990-801 (Sheet 2 of 2)

EFFECTIVITY
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TASK 28-22-13-400-801

3. Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation
(Figure 401)

A. General

- (1) This task gives instructions to install the center tank water scavenge jet pump nozzle assembly.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-44-400-802	Safety Cable Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995
G50375	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule)	BACC13AT3K, AMS 5689

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	O-ring	28-22-52-01A-315	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-165	LOM ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation

SUBTASK 28-22-13-420-001

- (1) To install the nozzle assembly [6] of a center tank water scavenge jet pump, do these steps:
- Get access to the applicable water scavenge jet pump, installed on the rear spar, out of the fuel tank.
 - Apply a thin layer of petrolatum grease, D00504, to the new O-ring [7].
 - Install the nozzle assembly [6] and new O-ring [7] into the pump assembly [2].
NOTE: The nozzle assembly contains two parts, the jet nozzle and nozzle plug.
 - Tighten the nozzle assembly [6] to 160 in-lb (18 N·m).



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- (e) Install lockwire, G01505, or safety cable kit, G50375, between the nozzle assembly [6] and jamnut [5] (TASK 20-10-44-400-801, TASK 20-10-44-400-802).

H. Center Tank Water Scavenge Jet Pump Nozzle Assembly Installation Test

SUBTASK 28-22-13-860-008



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-13-410-008

- (2) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-001

- (3) To do a test of the water scavenge jet pumps for leaks, operate the applicable center tank fuel boost pump (left or right) and look for leakage at the pump installation on the rear spar.

———— END OF TASK ————

EFFECTIVITY
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TASK 28-22-13-000-802

4. No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Removal
(Figure 402)

A. General

- (1) This task gives instructions to remove the No. 1 or No. 2 tank water scavenge jet pump nozzle assembly.

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
551	Left Wing - Rear Spar To Landing Gear Support Beam
651	Right Wing - Rear Spar to Landing Gear Support Beam

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel
651DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

D. Prepare for the Removal

SUBTASK 28-22-13-860-009

- (1) Make sure that the AFT boost pump switch for the applicable main tank is set to the OFF position.

SUBTASK 28-22-13-010-018

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-860-010



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open the applicable circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

E. No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Removal

SUBTASK 28-22-13-010-006

- (1) To remove the nozzle assembly [6] of the water scavenge jet pumps, do these steps:

NOTE: The nozzle assembly contains two parts, the jet nozzle and nozzle plug. It is not necessary to separate these parts.

- (a) To get access to the applicable water scavenge jet pump, installed on the rear spar, out of the fuel tank, do this step:(Figure 402).

Open the applicable access panels:

Number Name/Location

551DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel
651DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

- (b) Remove the lockwire [1] from the nozzle assembly [6].

- (c) Remove the nozzle assembly [6] as a unit from the pump assembly [2].

NOTE: There is an internal check valve in the housing that will prevent a fuel spill.

- (d) Discard the O-ring [7].

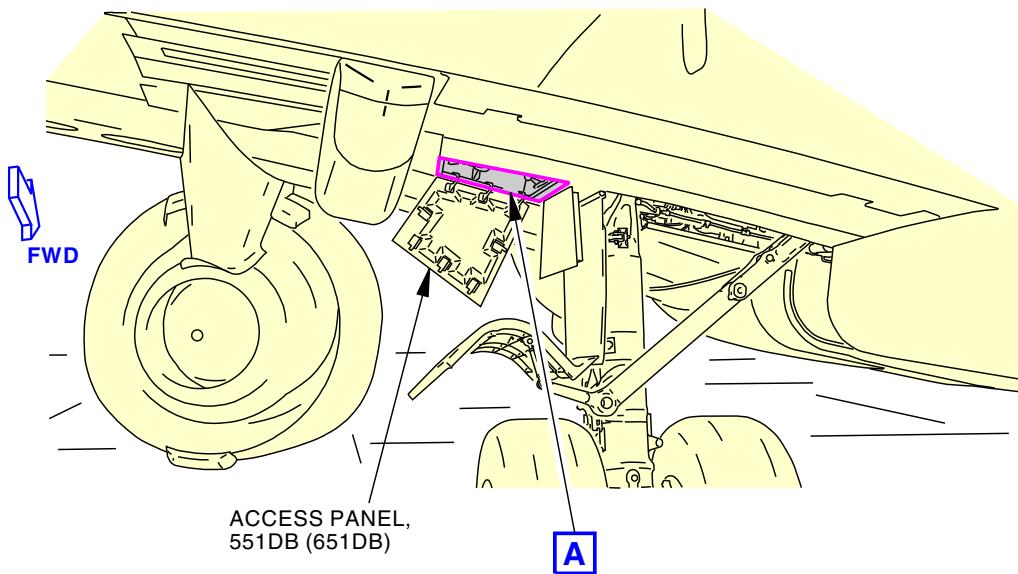
———— END OF TASK ————

EFFECTIVITY
LOM ALL

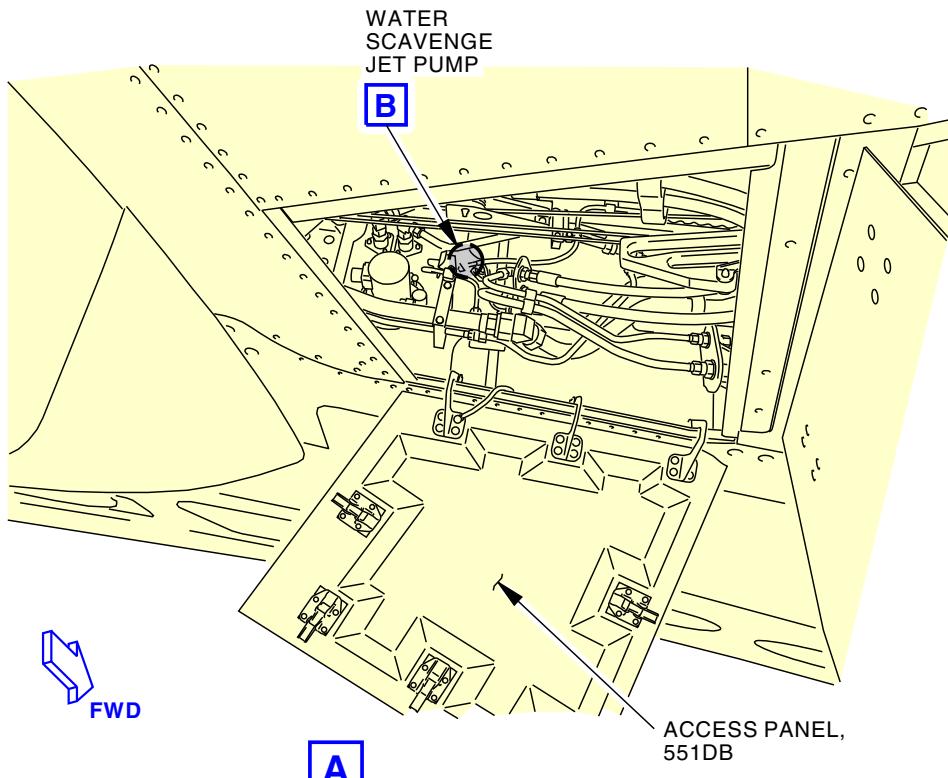
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LEFT WING
(RIGHT WING IS EQUIVALENT)



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No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Installation
Figure 402/28-22-13-990-802 (Sheet 1 of 2)

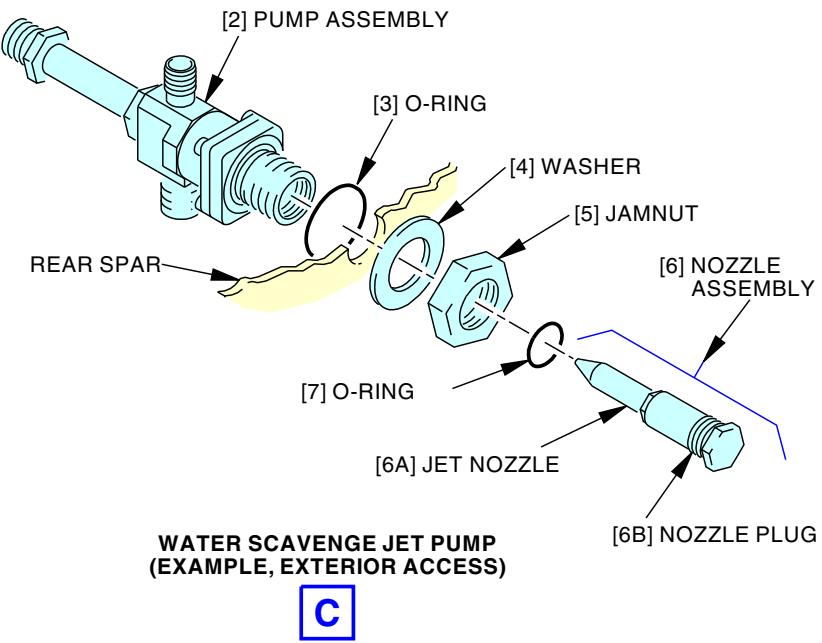
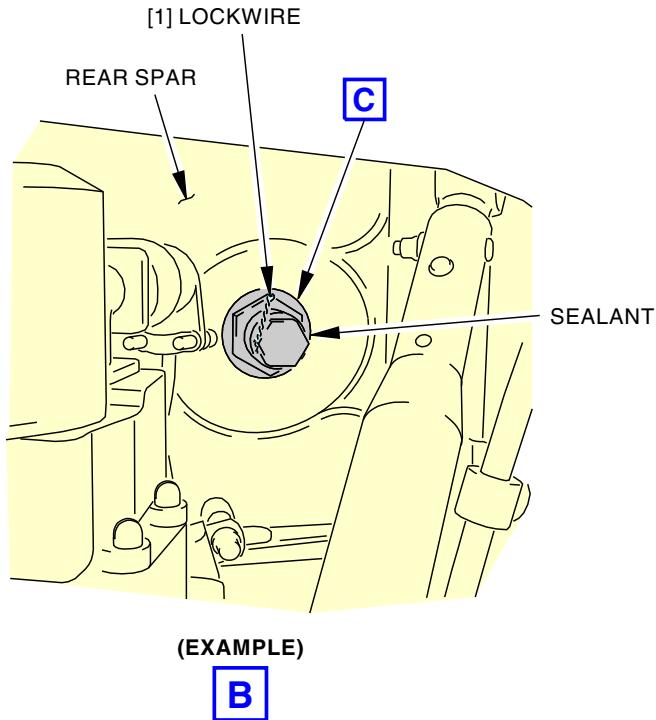
EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Installation
Figure 402/28-22-13-990-802 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-22-13-400-802

5. No. 1 or No. 2 Tank Water Scavenger Jet Pump Nozzle Assembly Installation
(Figure 402)

A. General

- (1) This task gives instructions to install the No. 1 or No. 2 tank water scavenger jet pump nozzle assembly.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-44-400-802	Safety Cable Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995
G50375	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule)	BACC13AT3K, AMS 5689

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	O-ring	28-22-52-01A-315	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-165	LOM ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
551	Left Wing - Rear Spar To Landing Gear Support Beam
651	Right Wing - Rear Spar to Landing Gear Support Beam

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel
651DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

G. No. 1 or No. 2 Tank Water Scavenger Jet Pump Nozzle Assembly Installation

SUBTASK 28-22-13-010-011

- (1) To get access to the applicable water scavenger jet pump, installed on the rear spar, out of the fuel tank, do this step:

EFFECTIVITY
LOM ALL

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- (a) If it is not open, open the applicable access panel(s):

<u>Number</u>	<u>Name/Location</u>
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel
651DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

SUBTASK 28-22-13-420-008

- (2) To install the nozzle assembly of the water scavenge jet pump (Figure 402), do these steps:
- Apply a thin layer of petrolatum grease, D00504, to the new O-ring [7].
 - Install the nozzle assembly [6] and O-ring [7] into the pump assembly [2].
NOTE: The nozzle assembly contains two parts, the jet nozzle and nozzle plug.
 - Tighten the nozzle assembly [6] to 160 in-lb (18 N·m).
 - Install lockwire, G01505, or safety cable kit, G50375, between the nozzle assembly [6] and jamnut [5] (TASK 20-10-44-400-801, TASK 20-10-44-400-802).

H. No. 1 or No. 2 Tank Water Scavenge Jet Pump Nozzle Assembly Installation Test

SUBTASK 28-22-13-860-011



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	3	C00828	FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406	D	4	C00828	FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406	D	2	C00826	FUEL BOOST PUMP TANK 1 AFT

LOM ALL

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LOM ALL

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SUBTASK 28-22-13-410-005

- (2) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-002

- (3) To do a test of the water scavenge jet pumps for leaks, operate the applicable fuel boost pump (the aft boost pump in the No. 1 or No. 2 tank) and look for leakage at the pump installation on the rear spar.
- (a) Monitor the fuel quantities for an uncommanded fuel transfer from the No. 1 or No. 2 tank to the center tank while you operate the boost pump.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-13-410-011

- (1) Close the access panel(s) that you opened to get access:

Number Name/Location

551DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

651DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

———— END OF TASK ————

TASK 28-22-13-000-803

6. Center Tank Water Scavenge Jet Pump Removal

(Figure 401, Figure 403)

A. General

- (1) This task gives instructions to remove the center tank water scavenge jet pump.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

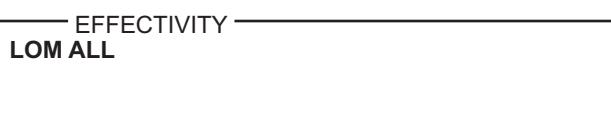
Reference	Description
STD-7423	Cover - Protective Tube

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door



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(Continued)

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access

F. Prepare for the Removal

SUBTASK 28-22-13-860-001

- (1) Make sure that the boost pump switches for the center fuel tank are set to the OFF position.

SUBTASK 28-22-13-010-019

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-860-002



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-13-840-001

- (4) Do one of these tasks to defuel the center fuel tank:

(a) Fuel Tank Defueling, TASK 28-26-00-650-801

(b) Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-13-840-002



WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD

CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) To prepare the center fuel tank for entry, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-22-13-020-005

- (6) To remove the water scavenge jet pump in the center tank, remove this access panel:

Number Name/Location

131AB Center Tank Access

(TASK 28-11-31-000-801).

G. Center Tank Water Scavenge Jet Pump Removal

SUBTASK 28-22-13-010-007

- (1) Remove the pump assembly [2]:

- (a) Remove the jamnut [5] and washer [4] from the pump assembly [2], from out of the fuel tank (Figure 401).
- (b) Go into the center fuel tank.
- (c) Disconnect the B-nut [22] between the motive flow line and the pump assembly [2] (Figure 403).
- (d) Disconnect the B-nut [23] between the scavenge inlet line and the pump assembly [2].
- (e) Disconnect the B-nut [21] between the outlet line and the pump assembly [2].
- (f) Remove the pump assembly [2].
 - 1) Discard the O-ring [3] (Figure 401).
- (g) Install protective covers, STD-7423, on the open fuel lines to keep unwanted materials out.

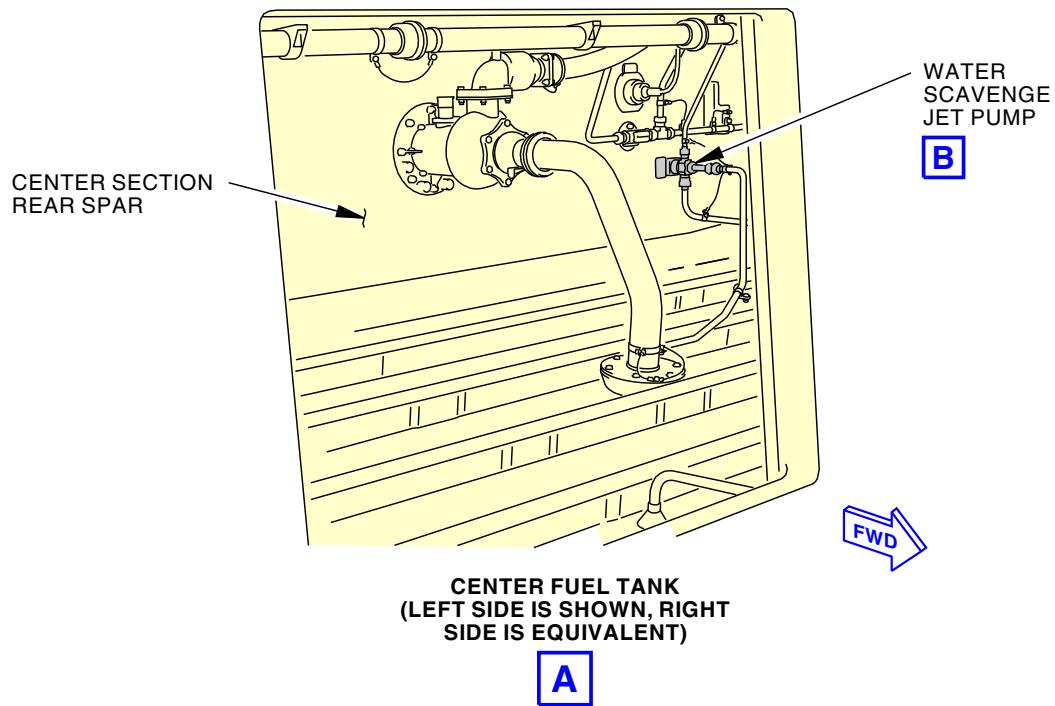
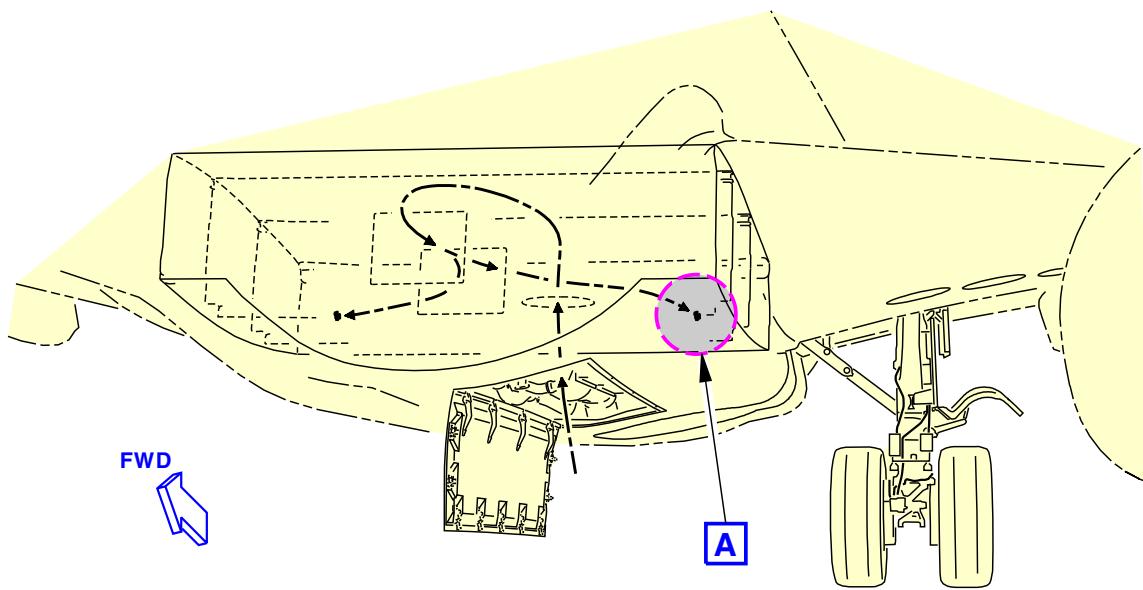
— END OF TASK —

EFFECTIVITY
LOM ALL

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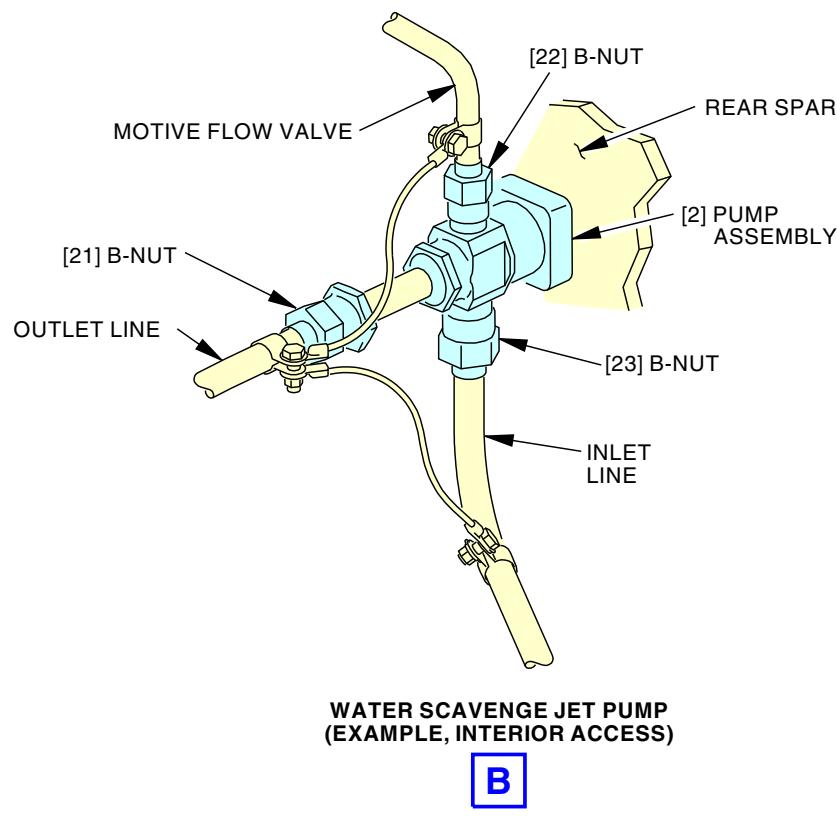
Center Tank Water Scavenging Jet Pump Installation
Figure 403/28-22-13-990-805 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

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Center Tank Water Scavenge Jet Pump Installation
Figure 403/28-22-13-990-805 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-22-13-400-803

7. Center Tank Water Scavenge Jet Pump Installation

(Figure 401, Figure 403)

A. General

- (1) This task gives instructions to install the center tank water scavenge jet pump.
- (2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110, are also acceptable sealants.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-11-00 P/B 801	FUEL TANKS - REPAIRS
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Pump assembly	28-22-52-01A-305	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-155	LOM ALL



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AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-22-52-01A-070	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-100	LOM ALL

F. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

G. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
131AB	Center Tank Access

H. Center Tank Water Scavenge Jet Pump Installation

SUBTASK 28-22-13-010-009

- (1) To install the pump assembly [2], do these steps:



WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) For the center fuel tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.
- (b) Go into the center fuel tank.
- (c) Remove the fuel line covers installed on the open fuel lines to keep unwanted materials out.
- (d) Lubricate a new O-ring [3] with a thin layer of grease, D00504 (Figure 401).
- (e) Install the O-ring [3] onto the pump assembly [2].
- (f) Put the pump assembly [2] in its position and install the washer [4] and jamnut [5] from out of the fuel tank.
 - 1) Make sure that the fuel lines align before you tighten the jamnut [5].
 - 2) Tighten the jamnut [5] to 360 ± 20 in-lb (41 ± 3 N·m).
- (g) Measure the bonding resistance between the pump assembly [2] and airplane structure (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the electrical bonding resistance is 0.001 ohm (1.0 milliohm) or less.
- (h) Connect the B-nut [22] between the motive flow line and pump assembly [2] (Figure 403).
- (i) Connect the B-nut [23] between the scavenge inlet line and pump assembly [2].
- (j) Connect the B-nut [21] between the outlet line and pump assembly [2].



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- (k) Apply a fillet seal of sealant, A00767, between the pump assembly [2] and rear spar (in the fuel tank) (PAGEBLOCK 28-11-00/801).
- (l) Apply a fillet seal of sealant, A02315, between the jamnut [5] and rear spar (out of the fuel tank) (PAGEBLOCK 51-31-00/201) (Figure 401).

I. Center Tank Water Scavenge Jet Pump Installation Test

SUBTASK 28-22-13-410-002

- (1) Do these steps to close the fuel tank:

(a) Go out of the center tank (TASK 28-11-00-410-801).

(b) Install the center tank access panel:

(TASK 28-11-31-400-801)

Number Name/Location

131AB Center Tank Access

(c) Refuel the airplane (TASK 12-11-00-650-802).

SUBTASK 28-22-13-860-003



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

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SUBTASK 28-22-13-410-006

- (3) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-003

- (4) To do a test of the water scavenge jet pumps for leaks, operate the applicable center tank fuel boost pump (left or right) and look for leakage at the pump installation on the rear spar.

————— END OF TASK ————

TASK 28-22-13-000-804

8. No. 1 or No. 2 Tank Water Scavenge Jet Pump Removal

(Figure 402, Figure 404)

A. General

- (1) This task gives instructions to remove the No. 1 or No. 2 tank water scavenge jet pump.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-7423	Cover - Protective Tube

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

F. Prepare for the Removal

SUBTASK 28-22-13-860-004

- (1) Make sure that the AFT boost pump switch for the applicable main tank is set to the OFF position.

SUBTASK 28-22-13-010-020

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

EFFECTIVITY
LOM ALL

28-22-13



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SUBTASK 28-22-13-860-005



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open the applicable circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-22-13-840-003

- (4) Do one of these tasks to defuel the applicable main tank:
(a) Fuel Tank Defueling, TASK 28-26-00-650-801
(b) Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

SUBTASK 28-22-13-840-004



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) To prepare the applicable fuel tank for entry, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-22-13-020-006

- (6) Remove the applicable access door:

EFFECTIVITY
LOM ALL

28-22-13



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- (a) To remove the water scavenge jet pump in the No. 1 tank, remove this access door:

Number **Name/Location**

532AB Main Tank Access Door - Wing Station 216

(TASK 28-11-11-000-801)

- (b) To remove the water scavenge jet pump in the No. 2 tank, remove this access door:

Number **Name/Location**

632AB Main Tank Access Door - Wing Station 216

(TASK 28-11-11-000-801).

G. No. 1 or No. 2 Tank Water Scavenge Jet Pump Removal

SUBTASK 28-22-13-010-008

- (1) To remove the pump assembly [2], do these steps:

- (a) Remove the jamnut [5] and washer [4] from the pump assembly [2], from out of the fuel tank (Figure 402).
- (b) Go into the applicable fuel tank.
- (c) Disconnect the B-nut [22] between the motive flow line and pump assembly [2] (Figure 404).
- (d) Disconnect the B-nut [23] between the scavenge inlet line and pump assembly [2].
- (e) Disconnect the B-nut [21] between the outlet line and pump assembly [2].
- (f) Remove the pump assembly [2].
 - 1) Discard the O-ring [3] (Figure 402).
- (g) Install protective covers, STD-7423, on the open fuel lines to keep unwanted materials out.

———— END OF TASK ————

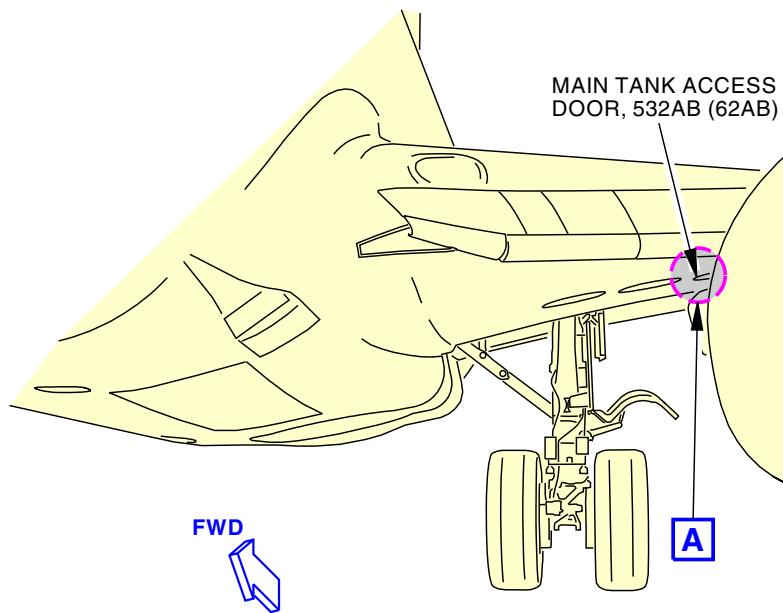
— EFFECTIVITY —

LOM ALL

28-22-13



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L01012 S0006571984_V2

No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation
Figure 404/28-22-13-990-806 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-22-13

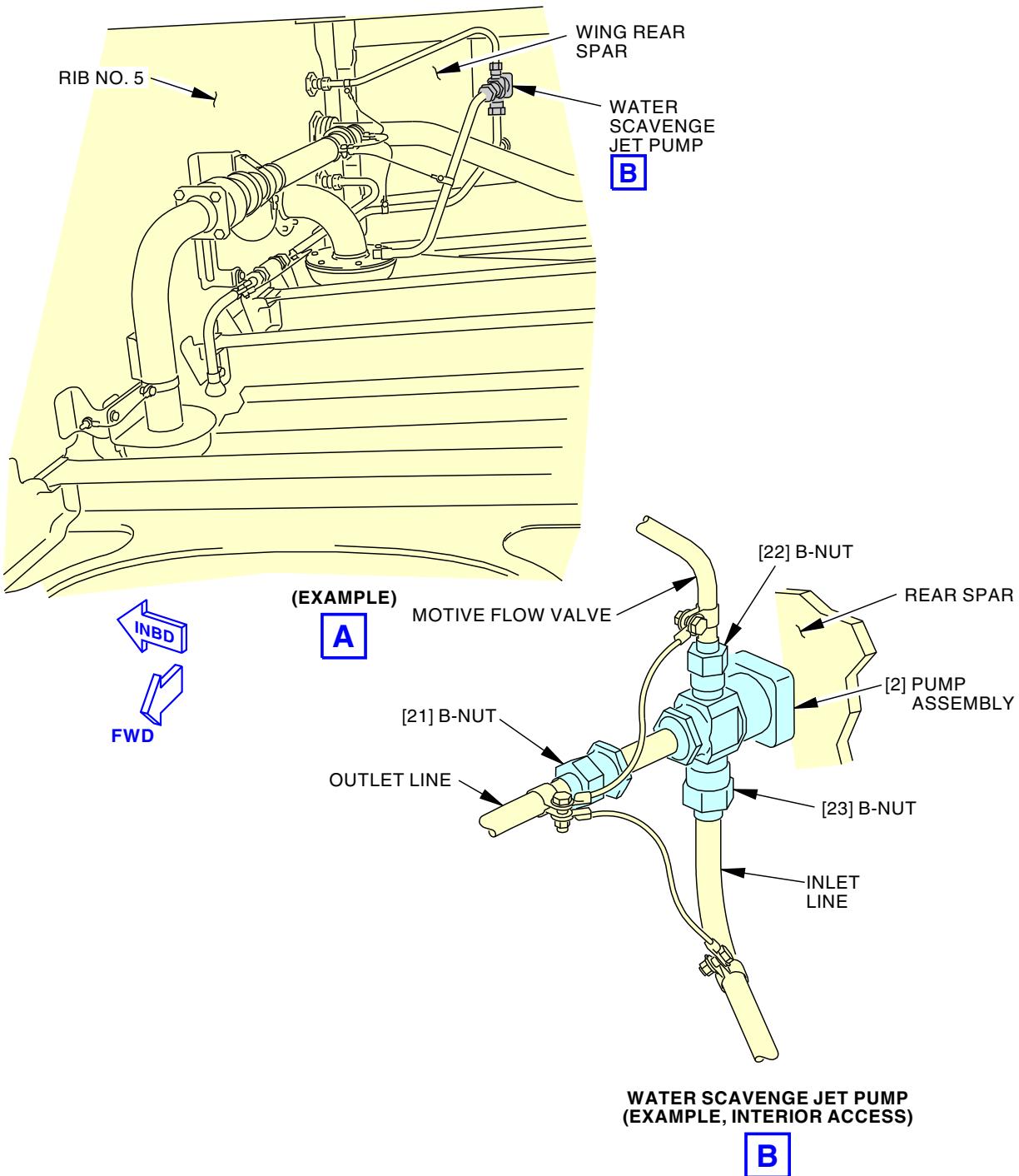
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BOEING

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**WATER SCAVENGE JET PUMP
(EXAMPLE, INTERIOR ACCESS)**



L01099 S0006571985_V3

**No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation
Figure 404/28-22-13-990-806 (Sheet 2 of 3)**

EFFECTIVITY
LOM 432; LOM 402, 404, 406, 407, 411, 412, 415, 416,
420, 422-431, 433, 434, 437-447, 450-457 PRE SB
737-28-1327

28-22-13

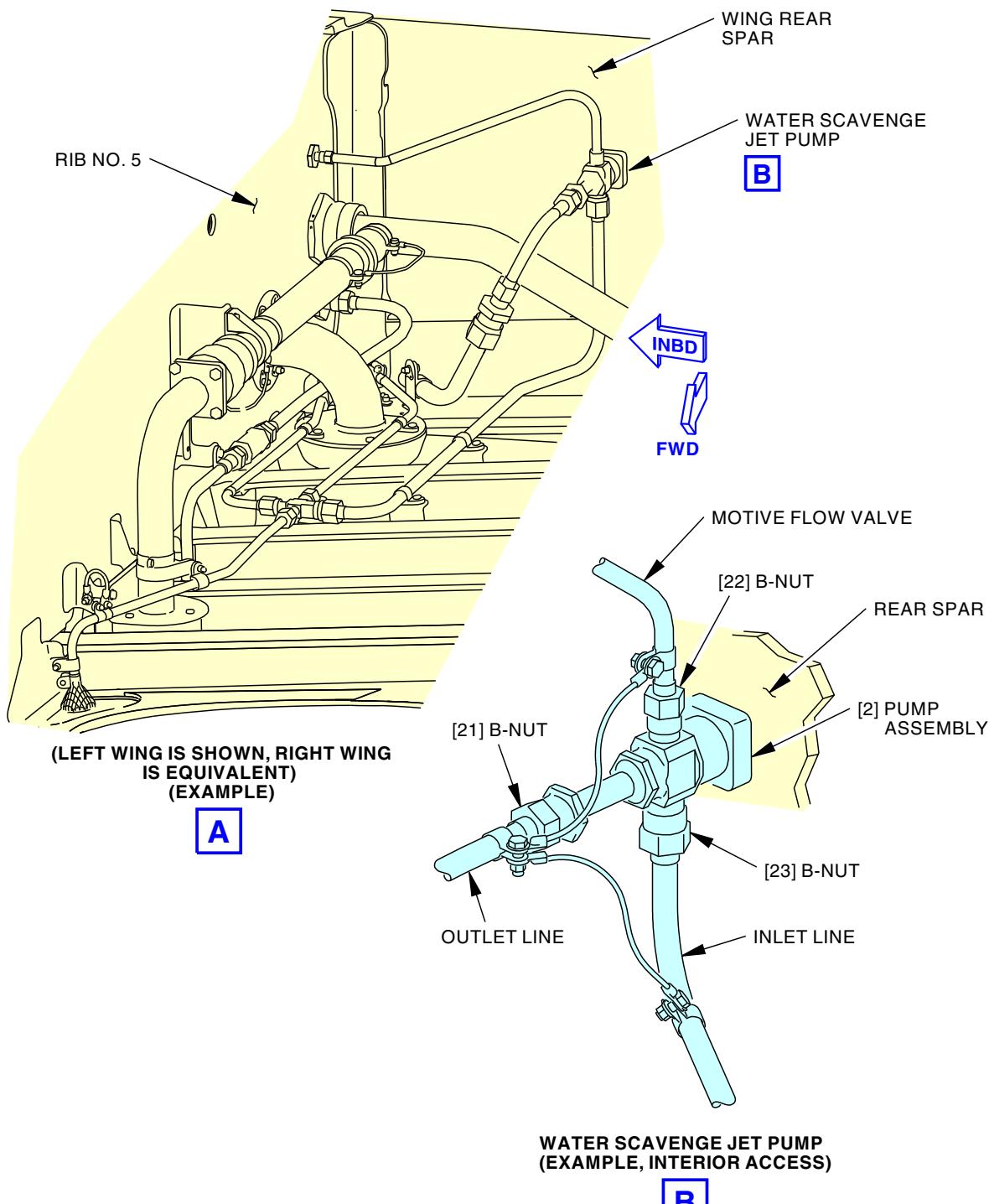
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BOEING

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**No. 1 or No. 2 Tank Water Scavenging Jet Pump Installation
Figure 404/28-22-13-990-806 (Sheet 3 of 3)**

EFFECTIVITY
LOM 458-999; LOM 402, 404, 406, 407, 411, 412, 415,
416, 420, 422-431, 433, 434, 437-447, 450-457 POST
SB 737-28-1327

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TASK 28-22-13-400-804

9. No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation

(Figure 402, Figure 404)

A. General

- (1) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110, are also acceptable sealants.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-11-00 P/B 801	FUEL TANKS - REPAIRS
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Pump assembly	28-22-52-01A-305	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-155	LOM ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-22-52-01A-070	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-100	LOM ALL

F. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

H. No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation

SUBTASK 28-22-13-010-010

- (1) To install the pump assembly [2], do these steps:



WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) For the applicable fuel tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.
- (b) Go into the applicable fuel tank.
- (c) Remove the fuel line covers installed on the open fuel lines to keep unwanted materials out.
- (d) Lubricate a new O-ring [3] with a thin layer of grease, D00504 (Figure 402).
- (e) Install the O-ring [3] onto the pump assembly [2].
- (f) Put the pump assembly [2] in its position and install the washer [4] and jamnut [5] from out of the fuel tank.
 - 1) Make sure that the fuel lines align before you tighten the jamnut [5].
 - 2) Tighten the jamnut [5] to 360 ± 20 in-lb (41 ± 3 N·m).
- (g) Measure the bonding resistance between the pump assembly [2] and the airplane structure (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the electrical bonding resistance is 0.001 ohm (1.0 milliohm) or less.
- (h) Connect the B-nut [22] between the motive flow line and pump assembly [2] (Figure 404).
- (i) Connect the B-nut [23] between the scavenge inlet line and pump assembly [2].

EFFECTIVITY
LOM ALL

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- (j) Connect the B-nut [21] between the outlet line and pump assembly [2].
- (k) Apply a fillet seal of sealant, A00767, between the pump assembly [2] and rear spar (in the fuel tank) (PAGEBLOCK 28-11-00/801).
- (l) Apply a fillet seal of sealant, A02315, between the jamnut [5] and rear spar (out of the fuel tank) (PAGEBLOCK 51-31-00/201) (Figure 402).

I. No. 1 or No. 2 Tank Water Scavenge Jet Pump Installation Test

SUBTASK 28-22-13-410-003

- (1) Do these steps to close the fuel tank:
 - (a) Go out of the fuel tank (TASK 28-11-00-410-801).
 - (b) Install the applicable access doors:

<u>Number</u>	<u>Name/Location</u>
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

(TASK 28-11-11-400-801)
 - (c) Refuel the airplane (TASK 12-11-00-650-802).

SUBTASK 28-22-13-860-006



WARNING

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WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

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SUBTASK 28-22-13-410-007

- (3) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-004

- (4) To do a test of the water scavenge jet pumps for leaks, operate the applicable fuel boost pump (the aft boost pump in the No. 1 or No. 2 tank) and look for leakage at the pump installation on the rear spar.
- (a) For the water scavenge jet pumps in the No. 1 tank or the No. 2 tank, monitor the fuel quantities for an uncommanded fuel transfer from the No. 1 or No. 2 tank to the center tank while you operate the boost pump.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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WATER SCAVENGE JET PUMP - INSPECTION/CHECK

1. General

- A. This procedure has these tasks:
 - (1) A check of the center tank water scavenge jet pump
 - (2) A check of the No. 1 or No. 2 tank water scavenge jet pump.
- B. The water scavenge jet pumps operate continuously when the related boost pumps operate. The aft boost pump in the No. 1 or No. 2 tank causes pressure that operates the water scavenge jet pump. The left and right boost pumps in the center tank cause pressure that operates the left and right water scavenge jet pump. The water scavenge pumps have no parts that move. Regular inspections of the water scavenge pumps are necessary to make sure that there is no pump blockage.

TASK 28-22-13-200-801

2. Center Tank Water Scavenge Jet Pump - Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-44-400-802	Safety Cable Installation (P/B 401)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

C. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995
G50375	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule)	BACC13AT3K, AMS 5689

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6A	Jet nozzle	28-22-52-01A-320	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
6B	Nozzle plug	28-22-52-03B-170 28-22-52-01A-310 28-22-52-03B-160	LOM ALL LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457 LOM ALL



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AIRCRAFT MAINTENANCE MANUAL

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	O-ring	28-22-52-01A-315	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-22-52-03B-165	LOM ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Prepare for the Check

SUBTASK 28-22-13-860-012

- (1) Make sure that the boost pump switches for the center fuel tank are set to the OFF position.

SUBTASK 28-22-13-010-021

- (2) To get access to the P91 and P92 panel, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 28-22-13-860-013



WARNING

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WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

EFFECTIVITY
LOM ALL

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LOM 402, 404, 406 (Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-13-480-001

- (4) Put the container below the pump to catch the fuel.

H. Center Tank Water Scavenge Jet Pump Check

SUBTASK 28-22-13-020-001

- (1) Do these steps to loosen and remove the nozzle assembly [6] from the pump housing.

(a) Remove the lockwire [1] that attaches the nozzle assembly to the jamnut [5].

(b) Loosen the nozzle assembly [6] from the pump.

(c) Remove the nozzle assembly [6] from the pump housing.

NOTE: The flapper valve in the pump housing closes to prevent fuel leakage when the nozzle assembly is moved away from the pump.

(d) Remove and discard the O-ring [7].

SUBTASK 28-22-13-020-002

- (2) Loosen and remove the jet nozzle [6A] from the nozzle plug [6B].

SUBTASK 28-22-13-210-001

- (3) Make sure that the holes of the jet nozzle [6A] are clean and have no blockage.

SUBTASK 28-22-13-110-001



WARNING

KEEP THE CLEANING SOLUTIONS AWAY FROM SPARKS, FLAMES, AND HEAT. CLEANING SOLUTIONS ARE FLAMMABLE, AND CAN CAUSE INJURIES TO PERSONNEL.



CAUTION

DO NOT USE ABRASIVE MATERIALS. ABRASIVE MATERIALS WILL CAUSE DAMAGE TO THIS COMPONENT.

- (4) If it is necessary, do these steps to clean the jet nozzle [6A]:

NOTE: The removal of the jet nozzle from the nozzle plug and cleaning of the jet nozzle are required when this task is performed to comply with MPD Items 28-060-01, 28-060-02, or 28-060-03.

(a) Clean the jet nozzle [6A] with solvent, B00074, or equivalent.

(b) If it is necessary, use a soft bristle brush, STD-123, to clean the jet nozzle [6A].

(c) Dry the nozzle with moisture-free compressed air or nitrogen.

SUBTASK 28-22-13-640-001

- (5) Apply a thin layer of grease, D00504, to the new O-ring [7].

EFFECTIVITY
LOM ALL

28-22-13

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SUBTASK 28-22-13-420-002

- (6) Install the O-ring [7] into the groove on the nozzle plug [6B].

SUBTASK 28-22-13-420-003

- (7) Install the jet nozzle [6A] into the nozzle plug [6B].
(a) Tighten the jet nozzle [6A] to 65 in-lb (7 N·m) - 75 in-lb (8 N·m).

SUBTASK 28-22-13-420-004

- (8) Do these steps to install the nozzle assembly [6] in the pump housing:
(a) Put the nozzle assembly [6] into the pump housing.
(b) Tighten the nozzle plug [6B] in the pump housing to 155 in-lb (18 N·m) - 165 in-lb (19 N·m).
(c) Install lockwire, G01505, or safety cable kit, G50375, between the nozzle assembly [6] and jamnut [5] (TASK 20-10-44-400-801, TASK 20-10-44-400-802).

SUBTASK 28-22-13-860-014



WARNING

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WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (9) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-13-410-009

- (10) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-005

- (11) Do these steps to do a leak test of the center tank water scavenge jet pumps:

- (a) Make sure that the fuel tank for the applicable fuel boost pump has 1000 lb (454 kg) of fuel (or more).
 - 1) If it is necessary, transfer fuel to the center tank, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.
- (b) Operate the applicable center tank fuel boost pump (left or right).
- (c) Look for leakage at the water scavenge jet pump installation on the rear spar.

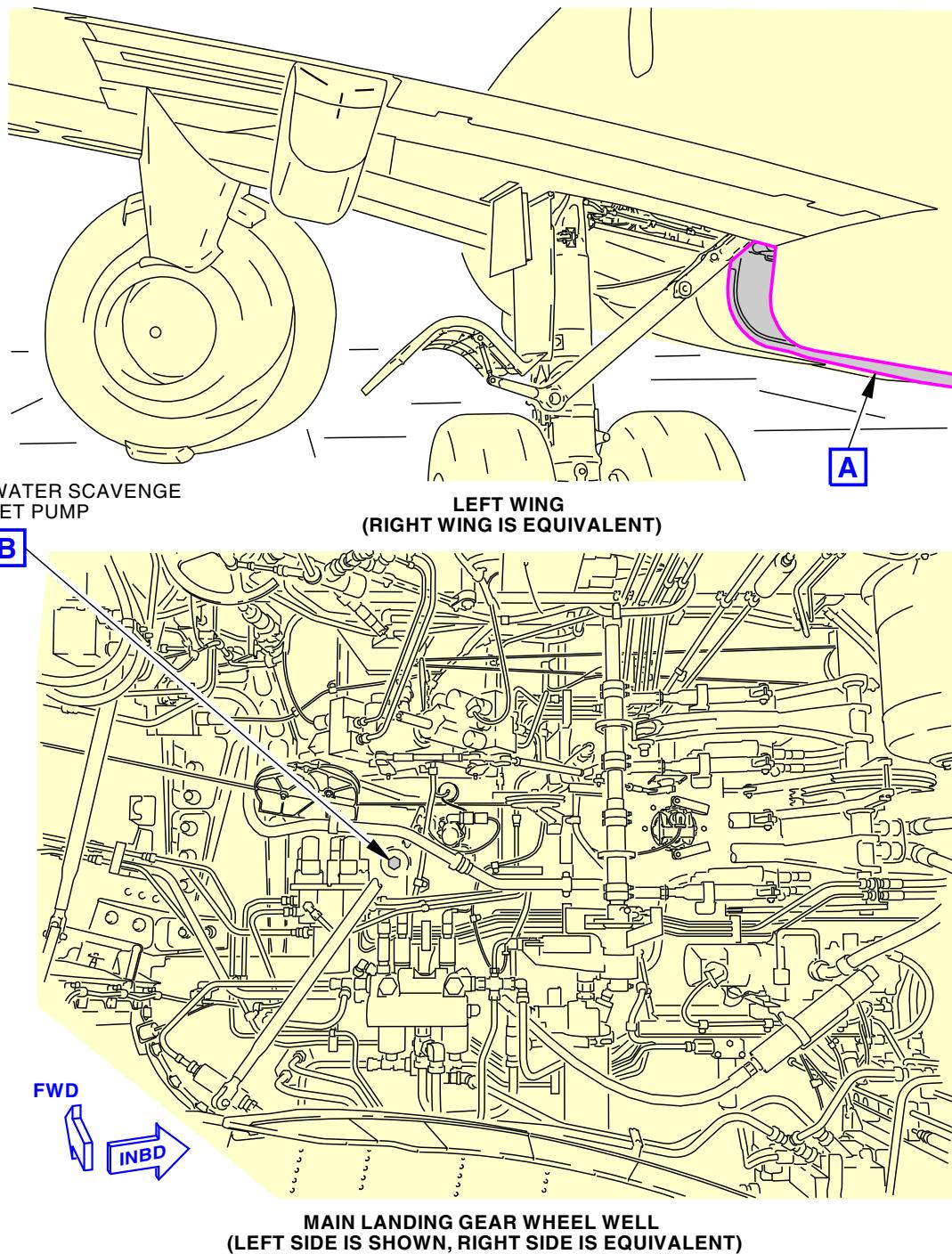
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EFFECTIVITY
LOM ALL

28-22-13



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Water Scavenging Ejector Pump Inspection
Figure 601/28-22-13-990-803 (Sheet 1 of 2)

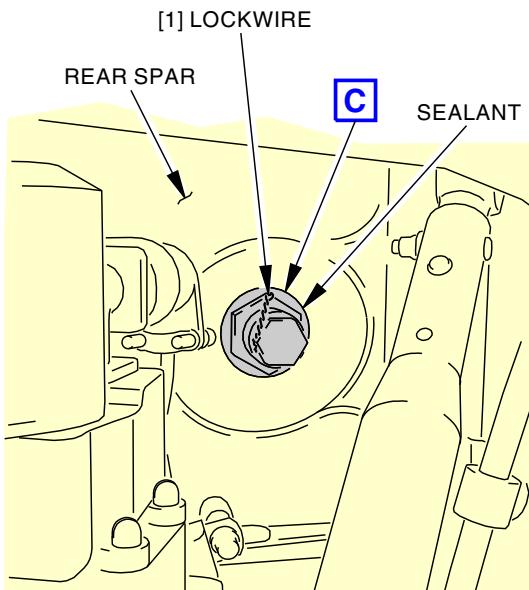
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LOM ALL

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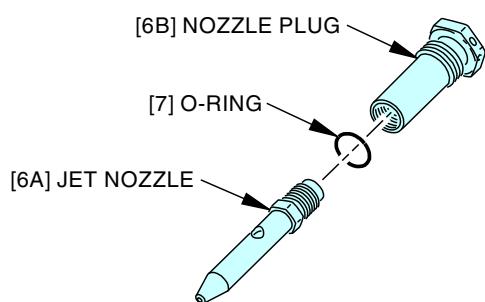
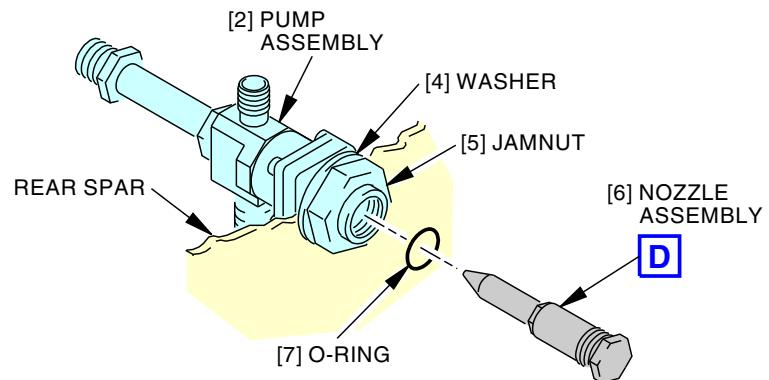
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(EXAMPLE)

B



NOZZLE ASSEMBLY

D

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Water Scavenge Ejector Pump Inspection
Figure 601/28-22-13-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-22-13-200-802

3. No. 1 or No. 2 Tank Water Scavenge Jet Pump - Check

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-44-400-802	Safety Cable Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

C. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995
G50375	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule)	BACC13AT3K, AMS 5689

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6A	Jet nozzle	28-22-52-01A-320	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
6B	Nozzle plug	28-22-52-03B-170 28-22-52-01A-310	LOM ALL LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
7	O-ring	28-22-52-03B-160 28-22-52-01A-315 28-22-52-03B-165	LOM ALL LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457 LOM ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
551	Left Wing - Rear Spar To Landing Gear Support Beam
651	Right Wing - Rear Spar to Landing Gear Support Beam



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F. Access Panels

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel
651DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

G. Prepare for the Check

SUBTASK 28-22-13-010-004

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

or open this access panel:

<u>Number</u>	<u>Name/Location</u>
651DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

SUBTASK 28-22-13-860-015

- (2) Make sure that the AFT boost pump switch for the applicable main tank is set to OFF.

SUBTASK 28-22-13-010-022

- (3) To get access to the P91 and P92 panel, open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 28-22-13-860-016



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open the applicable circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

EFFECTIVITY
LOM ALL

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LOM 402, 404, 406 (Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-22-13-480-002

- (5) Put the container below the pump to catch the fuel.

H. No. 1 or No. 2 Tank Water Scavenge Jet Pump Check

SUBTASK 28-22-13-020-003

- (1) Do these steps to loosen and remove the nozzle assembly [6] from the pump housing.

(a) Remove the lockwire [1] that attaches the nozzle assembly to the jamnut [5].

(b) Loosen the nozzle assembly [6] from the pump.

(c) Remove the nozzle assembly [6] from the pump housing.

NOTE: The flapper valve in the pump housing closes to prevent fuel leakage when you move the nozzle assembly away from the pump.

(d) Remove and discard the O-ring [7].

SUBTASK 28-22-13-020-004

- (2) Loosen and remove the jet nozzle [6A] from the nozzle plug [6B].

SUBTASK 28-22-13-210-002

- (3) Make sure that the holes of the jet nozzle [6A] are clean and have no blockage.

SUBTASK 28-22-13-110-002



WARNING

KEEP THE CLEANING SOLUTIONS AWAY FROM SPARKS, FLAMES, AND HEAT. CLEANING SOLUTIONS ARE FLAMMABLE, AND CAN CAUSE INJURIES TO PERSONNEL.



CAUTION

DO NOT USE ABRASIVE MATERIALS. ABRASIVE MATERIALS WILL CAUSE DAMAGE TO THIS COMPONENT.

- (4) If it is necessary, do these steps to clean the jet nozzle [6A]:

NOTE: The removal of the jet nozzle from the nozzle plug and cleaning of the jet nozzle are required when this task is performed to comply with MPD Items 28-060-01, 28-060-02, or 28-060-03.

(a) Clean the jet nozzle [6A] with solvent, B00074, or equivalent.

(b) If it is necessary, use a soft bristle brush, STD-123, to clean the jet nozzle [6A].

(c) Dry the nozzle with moisture-free compressed air or nitrogen.

SUBTASK 28-22-13-420-005

- (5) Apply a thin layer of grease, D00504, to the new O-ring [7].

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-13-420-009

- (6) Install the O-ring [7] into the groove on the nozzle plug [6B].

SUBTASK 28-22-13-420-006

- (7) Install the jet nozzle [6A] into the nozzle plug [6B].
(a) Tighten the jet nozzle [6A] to 65 in-lb (7 N·m) - 75 in-lb (8 N·m).

SUBTASK 28-22-13-420-007

- (8) Do these steps to install the nozzle assembly [6] in the pump housing:
(a) Put the nozzle assembly [6] into the pump housing.
(b) Tighten the nozzle plug [6B] in the pump housing to 155 in-lb (18 N·m) - 165 in-lb (19 N·m).
(c) Install lockwire, G01505, or safety cable kit, G50375, between the nozzle assembly [6] and jamnut [5] (TASK 20-10-44-400-801, TASK 20-10-44-400-802).

SUBTASK 28-22-13-860-017



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (9) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-13-410-010

- (10) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-13-710-006

- (11) Do these steps to do a leak test of the No. 1 or No. 2 tank water scavengen jet pump:
- Operate the applicable fuel boost pump (the aft boost pump in the No. 1 or No. 2 tank).
 - Look for leakage at the water scavengen jet pump installation on the rear spar.

SUBTASK 28-22-13-010-005

- (12) Close this access panel:

Number Name/Location

551DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

or close this access panel:

Number Name/Location

651DB Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

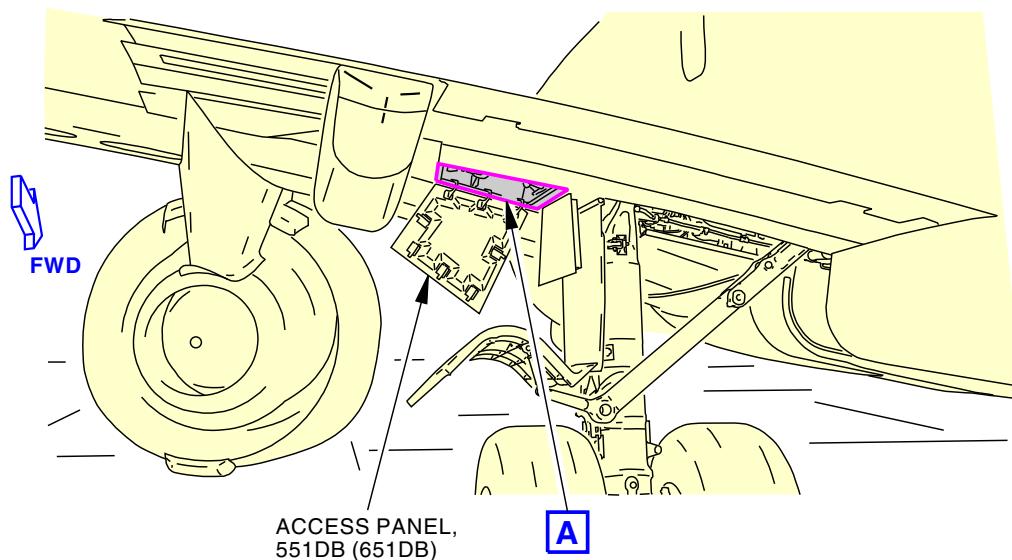
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EFFECTIVITY
LOM ALL

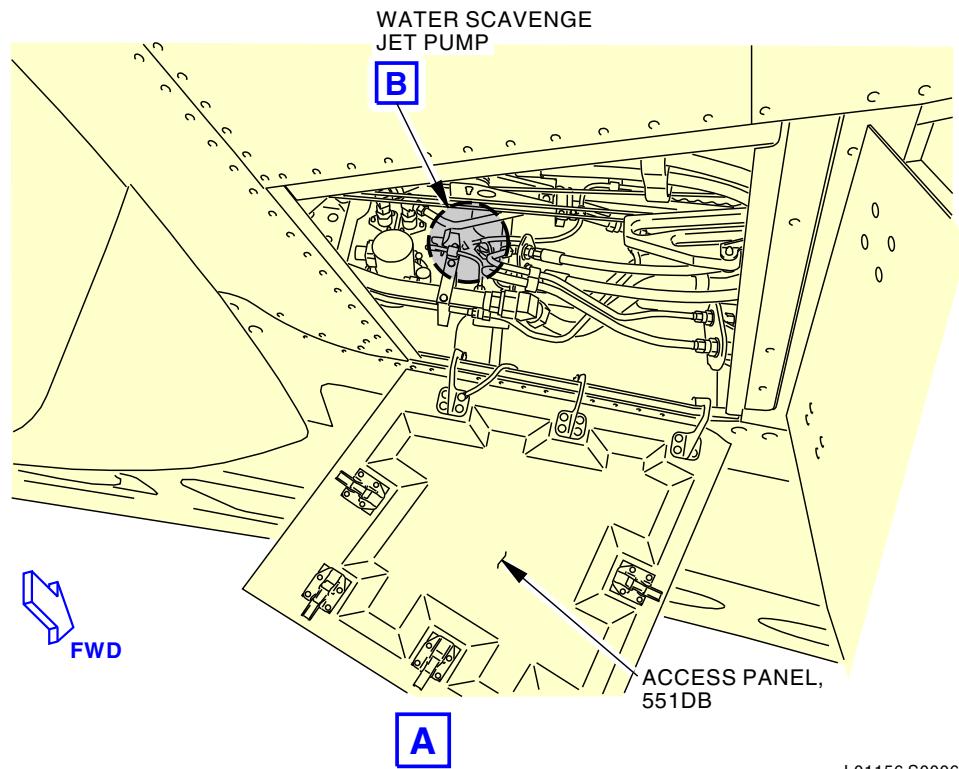
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LEFT WING
(RIGHT WING IS EQUIVALENT)



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Water Scavenging Jet Pump Inspection
Figure 602/28-22-13-990-804 (Sheet 1 of 2)

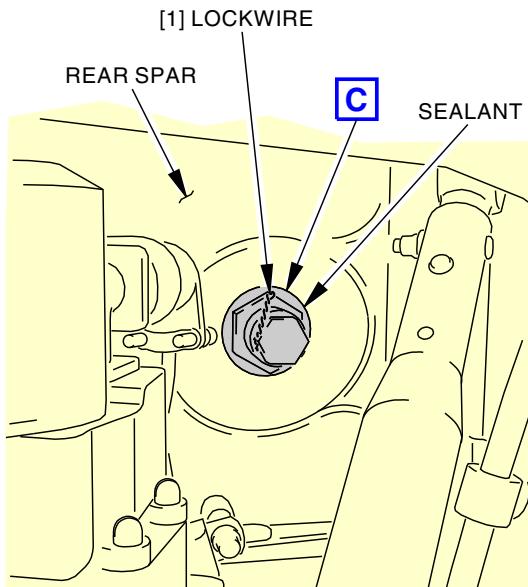
EFFECTIVITY
LOM ALL

28-22-13

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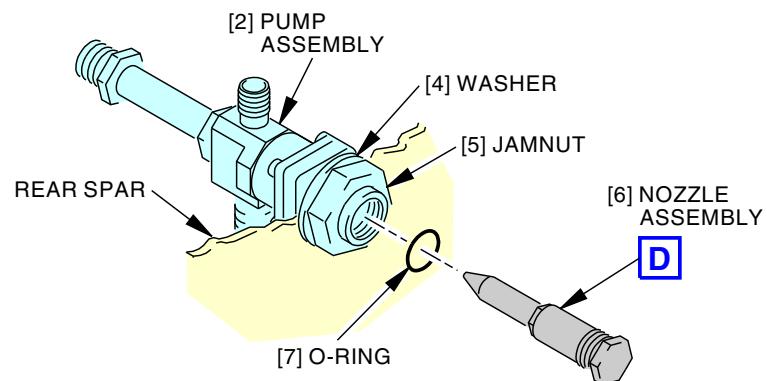
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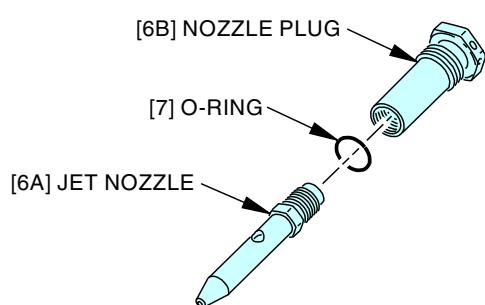


(EXAMPLE)

B



C



NOZZLE ASSEMBLY

D

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Water Scavenge Jet Pump Inspection
Figure 602/28-22-13-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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EMERGENCY FUEL SHUTOFF BATTERY - REMOVAL/INSTALLATION

1. General

- A. This procedure has this tasks:
- (1) A removal of the emergency fuel shutoff battery.
 - (2) An installation of the emergency fuel shutoff battery.

TASK 28-22-14-000-801

2. Emergency Fuel Shutoff Battery Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to remove the emergency fuel shutoff battery.
- (2) The battery and charger system is not a Boeing supplied part. Refer to the Component Maintenance Manual (CMM) for the battery and charger system instructions for disassembly.

B. References

Reference	Title
25-11-01-000-801	Captain's and First Officer's Seat Removal (P/B 401)
25-11-03-000-801	Floor-Mounted Stowage Box Removal (P/B 401)

C. Location Zones

Zone	Area
212	Flight Compartment - Right

D. Prepare for the Removal

SUBTASK 28-22-14-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

SUBTASK 28-22-14-020-012

- (2) If it is necessary, remove the first officer's seat, do this task: Captain's and First Officer's Seat Removal, TASK 25-11-01-000-801.

E. Emergency Fuel Shutoff Battery Removal

LOM 402, 406, 407, 412, 415, 416, 420, 423, 424, 427-432, 439, 441, 443-445, 458-460, 464, 465

SUBTASK 28-22-14-020-009

- (1) If it is necessary, do this task: Floor-Mounted Stowage Box Removal, TASK 25-11-03-000-801.

LOM ALL

SUBTASK 28-22-14-020-001

- (2) Open the P6-12 panel, on the right side of the flight compartment, behind the first officer's seat.

SUBTASK 28-22-14-020-010

- (3) Disconnect the electrical connector [3] from the battery and charger system [1].

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LOM 402, 404, 406

SUBTASK 28-22-14-020-002

- (4) Remove the screws [2] that attach the battery and charger system [1] to the top of P6-12 circuit breaker panel structure.

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 28-22-14-020-008

- (5) Remove the screws [2] and washers [4] that attach the battery and charger system [1] to the top of the P6-12 circuit breaker panel structure.

LOM ALL

SUBTASK 28-22-14-020-011

- (6) Remove the battery and charger system [1].

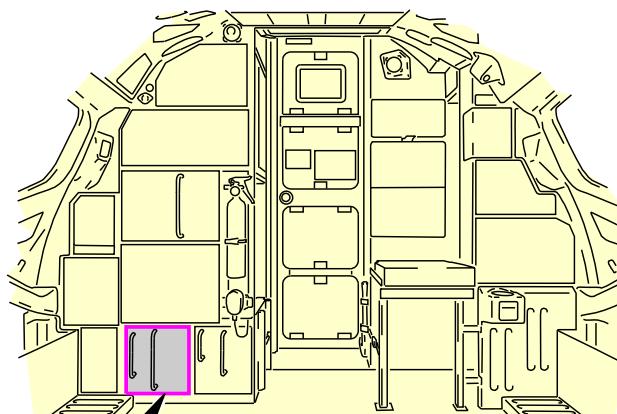
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EFFECTIVITY
LOM ALL

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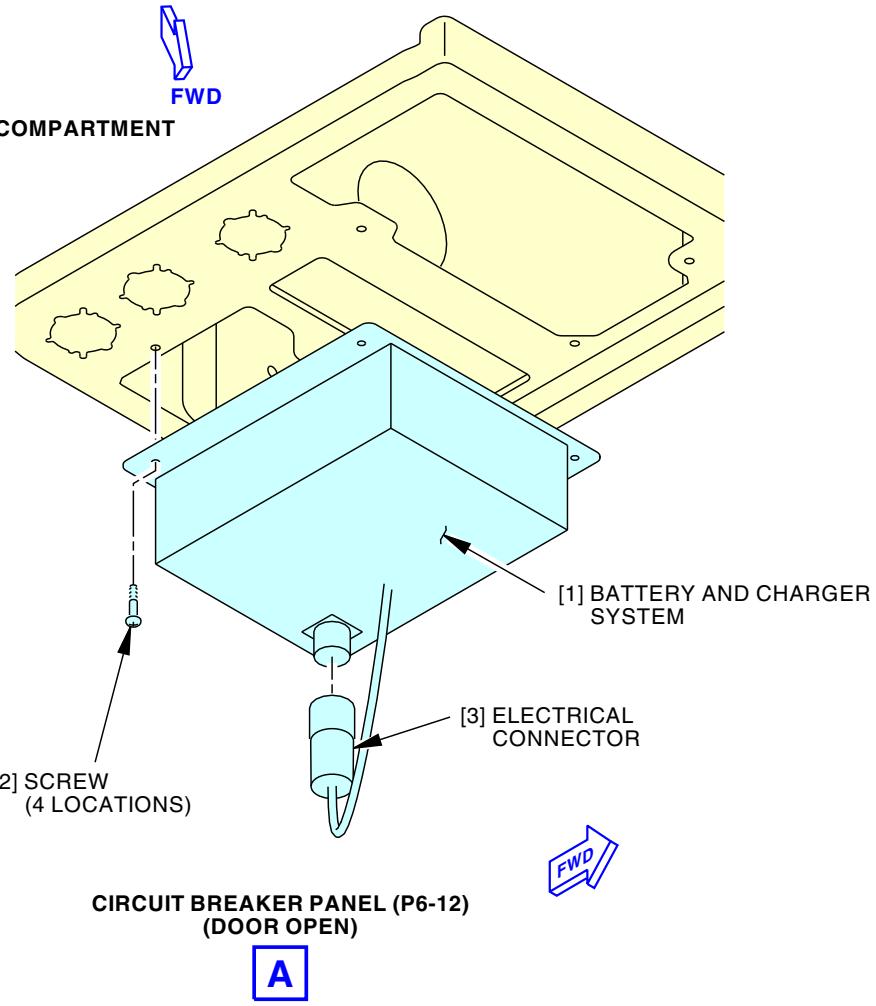


CIRCUIT BREAKER
PANEL (P6-12)

A

FWD

FLIGHT COMPARTMENT



2176901 S0000480224_V2

Emergency Fuel Shutoff Battery Installation
Figure 401/28-22-14-990-803 (Sheet 1 of 2)

EFFECTIVITY
LOM 402, 404, 406

28-22-14

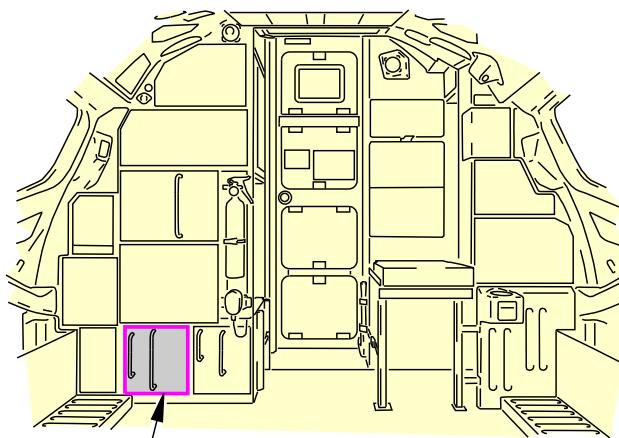
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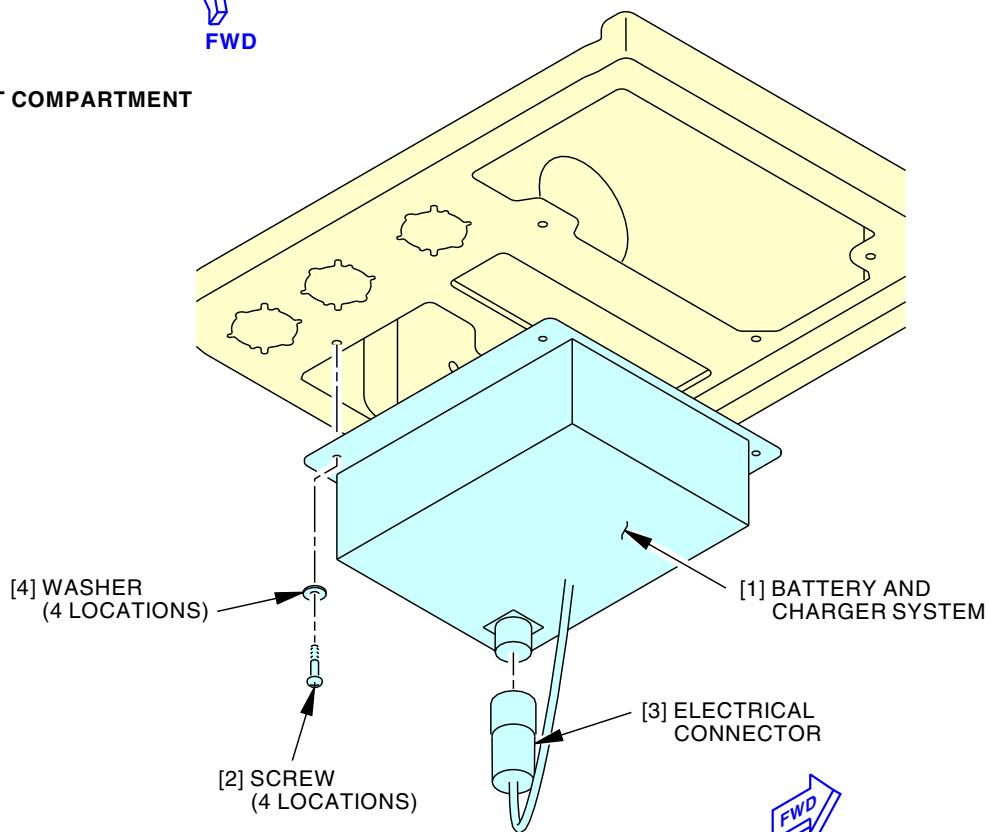


CIRCUIT BREAKER
PANEL (P6-12)

A



FLIGHT COMPARTMENT



CIRCUIT BREAKER PANEL (P6-12)
(DOOR OPEN)

A

2993603 S0000770314_V1

Emergency Fuel Shutoff Battery Installation
Figure 401/28-22-14-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999

28-22-14

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TASK 28-22-14-400-801

3. Emergency Fuel Shutoff Battery Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to install the emergency fuel shutoff battery.
- (2) The battery and charger system is not a Boeing supplied part. Refer to the Component Maintenance Manual (CMM) for the battery and charger system instructions for assembly.

B. References

Reference	Title
25-11-01-400-801	Captain's and First Officer's Seat Installation (P/B 401)
25-11-03-400-801	Floor-Mounted Stowage Box Installation (P/B 401)
28-22-00-720-801	Emergency Fuel Shutoff Battery - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Battery and charger system	28-22-14-01A-005	LOM ALL

D. Location Zones

Zone	Area
212	Flight Compartment - Right

E. Emergency Fuel Shutoff Battery Installation

LOM 402, 404, 406

SUBTASK 28-22-14-420-002

- (1) Install the battery and charger system [1] to the top of the P6-12 circuit breaker panel structure with the screws [2].

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 28-22-14-420-005

- (2) Install the battery and charger system [1] to the top of the P6-12 circuit breaker panel structure with the screws [2] and washers [4].

LOM ALL

SUBTASK 28-22-14-410-002

- (3) Connect the electrical connector [3] to the battery and charger system [1].

SUBTASK 28-22-14-420-004

- (4) Close the P6-12 panel.

F. Emergency Fuel Shutoff Battery Installation Test

SUBTASK 28-22-14-860-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

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SUBTASK 28-22-14-860-003

- (2) Charge the battery and charger system [1] for one hour.

SUBTASK 28-22-14-710-001

- (3) To test the engine fuel spar valve, do this task: Emergency Fuel Shutoff Battery - Operational Test, TASK 28-22-00-720-801.

G. Put the Airplane Back to Its Usual Condition

LOM 402, 406, 407, 412, 415, 416, 420, 423, 424, 427-432, 439, 441, 443-445, 458-460, 464, 465

SUBTASK 28-22-14-420-006

- (1) If the floor-mounted stowage box was removed, do this task: Floor-Mounted Stowage Box Installation, TASK 25-11-03-400-801.

LOM ALL

SUBTASK 28-22-14-420-007

- (2) If it is removed, install the first officer's seat, do this task: Captain's and First Officer's Seat Installation, TASK 25-11-01-400-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-22-14



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FUEL FEED MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION

1. General

- A. This procedure gives examples of the removal and installation procedures for the fuel feed lines and fittings. There are three types of fittings: a flexible full coupling, flexible half coupling, and a rigid coupling.
- B. This procedure contains two tasks. The first task gives examples for fuel line and fitting removal. The second task gives examples for fuel line and fitting installation.
- C. It is not necessary to replace the aluminum tubing for the fuel system (Types 2024, 5052, and 6061) if the damage is not more than the damage limits in (TASK 28-22-15-700-801).

TASK 28-22-15-000-801

2. Fuel Line, Fitting and Coupling Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Line, Fitting and Coupling.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-700-801	Engine and APU Fuel Feed, Shroud, Fuel Vent Line and Couplings, and NEADS Lines (if installed) Dent Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Prepare for the Removal

SUBTASK 28-22-15-650-001

- (1) To remove tubing in the fuel tanks, defuel all of the fuel tanks.
 - (a) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.





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SUBTASK 28-22-15-650-002



WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-22-15-010-001

- (3) To remove the applicable main fuel tank access door(s):
(a) Do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

SUBTASK 28-22-15-010-002

- (4) To remove the applicable center fuel tank access door(s):
(a) Do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.

SUBTASK 28-22-15-940-001

- (5) Go into the applicable fuel tank.

E. Fuel Line, Fitting and Coupling Removal

SUBTASK 28-22-15-020-009

- (1) To remove the bonding jumpers, do these steps (Figure 401):
(a) Remove the bolts, washers and nuts to disconnect the bonding jumpers.

SUBTASK 28-22-15-020-001

- (2) To remove the clamps from the fuel lines, do these steps (Figure 402):
(a) Remove the screws, washers and nuts to disconnect the clamps for the fuel lines from the airplane structure.

SUBTASK 28-22-15-020-010

- (3) To remove flexible half couplings, do these steps (Figure 403):
(a) Remove the lockwire from the coupling.
(b) Loosen the coupling nut [1].
(c) Discard the o-ring [2].
(d) Inspect the retaining rings [3], and coupling nut [1] for wear (TASK 28-22-15-700-801).
1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-011

- (4) To remove flexible full couplings, do these steps (Figure 404):
(a) Remove the lockwire from the coupling [25].
(b) Loosen the coupling nut [21].
(c) Discard the o-rings [22].
(d) Inspect the retaining rings [23], retainer halves [24], coupling [25], and coupling nut [21] for wear (TASK 28-22-15-700-801).
1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-012

- (5) To remove the rigid couplings, do these steps (Figure 405):
(a) Remove the lockwire from the coupling.
(b) Loosen the coupling nut [41].

EFFECTIVITY
LOM ALL

28-22-15



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- (c) Discard the o-ring [42].
- (d) Inspect the retaining ring [43] and coupling nut [41] for wear (TASK 28-22-15-700-801).
 - 1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-013

- (6) To remove fuel line bulkhead fittings, do these steps (Figure 406):
 - (a) Remove the sealant if it is necessary.
 - (b) Remove the lockwire from the coupling nut [61].
 - (c) Remove the coupling nut [61] from the body [70].
 - (d) Discard the o-ring [62].
 - (e) Inspect the retaining rings [67] and coupling nut [61] for wear (TASK 28-22-15-700-801).
 - 1) Replace these components if it is necessary.
 - (f) Remove the nut [69] from the body [70].
 - (g) Remove the nut [65] and washer [66] from the body [70] to remove the o-ring [64] from the bulkhead.
 - (h) Discard the o-ring [64].

SUBTASK 28-22-15-020-014

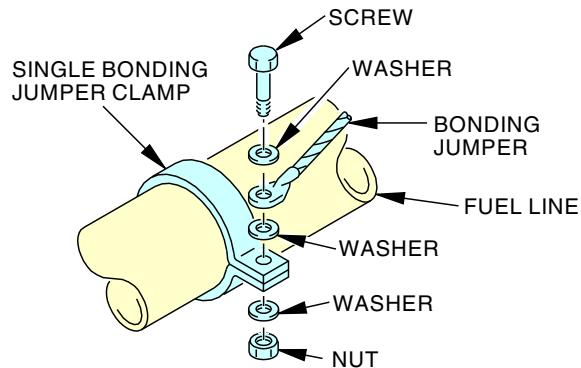
- (7) Remove the fuel lines, support clamps, and bonding jumpers as necessary.

———— END OF TASK ————

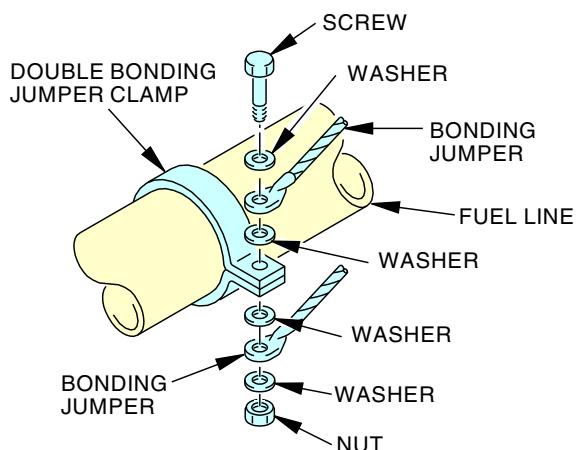
EFFECTIVITY
LOM ALL

28-22-15

BOEING
737-600/700/800/900
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**SINGLE BONDING JUMPER CLAMP
(EXAMPLE)**



**DOUBLE BONDING JUMPER CLAMP
(EXAMPLE)**

F79190 S0006572006_V2

**Bonding Jumper Clamp Installation
Figure 401/28-22-15-990-801**

EFFECTIVITY
LOM ALL

28-22-15

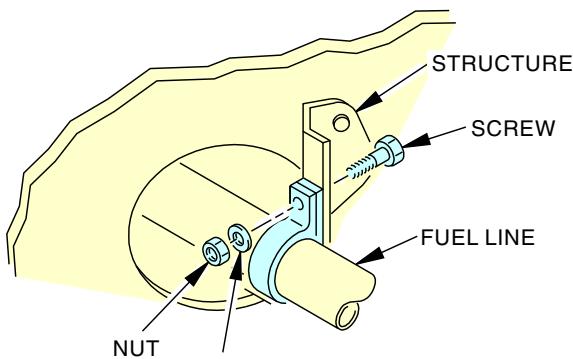
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

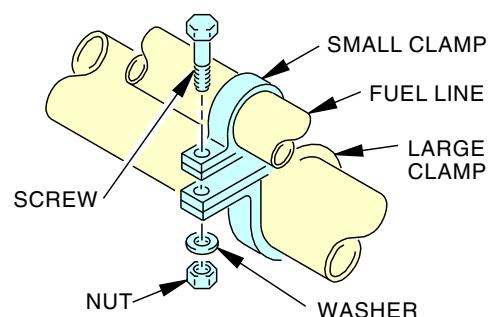
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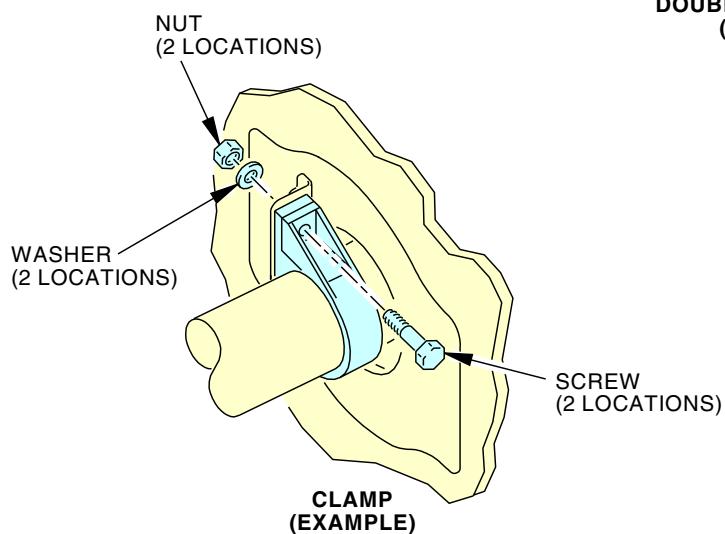
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LOOP CLAMP
(EXAMPLE)



DOUBLE LOOP CLAMP
(EXAMPLE)



NUT
(2 LOCATIONS)
WASHER
(2 LOCATIONS)
SCREW
(2 LOCATIONS)
CLAMP
(EXAMPLE)

F79191 S0006572007_V2

Fuel Feed Manifold and Couplings Installation
Figure 402/28-22-15-990-802

EFFECTIVITY
LOM ALL

28-22-15

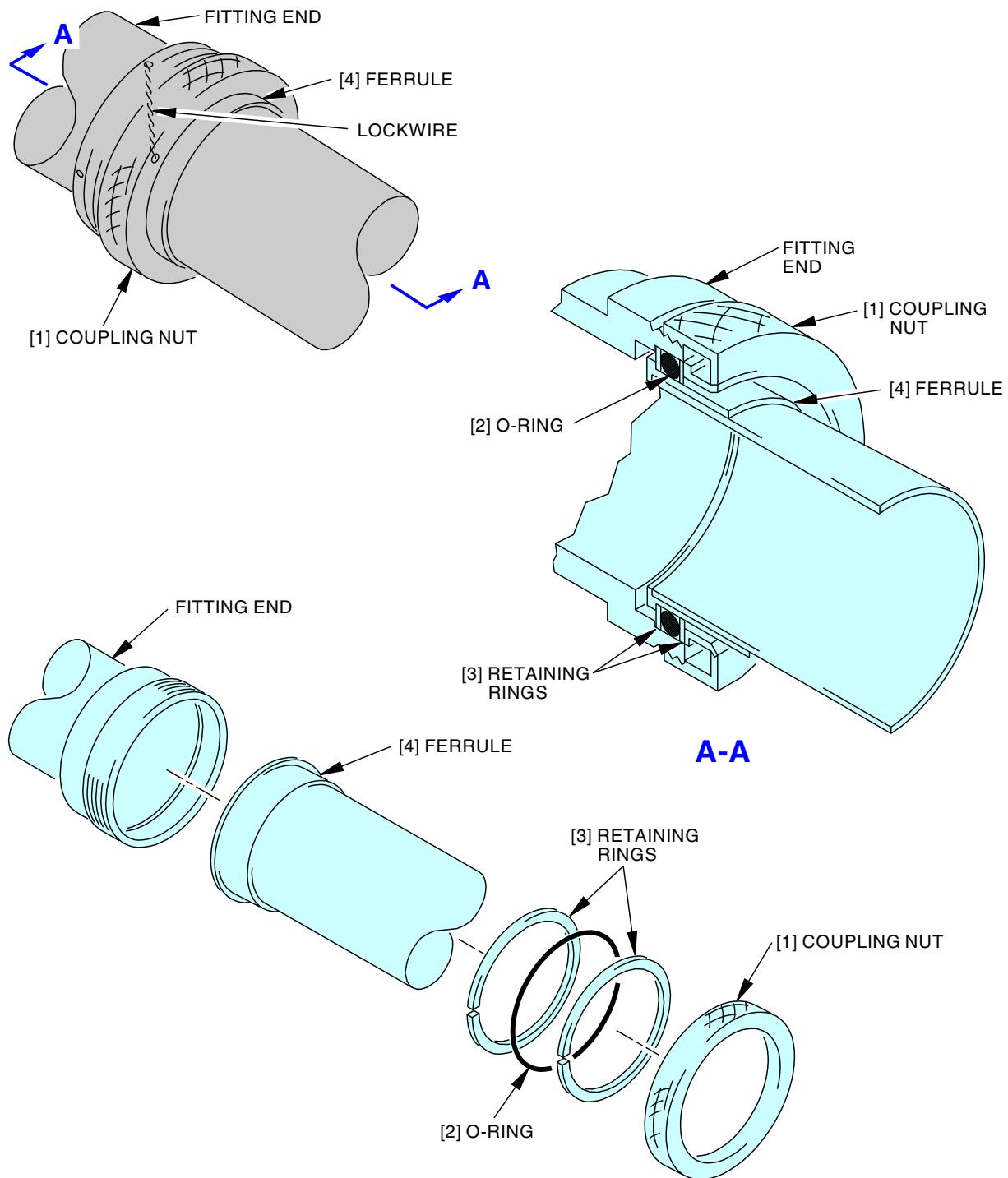
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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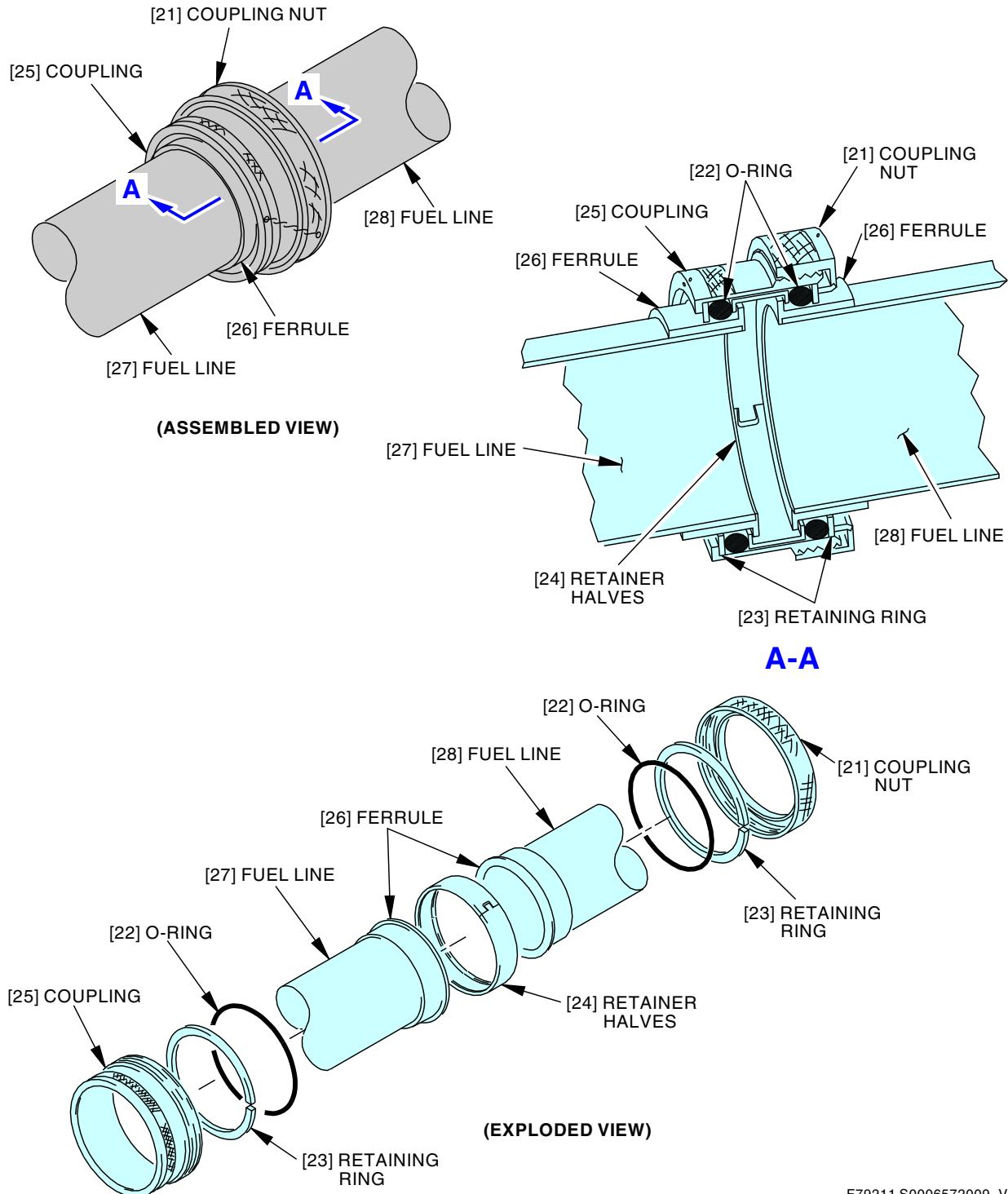
F79192 S0006572008_V2

Flexible Half Coupling Installation
Figure 403/28-22-15-990-803

EFFECTIVITY
LOM ALL

28-22-15

D633A101-LOM



F79211 S0006572009_V2

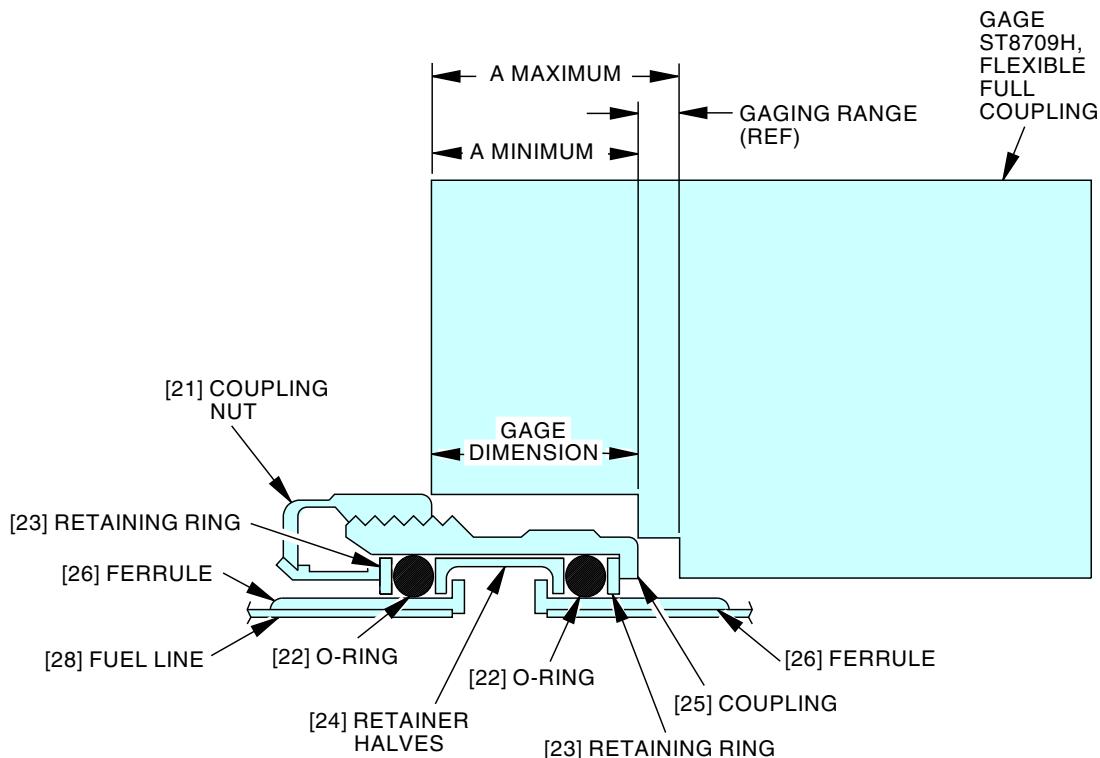
Flexible Full Coupling Installation
Figure 404/28-22-15-990-804 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-22-15



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AIRCRAFT MAINTENANCE MANUAL



FLEXIBLE FULL COUPLING WITH GAGE

SIZE	MAX GAGE 	MIN GAGE 	GAGE NO. ST8709H	SIZE	MAX GAGE 	MIN GAGE 	GAGE NO ST8709H
08	0.59	0.47	1	36	0.93	0.76	4
10	0.59	0.47	1	40	0.93	0.76	4
12	0.69	0.55	2	48	0.93	0.76	4
16	0.75	0.60	3	56	1.03	0.88	5
20	0.75	0.60	3	64	1.03	0.88	5
24	0.93	0.76	4	72	1.16	0.99	6
28	0.93	0.76	4	80	1.39	1.22	7
32	0.93	0.76	4	88	1.39	1.22	7

DIMENSIONAL REQUIREMENTS FOR ASSEMBLING FLEXIBLE FULL COUPLING

FLEXIBLE FULL COUPLING DIMENSIONS

F79212 S0006572010_V2

Flexible Full Coupling Installation
Figure 404/28-22-15-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

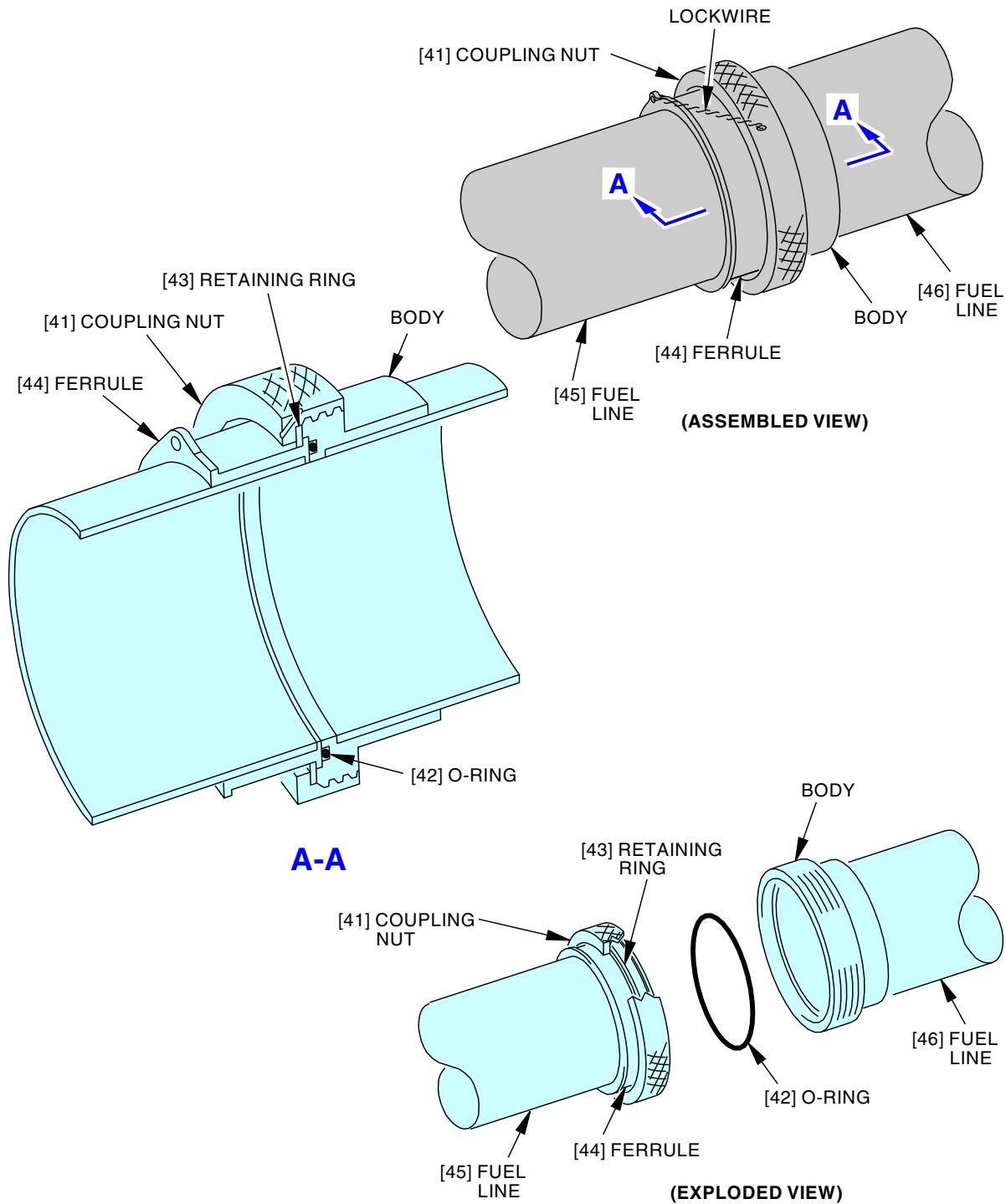
28-22-15

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



F79219 S0006572011_V2

Rigid Coupling Installation
Figure 405/28-22-15-990-805

EFFECTIVITY
LOM ALL

28-22-15

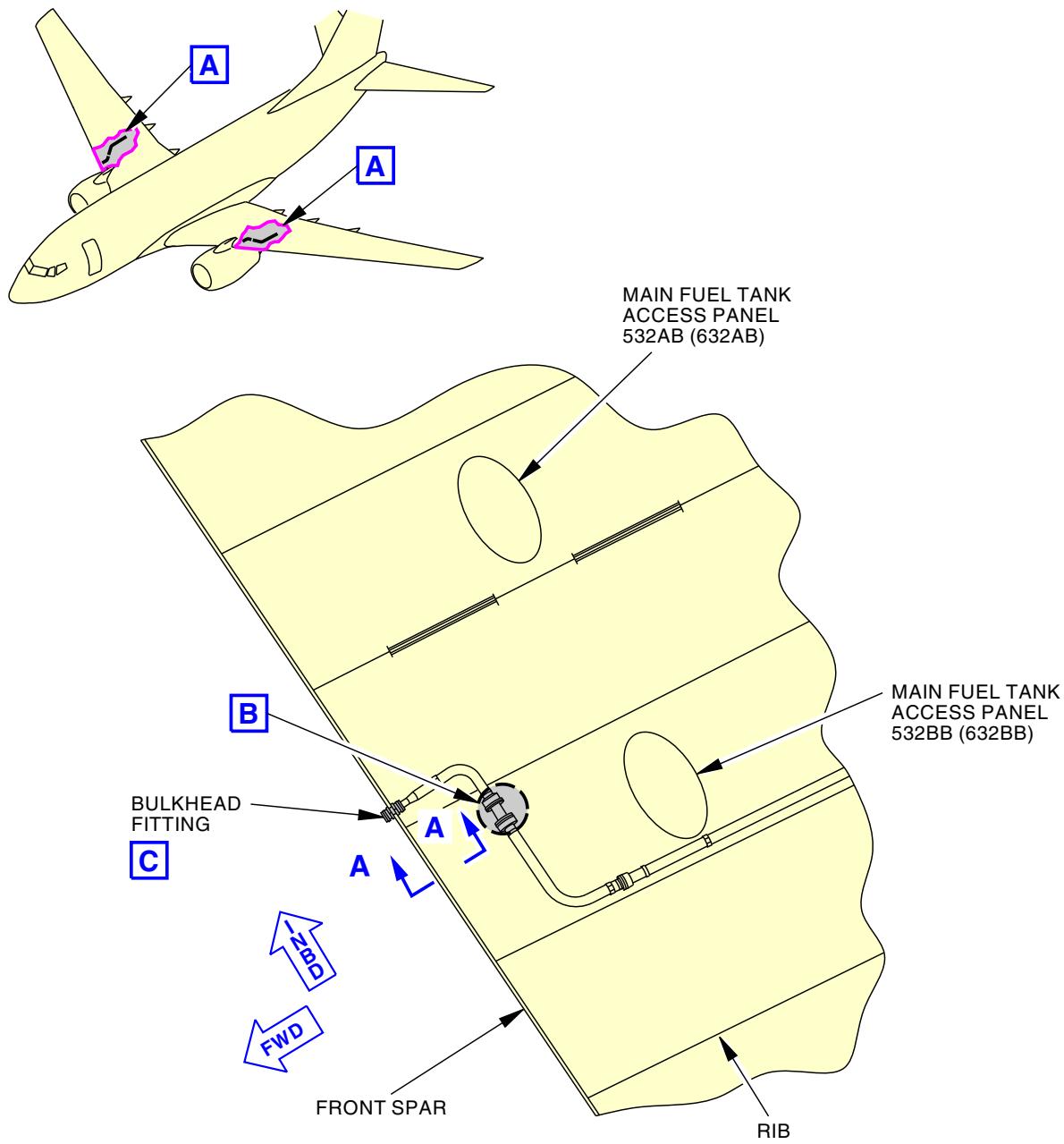
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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(LEFT WING IS SHOWN, RIGHT WING IS OPPOSITE)

A

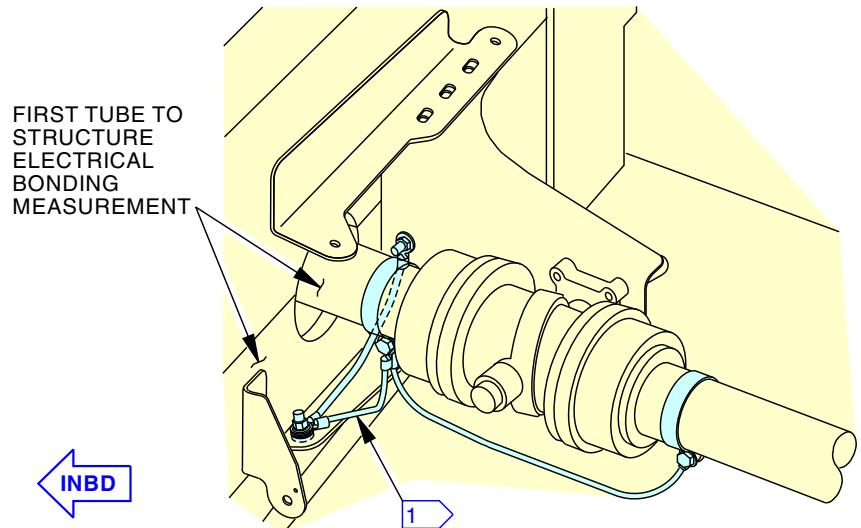
U34071 S0000192990_V5

Bulkhead Fitting Installation
Figure 406/28-22-15-990-806 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

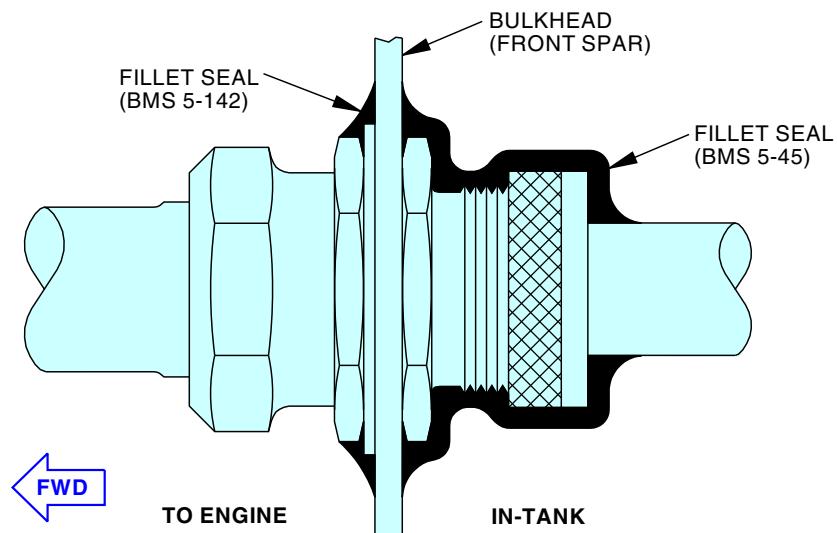
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(VIEW IN THE FORWARD DIRECTION)

B



A-A

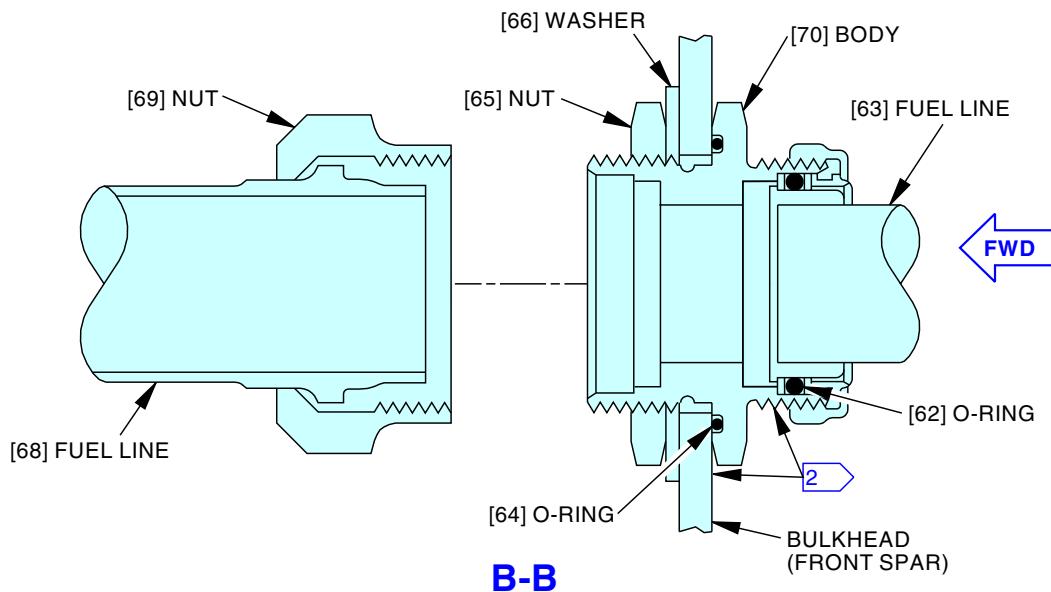
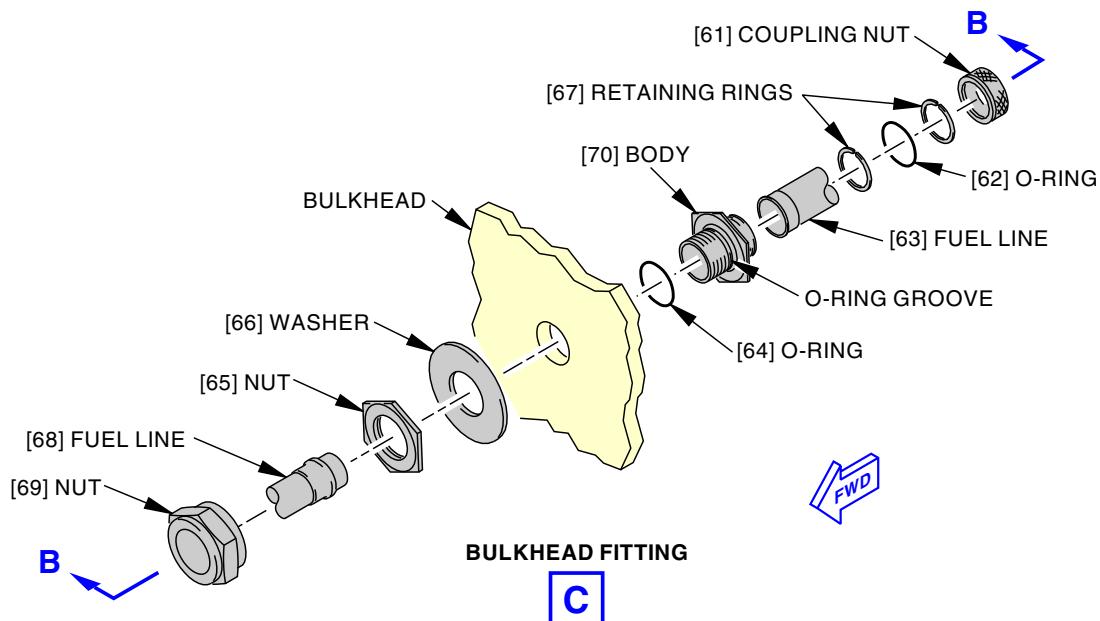
- 1 BONDING JUMPER LOCATED BETWEEN THE STRUCTURE INSIDE THE TANK AND THE FIRST TUBE THAT MATES WITH THE BULKHEAD FITTING.

F79225 S0006572012_V5

Bulkhead Fitting Installation
Figure 406/28-22-15-990-806 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

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2 RESISTANCE FROM THREADS ON BULKHEAD FITTING TO BULKHEAD (FRONT SPAR) MUST BE 0.0005 OHM (0.5 MILLIOHM) OR LESS.

U34039 S0000192988_V6

Bulkhead Fitting Installation
Figure 406/28-22-15-990-806 (Sheet 3 of 3)

EFFECTIVITY
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TASK 28-22-15-400-801

3. Fuel Line, Fitting and Coupling Installation

(Figure 401)

A. General

- (1) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are also acceptable sealants.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-710-802	Engine Fuel Suction Feed - Operational Test (P/B 501)
28-22-15-710-801	Engine Fuel Feed Manifold - Leak Test (P/B 601)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-00 Paragraph 21	MAXIMUM PERMITTED RESISTANCE OF ELECTRICAL BONDS
SWPM 20-20-00 Paragraph 8	Clamp and Tube or Conduit Bonds

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-7464	Go/No-Go Gage for Assembly of Wiggins BACC42R Coupling Part #: ST8709H-KIT Supplier: 62176

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45

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(Continued)

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
C00862	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236
G50078	Abrasive - Aluminum Oxide Paper, 320 grit or finer	

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
633	Right Wing - Surge Tank, Rib 22 to Rib 25, Wing Station 643.50 to Wing Buttock Line 616.75

F. Fuel Line, Fitting and Coupling Installation

SUBTASK 28-22-15-940-002



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Go into the applicable fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-15-420-001

- (2) Install the bolts, washers, and nuts to loosely connect the clamps for the fuel lines to the structure or support brackets (Figure 402).

SUBTASK 28-22-15-420-002

- (3) To install the bulkhead fittings, do these steps (Figure 406):

► 28-AWL-11: CDCCL

- (a) Install a fillet sealed fay surface bond between the body [70] (bulkhead fitting) and bulkhead (front spar) inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.



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- (b) Do these steps to clean the bulkhead fitting and the surfaces on the front spar to provide a good electrical bond:
- 1) Clean and remove the finish from the threads and surfaces of the bulkhead fitting (SWPM 20-20-00).
 - 2) Polish the bulkhead fitting flange.
 - a) Remove the anodic surface finish with 320 grit or finer abrasive paper, G50078, to make a flat bare metal surface all the way around the mating surface (SWPM 20-20-00).
 - b) Remove a minimum quantity of material.
 - 3) Clean the wing front spar web area, both wet and dry sides.
 - a) Remove contamination and dirt from the contact areas of the front spar (SWPM 20-20-00).
 - b) Clean the surrounding surface to prepare for applying chemical conversion coating and sealant (SWPM 20-20-00).
 - 4) Polish the fay surface area of the front spar web at the mating surface of the bulkhead fitting flange with 320 grit or finer abrasive paper, G50078.
 - a) Remove a minimum quantity of material.
NOTE: The anodic surface finish is less than 0.0001 in. (0.0025 mm).
 - b) Polish and clean to a minimum of 0.0625 in. (1.59 mm) diameter more than the spar fitting on the dry side.
 - c) Polish and clean to a minimum of 0.0625 in. (1.59 mm) diameter more than the nut on the wet side.



CAUTION

KEEP THE TIME THAT THE METAL SURFACES ARE BARE TO A MINIMUM. IF THE SURFACES STAY BARE FOR MORE THAN FOUR HOURS, RUB THEM LIGHTLY AGAIN BEFORE YOU APPLY THE CONVERSION COATING.

- 5) Apply Bonderite M-CR 600 Aero coating, C00862, to the inside and outside surfaces of the front spar web.
 - a) Apply Bonderite M-CR 600 Aero coating, C00862, to the bare metal surfaces with a small clean brush.
- (c) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [64].
- (d) Put the new o-ring [64] on the body [70], and put the body [70] in its position in the bulkhead.
- (e) Install the nut [65] and washer [66] to the body [70] in the bulkhead.
 - 1) While someone holds the body [70] and fuel line [63] on the wet side, tighten the nut [65] to 500 ± 25 in-lb (56.5 ± 2.8 N·m).

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► 28-AWL-11: CDCCL

- (f) Measure the electrical bonding resistance between the threads on the body [70] (bulkhead fitting) and bulkhead (front spar) inside the tank (SWPM 20-20-00) (View B-B, Figure 406).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-11: CDCCL

- 2) Make sure that the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

- (g) Put the coupling nut [61] on the ferrule of the fuel line [63].



CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (h) Put a retaining ring [67] on the ferrule to hold the coupling nut [61] on the fuel line [63].

- (i) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [62].



CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

- (j) Install the new o-ring [62] on the fuel line [63].



CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (k) Put the second retaining ring [67] on the ferrule of the fuel line [63].

- (l) Make sure that the fuel line [63] aligns to the body [70] of the bulkhead fitting.



CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

- (m) Hand tighten the coupling nut [61] to connect the fuel line [63].

- (n) Back off the coupling nut [61] one turn and again, retighten the coupling nut [61] by hand.

- (o) Install the lockwire on the coupling nut [61].

- (p) Install the nut [69] on the fuel line [68].

- (q) Tighten the nut [69] to 750 ± 38 in-lb (84.7 ± 4.3 N·m)

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- (r) Loosen the torque on the nut [69] to relieve tension in the fuel line [68].
- (s) Again, tighten the nut [69] to 750 ± 38 in-lb (84.7 ± 4.3 N·m) to connect the fuel line [68].

► 28-AWL-11: CDCCL

- (t) On the aft side of the front spar (inside the tank), apply sealant encapsulating the engine fuel feed tube fitting to the front spar (tank wall interface) (Figure 406, View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

- 1) Use sealant, A00767.
- 2) Make sure the sealant extends to the flat dimension of the coupling nut [61] and at least two threads of the bulkhead fitting.

► 28-AWL-11: CDCCL

- (u) On the aft side of the front spar (inside the tank), apply sealant encapsulating the aft side of the front spar to the adjacent fuel line (the first fuel tube coupling to the fitting interface) (Figure 406, View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

- 1) Use sealant, A00767.
- 2) Seal to a minimum thickness of 0.10 in. (2.54 mm).
- 3) Seal to a minimum of 0.1875 in. (4.7625 mm) diameter more than the spar fitting on the front spar web.

► 28-AWL-11: CDCCL

- (v) On the forward side of the front spar (outside the tank), apply a fillet seal to the joint between the outside diameter of the engine fuel feed spar bulkhead fitting nut [65] (jam nut) and washer [66], and the wing front spar (Figure 406., View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

- 1) Use sealant, A02315, to apply the fillet seal.
- 2) Seal to a minimum of 0.1875 in. (4.7625 mm) diameter more than the nut [65] on the other side of the front spar web.

- (w) Clean the wing front spar area of all particles and dust caused by the fay surfacing process.

SUBTASK 28-22-15-420-003

- (4) To install the rigid couplings on the fuel line, do these steps (Figure 405):

- (a) Loosen the adjacent clamps and couplings before you install the rigid coupling.

NOTE: This will prevent a preload on the rigid coupling.

- (b) Put the coupling nut [41] on the ferrule [44] of the fuel line.

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CAUTION
DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (c) Put a new retaining ring [43] on the ferrule to hold the coupling nut [41] on the fuel line.
- (d) Make sure that the fuel line [45] and fuel line [46] align correctly.
NOTE: You must align the fuel tubes correctly for rigid couplings. If you do not align the fuel lines correctly a fuel leak will occur.
- (e) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [42].



CAUTION
DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

- (f) Install the o-ring [42] on the fuel line [45].
- (g) Make sure that the fuel line [45] and fuel line [46] align end to end.



CAUTION
DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

- (h) Manually tighten the coupling nut [41] of the rigid coupling to connect the fuel lines.
- (i) Install the lockwire between the coupling nut [41] and ferrule [44] (TASK 20-10-44-400-801).
- (j) Tighten the adjacent clamps and couplings.

SUBTASK 28-22-15-420-004

- (5) To install the flexible half couplings on the fuel line, do these steps (Figure 403):
 - (a) Put the coupling nut [1] on the ferrule [4] of the fuel line.



CAUTION
DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (b) Put one retaining ring [3] on the ferrule [4] to hold the coupling nut [1] on the fuel line.
- (c) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [2].



CAUTION
DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (d) Put the new o-ring [2] on the ferrule [4].



CAUTION
DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (e) Put the second retaining ring [3] on the ferrule [4].

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- (f) Put the fuel line into the half coupling fitting.



CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

- (g) Manually tighten the coupling nut [1].
(h) Install the lockwire between the coupling nut [1] and ferrule [4] (TASK 20-10-44-400-801).

SUBTASK 28-22-15-420-005

- (6) To install the flexible full couplings on the fuel lines, do these steps (Figure 404):

- (a) Put the coupling nut [21] on the ferrule [26] of fuel line [28].
(b) Put the coupling [25] on the ferrule [26] of the opposite fuel line [27].



CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (c) Put one retaining ring [23] on each ferrule to hold the coupling nut [21] and coupling [25] on the ends of fuel line [27] and fuel line [28].
(d) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [22].



CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

- (e) Put one o-ring [22] on each ferrule [26].
(f) Align the ends fuel line [27] and fuel line [28] with a 0.12 ± 0.03 in. (3.05 ± 0.76 mm) clearance between the ferrules [26].
(g) Put the retainer halves [24] together on the ferrules [26] to connect fuel line [27] and fuel line [28].



CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

- (h) Manually tighten the coupling nut [21] to the necessary dimension (Figure 404).

NOTE: You can use the Go/No-Go Gage, SPL-7464, to make sure a flexible full coupling is installed correctly. The flexible full couplings can catch and feel tight when the coupling nut is not fully installed. The Go/No-Go Gage, SPL-7464, will show a coupling nut that is not installed correctly.

- (i) Install lockwire between the coupling nut [21] and coupling [25] (TASK 20-10-44-400-801).

SUBTASK 28-22-15-420-006

- (7) Tighten the clamps on the fuel line to the structure or support brackets (Figure 402).

SUBTASK 28-22-15-420-010

- (8) Tighten the support brackets to the structure with bolts, washers, and nuts (if the support brackets are not riveted).

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SUBTASK 28-22-15-210-001

- (9) Make sure that the fuel line does not touch the structure.

SUBTASK 28-22-15-210-002

- (10) Make sure that the distance between the fuel line and the structure is a minimum of 0.25 in. (6.35 mm).

NOTE: This does not include the area near the support bracket.

SUBTASK 28-22-15-420-011

- (11) To install a single bonding jumper clamps, do the following steps (Figure 401):

- (a) Clean the fay surfaces of the aluminum fuel line, aluminum bonding jumper clamp, and terminal of the bonding jumper (SWPM 20-20-00 Paragraph 8).
- (b) Install the bonding jumper clamp on the fuel line.
- (c) Install the screw, washers, bonding jumper, and nut on the bonding jumper clamp.
- (d) Tighten the nut (SWPM 20-20-00 Paragraph 8).
- (e) Measure the electrical bonding resistance between the terminal on the bonding jumper and fuel line with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00 Paragraph 21).
 - 1) Make sure that the measured resistance is less than the maximum bonding resistance as specified in SWPM 20-20-00 Paragraph 21.

SUBTASK 28-22-15-420-013

- (12) To install a double bonding jumper clamp, do the following steps (Figure 401):

- (a) Clean the fay surfaces of the aluminum fuel line, aluminum bonding jumper clamp, and terminal of the bonding jumpers (SWPM 20-20-00 Paragraph 8).
- (b) Install the bonding jumper clamp on the fuel line.
- (c) Install the screw, washers, bonding jumpers, washer, and nut on the bonding jumper clamp.
- (d) Tighten the nut (SWPM 20-20-00 Paragraph 8).
- (e) Measure the electrical bonding resistance between the terminal on the bonding jumpers and fuel line with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00 Paragraph 21).
 - 1) Make sure that the measured resistance is less than the maximum bonding resistance as specified in SWPM 20-20-00 Paragraph 21.

28-AWL-11: CDCCL

SUBTASK 28-22-15-420-012

- (13) If it was removed, install a bonding jumper between the first fuel tube that mates with the bulkhead fitting and the structure (wing rib) inside the tank (Figure 406).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

SUBTASK 28-22-15-220-001

- (14) Measure the electrical bonding resistances with an intrinsically safe approved bonding meter, COM-1550.

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► 28-AWL-11: CDCCL

- (a) For the first fuel tube in the tank that mates with the bulkhead fitting, if the bonding jumper was removed or replaced, measure the electrical bonding resistance from the structure (wing rib) inside the tank to the first fuel tube (SWPM 20-20-00) (Figure 406, View B).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

► 28-AWL-11: CDCCL

- 1) Make sure the electrical bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-11.

SUBTASK 28-22-15-790-003

- (15) Prior to install the fuel tank access doors, do this task: (TASK 28-22-15-710-801).

SUBTASK 28-22-15-080-002

- (16) Remove all the tools and equipment from the fuel tank.

SUBTASK 28-22-15-410-001

- (17) Install the applicable main fuel tank access doors (TASK 28-11-11-400-801).

SUBTASK 28-22-15-410-002

- (18) Install the applicable center fuel tank access doors (TASK 28-11-31-400-801).

G. Fuel Line, Fitting and Coupling Installation Test

SUBTASK 28-22-15-710-002

- (1) Do this task: Engine Fuel Suction Feed - Operational Test, TASK 28-22-00-710-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-15-650-003

- (1) Refuel the fuel tanks (if no more work is necessary) (TASK 12-11-00-650-802).

———— END OF TASK ————

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FUEL FEED MANIFOLD COUPLINGS - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains two tasks. These are the tasks:
 - (1) Engine Fuel Feed Manifold - Leakage Test
 - (2) Fuel Line Dent Criteria - Inspection/Check

TASK 28-22-15-710-801

2. Engine Fuel Feed Manifold - Leak Test

(Figure 601, Figure 602, Figure 603, Figure 604)

A. General

- (1) This test is a positive pressure test of the engine fuel feed manifold. It can be used to find and isolate leakage in the engine fuel feed manifold.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-812	Remove Electrical Power (P/B 201)
24-22-00-860-813	Supply External Power (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-22-11-000-801	Actuator of the Spar Valve Removal (P/B 401)
28-22-11-000-803	Valve Body of the Spar Valve Removal (P/B 401)
28-22-11-000-804	Actuator of the Spar Valve Removal (P/B 401)
28-22-11-400-801	Actuator of the Spar Valve Installation (P/B 401)
28-22-11-400-803	Valve Body of the Spar Valve Installation (P/B 401)
28-22-11-400-804	Actuator of the Spar Valve Installation (P/B 401)
28-22-11-820-801	Spar Valve Alignment (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-21-000-801	Actuator of the Engine Fuel Crossfeed Valve Removal (P/B 401)
28-22-21-000-803	Engine Fuel Crossfeed Valve Body Removal (P/B 401)
28-22-21-000-804	Actuator of the Engine Fuel Crossfeed Valve Removal (P/B 401)
28-22-21-400-801	Actuator of the Engine Fuel Crossfeed Valve Installation (P/B 401)
28-22-21-400-803	Install the Engine Fuel Crossfeed Valve Body (P/B 401)
28-22-21-400-804	Actuator of the Engine Fuel Crossfeed Valve Installation (P/B 401)
28-22-21-820-801	Crossfeed Valve Alignment (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
71-00-00-800-811-F00	Power Plant Test Reference Table (P/B 501)
71-00-02-000-801-F00	Power Plant - Removal (P/B 401)
71-11-02-000-801-F00	Fan Cowl Panel Removal (Selection) (P/B 401)
71-11-02-400-801-F00	Fan Cowl Panel Installation (Selection) (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

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C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1776	Test Equipment - Engine Fuel Feed Manifold Part #: C28014-1 Supplier: 81205
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
D00601 [CP2101]	Vaseline - Graphite Mineral	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	O-ring	73-11-01-01-065	LOM 402, 404, 406, 407, 411, 416, 445
		73-11-01-01A-115	LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Prepare for Test

SUBTASK 28-22-15-650-004

- (1) Make sure that the fuel quantity in the main tanks is below the spar valves at a minimum (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

NOTE: If this test finds a leak, you will need to defuel the applicable tank(s) to find and repair the leak.

SUBTASK 28-22-15-650-005

- (2) Make sure that the Auxiliary Power Unit (APU) start switch is in the OFF position.

SUBTASK 28-22-15-650-006

- (3) Do these steps to make sure that the engine fuel valves are in the correct positions:

NOTE: There are two sets of engine fuel valves. The first set are the high pressure shutoff valves (HPSOV) that are installed on the engines. The second set are the spar valves that are installed in the main fuel tanks. For this test both HPSOV are closed when both engine fuel spar valves are open.

- (a) Make sure that the engine start levers on the control stand are in the CUTOFF position.
- (b) Make sure that the Engine Start Switches on the P5 Overhead Panel are in the OFF position.



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- 1) The AUTO position is the OFF position.

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- (c) Put a DO-NOT-OPERATE placard on the left and right engine START switches, on the P5 overhead panel.
- (d) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

- (e) On the P5 fuel system panel, set the CROSSFEED switch to the open position.
- (f) Make sure that the VALVE OPEN light for the crossfeed valve comes ON bright during valve transit and then stays ON dim to show that the crossfeed valve is open.
- (g) Move the engine start levers on the control stand to the IDLE position.
NOTE: This opens the fuel spar valves.
- (h) On the P5 panel, make sure that the two SPAR VALVE CLOSED lights are OFF.

SUBTASK 28-22-15-860-001

- (4) Make sure that the defuel valve is in the closed position.

SUBTASK 28-22-15-010-003

- (5) Do this task: Fan Cowl Panel Removal (Selection), TASK 71-11-02-000-801-F00.

SUBTASK 28-22-15-010-004



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (6) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 28-22-15-860-002



WARNING

MAKE SURE YOU REMOVE ELECTRICAL POWER BEFORE YOU DISCONNECT THE FUEL, THE HYDRAULIC, AND THE ELECTRICAL LINES. IF YOU DO NOT, YOU CAN CAUSE INJURY TO PERSONNEL BY ACCIDENTAL APPLICATION OF PRESSURIZED FLUIDS, ENERGIZING OF ELECTRICAL CIRCUITS, OR FIRE.

- (7) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-22-15-680-001

- (8) Do these steps to drain the fuel supply line for the left and right engines (Figure 602):

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- (a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel filter drain plug [23].
- (b) Remove the drain plug [23] and let the fuel drain.
- (c) Remove and discard the O-ring [22] from the drain plug [23].
- (d) Lubricate a new O-ring [22] with grease, D00504, and install it on the drain plug [23].
- (e) Lubricate the threads of the drain plug [23] with graphite mineral vaseline, D00601 [CP2101].
- (f) Install the drain plug [23].
 - 1) Tighten the drain plug [23] to 50 ± 5 in-lb (6 ± 1 N·m).
- (g) Attach a lockwire to the drain plug [23].

SUBTASK 28-22-15-020-002

- (9) Disconnect the engine fuel supply line for the left and right engines at the service quick disconnect panel (Figure 601) (TASK 71-00-02-000-801-F00).

SUBTASK 28-22-15-480-001

- (10) Connect the manifold test equipment, SPL-1776, to each engine fuel supply line (Figure 603).

H. Engine Fuel Feed Manifold - Leak Test

SUBTASK 28-22-15-860-003

- (1) Do these steps to test the fuel feed manifold for leaks:
 - (a) Close the shutoff valve on the manifold test equipment, SPL-1776, at the right engine.
 - (b) Use the regulator to apply 40 ± 2 psig (276 ± 14 kPa) air pressure to the fuel supply line at the left engine.
 - (c) Close the shutoff valve on the manifold test equipment, SPL-1776, at the left engine to hold a pressure of 40 ± 2 psig (276 ± 14 kPa).
 - (d) Make sure that the pressure is stable.
 - (e) Make a written record of the time.
 - (f) Make sure that the pressure at the left fuel supply line does not decrease more than 1.5 psi (10.3 kPa) in 10 minutes.
 - (g) If the pressure does not decrease more than 1.5 psi (10.3 kPa) in 10 minutes, the fuel feed manifold is OK.
 - 1) Do this procedure: Put the Airplane Back to Its Usual Condition.
 - (h) If the pressure decreases more than 1.5 psi (10.3 kPa) in 10 minutes, there is a leak in the fuel feed manifold.

SUBTASK 28-22-15-790-001

- (2) To find the general location of the leak in the fuel manifold, do these steps (Figure 604):
 - (a) Close the right spar valve and do the test again.
 - (b) If the pressure does not decrease by more than 1.5 psi (10.3 kPa) in 10 minutes, the leak is between the right spar valve and the right engine fuel valve.
 - (c) If the pressure decreases by more than 1.5 psi (10.3 kPa) in 10 minutes, close the crossfeed valve and do the test again.
 - (d) If the pressure does not decrease by more than 1.0 psi (6.9 kPa) in 10 minutes, the leak is between the crossfeed valve and the right spar valve.
 - (e) If the pressure decreases by more than 1.0 psi (6.9 kPa) in 10 minutes, close the left spar valve and do the test again.

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- (f) If the pressure does not decrease by more than 1.0 psi (6.9 kPa) in 10 minutes, the leak is between the crossfeed valve and the left spar valve.
- (g) If the pressure decreases by more than 1.0 psi (6.9 kPa) in 10 minutes, the leak is between the left spar valve and the test equipment on the left engine.

SUBTASK 28-22-15-360-002

- (3) If there is a leak then do these steps:
 - (a) Open the shutoff valve on the manifold test equipment, SPL-1776, to drain all fuel that remains in the fuel supply line.
 - (b) Remove the manifold test equipment, SPL-1776, from the fuel supply line.
 - (c) Connect the left and right engine fuel supply line to the quick disconnect panel (Figure 601).
 - (d) Completely defuel the applicable fuel tank(s) (TASK 28-26-00-650-801).
 - (e) Disconnect the engine fuel supply line for the left and right engines at the service quick disconnect panel (Figure 601) (TASK 71-00-02-000-801-F00).
 - (f) Connect the manifold test equipment, SPL-1776, to each engine fuel supply line (Figure 603).

SUBTASK 28-22-15-360-001

- (4) After you find the general location of the leak, do these steps to find the exact location of the leak:
 - (a) For the applicable tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.
 - (b) Pressurize the fuel feed manifold at the inlet line for the left engine.
 - (c) Go into the applicable fuel tank to isolate the leak (TASK 28-11-00-910-802).
 - (d) Do a leak check of the fuel feed lines and couplings in the area where the pressure test failed:



DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

- (e) If a coupling has a leak, disconnect the coupling, replace the O-rings, and then connect the coupling (TASK 28-22-15-400-801).
- (f) If a fuel line has a leak, or has damage, remove and install a new fuel line (TASK 28-22-15-400-801).

SUBTASK 28-22-15-790-002

- (5) After you repair a leak, do these steps:
 - (a) Pressurize the complete fuel feed manifold to 40 psi (276 kPa) from the inlet fuel line for the left engine to the right engine.
 - (b) If the pressure does not decrease by more than 1.5 psi (10.3 kPa) in 10 minutes, the system is OK.

I. Right Fuel Spar Valve Leak Test

SUBTASK 28-22-15-860-020

- (1) To do a test of the right spar valve, put the valves in these positions:

NOTE: The valves must be electrically commanded to the open or closed position.

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- (a) Make sure that the APU fuel shutoff valve is closed.
 - 1) Make sure that the APU start switch is in the OFF position.
- (b) Make sure that the crossfeed valve is open.
 - 1) On the P5 fuel system panel, set the CROSSFEED switch to the open position.
- (c) Make sure that the left engine fuel shutoff valve (spar valve) is open.
 - 1) Move the left engine start lever on the control stand to the IDLE position.
- (d) Make sure that the right engine fuel shutoff valve (spar valve) is closed.
 - 1) Move the right engine start lever on the control stand to the CUTOFF position.
- (e) Make sure that the defuel valve is in the closed position.

SUBTASK 28-22-15-790-008

- (2) Use the regulator to apply 40 ± 2 psig (276 ± 14 kPa) air pressure to the fuel supply line at the left engine.
 - (a) Make sure that the pressure is stable.
 - (b) Close the shutoff valve on the manifold test equipment, SPL-1776, at the left engine to hold a pressure of 40 ± 2 psig (276 ± 14 kPa).

SUBTASK 28-22-15-970-001

- (3) Make a written record of the pressure reduction rate for the next 10 minutes.

SUBTASK 28-22-15-790-009

- (4) Make sure that the pressure is 40 psig (276 kPa) on the pressure gage for the left engine pressure check equipment.

NOTE: If the pressure decreases, the Engine Fuel Feed Manifold - Leak Test will give the section of the manifold that has a leak.

SUBTASK 28-22-15-790-010

- (5) Make sure that the outlet pressure at the right engine disconnect is 0 psig (0 kPa).
 - (a) If the outlet pressure is more than 0 psig (0 kPa), there is a leak in the right spar valve.

NOTE: The leak can be caused by the valve body, adapter shaft if it is not aligned, or actuator.

 - 1) If necessary, do this task for the right spar valve: Spar Valve Alignment, TASK 28-22-11-820-801.
 - 2) If necessary, do these tasks to replace the right spar valve actuator:
 - a) Actuator of the Spar Valve Removal, TASK 28-22-11-000-801 or Actuator of the Spar Valve Removal, TASK 28-22-11-000-804.
 - b) Actuator of the Spar Valve Installation, TASK 28-22-11-400-801 or Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.
 - 3) If necessary, do these tasks to replace the right spar valve:
 - a) Valve Body of the Spar Valve Removal, TASK 28-22-11-000-803.
 - b) Valve Body of the Spar Valve Installation, TASK 28-22-11-400-803.

J. Fuel Crossfeed Valve Leak Test

SUBTASK 28-22-15-860-021

- (1) To do a test of the fuel crossfeed valve, put the valves in these positions:

NOTE: The valves must be electrically commanded to the open or closed position.

- (a) Make sure that the APU fuel shutoff valve is closed.

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- 1) Make sure that the APU start switch is in the OFF position.
- (b) Make sure that the crossfeed valve is closed.
 - 1) On the P5 fuel system panel, set the CROSSFEED switch to the closed position.
- (c) Make sure that the left engine fuel shutoff valve (spar valve) is open.
 - 1) Move the left engine start lever on the control stand to the IDLE position.
- (d) Make sure that the right engine fuel shutoff valve (spar valve) is open.
 - 1) Move the right engine start lever on the control stand to the IDLE position.
- (e) Make sure that the defuel valve is in the closed position.

SUBTASK 28-22-15-790-011

- (2) Use the regulator to apply 40 ± 2 psig (276 ± 14 kPa) air pressure to the fuel supply line at the left engine.
 - (a) Make sure that the pressure is stable.
 - (b) Close the shutoff valve on the manifold test equipment, SPL-1776, at the left engine to hold a pressure of 40 ± 2 psig (276 ± 14 kPa).

SUBTASK 28-22-15-970-002

- (3) Make a written record of the pressure reduction rate for the next 10 minutes.

SUBTASK 28-22-15-790-012

- (4) Make sure that the pressure is 40 psig (276 kPa) on the pressure gage for the left engine pressure check equipment.

NOTE: If the pressure decreases, the Engine Fuel Feed Manifold - Leak Test will give the section of the manifold that has a leak.

SUBTASK 28-22-15-790-013

- (5) Make sure that the outlet pressure at the right engine disconnect is 0 psig (0 kPa).
 - (a) If the outlet pressure is more than 0 psig (0 kPa), there is a leak in the crossfeed valve.

NOTE: The leak can be caused by the valve body or the valve adapter if it is not aligned.

 - 1) If necessary, do this task for the crossfeed valve(s): Crossfeed Valve Alignment, TASK 28-22-21-820-801.
 - 2) If necessary, do these tasks to replace the crossfeed valve(s) actuator:
 - a) Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-801 or Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-804.
 - b) Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-801 or Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-804.
 - 3) If necessary, do these tasks to replace the crossfeed valve:
 - a) Engine Fuel Crossfeed Valve Body Removal, TASK 28-22-21-000-803.
 - b) Install the Engine Fuel Crossfeed Valve Body, TASK 28-22-21-400-803.

K. Left Fuel Spar Valve Leak Test

SUBTASK 28-22-15-860-022

- (1) To do a test of the left spar valve, put the valves in these positions:

NOTE: The valves must be electrically commanded to the open or closed position.

- (a) Make sure that the APU fuel shutoff valve is closed.

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- 1) Make sure that the APU start switch is in the OFF position.
- (b) Make sure that the crossfeed valve is open.
 - 1) On the P5 fuel system panel, set the CROSSFEED switch to the open position.
- (c) Make sure that the left engine fuel shutoff valve (spar valve) is closed.
 - 1) Move the left engine start lever on the control stand to the CUTOFF position.
- (d) Make sure that the right engine fuel shutoff valve (spar valve) is open.
 - 1) Move the right engine start lever on the control stand to the IDLE position.
- (e) Make sure that the defuel valve is in the closed position.

SUBTASK 28-22-15-790-014

- (2) Use the regulator to apply 40 ± 2 psig (276 ± 14 kPa) air pressure to the fuel supply line at the left engine.
 - (a) Make sure that the pressure is stable.
 - (b) Close the shutoff valve on the manifold test equipment, SPL-1776, at the left engine to hold a pressure of 40 ± 2 psig (276 ± 14 kPa).

SUBTASK 28-22-15-970-003

- (3) Make a written record of the pressure reduction rate for the next 10 minutes.

SUBTASK 28-22-15-790-015

- (4) Make sure that the pressure is 40 psig (276 kPa) on the pressure gage for the left engine pressure check equipment.

NOTE: If the pressure decreases, the Engine Fuel Feed Manifold - Leak Test will give the section of the manifold that has a leak.

SUBTASK 28-22-15-790-016

- (5) Make sure that the outlet pressure at the right engine disconnect is 0 psig (0 kPa).
 - (a) If the outlet pressure is more than 0 psig (0 kPa), there is a leak in the left spar valve.

NOTE: The leak can be caused by the valve body or the adapter shaft if it is not aligned.

 - 1) If necessary, do this task for the left spar valve: Spar Valve Alignment, TASK 28-22-11-820-801.
 - 2) If necessary, do these tasks to replace the left spar valve actuator:
 - a) Actuator of the Spar Valve Removal, TASK 28-22-11-000-801 or Actuator of the Spar Valve Removal, TASK 28-22-11-000-804.
 - b) Actuator of the Spar Valve Installation, TASK 28-22-11-400-801 or Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.
 - 3) If necessary, do these tasks to replace the left spar valve:
 - a) Valve Body of the Spar Valve Removal, TASK 28-22-11-000-803.
 - b) Valve Body of the Spar Valve Installation, TASK 28-22-11-400-803.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-15-410-003

- (1) To remove the manifold test equipment, SPL-1776, from the engine fuel supply line, do these steps:

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- (a) Open the shutoff valve on the manifold test equipment, SPL-1776, to drain all fuel that remains in the fuel supply line.
NOTE: If you do not drain all of the fuel, fuel will spill from the fuel supply line onto the engine.
- (b) Remove the manifold test equipment, SPL-1776, from the fuel supply line.
- (c) Connect the left and right engine fuel supply line to the quick disconnect panel (Figure 601).
- (d) Do this task: Supply External Power, TASK 24-22-00-860-813.
- (e) Put the fuel crossfeed switch, on the P5 Overhead Panel, to the CLOSED position.
- (f) Put the engine start levers on the control stand to the CUTOFF position.
NOTE: This closes the fuel spar valves.
- (g) On the P5 panel, make sure that the two SPAR VALVE CLOSED lights are dim.

SUBTASK 28-22-15-860-007

- (2) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 28-22-15-010-005



WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS WHEN YOU CLOSE THE THRUST REVERSERS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 28-22-15-410-005

- (4) Do this task: Fan Cowl Panel Installation (Selection), TASK 71-11-02-400-801-F00.

SUBTASK 28-22-15-650-007

- (5) Remove the DO-NOT-OPERATE placards from the left and right engine START switches, on the P5 overhead panel.

SUBTASK 28-22-15-650-008

- (6) Refuel the fuel tanks (TASK 12-11-00-650-802).

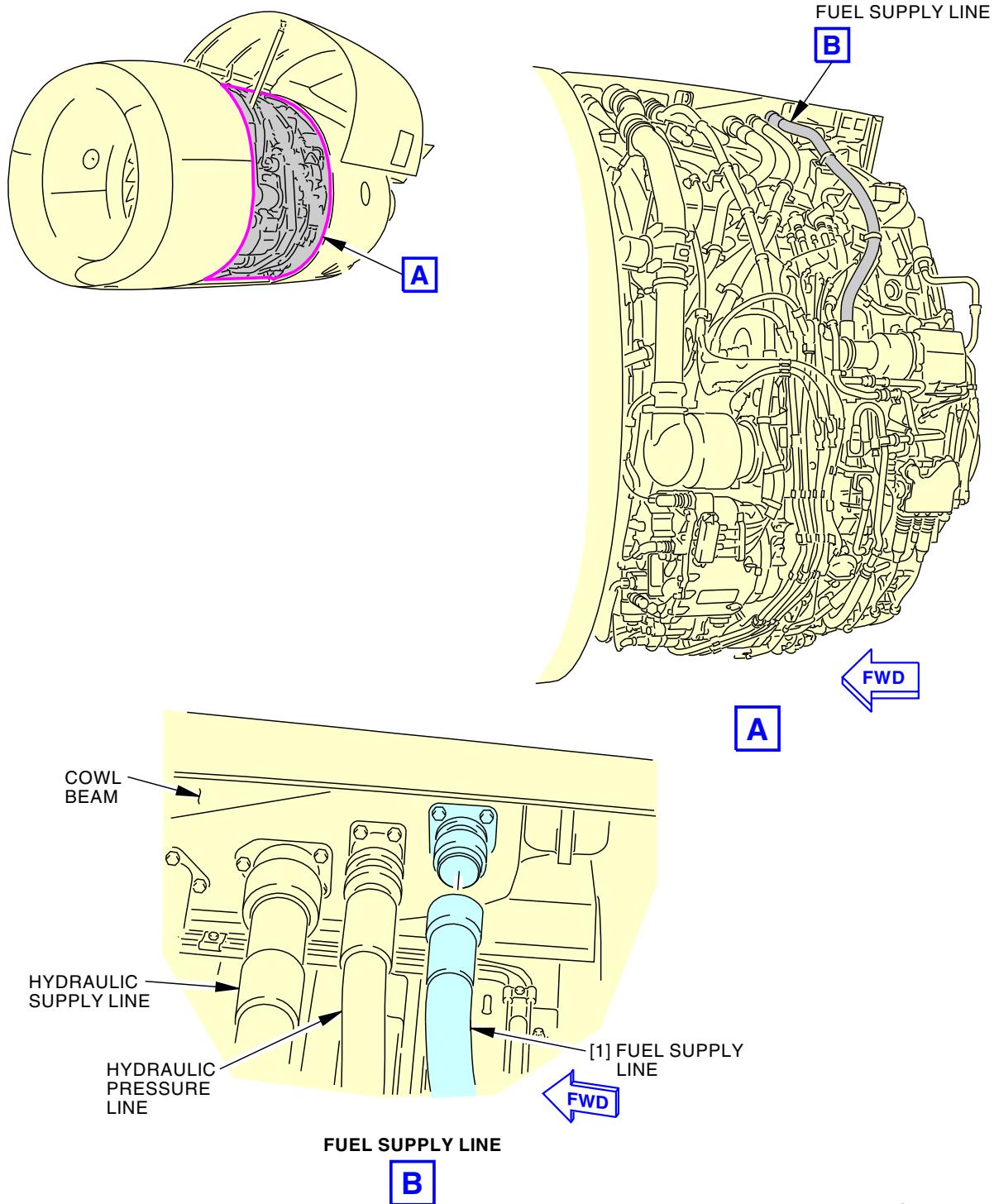
SUBTASK 28-22-15-700-001

- (7) Do a leak check of the main fuel supply line (TASK 71-00-00-800-811-F00).

———— END OF TASK ————

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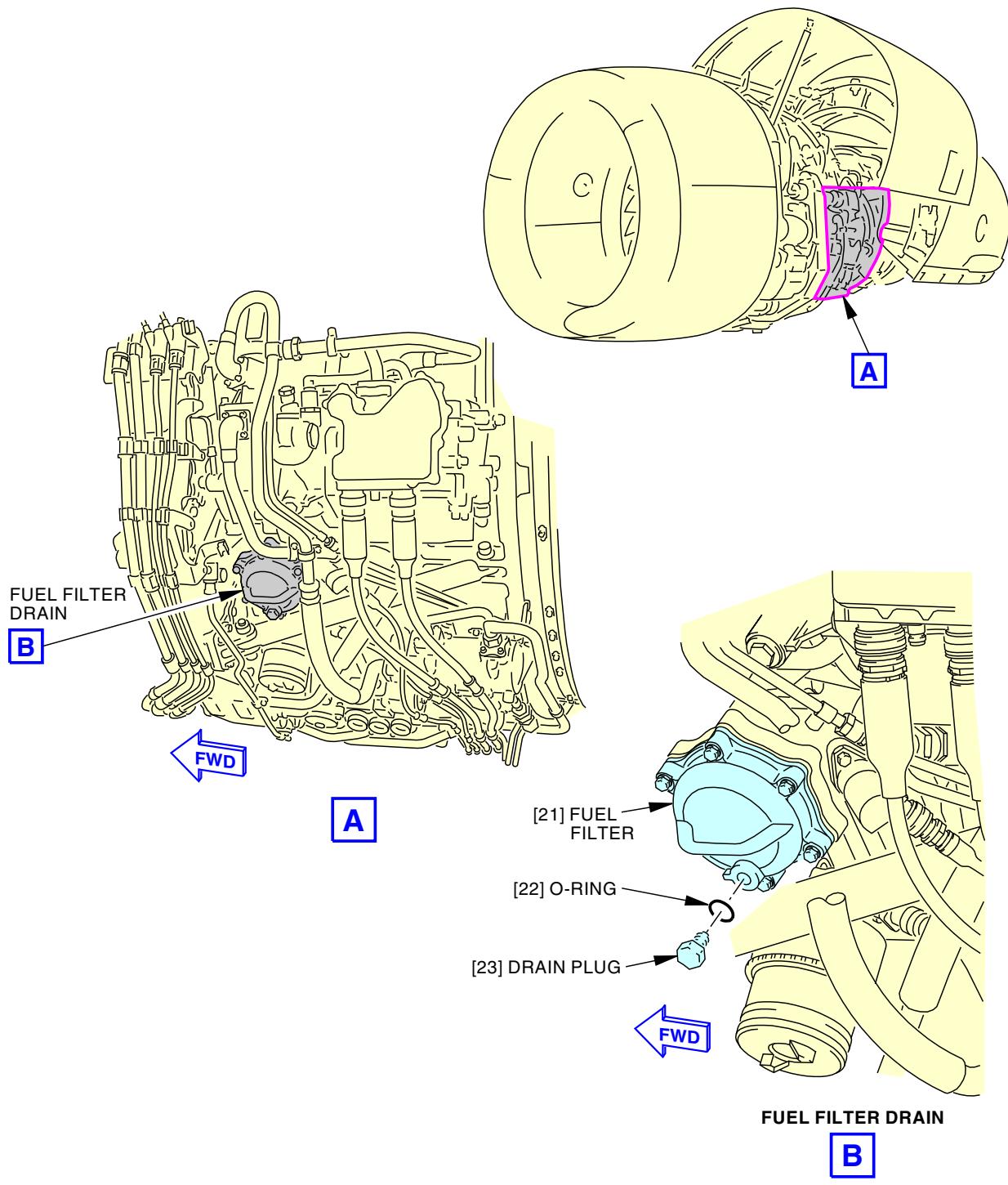


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Fuel Supply Line Disconnect for Fuel-Feed Manifold Pressure Check
Figure 601/28-22-15-990-811

EFFECTIVITY
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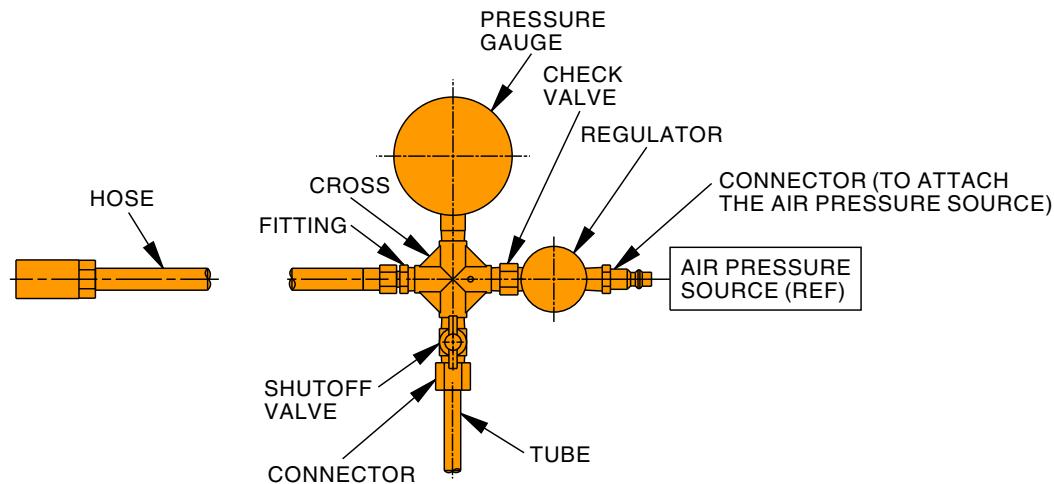
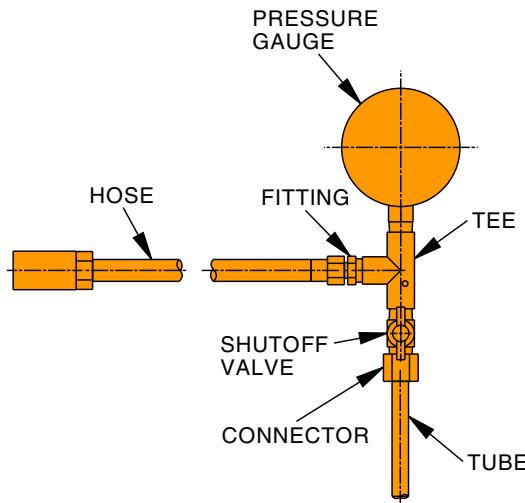


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Fuel Filter Drain Location
Figure 602/28-22-15-990-812

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PRESSURE CHECK EQUIPMENT - LEFT FUEL SUPPLY LINE

PRESSURE CHECK EQUIPMENT - RIGHT FUEL SUPPLY LINE

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**Pressure Check Equipment
Figure 603/28-22-15-990-813**

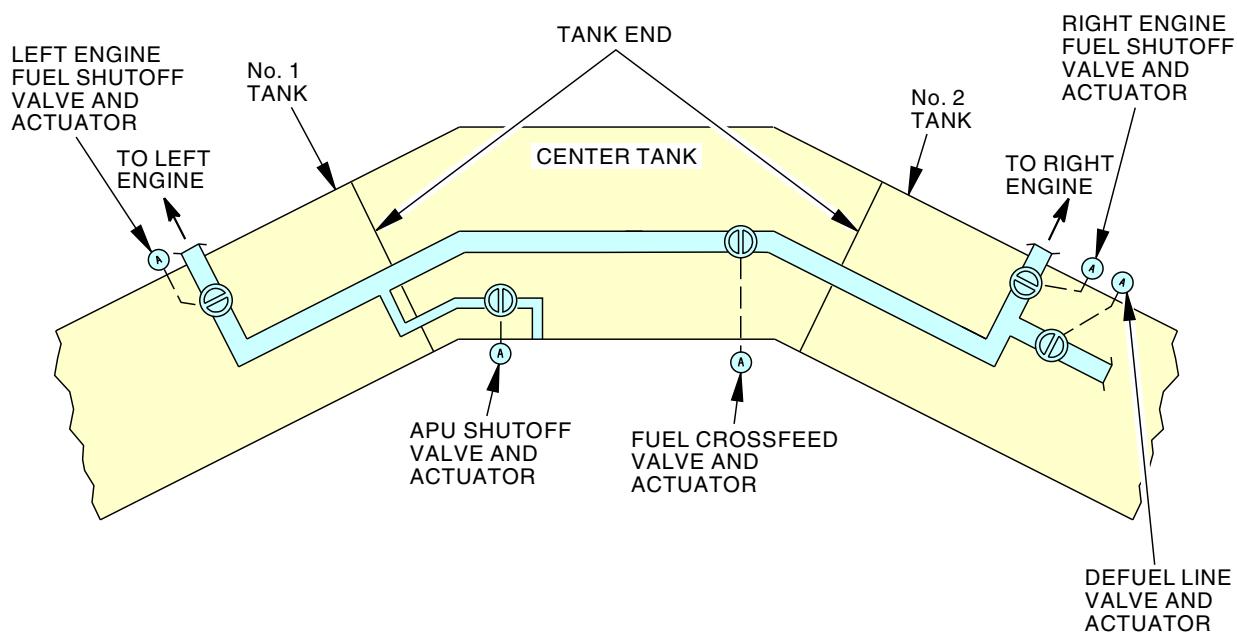
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LEGEND:

- Ⓐ VALVE BODY
- Ⓑ ACTUATOR

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Fuel Feed Manifold - Simplified Schematic
Figure 604/28-22-15-990-814

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TASK 28-22-15-700-801

3. Engine and APU Fuel Feed, Shroud, Fuel Vent Line and Couplings, and NEADS Lines (if installed)
Dent Criteria - Inspection/Check

A. General

- (1) The inspection criteria apply to:
 - (a) Engine fuel feed lines
 - (b) Pressure refueling lines
 - (c) APU shroud
 - (d) Fuel vent lines and related couplings

| **LOM 406, 407, 412, 415, 422-434, 437-447, 450-999; LOM 402, 404, 411, 416, 420 POST SB 737-47-1003**
(e) NEADS lines

LOM ALL

- (2) Each of these is referred to as a "fuel line" in this task, except the couplings.

B. References

Reference	Title
20-10-51-000-801	Flareless Tubing Assembly Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)

C. Procedure

SUBTASK 28-22-15-210-003

- (1) Visually examine all the fuel lines to make sure it is tightly and correctly attached.

SUBTASK 28-22-15-420-007

- (2) Adjust the installation of the fuel lines that are not correctly attached.

SUBTASK 28-22-15-210-004

- (3) Visually examine all the fuel lines for these types of damage and make sure the damage is permitted.
 - (a) Make an inspection for cracks.
 - 1) Make sure there are no cracks.
 - (b) Make an inspection for dents (areas that are pushed into the fuel line).
 - 1) All dents must have an area that is large compared to the depth of the dent.
 - 2) No single dent in the fuel line is permitted to decrease the diameter of the fuel line by more than 2.5 percent.
 - 3) If there are multiple dents, the total dent depth (individual depths added together) in any section five times the fuel line diameter long, must be no more than ten percent of the fuel line diameter.
 - 4) The dents in the fuel line must be farther than one diameter of the fuel line from the end of the fuel line.
 - 5) The dents in the fuel line must not have an area of more than 0.125 in² (80.6 mm²).
 - 6) If the dent is on the outer part of a bend in the fuel line, the dent must not have a depth of more than 0.015 in. (0.38 mm).
 - (c) Do an inspection for nicks.
 - 1) The nicks in the fuel line must have a rounded bottom.

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- 2) The nicks in the fuel line must not have a depth of more than 0.004 in. (0.102 mm).
- 3) You must remove all the burrs from the nick if there are some burrs.
- (d) Do an inspection for fretting.
 - 1) Fretting must not have a depth of more than 0.004 in. (0.102 mm).
- (e) Do an inspection for scoring.
 - 1) If you find some small scoring, you can make it smooth again, but obey these conditions:
 - a) The scoring must not be on the outer part of a bend.
 - b) You must not remove more than 0.004 in. (0.102 mm) of metal.
- (f) Do an inspection for fuel lines with a cross section that is not fully circular (fuel lines with ovality).
 - 1) Calculate the percent ovality with this formula:
percent ovality = [(OD Max - OD Min) ÷ (OD Nominal)] X 100%
 - a) OD Max is the maximum outer diameter of the fuel line
 - b) OD Min is the minimum outer diameter of the fuel line
 - c) OD Nominal is the outer diameter of the fuel line at a position where the fuel line is circular or almost circular.
 - 2) The percent ovality must not be more than 10 percent.
 - 3) The percent ovality must be more than 5 percent for fuel lines with a diameter of more than 2 in. (51 mm).
- (g) Do an inspection for wrinkles.

NOTE: The height of a wrinkle is the distance between a straight line that touches the high point of a wrinkle and a straight line that touches the low point of a wrinkle.

- 1) Wrinkles must not have a height larger than the applicable maximum wrinkle height given in this table:

Table 601/28-22-15-993-801 Allowable Wrinkle Height

Fuel Line Diameter inches (mm)	Maximum Wrinkle Height inches (mm)
less than 1 in. (25.4 mm)	0.020 in. (0.508 mm)
1 in. (25.4 mm) to 1.99 in. (50.55 mm)	0.030 in. (0.762 mm)
2 in. (50.8 mm) to 2.99 in. (75.95 mm)	0.040 in. (1.016 mm)
3 in. (76.2 mm) or more	0.050 in. (1.270 mm)

SUBTASK 28-22-15-350-001

- (4) Repair or replace all the fuel lines that have damage that is not permitted (TASK 20-10-51-000-801 or TASK 28-22-15-000-801).

SUBTASK 28-22-15-210-005

- (5) Visually examine all the couplings for external indications of these types of damage and make sure the damage is permitted.
 - (a) Do an inspection for cracks.
 - 1) No cracks are permitted.
 - (b) Do an inspection for scratches.

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- 1) The scratches in the couplings must not have a depth of more than 0.004 in.
(0.102 mm).
- (c) Do an inspection for nicks.
 - 1) The nicks in the couplings must have rounded bottoms.
 - 2) The nicks in the couplings must not have a depth of more than 0.004 in.
(0.102 mm).
 - 3) You must remove all the burrs around the nick.
- (d) Do an inspection for worn areas (galling).
 - 1) No worn areas in the surfaces that have an O-ring seal are permitted.

SUBTASK 28-22-15-350-002

- (6) Replace all the couplings which have damage that is not permitted (TASK 28-22-15-000-801).

———— END OF TASK ————

TASK 28-22-15-790-801

4. Fuel Pressure Leak Check in Strut with Fuel Pumps

A. General

- (1) This test will do a visual check for leakage in the fuel lines from the front spar to the engine fuel pump. The fuel spar valve is open and the fuel line is pressurized with fuel from the fuel system pumps.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-22-15 P/B 401	FUEL FEED MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION
54-53-01-000-801	Strut Access Panel Removal (P/B 401)
54-53-01-400-801	Strut Access Panel Installation (P/B 401)
54-55-01-720-801	Strut Drain - Functional Test (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
73-11-10-000-801-F00	Fuel Supply Hose Removal (P/B 401)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Prepare for the Test

SUBTASK 28-22-15-860-009

- (1) Make sure that the Engine 1 Start Lever and the Engine 2 Start Lever are in the CUTOFF position.

SUBTASK 28-22-15-860-010

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-22-15-860-011

- (3) Make sure the fuel tanks have sufficient quantities of fuel to operate the boost pumps.

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- (a) Make sure there is 500 lb (227 kg) of fuel (or more) in the No. 1 tank.
- (b) Make sure there is 500 lb (227 kg) of fuel (or more) in the No. 2 tank.
- (c) Make sure there is 1000 lb (454 kg) of fuel (or more) in the center tank.

SUBTASK 28-22-15-010-009

- (4) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-15-860-012



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-15-410-007

- (6) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-15-860-013

- (7) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row Col Number Name

A 1 C00458 ENGINE 1 IGNITION RIGHT

A 3 C00153 ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

Row Col Number Name

D 4 C00459 ENGINE 2 IGNITION RIGHT

D 6 C00151 ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

Row Col Number Name

E 3 C01321 ENGINE FUEL ENGINE 2 HPSOV CONT

E 5 C01320 ENGINE FUEL ENGINE 1 HPSOV CONT

SUBTASK 28-22-15-040-001



WARNING

DO THE THRUST REVERSER DEACTIVATION PROCEDURE FOR GROUND
MAINTENANCE TO PREVENT THE OPERATION OF THE THRUST
REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER
CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (8) Do this task: Thrust Reverser Deactivation For Ground Maintenance,
TASK 78-31-00-040-802-F00.

SUBTASK 28-22-15-010-008

- (9) Open or remove the applicable strut access doors or panels (TASK 54-53-01-000-801).

E. Fuel Pressure Leak Check in Strut with Fuel Pumps

SUBTASK 28-22-15-860-015

- (1) Set the CROSSFEED valve switch, on the P5 overhead panel, to the OPEN position.

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- (a) Make sure that the VALVE OPEN light for the crossfeed valve comes on bright during valve transit.
- (b) Make sure that the VALVE OPEN light stays on dim after the valve is fully open.

SUBTASK 28-22-15-860-016

- (2) Put the applicable engine start lever, on the P8 control stand, to the IDLE position.

SUBTASK 28-22-15-790-004



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (3) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the fuel tank.
 - (a) Immediately set the applicable fuel pump switch to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-15-790-005

- (4) Set the FUEL PUMP CTR TANK - LEFT switch or the FUEL PUMP CTR TANK - RIGHT, on the P5 overhead panel, to the ON position.
 - (a) Set the applicable fuel pump switch to the off position if the LOW PRESSURE light stays on.

SUBTASK 28-22-15-790-006

- (5) Do a visual inspection of the fuel line in the strut area and at the engine fuel pump with the fuel supply hose pressurized.

NOTE: No fuel leaks are permitted.

SUBTASK 28-22-15-360-003

- (6) If there is a fuel leak, do these steps:
 - (a) Set the applicable fuel pump switch to the off position.
 - (b) Put the applicable engine start lever to the CUTOFF position.
 - (c) Do the applicable steps to drain the fuel supply hose in this task: Fuel Supply Hose Removal, TASK 73-11-10-000-801-F00.

NOTE: Only do the steps necessary to remove the bottom end of the flexible fuel line and drain the fuel from the fuel line.



CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

- (d) If a coupling has a leak, disconnect the coupling, replace the O-rings, and then connect the coupling again (PAGEBLOCK 28-22-15/401).
 - 1) Make sure that the O-ring(s) are lubricated correctly.
- (e) If a fuel tube has a leak, replace the fuel tube (PAGEBLOCK 28-22-15/401).
- (f) Do the steps in this procedure again to pressurize the applicable fuel line and do a check for leaks.

SUBTASK 28-22-15-860-018

- (7) When the fuel line is satisfactory (no leaks), do these steps:

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- (a) Put the applicable center tank boost pump switch to the OFF position.
- (b) Put the applicable engine start switch to the CUTOFF position.
- (c) Set the CROSSFEED VALVE switch, on the P5 overhead panel, to the CLOSED position.

SUBTASK 28-22-15-720-001

- (8) Do this task: Strut Drain - Functional Test, TASK 54-55-01-720-801.

NOTE: This will make sure that any fuel leak will not collect in the strut but will drain away.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-15-940-003



MAKE SURE YOU REMOVE ALL TOOLS, LOOSE MATERIAL, AND DEBRIS FROM THE STRUT CAVITY. IF YOU DO NOT, THE DRAIN MAY BECOME BLOCKED AND CAUSE DAMAGE TO EQUIPMENT.

- (1) Make sure that all tools and unwanted material are removed from the strut.

SUBTASK 28-22-15-410-006

- (2) Close or install the strut access doors or panels (TASK 54-53-01-400-801).

SUBTASK 28-22-15-440-001

- (3) Activate the thrust reverser (TASK 78-31-00-440-803-F00).

SUBTASK 28-22-15-860-019

- (4) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

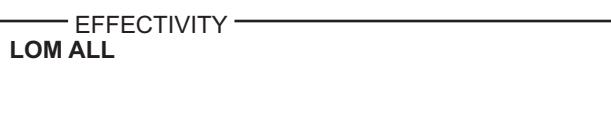
F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

SUBTASK 28-22-15-980-001

- (5) Dry motor the applicable engine before the next engine start to purge all fuel that remains (TASK 71-00-00-700-821-F00).

———— END OF TASK ————



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FUEL SCAVENGE FLOAT-OPERATED SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

- A. The fuel scavenge float-operated shutoff valve is part of the center tank fuel scavenge system. The fuel scavenge float-operated shutoff valve is found in the No. 1 fuel tank.
- B. The fuel scavenge float-operated shutoff valve lets fuel flow into the No. 1 fuel tank when the No. 1 fuel tank is less than two-thirds full. The valve prevents fuel flow into the No. 1 fuel tank when the No. 1 fuel tank is full.
- C. The fuel scavenge float-operated shutoff valve will be referred to as "the valve" in this procedure.
- D. This procedure contains two tasks. The first task removes the valve. The second task installs the valve.

TASK 28-22-16-000-801

2. Fuel Scavenge Float-Operated Shutoff Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Scavenge Float-Operated Shutoff Valve.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

D. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
532BB	Main Tank Access Door - Wing Station 265

E. Prepare for the Removal

SUBTASK 28-22-16-650-001

- (1) Defuel the No. 1 tank (TASK 28-26-00-650-801) or transfer fuel out of the No. 1 tank (TASK 28-26-00-650-802).

SUBTASK 28-22-16-940-001



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (2) For the No.1 tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

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SUBTASK 28-22-16-010-003

- (3) Remove this access panel:

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1
(TASK 06-43-00-800-801).

SUBTASK 28-22-16-010-001

- (4) Remove this access panel:

Number Name/Location

532BB Main Tank Access Door - Wing Station 265
(TASK 28-11-11-000-801).

F. Fuel Scavenge Float-Operated Shutoff Valve Removal

SUBTASK 28-22-16-940-002

- (1) Go into the No. 1 tank.

SUBTASK 28-22-16-010-002

- (2) Find the valve [1] near the front spar.

SUBTASK 28-22-16-020-001

- (3) Remove the screws [6], washers [5], and nuts [2] that attach the valve [1] and the bonding jumper [3] to the support bracket.

SUBTASK 28-22-16-020-005

- (4) If it is necessary, remove the lockwire from the valve [1].

SUBTASK 28-22-16-020-002

- (5) Loosen the coupling nut [4] to disconnect the valve [1] from the tubing.

SUBTASK 28-22-16-420-001

- (6) Put a cap on the open end of the tubing to keep out unwanted material.

SUBTASK 28-22-16-020-003

- (7) Remove the valve [1] from the fuel tank.

———— END OF TASK ————

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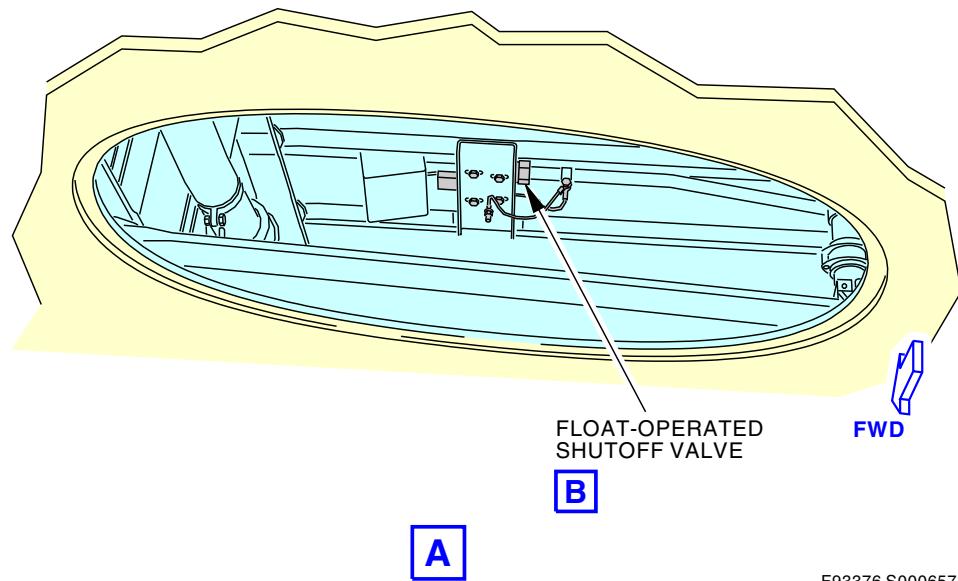
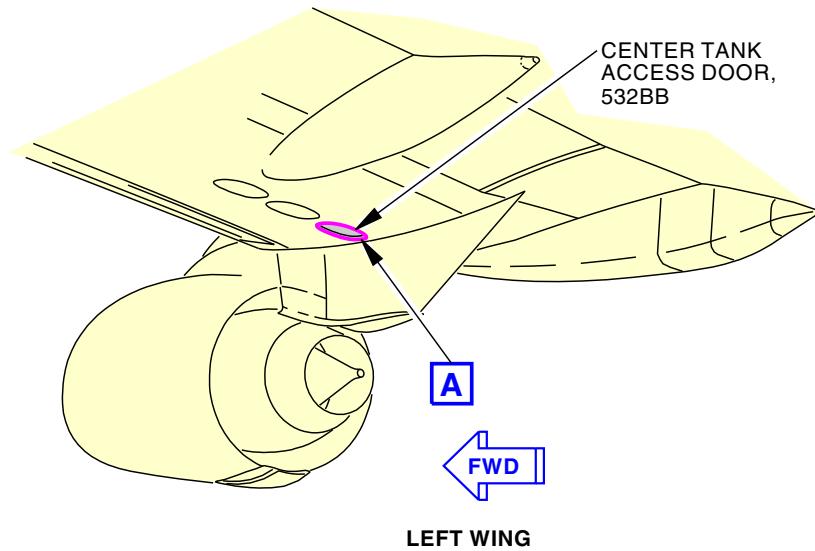
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Float-Operated Shutoff Valves Installation
Figure 401/28-22-16-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

D633A101-LOM

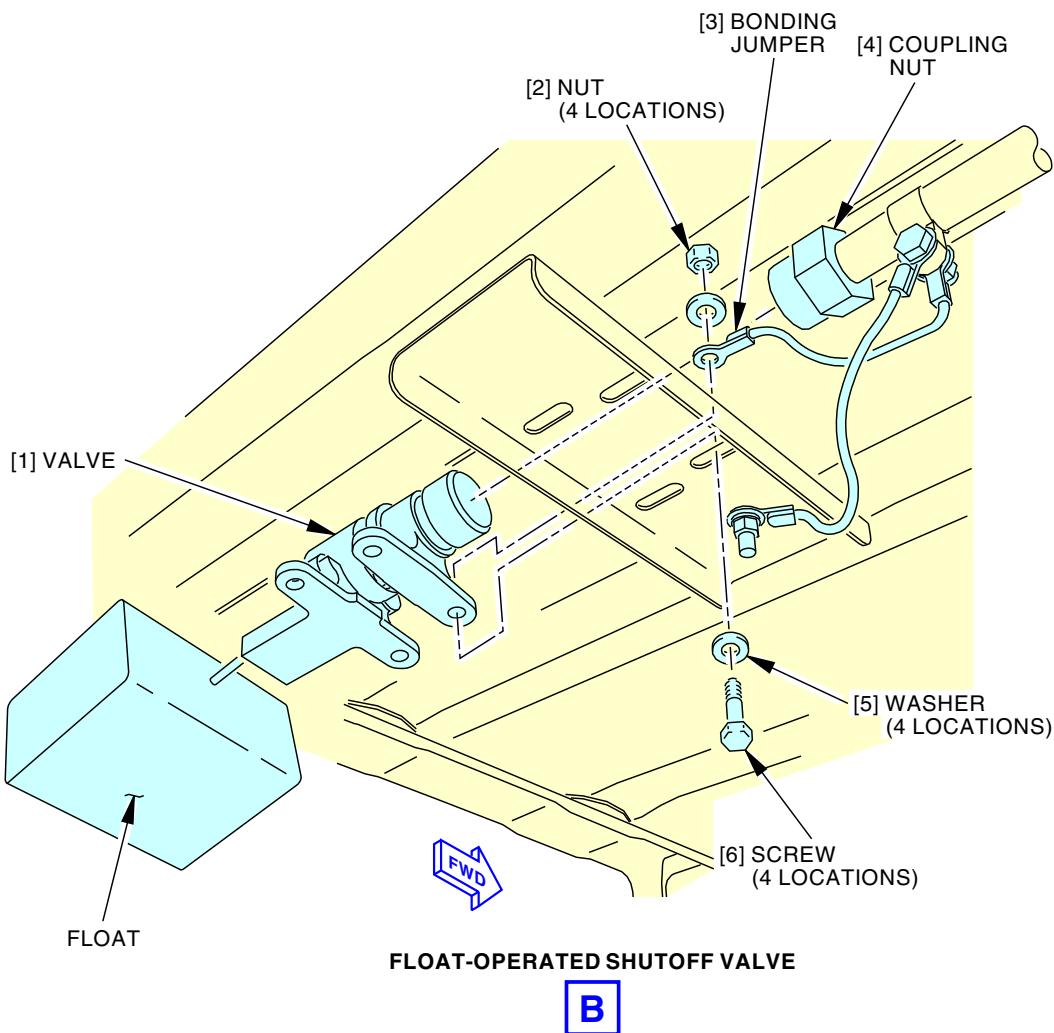
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F93386 S0006572027_V2

Float-Operated Shutoff Valves Installation
Figure 401/28-22-16-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-22-16-400-801

3. Fuel Scavenge Float-Operated Shutoff Valve Installation

(Figure 401)

A. General

(1) This task gives instructions to install the Fuel Scavenge Float-Operated Shutoff Valve.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-720-802	Fuel Scavenge System - Operational Test (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	28-22-00-02A-275	LOM ALL

E. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

F. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
532BB	Main Tank Access Door - Wing Station 265



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G. Fuel Scavenge Float-Operated Shutoff Valve Installation

SUBTASK 28-22-16-940-004



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Go into the No. 1 tank (TASK 28-11-00-910-802).

SUBTASK 28-22-16-020-004

- (2) Remove the cap on the open end of the fuel scavenge tubing if one is installed.

SUBTASK 28-22-16-420-002

- (3) Put the valve [1] in its position and install the four screws [6], washers [5], nuts [2] and the bonding jumper [3] to the support bracket.

NOTE: Make sure that the bonding surfaces are clean.

SUBTASK 28-22-16-420-003

- (4) Tighten the coupling nut [4] to connect the valve [1] to the tubing.

SUBTASK 28-22-16-760-001

- (5) Measure the bonding resistance between the valve [1] and the fuel tube with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (a) Make sure that the bonding resistance is 0.01 ohm (10 milliohms) or less.

LOM 422-434, 437-447, 450-999

SUBTASK 28-22-16-420-004

- (6) Install lockwire between the valve [1] and the coupling nut [4] (TASK 20-10-44-400-801).

LOM ALL

SUBTASK 28-22-16-220-001

- (7) Make sure that there is 0.2 in. (5.1 mm) of clearance between the valve [1] and the fuel tank structure and wiring, in all positions.

H. Fuel Scavenge Float-Operated Shutoff Valve Installation Test

SUBTASK 28-22-16-410-001

- (1) Install this access panel:

Number Name/Location

532BB Main Tank Access Door - Wing Station 265
(TASK 28-11-11-400-801).

SUBTASK 28-22-16-410-002

- (2) Install this access panel:

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1
(TASK 06-43-00-800-801)

SUBTASK 28-22-16-650-002

- (3) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-22-16-700-001

- (4) Do this task: Fuel Scavenge System - Operational Test, TASK 28-22-00-720-802.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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FUEL SCAVENGE JET PUMP - REMOVAL/INSTALLATION

1. General

- A. This procedure contains four tasks. The first task removes the nozzle assembly of the fuel scavenge jet pump. The second task installs the nozzle assembly of the fuel scavenge jet pump. The third task removes the fuel scavenge jet pump. The fourth task installs the fuel scavenge jet pump.

TASK 28-22-17-020-801

2. Nozzle Assembly of the Fuel Scavenger Jet Pump Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Nozzle Assembly of the Fuel Scavenger Jet Pump.

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)

C. Location Zones

Zone	Area
511	Left Wing - Leading Edge To Front Spar

D. Prepare for the Removal

SUBTASK 28-22-17-860-003



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) To get access to the nozzle assembly of the fuel scavenge pump on the front spar, extend the leading edge slats and flaps (TASK 27-81-00-860-803).



INSTALL THE LOCK ON LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT THE ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Install the flap locks on the leading edge slats and flaps (TASK 27-81-00-480-801).

E. Nozzle Assembly of the Fuel Scavenger Jet Pump Removal

SUBTASK 28-22-17-010-004

- (1) To remove the nozzle assembly of the fuel scavenge jet pump, do these steps:
- The nozzle assembly [12] contains two parts, the nozzle [12A] and the plug [12B]. It is not necessary to separate these parts.
 - Get access to the fuel scavenge jet pump, installed on the front spar, out of the fuel tank (Figure 401).
 - Remove the lockwire from the nozzle assembly [12].
 - Remove the nozzle assembly [12] from the pump assembly [8].

NOTE: There is an internal check valve in the housing that will prevent a fuel spill.

EFFECTIVITY
LOM ALL

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(e) Discard the O-ring [13].

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

28-22-17

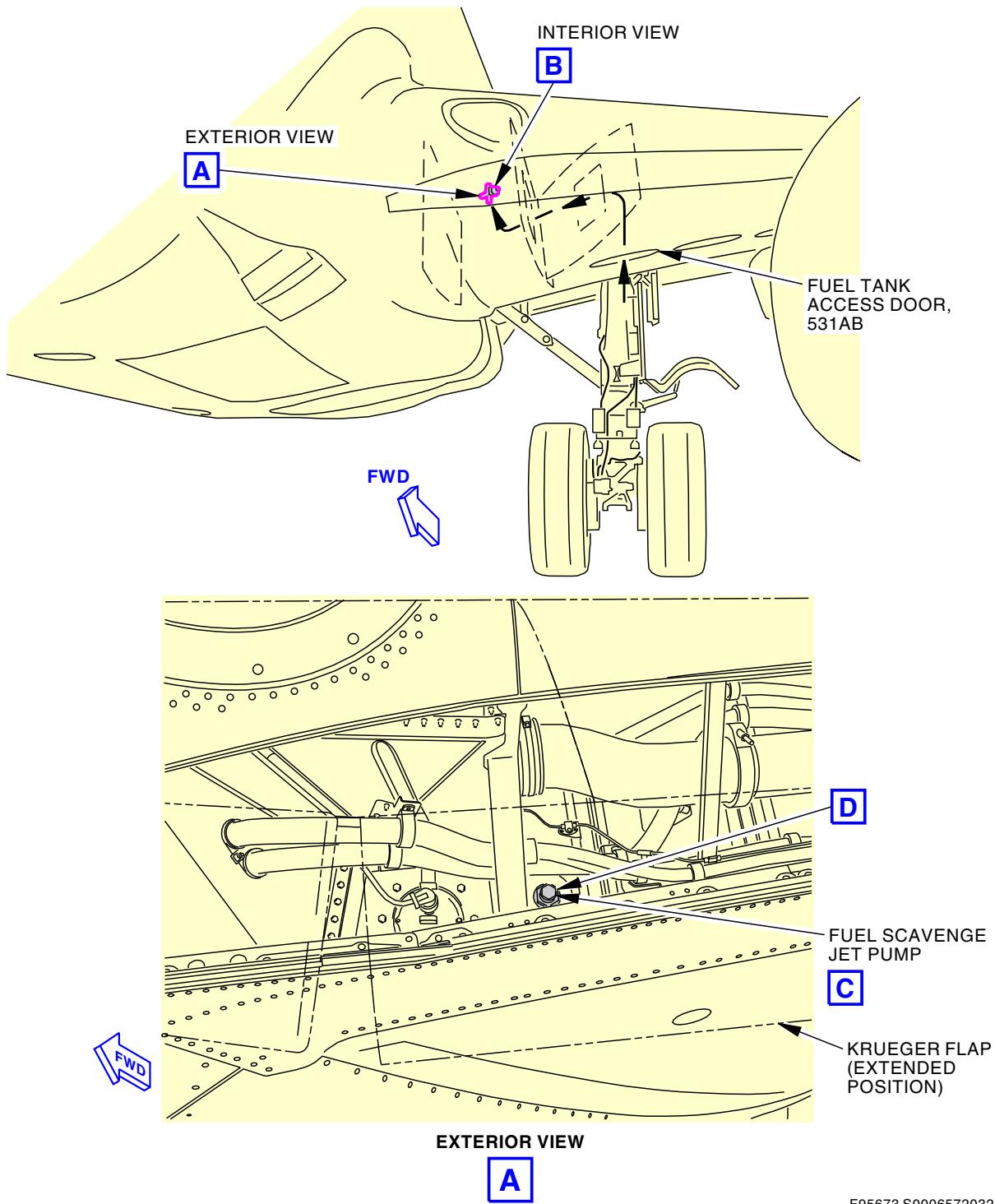
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Fuel Scavenge Jet Pump Installation
Figure 401/28-22-17-990-802 (Sheet 1 of 2)

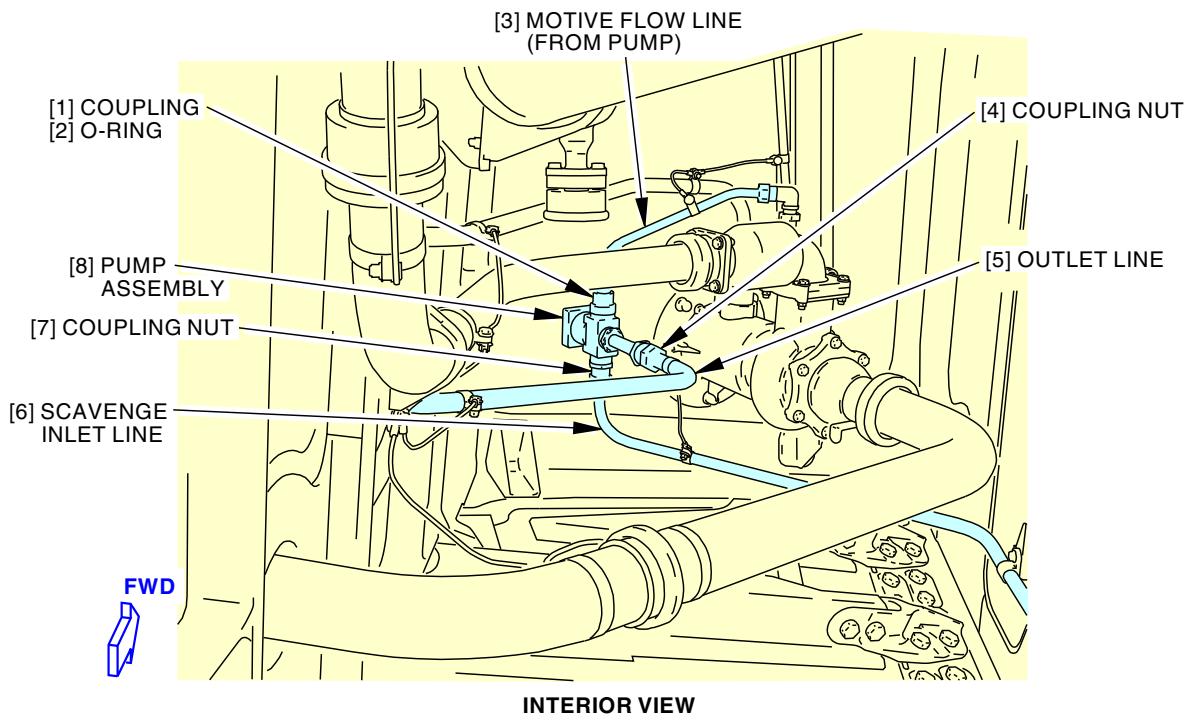
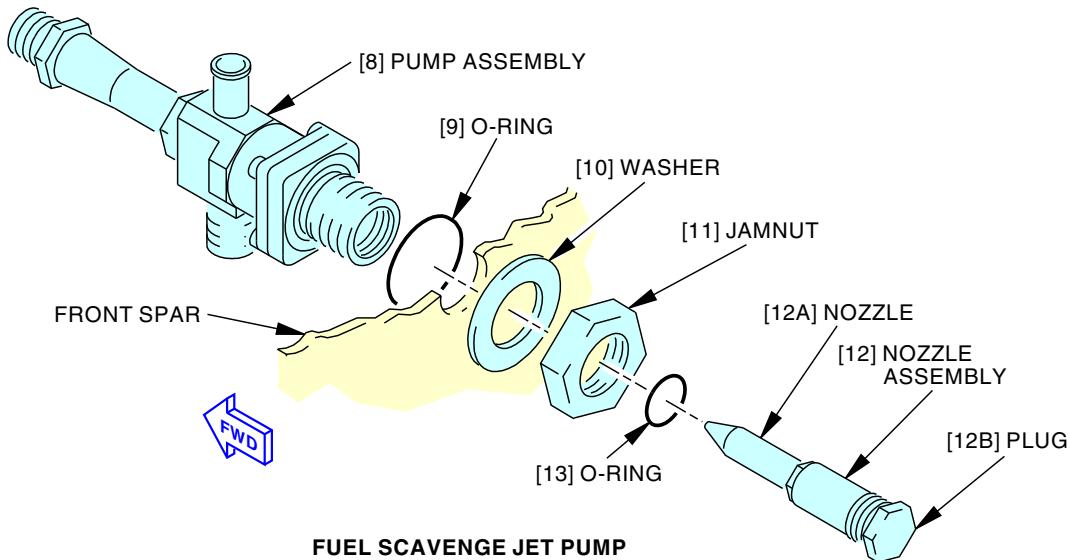
EFFECTIVITY
LOM ALL

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B

C

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Fuel Scavenging Jet Pump Installation
Figure 401/28-22-17-990-802 (Sheet 2 of 2)

 EFFECTIVITY
LOM ALL

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TASK 28-22-17-420-801

3. Nozzle Assembly of the Fuel Scavenger Jet Pump Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Nozzle Assembly of the Fuel Scavenger Jet Pump.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Pump assembly	28-22-00-02A-280	LOM ALL
12A	Nozzle	28-22-00-02A-295	LOM ALL
12B	Plug	28-22-00-02A-285	LOM ALL
13	O-ring	28-22-00-02A-290	LOM ALL

E. Location Zones

Zone	Area
511	Left Wing - Leading Edge To Front Spar

F. Nozzle Assembly of the Fuel Scavenger Jet Pump Installation

SUBTASK 28-22-17-420-002

- (1) To install the nozzle assembly of the fuel scavenger jet pump, do these steps:
- Get access to the fuel scavenger jet pump, installed on the front spar, out of the fuel tank (Figure 401).
 - Apply a thin layer of petrolatum grease, D00504, to the new O-ring [13] and install it on the nozzle assembly [12].
 - The nozzle assembly [12] contains two parts, the nozzle [12A] and the plug [12B]. It is not necessary to separate these parts.
 - Install the nozzle assembly [12] into the pump assembly [8].
 - Tighten the nozzle assembly [12] to a 200 in-lb (23 N·m).
 - Install lockwire between the nozzle assembly [12] and the jamnut [11] (TASK 20-10-44-400-801).
 - Apply sealant, A02315, between the jamnut [11] and the front spar if it is necessary.



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G. Put the Airplane Back to its Usual Condition

SUBTASK 28-22-17-860-007



WARNING

INSTALL THE LOCK ON LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT THE ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Remove the flap locks from the leading edge slats if you installed them before (TASK 27-81-00-080-801).

SUBTASK 28-22-17-860-008



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Retract the leading edge slats if they are extended (TASK 27-81-00-860-804).

———— END OF TASK ————

TASK 28-22-17-000-801

4. Fuel Scavenge Jet Pump Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Scavenge Jet Pump.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Pump assembly	28-22-00-02A-280	LOM ALL

D. Location Zones

Zone	Area
511	Left Wing - Leading Edge To Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

E. Access Panels

Number	Name/Location
531AB	Center Tank Access Door - Wing Station 168

F. Fuel Scavenge Jet Pump Removal

SUBTASK 28-22-17-020-001

- (1) Do this task: Nozzle Assembly of the Fuel Scavenge Jet Pump Removal, TASK 28-22-17-020-801.

— EFFECTIVITY —
LOM ALL

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SUBTASK 28-22-17-010-002

- (2) To remove the pump assembly [8] for the fuel scavenge jet pump, do these steps:



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (a) Defuel the center fuel tank and the No. 1 tank (TASK 28-26-00-650-801) or transfer all the fuel out of the center tank and the No. 1 tank (Tank to Tank Fuel Transfer, TASK 28-26-00-650-802).
- (b) For the center fuel tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802
- (c) For the left center fuel tank, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.

Open this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

- (d) Remove the jamnut [11] and washer [10] from the pump assembly [8], from out of the fuel tank.
- (e) Go into the center fuel tank.
- (f) Disconnect the coupling [1] between the motive flow line [3] and the pump assembly [8] (TASK 28-22-15-000-801).
 - 1) Discard the O-ring [2].
- (g) Disconnect the coupling nut [7] between the scavenge inlet line [6] and the pump assembly [8].
- (h) Disconnect the coupling nut [4] between the outlet line [5] and the pump assembly [8].
- (i) Remove the pump assembly [8] from the fuel tank.
 - 1) Discard the O-ring [9].
- (j) Install covers on the open fuel lines to keep unwanted materials out.

———— END OF TASK ————

TASK 28-22-17-400-801

5. Fuel Scavenge Jet Pump Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel Scavenge Jet Pump.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-720-802	Fuel Scavenge System - Operational Test (P/B 501)

EFFECTIVITY
LOM ALL

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(Continued)

Reference	Title
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	28-22-00-02A-230	LOM ALL
8	Pump assembly	28-22-00-02A-280	LOM ALL
9	O-ring	28-22-00-02A-225	LOM ALL

E. Location Zones

Zone	Area
511	Left Wing - Leading Edge To Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Access Panels

Number	Name/Location
531AB	Center Tank Access Door - Wing Station 168

G. Prepare for the Installation

SUBTASK 28-22-17-860-009



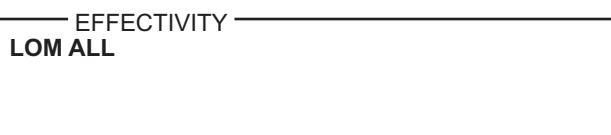
OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) For the center fuel tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

H. Fuel Scavenge Jet Pump Installation

SUBTASK 28-22-17-010-003

- (1) Install the pump assembly [8], do these steps:
 - (a) Remove the fuel line covers installed on the open fuel lines to keep unwanted materials out.
 - (b) Go into the fuel tank.
 - (c) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [9].
 - (d) Install the O-ring [9] onto the pump assembly [8].
 - (e) Put the pump assembly [8] in its position in the fuel tank.
 - (f) Install the washer [10] and jamnut [11] from out of the fuel tank.
 - 1) Make sure that the fuel lines align before you tighten the jamnut [11].
 - 2) Tighten the jamnut [11] to 425 in-lb (48 N·m) - 480 in-lb (54 N·m).
 - (g) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [2].



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- (h) Install the O-ring [2] and connect the coupling [1] between the motive flow line [3] and pump assembly [8] (TASK 28-22-15-400-801).
- (i) Install the lockwire to the coupling [1] (TASK 20-10-44-400-801).
- (j) Connect the coupling nut [7] between the inlet scavenge inlet line [6] and pump assembly [8].
 - 1) Tighten the coupling nut [7] to 280 ± 14 in-lb (32 ± 2 N·m).
- (k) Connect the coupling nut [4] between the outlet line [5] and pump assembly [8].
 - 1) Tighten the coupling nut [4] to 360 ± 18 in-lb (41 ± 2 N·m).
- (l) Apply a fillet seal of sealant, A00767, between the pump assembly [8] and front spar (in the fuel tank).
- (m) Apply a fillet seal of sealant, A02315, between the jamnut [11] and front spar (out of the fuel tank).

I. Fuel Scavenge Jet Pump Installation Test

SUBTASK 28-22-17-410-001

- (1) For the left center tank, do this step (TASK 28-11-31-400-801):

Close this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

SUBTASK 28-22-17-710-001

- (2) Do this task: Fuel Scavenge System - Operational Test, TASK 28-22-00-720-802.

SUBTASK 28-22-17-650-003

- (3) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-17-020-002

- (1) Do this task: Nozzle Assembly of the Fuel Scavenge Jet Pump Installation, TASK 28-22-17-420-801.

———— END OF TASK ————



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GROUND FAULT INTERRUPTER (GFI) RELAY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the Ground Fault Interrupter (GFI) relay
 - (2) An installation of the GFI relay.
- B. There are six GFI relays for the fuel boost pumps. The R19, R20, and R54 GFI relays are found in the P91 power distribution panel. The R18, R21, and R55 GFI relays are found in the P92 power distribution panel.

TASK 28-22-18-000-801

2. GFI Relay Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Ground Fault Interrupter (GFI) relay.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
123	Forward Cargo Compartment - Left
124	Forward Cargo Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 28-22-18-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL
COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH
VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO
EQUIPMENT.

- (1) If electrical power is connected, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-22-18-860-002

- (2) Make sure that these fuel boost pump switches, on the P5 overhead panel, are in the OFF position:
 - (a) FUEL PUMP TANK 1 - AFT
 - (b) FUEL PUMP TANK 1 - FWD
 - (c) FUEL PUMP CTR TANK - LEFT
 - (d) FUEL PUMP TANK 2 - AFT
 - (e) FUEL PUMP TANK 2 - FWD

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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- (f) FUEL PUMP CTR TANK - RIGHT.

F. GFI Relay Removal

SUBTASK 28-22-18-010-001

- (1) Get access to the applicable GFI relay.

- (a) Open this access door:

Number Name/Location

117A Electronic Equipment Access Door

- (b) Make sure that all the power warning lights, on the P91 and P92 power distribution panels, are off.



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (c) Open the applicable power distribution panel to get access to the applicable circuit breakers and GFI relays.

- 1) These GFI relays are found in the upper left corner of the P91 panel:

- a) R19, Fuel Pump Tank 1 - FWD
- b) R20, Fuel Pump Tank 2 - AFT
- c) R54, Fuel Pump Center Tank - LEFT.

- 2) These GFI relays are found in the upper left corner of the P92 panel:

- a) R18, Fuel Pump Tank 1 - AFT
- b) R21, Fuel Pump Tank 2 - FWD
- c) R55, Fuel Pump Center Tank - RIGHT.

SUBTASK 28-22-18-860-003



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Open the applicable circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

SUBTASK 28-22-18-020-001

- (3) Remove the lock nuts and flat washers from the applicable GFI relay.

- (a) Discard the lock nuts and washers.

NOTE: If the GFI relay is removed for troubleshooting or testing reasons, it is not necessary to discard the lock nuts and washers.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201



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SUBTASK 28-22-18-020-002

- (4) Remove the applicable GFI relay.

———— END OF TASK ————

— EFFECTIVITY —
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

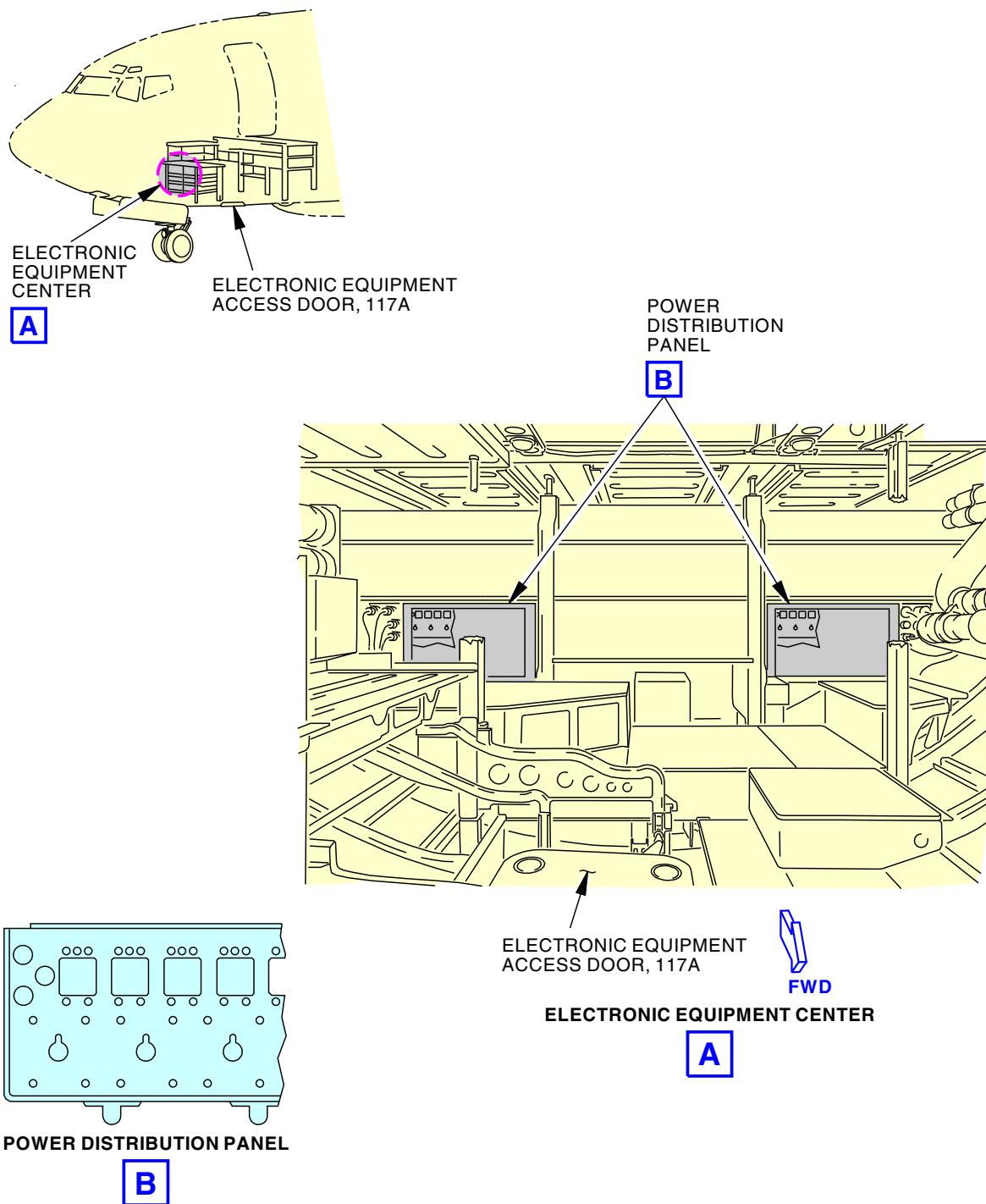
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1981580 S0000382677_V2

GFI Relay Installation
Figure 401/28-22-18-990-801

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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TASK 28-22-18-400-801

3. GFI Relay Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Ground Fault Interrupter (GFI) relay.

B. References

Reference	Title
28-22-41-720-802	Ground Fault Interrupter (GFI) - Operational Test (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-614	Bonding Meters - Non-Intrinsically Safe (For use in outside Class I, Divisions I & II non-hazardous locations. For hazardous locations, use COM-1550). Part #: 247000 Supplier: 00426 Part #: 620LK Supplier: 1CRL2 Part #: BLR-0003-XX Supplier: KC432 Part #: BT51 Supplier: 00426 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659 Opt Part #: 247001 Supplier: 00426

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersedes BMS15-5 CL A)

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
123	Forward Cargo Compartment - Left
124	Forward Cargo Compartment - Right

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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G. GFI Relay Installation

SUBTASK 28-22-18-410-001



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Get access to the applicable GFI relay on either the P91 or P92 power distribution panel.

SUBTASK 28-22-18-160-001

- (2) Clean the contact surfaces of the mounting hardware and bonding surface for the GFI relay with a clean cotton wiper, G00034, moist with alcohol, B00130.

SUBTASK 28-22-18-420-001

- (3) Put the GFI relay in its position.

SUBTASK 28-22-18-420-002

- (4) Install the supplied flat washers and lock nuts.

NOTE: If the GFI relay was removed for troubleshooting or testing reasons, it is possible to use the removed lock nuts and washers.

SUBTASK 28-22-18-420-003

- (5) Tighten each lock nut 6 in-lb (0.68 N·m) to 7 in-lb (0.79 N·m) above the self-locking torque.

SUBTASK 28-22-18-760-001

- (6) Measure the electrical bonding resistance between the GFI relay mounting flange to a point on the panel crossmember that is a distance of 1 in. (2.54 cm) or more from the point on the GFI relay mounting flange (SWPM 20-20-00).
 - (a) Use a non-intrinsically safe bonding meter, COM-614.
 - (b) Make sure that the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

H. GFI Relay Installation Test

SUBTASK 28-22-18-720-001

- (1) Do this task: Ground Fault Interrupter (GFI) - Operational Test, TASK 28-22-41-720-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-18-860-004



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Remove the safety tags and close the applicable circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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SUBTASK 28-22-18-860-005



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Close the applicable power distribution panel.

SUBTASK 28-22-18-860-006

- (3) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

— EFFECTIVITY —
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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ENGINE FUEL CROSSFEED VALVE - REMOVAL/INSTALLATION

1. General

- A. The engine fuel crossfeed valve has an actuator installed out of the fuel tank. An adapter shaft and valve body are installed in the fuel tank.
- B. The engine fuel crossfeed valve actuator is installed on the rear spar of the center fuel tank, to the right of the body centerline. It is not necessary to defuel the center fuel tank to remove the actuator. It is necessary to defuel the center fuel tank to remove the adapter shaft. It is necessary to defuel all the fuel tanks to remove the valve body.
- C. This procedure contains these tasks:
 - (1) Remove the Actuator of the Engine Fuel Crossfeed Valve
 - (2) Install the Actuator of the Engine Fuel Crossfeed Valve
 - (3) Remove the Valve Adapter of the Engine Fuel Crossfeed Valve
 - (4) Install the Valve Adapter of the Engine Fuel Crossfeed Valve
 - (5) Remove the Valve Body of the Engine Fuel Crossfeed Valve
 - (6) Install the Valve Body of the Engine Fuel Crossfeed Valve
 - (7) Crossfeed Valve Alignment

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

- (8) Rework the Electrical Faying Surface Bonds for the Engine Fuel Crossfeed Valve

LOM ALL

- (9) Crossfeed Valve Operational Test

**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017**

TASK 28-22-21-000-801

2. Actuator of the Engine Fuel Crossfeed Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Actuator of the Engine Fuel Crossfeed Valve.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Prepare for the Removal

SUBTASK 28-22-21-862-001

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

EFFECTIVITY
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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

SUBTASK 28-22-21-490-001



WARNING

MAKE SURE YOU INSTALL THE GROUND LOCK ASSEMBLIES IN ALL
LANDING GEAR. ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN
CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-21-010-007

- (3) Go to the crossfeed valve location on the rear spar in the main landing gear wheel well (right side) (View A).

E. Actuator of the Engine Fuel Crossfeed Valve Removal

SUBTASK 28-22-21-020-014

- (1) Move the manual override lever [9] to the fully CLOSED position.

SUBTASK 28-22-21-020-015

- (2) Disconnect the electrical connector [1] from the actuator [2].

SUBTASK 28-22-21-020-016

- (3) Remove the old sealant from the bonding jumper [10], fasteners and bonding jumper tab.

SUBTASK 28-22-21-020-017

- (4) Remove the screw [11], three washers [8], nut [7], and bonding jumper [10] from the bonding jumper tab on the actuator [2].

SUBTASK 28-22-21-020-018

- (5) Remove the lockwire from the mounting screws [3].

SUBTASK 28-22-21-020-019

- (6) Remove the four mounting screws [3] and the washers [4].

SUBTASK 28-22-21-020-020

- (7) Remove the actuator [2].

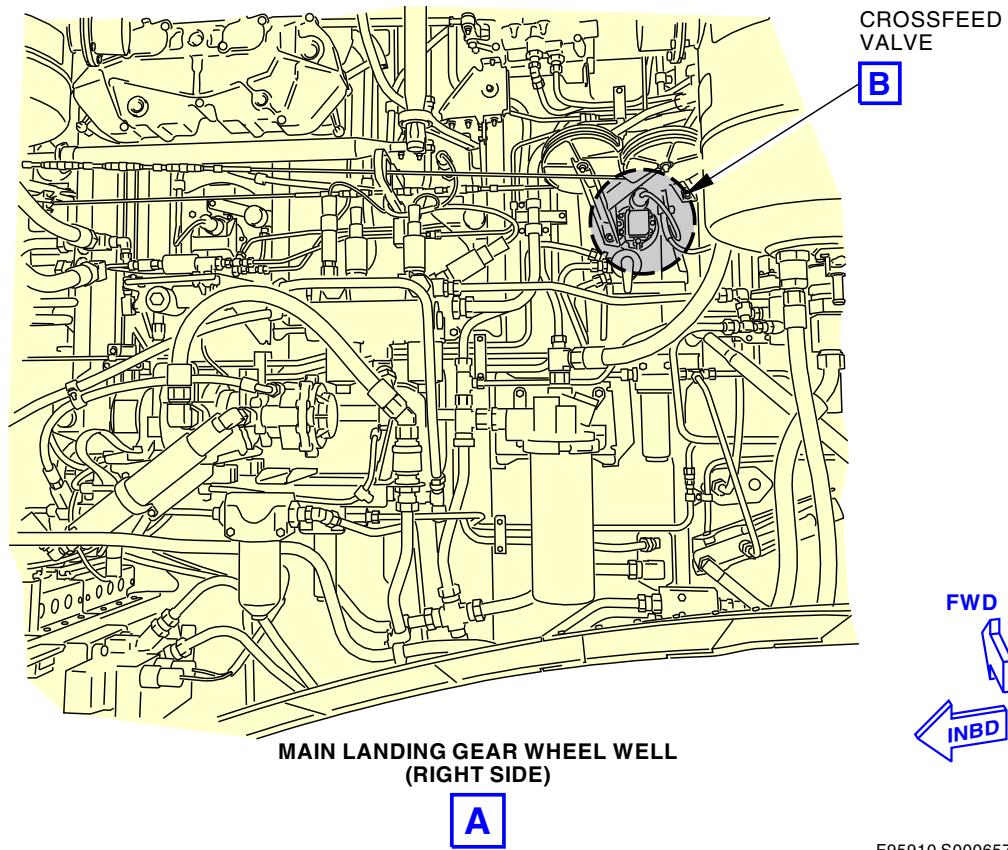
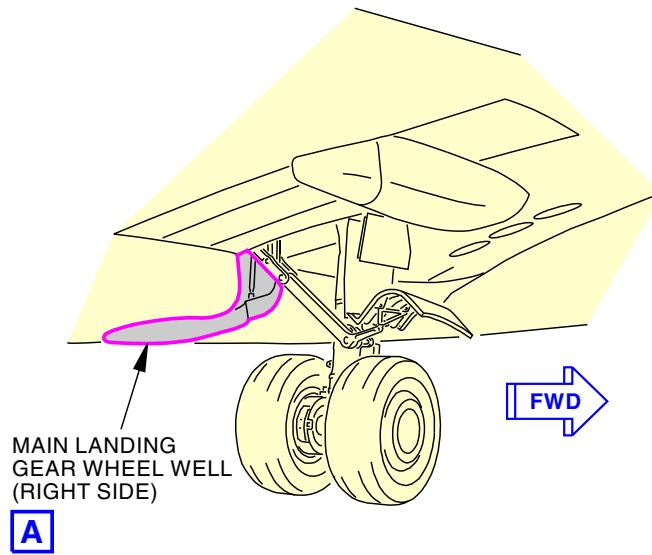
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

28-22-21



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AIRCRAFT MAINTENANCE MANUAL



F95910 S0006572041_V2

Crossfeed Valve Actuator Installation
Figure 401/28-22-21-990-804 (Sheet 1 of 2)

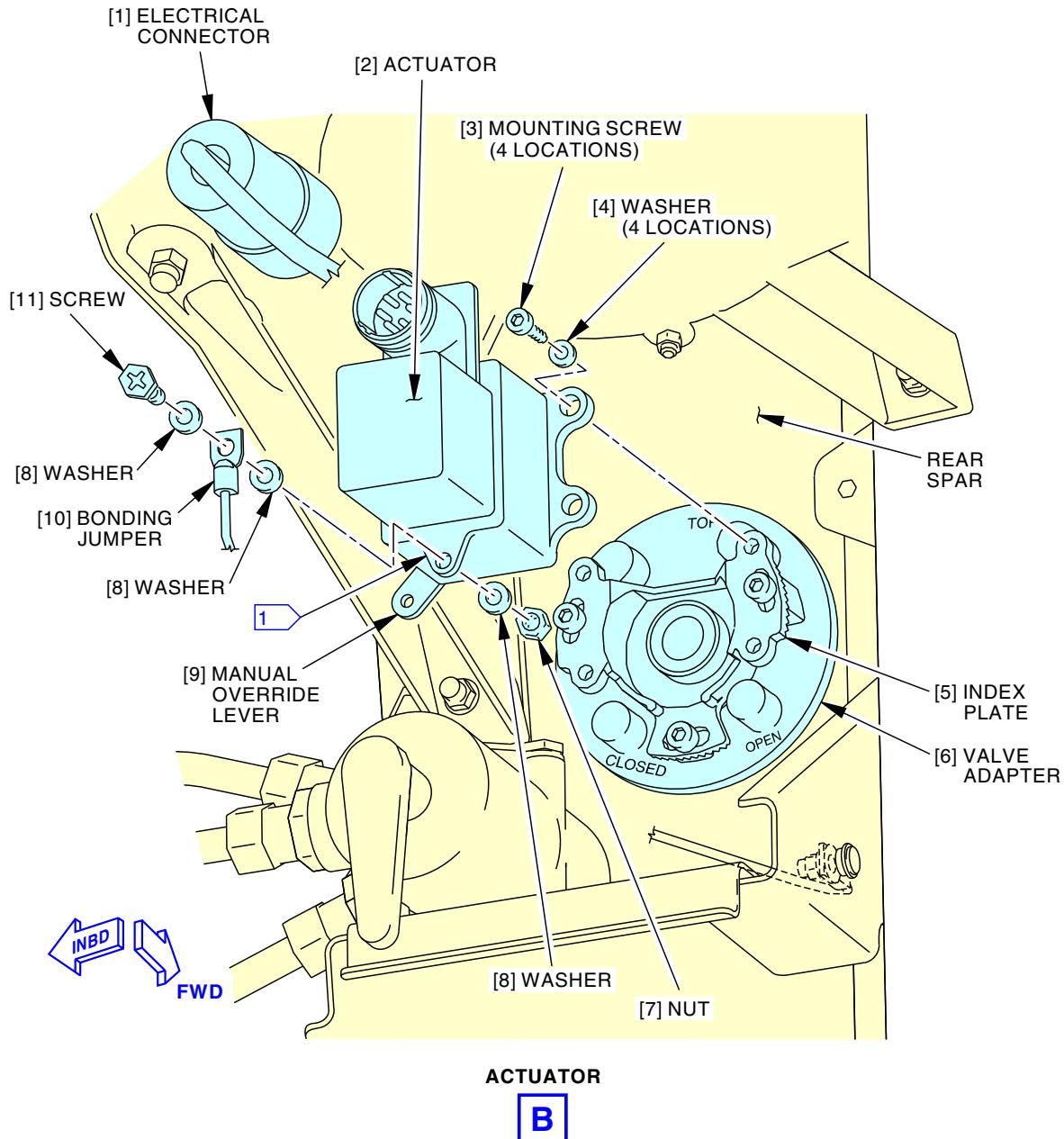
EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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- 1** PREPARE THE FAYING SURFACE OF THE BONDING JUMPER AND BONDING JUMPER TAB FOR AN ELECTRICAL SURFACE BOND. APPLY A FILLET SEAL TO THE BONDING JUMPER TERMINAL (SWPM 20-20-00).

G07915 S0006572042_V3

Crossfeed Valve Actuator Installation
Figure 401/28-22-21-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207;
AIRPLANES WITHOUT ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

TASK 28-22-21-400-801

3. Actuator of the Engine Fuel Crossfeed Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Actuator of the Engine Fuel Crossfeed Valve.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II

EFFECTIVITY
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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Reference	Description	Specification
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

F. Actuator of the Engine Fuel Crossfeed Valve Installation

SUBTASK 28-22-21-867-001



CHECK THAT GROUND LOCK ASSEMBLIES ARE INSTALLED IN MAIN LANDING GEAR TO PREVENT INADVERTENT OPERATION OF GEAR. INJURY TO PERSONNEL AND/OR EQUIPMENT COULD RESULT IF GEAR RETRACTS.

- (1) Make sure that the ground locks are installed on the landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-21-140-001

- (2) Remove the old sealant from these components (TASK 20-30-92-910-801):
 - (a) actuator [2] (if re-used)
 - (b) bonding jumper [10], screw [11], nut [7] and washers [8].



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-21-420-020

- (3) Move the manual override lever [9] of the actuator to the CLOSED position.

SUBTASK 28-22-21-420-021

- (4) Align the actuator output shaft with the adapter shaft.

EFFECTIVITY
LOM ALL

28-22-21



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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

SUBTASK 28-22-21-420-022

- (5) Make sure the two spaces for teeth on the adapter shaft align with the actuator output shaft.

SUBTASK 28-22-21-420-023

- (6) Put the actuator output shaft into the adapter shaft.

NOTE: The mounting feet on the actuator automatically align with the mounting points on the index plate.

SUBTASK 28-22-21-420-024

- (7) Install the four mounting screws [3] and the four washers [4].

SUBTASK 28-22-21-420-025

- (8) Tighten the mounting screws [3] to 20 in-lb (2.3 N·m).

SUBTASK 28-22-21-420-026

- (9) Install the lockwire on the mounting screws [3].

SUBTASK 28-22-21-110-001

- (10) Do these steps to prepare the bonding jumper [10] and the fasteners for an electrical faying surface bond (SWPM 20-20-00 and SWPM 20-20-10):



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- (a) Final clean the contact surfaces of the actuator [2], bonding jumper [10], and the fasteners with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
(b) Rub dry with a clean, dry cotton wiper, G00034.
(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-21-420-027

- (11) Install the nut [7], three washers [8], bonding jumper [10], and screw [11] to the actuator [2].
(a) Tighten the screw [11] to 35 in-lb (4 N·m).

SUBTASK 28-22-21-765-001

- (12) Make sure that the bonding resistance between the actuator [2] and the rear spar is 0.010 ohm (10 milliohms) or less (SWPM 20-20-00).
(a) Use an intrinsically safe approved bonding meter, COM-1550.

SUBTASK 28-22-21-420-028

- (13) Apply a cap seal of BMS5-142 sealant, A02315, on the bonding jumper [10] to fully cover the bonding jumper terminal with sealant.

EFFECTIVITY
LOM ALL

28-22-21



**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**

LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

SUBTASK 28-22-21-916-002

- (14) Do this task to apply protective finishes to the bare metal areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coating to the rear spar where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-21-916-001

- (15) Apply chemical conversion coating to any bare metal areas of the actuator [2] (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the actuator [2] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper tab that are not covered with sealant.

SUBTASK 28-22-21-410-004

- (16) Connect the electrical connector [1] to the actuator [2].

G. Actuator of the Engine Fuel Crossfeed Valve Installation Test

SUBTASK 28-22-21-860-005

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-710-001

- (2) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.

H. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-21-210-004



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Remove the ground locks installed on the landing gear if they are not needed for other tasks (TASK 32-00-01-080-801).

— END OF TASK —

EFFECTIVITY
LOM ALL

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017

TASK 28-22-21-000-804

4. Actuator of the Engine Fuel Crossfeed Valve Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the Actuator of the Engine Fuel Crossfeed Valve.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

EFFECTIVITY
LOM ALL

28-22-21



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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

E. Prepare for the Removal

SUBTASK 28-22-21-862-002

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-490-002



MAKE SURE YOU INSTALL THE GROUND LOCK ASSEMBLIES IN ALL
LANDING GEAR. ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN
CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-21-010-008

- (3) Go to the crossfeed valve location on the rear spar in the main landing gear wheel well (right side) (View A).

F. Actuator of the Engine Fuel Crossfeed Valve Removal

SUBTASK 28-22-21-420-029

- (1) Move the manual override lever [9] to the fully CLOSED position.

SUBTASK 28-22-21-420-030

- (2) Disconnect the electrical connector [1] from the actuator [15].

SUBTASK 28-22-21-140-002

- (3) Remove the sealant from the bonding jumper [13] and fasteners at the actuator attachment location.

(a) Use sealant removal tool, COM-2481, or equivalent.

SUBTASK 28-22-21-420-032

- (4) Remove the screw [14], two washers [12], and bonding jumper [13] from the actuator [15].

SUBTASK 28-22-21-420-033

- (5) Remove the four mounting screws [3] and the washers [4].

SUBTASK 28-22-21-420-034

- (6) Carefully disassemble the actuator [15] from the index plate [5].

NOTE: The actuator and index plate are bonded with faying surface sealant.

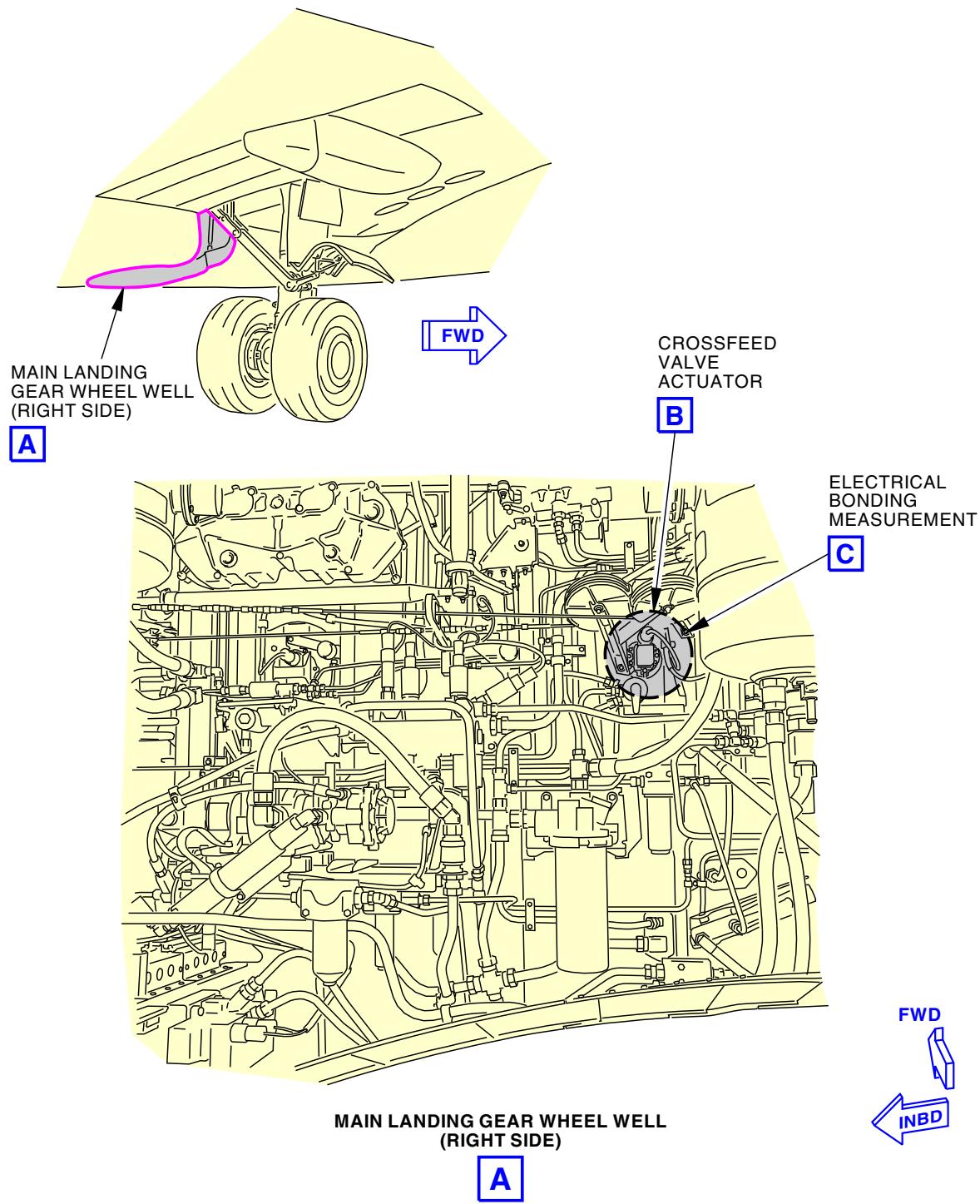
SUBTASK 28-22-21-420-035

- (7) Remove the actuator [15].

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-22-21



U45799 S0000197069_V2

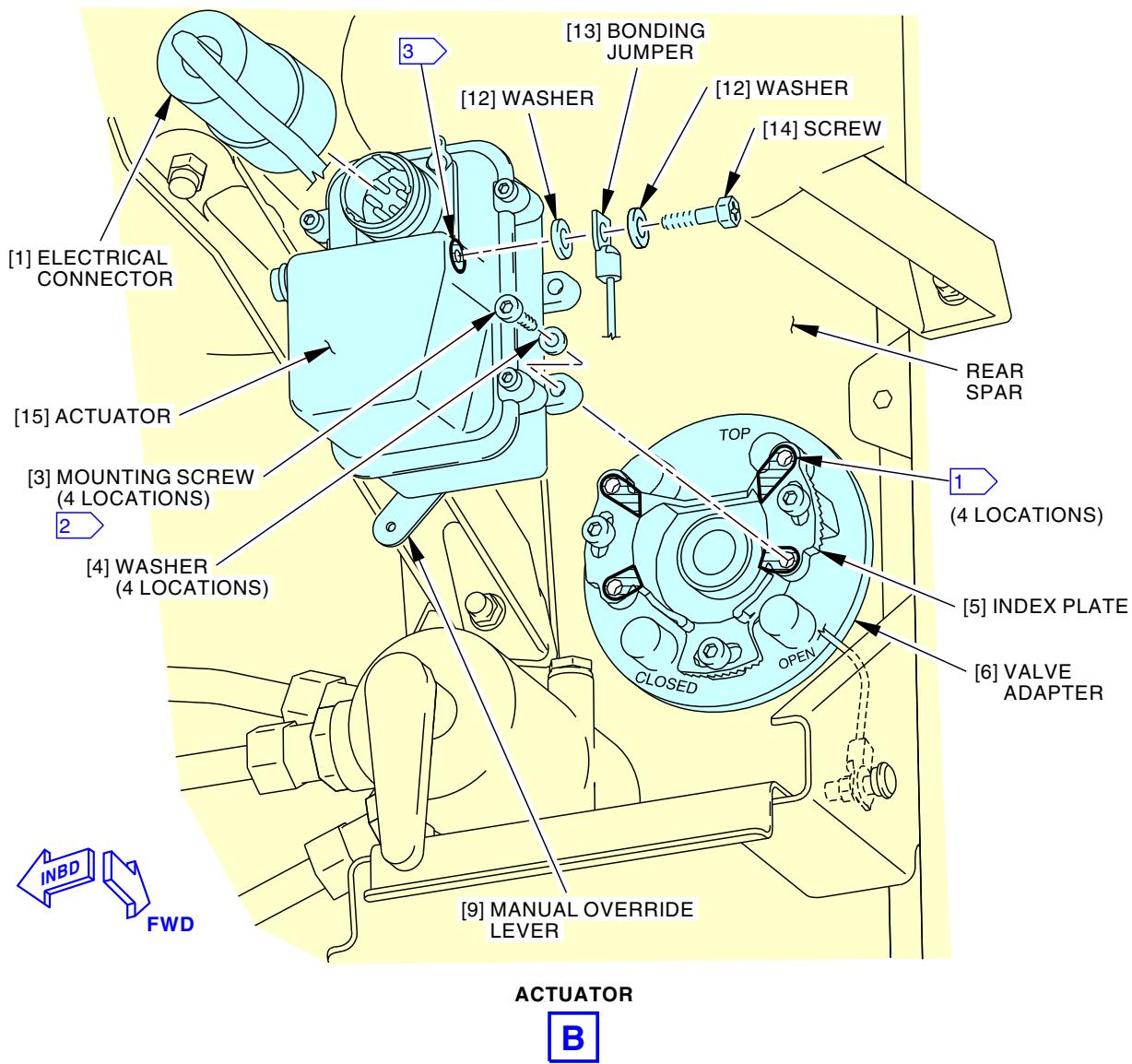
Crossfeed Valve Actuator Installation
Figure 402/28-22-21-990-806 (Sheet 1 of 4)

EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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- [1] PREPARE AND INSTALL THE CONTACT SURFACES OF THE INDEX PLATE AND ACTUATOR FOOTPADS (4 LOCATIONS) WITH A FAY SEALED FAY SURFACE BOND (SWPM 20-20-00).
- [2] APPLY SEALANT TO THE SHANK AND THREADS OF THE MOUNTING SCREWS.
- [3] CLEAN THE CONTACT SURFACES OF THE ACTUATOR AND BONDING JUMPER. AFTER ELECTRICAL BONDING MEASUREMENT, APPLY A CAP SEAL TO THE BONDING JUMPER SCREW.

U44339 S0000195975_V7

Crossfeed Valve Actuator Installation

Figure 402/28-22-21-990-806 (Sheet 2 of 4)

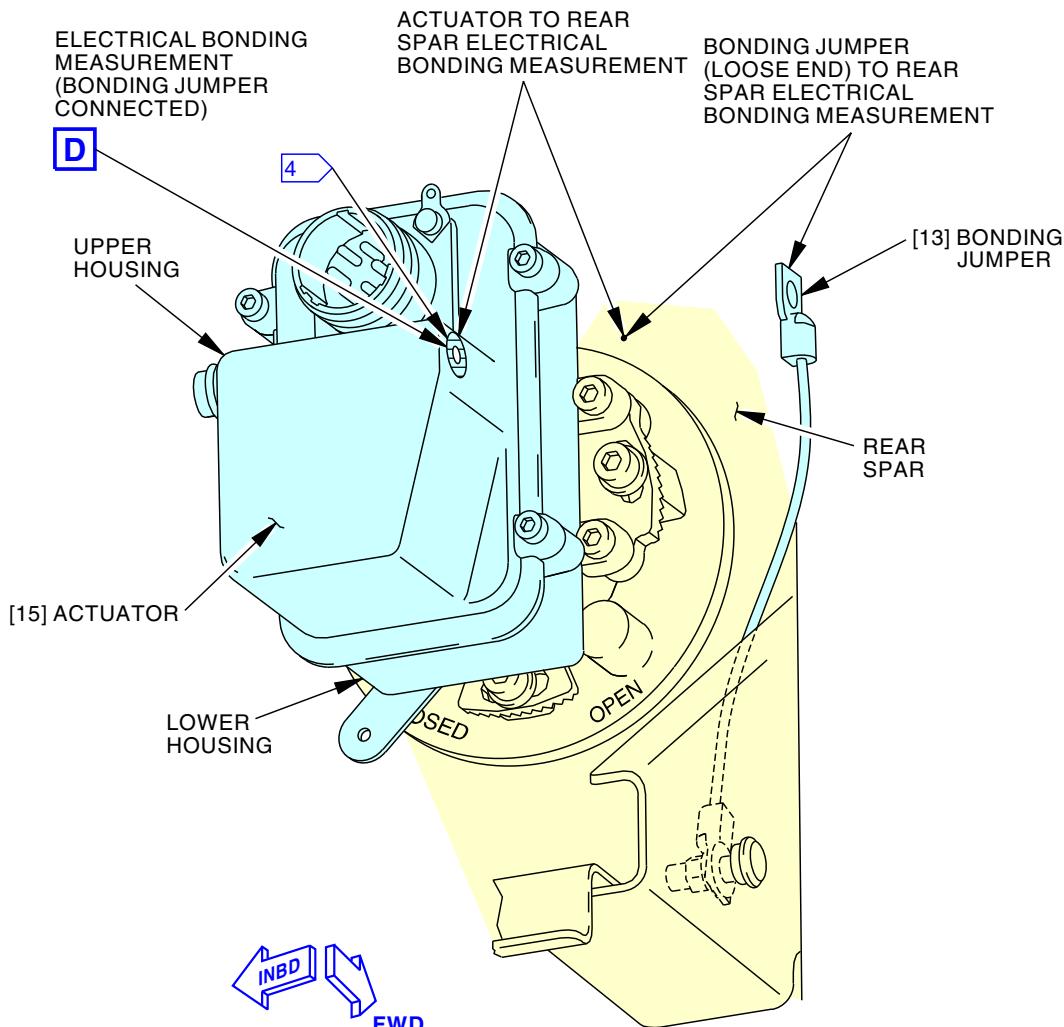
EFFECTIVITY
 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR
 MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**ELECTRICAL BONDING MEASUREMENT
(BONDING JUMPER DISCONNECTED)**

C

4 BARE METAL CONTACT SURFACE OF THE ACTUATOR AT
THE BONDING JUMPER INSTALLATION.

U45778 S0000197070_V3

**Crossfeed Valve Actuator Installation
Figure 402/28-22-21-990-806 (Sheet 3 of 4)**

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

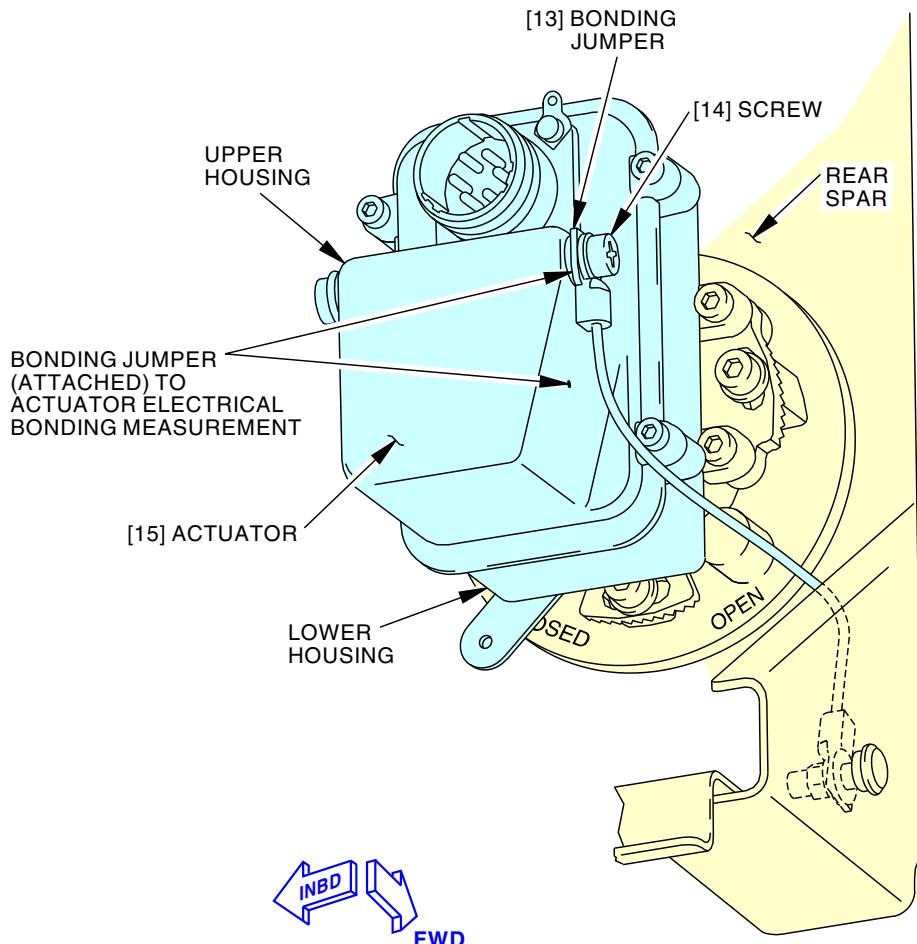
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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ELECTRICAL BONDING MEASUREMENT
(BONDING JUMPER CONNECTED)

D

U49687 S0000201352_V2

Crossfeed Valve Actuator Installation
Figure 402/28-22-21-990-806 (Sheet 4 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

TASK 28-22-21-400-804

5. Actuator of the Engine Fuel Crossfeed Valve Installation

(Figure 402)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

B. References

Reference	Title
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-11-300-801	Rework the Electrical Faying Surface Bonds for the Spar Valve (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659



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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
 AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Reference	Description	Specification
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

F. Procedure (View B)

SUBTASK 28-22-21-490-003



WARNING CHECK THAT GROUND LOCK ASSEMBLIES ARE INSTALLED IN MAIN LANDING GEAR TO PREVENT INADVERTENT OPERATION OF GEAR. INJURY TO PERSONNEL AND/OR EQUIPMENT COULD RESULT IF GEAR RETRACTS.

- (1) Make sure the ground locks are installed on the landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-21-110-002

- (2) Remove the old sealant and clean the actuator [15], index plate [5], and the fasteners (if reused).
(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant.



WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
1) soft bristle brush, STD-123
2) cotton wiper, G00034

SUBTASK 28-22-21-110-003

- (3) Do these steps to prepare the actuator [15] and the index plate [5] for a fay sealed fay surface bond (SWPM 20-20-00, SWPM 20-20-10):

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)



WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-21: CDCCL

- (d) Apply a thin continuous layer of sealant to the mating surfaces between the actuator [15] and the index plate [5] to install a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296, for the faying surface seal that is outside the tank.
 - 2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.
- (e) Apply sealant to the shank and the threads of the four mounting screws [3].
 - 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296 for the wet installation of the mounting screws [3].
 - 2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-21-420-036

- (4) Do these steps to install the actuator [15] to the index plate [5]:
 - (a) Make sure the manual override lever [9] on the actuator is in the CLOSED position.
 - (b) Align the actuator output shaft with the valve adapter [6].
 - (c) Make sure the two spaces for teeth on the valve adapter [6] align with the actuator output shaft.
 - (d) Put the actuator output shaft into the valve adapter [6].
- NOTE: The mounting feet on the actuator automatically align with the mounting points on the index plate.
- (e) Install the four mounting screws [3] and the washers [4].
- NOTE: Lockwire is not necessary for the mounting screws [3].
- (f) Tighten the mounting screws [3] to 20 in-lb (2.3 N·m).

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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.
- (h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.
- (i) Shape the squeezed out sealant into a fillet seal.
- (j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-21-765-002

► 28-AWL-21: CDCCL

- (5) Measure the electrical bonding resistance between the upper housing of the actuator [15] (at the bare metal bonding jumper installation location) and the rear spar (SWPM 20-20-10) (View C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (a) Do this measurement with the bonding jumper [13] and the electrical connector [1] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (b) Make sure the bonding jumper [13] does not touch the actuator [15] during the bonding measurement.
- (c) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (d) If the actuator [15], index plate [5] and valve adapter [6] (plate) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

EFFECTIVITY
LOM ALL

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

► 28-AWL-21: CDCCL

- (e) If the actuator [15] and index plate [5] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

► 28-AWL-21: CDCCL

- (f) If only the actuator [15] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-390-008

► 28-AWL-21: CDCCL

- (6) If the terminal of the bonding jumper [13] is disconnected from the stiffener, install the bonding jumper [13] with a fillet sealed fay surface bond between the stiffener and the terminal of the bonding jumper [13] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (a) if the terminal of the bonding jumper [13] is disconnected from the stiffener, apply a fillet seal to the terminal of the bonding jumper [13] at the stiffener (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- (b) If the terminal of the bonding jumper [13] is disconnected from the stiffener, measure the electrical bonding resistance between the loose end of the bonding jumper [13] and the spar (SWPM 20-20-10) (View C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

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► 28-AWL-21: CDCCL

- 2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801

SUBTASK 28-22-21-765-014

► 28-AWL-21: CDCCL

- (7) If the terminal of the bonding jumper [13] is not disconnected from the stiffener and prior to attaching the bonding jumper [13] to the actuator [15], measure the electrical bonding resistance between the loose end of the bonding jumper [13] and the spar (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-420-037

- (8) Do these steps to install the bonding jumper [13] to the actuator [15]:

- (a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
1) Rub dry with a clean, dry cotton wiper, G00034.
2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

► 28-AWL-21: CDCCL

- (b) Install the bonding jumper [13] with the screw [14] and the two washers [12], to the upper housing of the actuator [15] with a fillet sealed fay surface bond between the actuator [15] and the terminal of the bonding jumper [13] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

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- (c) Tighten the screw [14] to 35 in-lb (4 N·m).

SUBTASK 28-22-21-765-013

► 28-AWL-21: CDCCL

- (9) With the electrical connector [1] disconnected, measure the electrical bonding resistance between the upper housing of the actuator [15] and the attached terminal of the bonding jumper [13] (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Do not touch the screw [14] when you make the bonding measurement.
(b) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (c) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0010 ohm (1.0 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-390-006

► 28-AWL-21: CDCCL

- (10) Apply a cap seal over the screw [14] and the terminal lug of the bonding jumper [13] attached to the actuator [15].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296 to apply the cap seal.

SUBTASK 28-22-21-916-003

- (11) Do this task to apply protective finishes to the bare metal areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coatings to the rear spar where the electrical bonding probe removed the finish.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

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SUBTASK 28-22-21-916-004

- (12) Apply chemical conversion coating to all bare areas of the actuator [15]
(TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the actuator [15] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-22-21-410-005

- (13) Connect the electrical connector [1] to the actuator [15].

G. Crossfeed Valve Actuator Operational Test

SUBTASK 28-22-21-861-001

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-760-002

- (2) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.

H. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-21-090-001



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Remove the ground locks installed on the landing gear if they are not needed for other tasks
(TASK 32-00-01-080-801).

———— END OF TASK ————

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TASK 28-22-21-000-802

6. Engine Fuel Crossfeed Valve Adapter Removal

(Figure 403)

A. General

- (1) This task gives instructions to remove the Actuator of the Engine Fuel Crossfeed Valve Adapter.
- (2) The valve adapter and shaft assembly (valve adapter) is used to connect the actuator to the crossfeed valve body. The valve adapter consists of these components:
- Index plate
 - Adapter plate
 - Adapter shaft (with U-joint connection).

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B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

E. Access Panels

Number	Name/Location
131AB	Center Tank Access



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F. Prepare for the Removal

SUBTASK 28-22-21-650-001

- (1) Defuel the center fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-22-21-910-001



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

SUBTASK 28-22-21-650-003

- (3) Drain and purge the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-21-010-001

- (4) Remove this access panel:

Number Name/Location

131AB Center Tank Access

- (a) Do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.

G. Engine Fuel Crossfeed Valve Adapter Removal

SUBTASK 28-22-21-020-021

- (1) Do these steps on the outside of the fuel tank:

- (a) Do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-801.
- (b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate (View A-A).
 - 1) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent.

SUBTASK 28-22-21-020-022



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Go inside the center wing tank (TASK 28-11-00-910-802):

- (a) Go to the valve adapter [6] location (View B).
- (b) Remove the old sealant from the bolts [26] (View A-A).
- (c) Remove the four bolts [26] and the washers [27] to disconnect the valve adapter [6].
- (d) Disengage the shaft attached to the valve adapter [6] from the crossfeed valve body [21] (View C).

SUBTASK 28-22-21-020-023

- (3) Go out of the tank and remove the valve adapter [6].

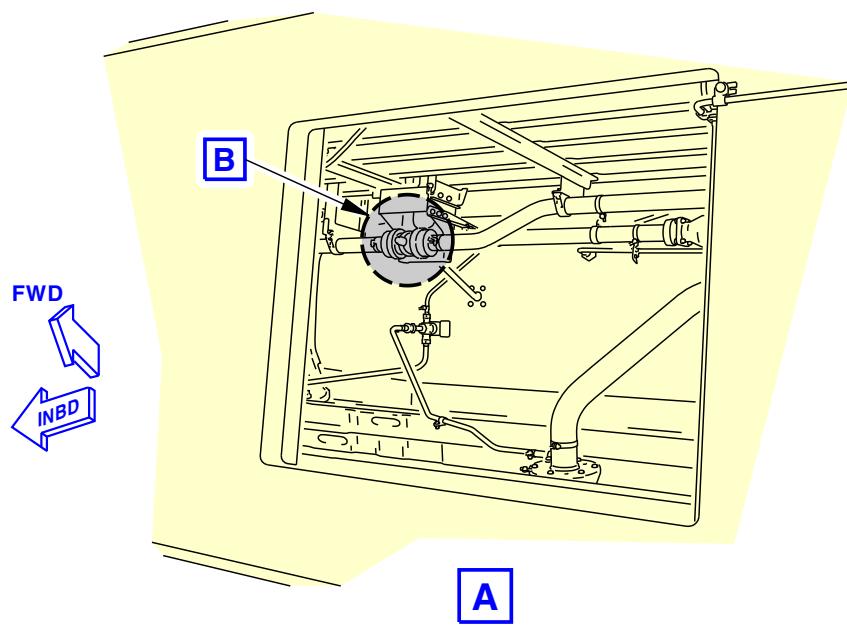
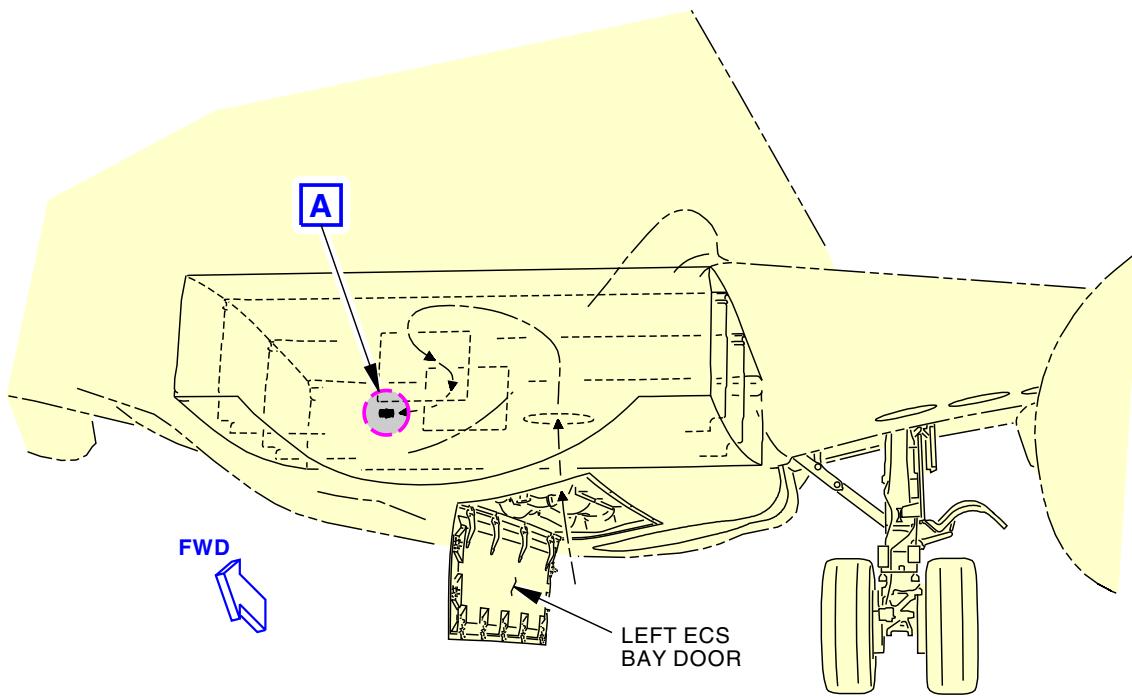
— END OF TASK —

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G08080 S0006572045_V3

Crossfeed Valve Adapter Installation
Figure 403/28-22-21-990-807 (Sheet 1 of 4)

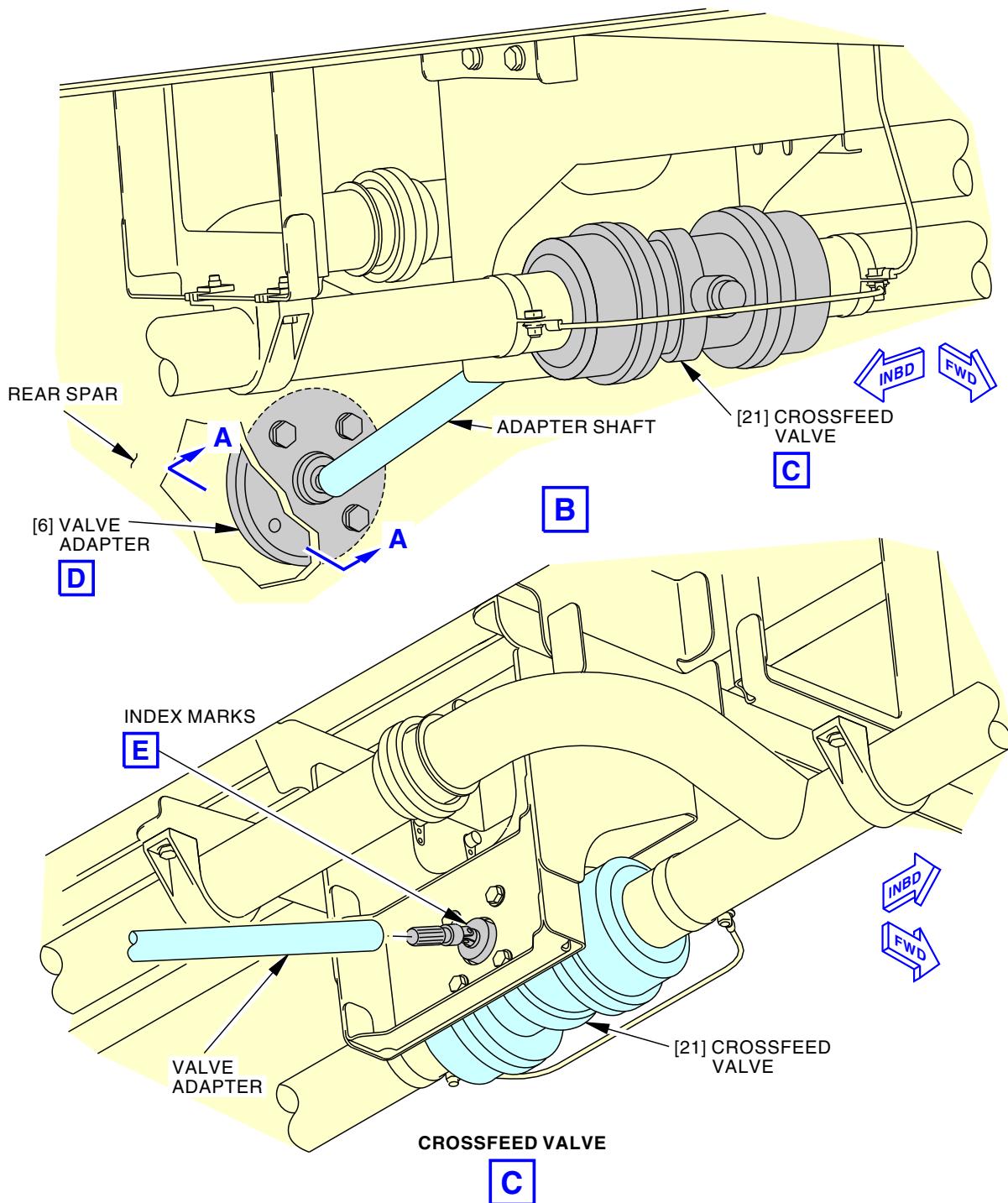
EFFECTIVITY
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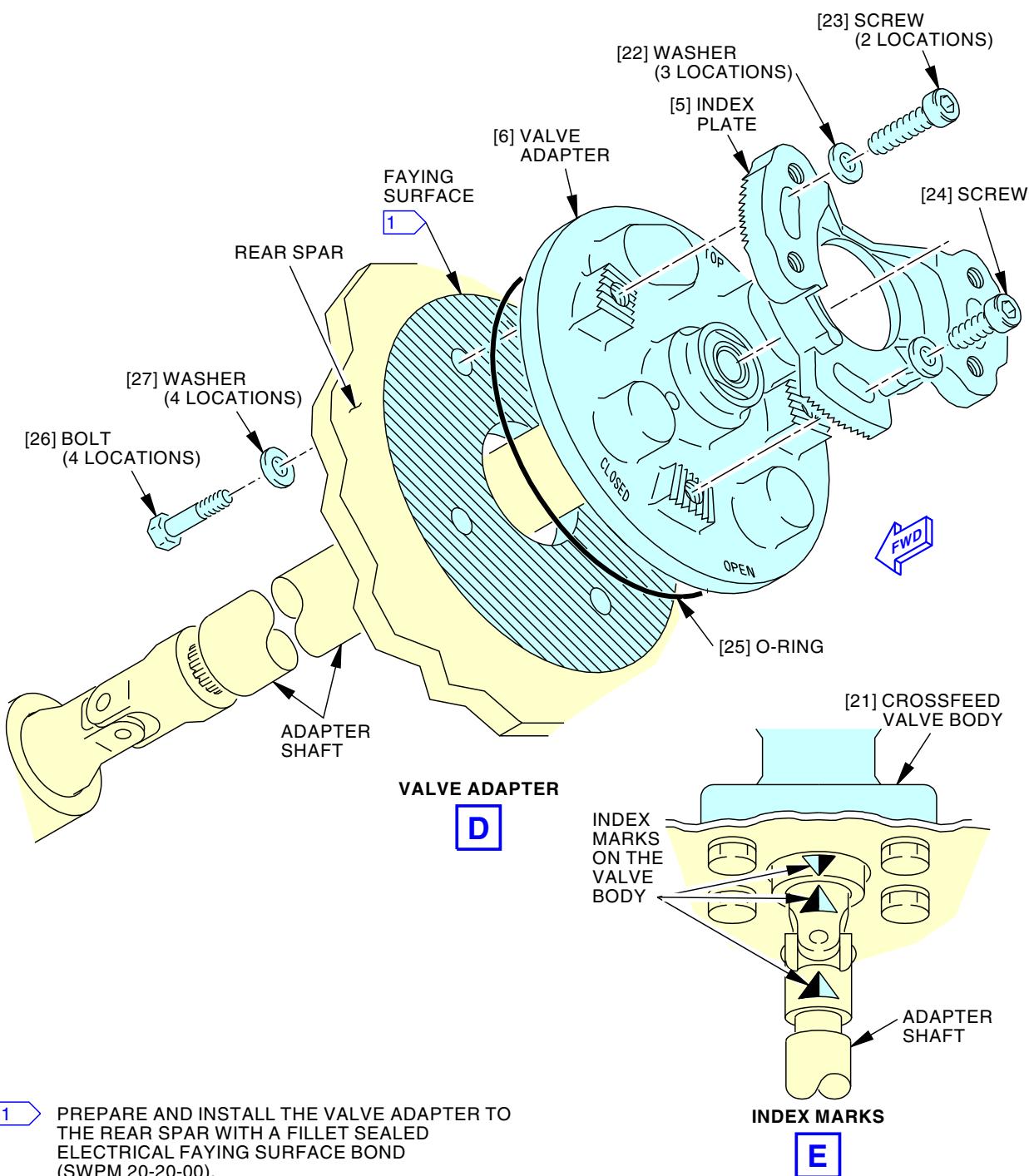
Crossfeed Valve Adapter Installation
Figure 403/28-22-21-990-807 (Sheet 2 of 4)

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U44435 S0000196435_V3

Crossfeed Valve Adapter Installation
Figure 403/28-22-21-990-807 (Sheet 3 of 4)

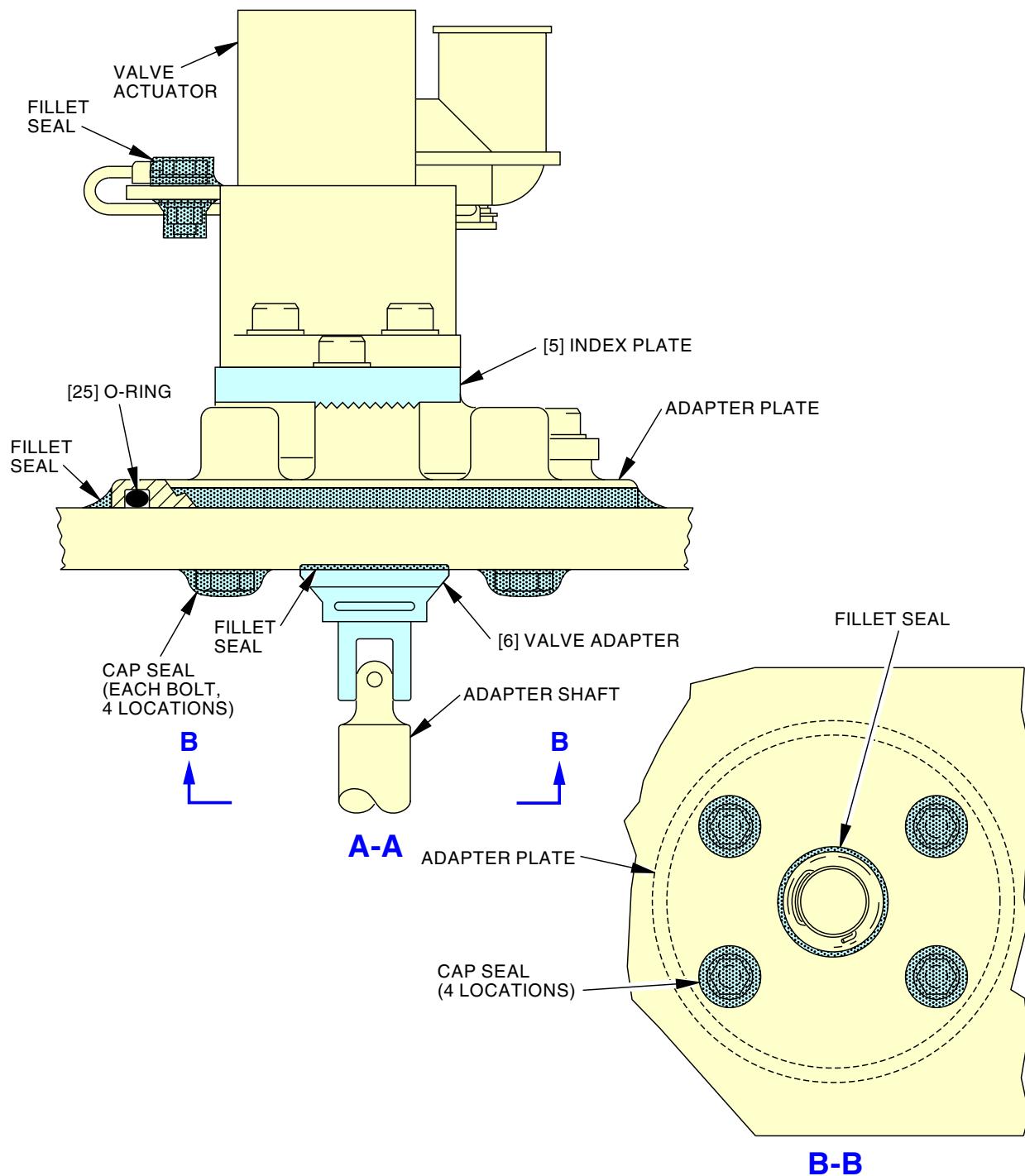
EFFECTIVITY
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 MA30A1001 OR MA30A1017

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U44436 S0000196436_V2

Crossfeed Valve Adapter Installation
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TASK 28-22-21-400-802

7. Engine Fuel Crossfeed Valve Adapter Installation

(Figure 403)

A. General

- (1) This task contains these procedures:
 - (a) Install the Valve Adapter
 - (b) Install the Index Plate
 - (c) Crossfeed Valve Operational Tests
 - (d) Put the Airplane Back to the Usual Condition

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-730-802	Crossfeed Valve - Functional Test (P/B 501)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

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(Continued)

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3

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(Continued)

Reference	Description	Specification
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersedes BMS15-5 CLA)
G50021	Pad - General Purpose Scrubbing - Scotch-Brite 96W	

E. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

F. Access Panels

Number	Name/Location
131AB	Center Tank Access

G. Engine Fuel Crossfeed Valve Adapter Installation

SUBTASK 28-22-21-140-003

- (1) Remove the old sealant and clean the rear spar contact area, valve adapter [6], and the fasteners (if reused).
 - (a) To remove the sealant from the rear spar use a sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034
 - 3) Scotch-Brite 96W pad, G50021

SUBTASK 28-22-21-110-004

- (2) Do these steps to prepare the valve adapter [6] and the rear spar for a fillet sealed electrical faying surface bond (View D):

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WARNING

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- (a) Final clean the contact surfaces of the valve adapter [6] and the rear spar with a cotton wiper, G00034 soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034 stays clean.

SUBTASK 28-22-21-420-038

- (3) On the outside of the airplane, do these steps (View D):

- (a) Put a thin layer of petrolatum grease, D00504 on the new O-ring [25].
- (b) Put the O-ring [25] in the O-ring groove of the valve adapter [6].
- (c) Put the adapter shaft attached to the valve adapter [6] through the hole in the rear spar.

SUBTASK 28-22-21-410-006



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Go into the fuel tank to the crossfeed valve location (View B).

SUBTASK 28-22-21-420-039

- (5) Do these steps to install the valve adapter [6]:

- (a) Make sure that the index marks on the crossfeed valve body [21] are aligned (View E).
NOTE: A small misalignment of the index marks is satisfactory.
- (b) Engage the adapter shaft of the valve adapter [6] with the crossfeed valve body [21] (View C).
- (c) Make sure that the shoulder of the valve adapter [6] does not bind in the opening of the rear spar.
- (d) Install the four bolts [26] and washers [27] to attach the valve adapter [6] to the rear spar.

SUBTASK 28-22-21-765-004

- (6) Measure the bonding resistance between the adapter plate of the valve adapter [6] and the rear spar with an electrical bonding intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

- (a) Make sure that the bonding resistance is not more than 0.0005 ohm (0.5 milliohm).

SUBTASK 28-22-21-390-004

- (7) On the inside of the fuel tank apply BMS5-45 sealant, A00767 to these components (View B-B):

- (a) A cap seal on the four bolts [26] (TASK 51-31-00-390-804).

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**LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR
MA30A1017 (Continued)**

- (b) A fillet seal on the periphery of the rear spar penetration and the stationary part of the adapter plate.

NOTE: Make sure that the sealant does not touch the adapter shaft or the other parts of the valve adapter that rotate.

SUBTASK 28-22-21-390-005

- (8) On the outside of the fuel tank, apply a fillet seal of BMS5-95 sealant, A00247 around the periphery of the valve adapter [6] (TASK 51-31-00-390-804) (View A-A).

SUBTASK 28-22-21-916-005

- (9) Do this task to apply protective finishes to the bare metal areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coating to the rear spar at all bare metal areas that are not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

SUBTASK 28-22-21-916-006

- (10) Apply chemical conversion coating to all bare areas of the valve adapter [6] (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the valve adapter [6] where the electrical bonding probe removed the finish.

SUBTASK 28-22-21-860-012

- (11) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

- (a) Install this access panel:

Number	Name/Location
131AB	Center Tank Access
(TASK 28-11-31-400-801).	

SUBTASK 28-22-21-820-007

- (12) Do this task: Crossfeed Valve Alignment, TASK 28-22-21-820-801.

H. Install the Index Plate

SUBTASK 28-22-21-820-008

- (1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate [5] and the valve adapter [6] per this task: Crossfeed Valve Alignment, TASK 28-22-21-820-801.

SUBTASK 28-22-21-420-040

- (2) Do these steps to install the index plate [5]:

- (a) Align the index plate [5] and the valve adapter [6] with the mark that you made during crossfeed valve alignment procedure.
- (b) Install the shorter index screw [24] and washer [22] in the bottom index location (6 o'clock position).

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LOM 402, 404, 406 PRE SB 737-28A1207; AIRPLANES WITHOUT ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

- (c) Install the two longer index screws [23] and washers [22] in the top index mounting locations.
- (d) Tighten the index screws to 22 ± 1 in-lb (2.5 ± 0.1 N·m).
- (e) Lockwire the top two screws [23] and the bottom screw [24] to the index plate [5].

SUBTASK 28-22-21-420-041

- (3) Do this task: Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-801.

I. Crossfeed Valve Operational Tests

NOTE: These tests will make sure the crossfeed valve electrical operation is correct, the crossfeed valve plate alignment is correct, and that there are no fuel leaks through the rear spar.

SUBTASK 28-22-21-710-005

- (1) Do these tasks:

- (a) Crossfeed Valve Operational Test, TASK 28-22-21-710-801

NOTE: This test is done when you install the valve actuator.

- (b) Crossfeed Valve - Functional Test, TASK 28-22-00-730-802.

SUBTASK 28-22-21-790-001

- (2) Do this leak check if you have replaced the valve adapter [6]:

NOTE: The leak check is only necessary if you have done a fuel tank entry and replaced the valve adapter [6]. It is not necessary if you have replaced or aligned the index plate [5] for adjustment purposes only.

- (a) Refuel the center fuel tank to a minimum of 13,000 pounds (5900 kilograms) (TASK 12-11-00-650-802).

NOTE: This is the fuel quantity necessary to make sure that there are no leaks at the rear spar.

- (b) Make sure that there are no fuel leaks at the valve adapter [6] installation on the rear spar.

- (c) Make sure there is no fuel leaks at this access door:

Number Name/Location

131AB Center Tank Access

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-21-090-002



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Remove the ground locks installed on the landing gear if they are not needed for other tasks (TASK 32-00-01-080-801).

———— END OF TASK ————

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017

TASK 28-22-21-000-805

8. Engine Fuel Crossfeed Valve Adapter Removal

(Figure 404)

A. General

- (1) This task gives instructions to remove the Engine Fuel Crossfeed Valve Adapter.
- (2) The valve adapter and shaft assembly (valve adapter) is used to connect the actuator to the crossfeed valve body. The valve adapter consists of these components:
 - (a) Index plate
 - (b) Adapter plate
 - (c) Adapter shaft (with U-joint connection).

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975

EFFECTIVITY
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

(Continued)

Reference	Description
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

E. Access Panels

Number	Name/Location
131AB	Center Tank Access

F. Prepare for the Removal

SUBTASK 28-22-21-650-004

- (1) Defuel the center fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-22-21-860-013



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

SUBTASK 28-22-21-650-005

- (3) Drain and purge the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-21-010-009

- (4) Remove this access panel:

Number Name/Location

131AB Center Tank Access

- (a) Do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.

G. Engine Fuel Crossfeed Valve Adapter Removal

SUBTASK 28-22-21-020-024

- (1) Do these steps on the outside of the fuel tank:

- (a) Do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-804.
- (b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate (View A-A).
 - 1) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent.



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**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

SUBTASK 28-22-21-020-025



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Go into the center tank and do these steps:
 - (a) Go to the valve adapter [6] location (View B).
 - (b) Remove the old sealant from the four bolts [26] and the valve adapter [6] rear spar penetration (View A-A).
 - (c) Remove the four bolts [26] and the washers [27] to disconnect the valve adapter [6].
 - (d) Disengage the adapter shaft attached to the valve adapter [6] from the crossfeed valve body [21] (View C).

SUBTASK 28-22-21-020-026

- (3) Go out of the tank and remove the valve adapter [6] from the rear spar.

H. Remove the Index Plate

NOTE: Do these steps if you will reuse the valve adapter and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old valve adapter and install a new valve adapter, it is not necessary to disassemble the index plate.

SUBTASK 28-22-21-020-027

- (1) Do these steps to remove the index plate [5] from the valve adapter [6] (View D):
 - (a) Remove the lockwire from the two index screws [23] and index screw [24].
 - (b) Remove index screws [23], index screw [24], and the washers [22].
 - (c) Carefully disassemble the index plate [5] and the valve adapter [6].

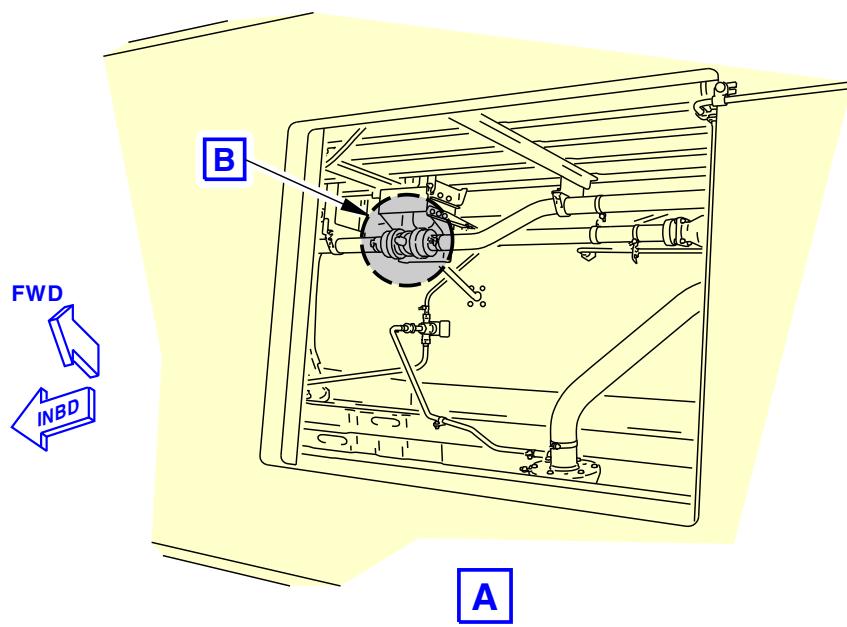
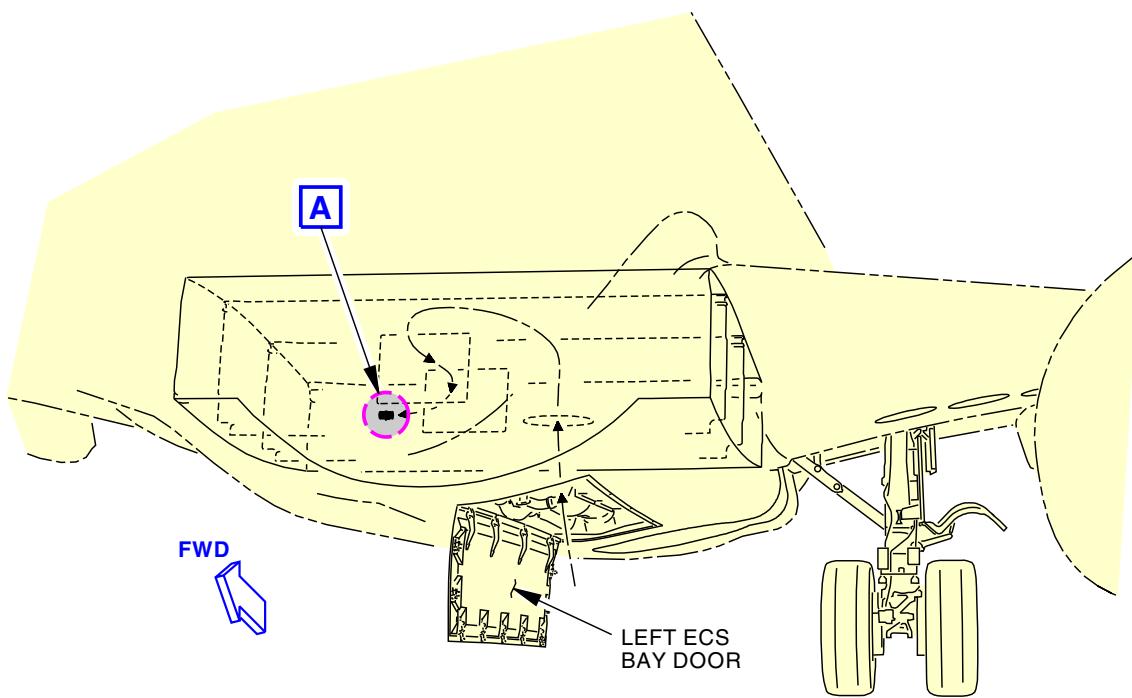
NOTE: The two plates are bonded with faying surface sealant.

———— END OF TASK ————

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G08080 S0006572045_V3

**Crossfeed Valve Adapter Installation
Figure 404/28-22-21-990-808 (Sheet 1 of 5)**

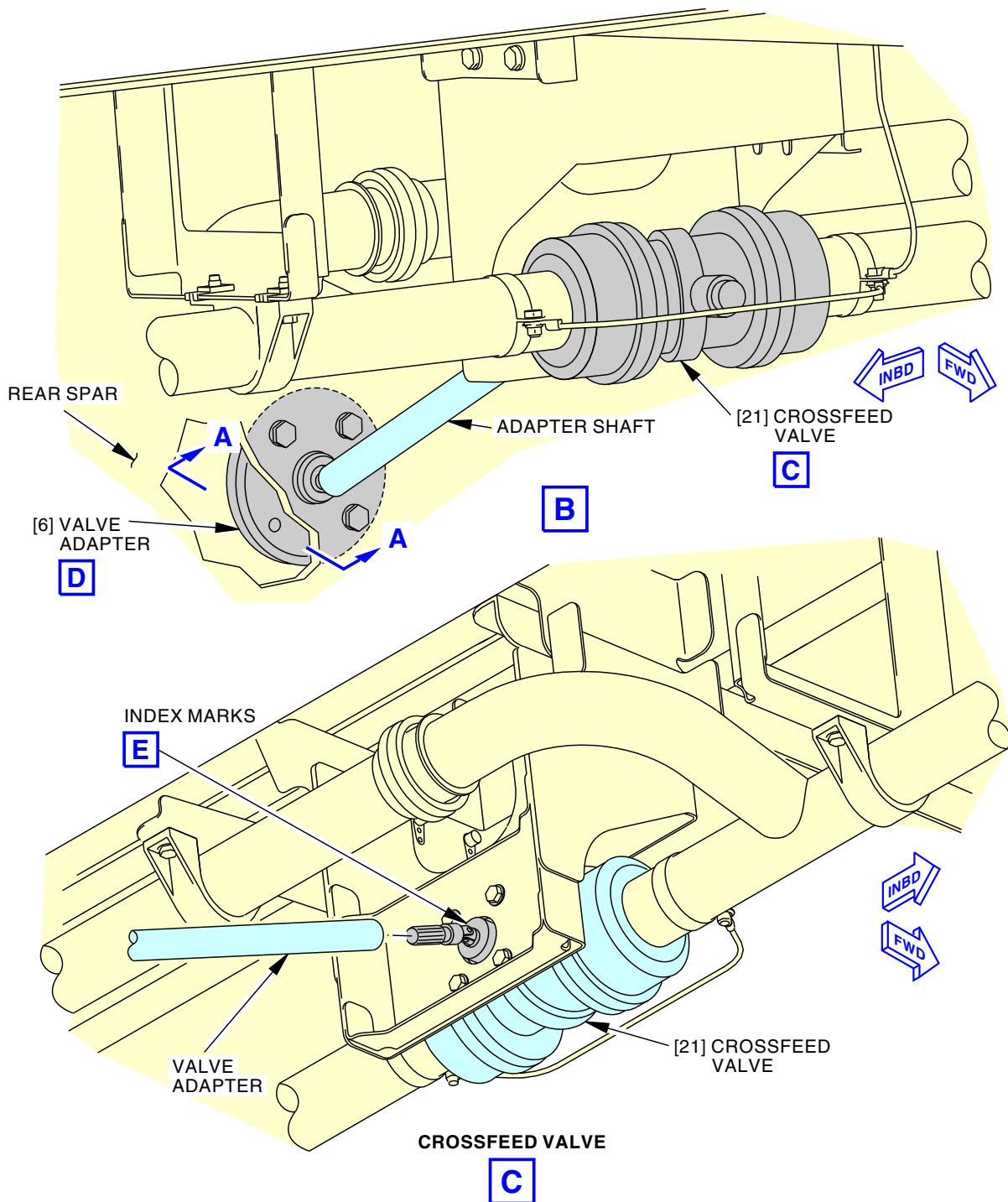
EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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U44542 S0000196434_V3

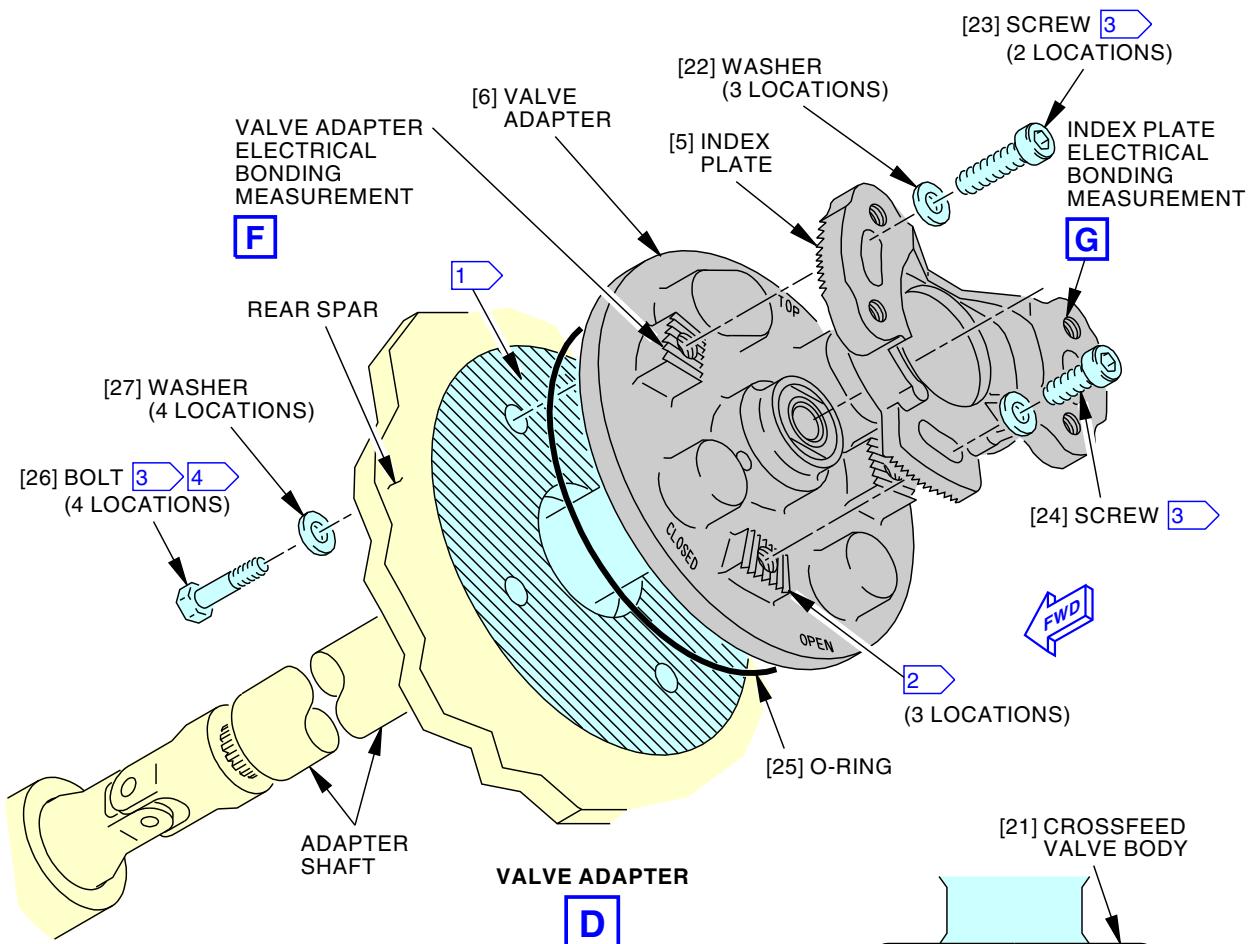
Crossfeed Valve Adapter Installation
Figure 404/28-22-21-990-808 (Sheet 2 of 5)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

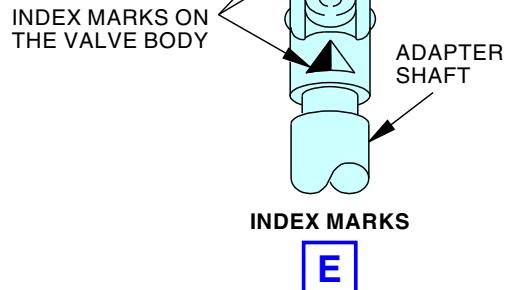
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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- 1** PREPARE AND INSTALL THE VALVE ADAPTER TO THE REAR SPAR WITH A FILLET SEAL FAY SURFACE BOND (SWPM 20-20-00).
- 2** PREPARE AND INSTALL THE SERRATED CONTACT SURFACES OF THE VALVE ADAPTER AND INDEX PLATE WITH A FAY SEALED FAY SURFACE BOND (3 LOCATIONS) (SWPM 20-20-00).
- 3** APPLY SEALANT TO THE SHANK AND THREADS OF THE FASTENERS DURING THE INSTALLATION.
- 4** AFTER INSTALLATION, APPLY A CAP SEAL TO THE HEAD OF THE FASTENERS.



U44431 S0000196481_V4

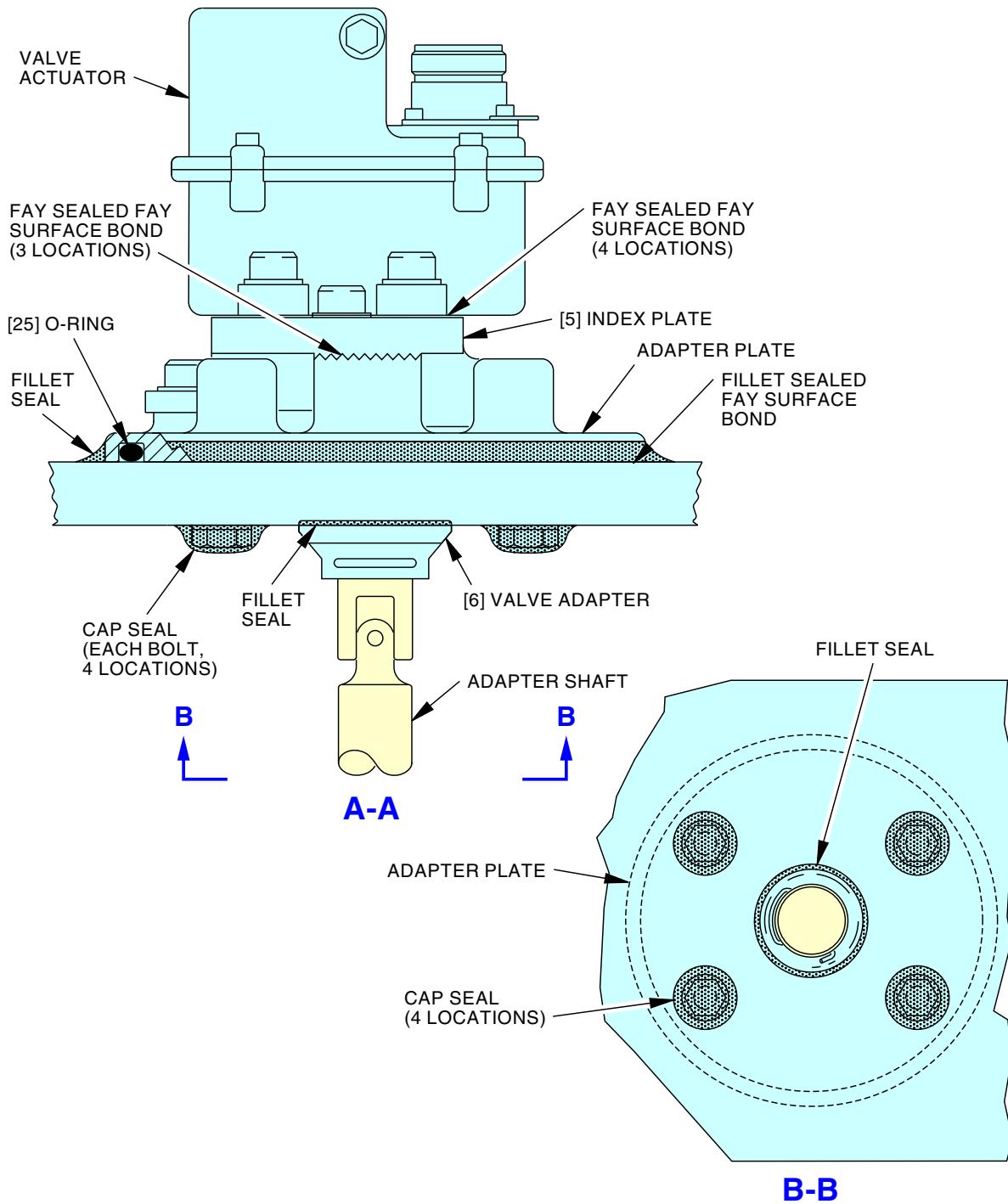
Crossfeed Valve Adapter Installation
Figure 404/28-22-21-990-808 (Sheet 3 of 5)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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U44440 S0000196482_V3

Crossfeed Valve Adapter Installation
Figure 404/28-22-21-990-808 (Sheet 4 of 5)

EFFECTIVITY

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

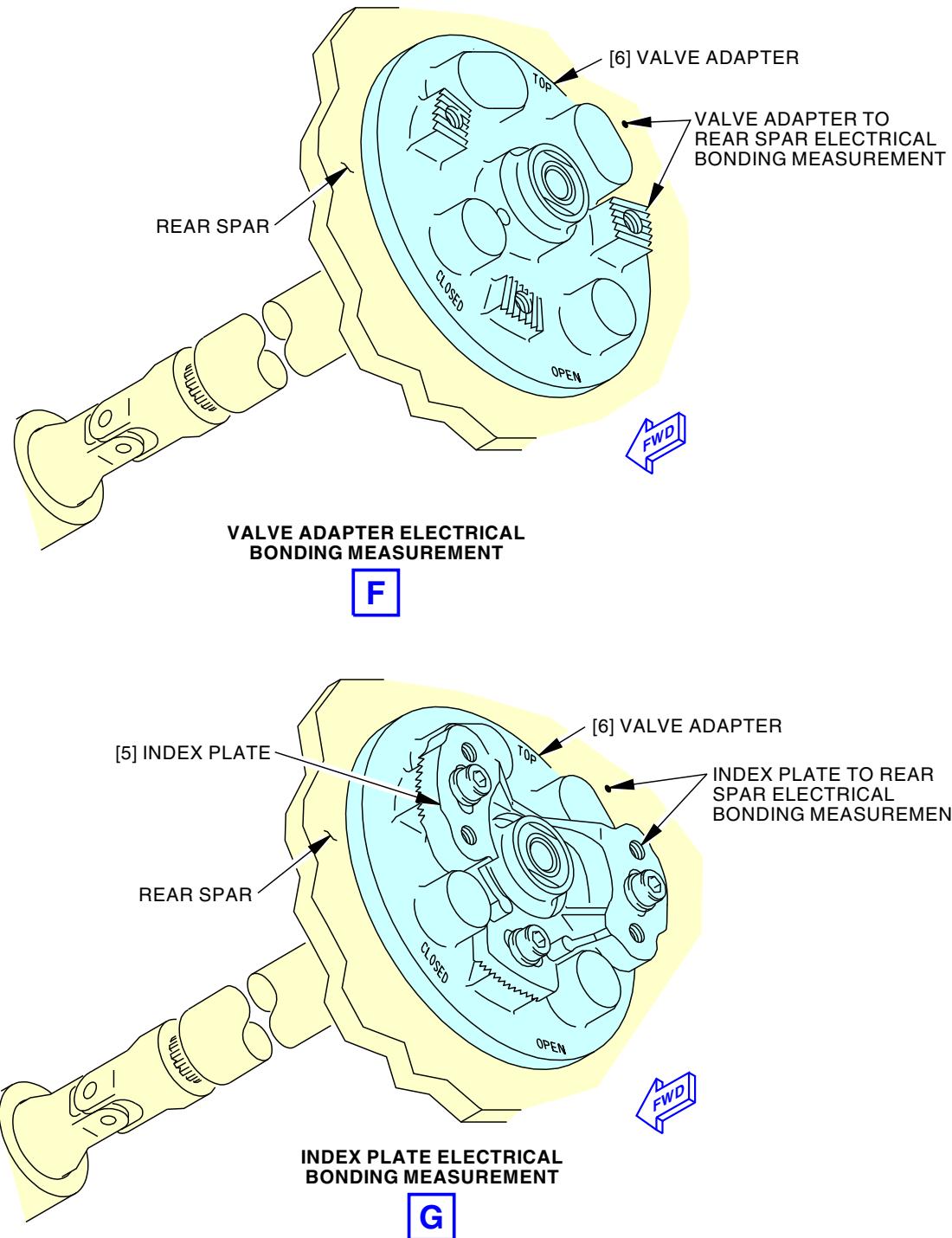
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U46101 S0000197102_V2

Crossfeed Valve Adapter Installation
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EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR
MA30A1001 OR MA30A1017

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

TASK 28-22-21-400-805

9. Engine Fuel Crossfeed Valve Adapter Installation

(Figure 404)

A. General

- (1) This task has these procedures:
 - (a) Install the Valve Adapter
 - (b) Install the Index Plate
 - (c) Crossfeed Valve Operational Tests
 - (d) Put the Airplane Back to the Usual Condition
- (2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are acceptable sealants.
- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-730-802	Crossfeed Valve - Functional Test (P/B 501)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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 AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

(Continued)

Reference	Description	Specification
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

F. Access Panels

Number	Name/Location
131AB	Center Tank Access

G. Install the Valve Adapter

SUBTASK 28-22-21-140-004

- (1) Remove the old sealant and clean the rear spar, valve adapter [6], index plate [5], and the fasteners (if re-used).
 - (a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.
 - (b) If new, use an abrasive pad to remove the anodized finish from the faying surfaces of the valve adapter [6] and index plate [5] (SWPM 20-20-00).

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
- 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-22-21-110-005

- (2) Do these steps to prepare the valve adapter [6] and the rear spar for a fay sealed fay surface bond (View D):



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces of the valve adapter [6] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-21-390-007

► 28-AWL-21: CDCCL

- (3) Install a fillet sealed fay surface bond between the valve adapter [6] (plate) and the rear spar outside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

SUBTASK 28-22-21-420-045

- (4) On the outside of the airplane, do these steps:
- (a) Put a thin layer of petrolatum grease, D00504, on the new O-ring [25].
 - (b) Put the O-ring [25] in the O-ring groove of the valve adapter [6].
 - (c) Put the adapter shaft attached to the valve adapter [6] through the hole in the rear spar.
 - (d) Make sure the shoulder of the valve adapter [6] does not bind in the opening of the rear spar.

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

SUBTASK 28-22-21-410-007



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Go into the center tank to the crossfeed valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-21-420-043

- (6) Do these steps to install the valve adapter [6]:

- (a) Make sure that the index marks on the body of the crossfeed valve body [21] are aligned (View E).

NOTE: A small misalignment of the index marks is satisfactory.

- (b) Engage the adapter shaft of the valve adapter [6] with the crossfeed valve body [21] (View C).

- (c) Apply sealant to the shank and the threads of the four bolts [26].

- 1) Use sealant, A50110, for the wet installation of the bolts [26].

- 2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

- (d) Install the four bolts [26] and washers [27] to attach the valve adapter [6].

SUBTASK 28-22-21-420-044

► 28-AWL-21: CDCCL

- (7) On the inside of the tank, apply a cap seal to each of the four bolts [26] (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use sealant, A50110, Class B, to apply the cap seal.

SUBTASK 28-22-21-420-064

► 28-AWL-21: CDCCL

- (8) On the inside of the tank, apply a fillet seal around the edge of the hole and the stationary part of the valve adapter plate (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Make sure the sealant does not touch the adapter shaft or other parts of the valve adapter that turn.

- (b) Use sealant, A50110, Class B, to apply the fillet seal.

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SUBTASK 28-22-21-420-046

► 28-AWL-21: CDCCL

- (9) On the outside of the tank, apply a fillet seal around the periphery of the valve adapter [6] (plate) and the spar (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801 for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use sealant, A50110, Class B, to apply the fillet seal.

SUBTASK 28-22-21-765-005

- (10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised serrated surfaces of the valve adapter [6] (plate) and the rear spar (View F) (SWPM 20-20-00).

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-410-008

- (11) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

- (a) Install this access panel:

Number Name/Location

131AB Center Tank Access

Do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801.

SUBTASK 28-22-21-820-009

- (12) Do this task: Crossfeed Valve Alignment, TASK 28-22-21-820-801.

H. Install the Index Plate

SUBTASK 28-22-21-820-010

- (1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate and adapter plate per this task: Crossfeed Valve Alignment, TASK 28-22-21-820-801.

SUBTASK 28-22-21-020-028

- (2) Remove the index plate [5] from the valve adapter [6].

SUBTASK 28-22-21-110-006

- (3) Do these steps to prepare the index plate [5] and the valve adapter [6] for a sealed electrical faying surface bond (SWPM 20-20-00):

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- (a) Protect the alignment reference mark when you clean the index plate [5] and the valve adapter [6] for the electrical bond.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
(c) Rub dry with a clean, dry cotton wiper, G00034.
(d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-21: CDCCL

- (e) Apply a thin continuous layer of sealant to the serrated surface of the index plate [5] (three locations) to install a fay sealed fay surface bond between the serrated mating surfaces of the index plate [5] and the valve adapter [6] (plate).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296, for the faying surface seal that is outside the tank.
 - 2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.
- (f) Apply sealant to the shank and the threads of the two top index screws [23] and the bottom index screw [24].
- 1) Use sealant, A50337 (BMS 5-45 Class B), for the wet installation of the index screws.
 - 2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-21-420-047

- (4) Do these steps to install the index plate [5]:
- (a) Align the index plate [5] and the valve adapter [6] with the alignment reference mark that you made during the crossfeed valve alignment procedure.
 - (b) Install the two longer index screws [23] and washers [22] in the top index mounting hole positions.
 - (c) Install the shorter index screw [24] and washer [22] in the bottom index mounting hole location (6 o'clock position).
 - (d) Tighten the index screws to 22 ± 1 in-lb (2.5 ± 0.1 N·m).
 - (e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

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- (f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.
- (g) Shape the squeezed out sealant into a fillet seal (TASK 51-31-00-390-804).
- (h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-21-765-006

- (5) Measure the electrical bonding resistance between one of the actuator feet contact surfaces on the index plate [5] (bare metal surface) and the rear spar (View G).
 - (a) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (b) Make sure the electrical bonding resistance is 0.002 ohm (2.0 milliohms) or less.
 - 1) If the electrical bonding resistance is more than 0.002 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-760-004

► 28-AWL-21: CDCCL

- (6) Measure the electrical bonding resistance between the index plate [5] and the valve adapter [6] (plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

► 28-AWL-21: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve, TASK 28-22-21-300-801.

SUBTASK 28-22-21-420-048

- (7) Lockwire the two top two screws [23] and the bottom screw [24] to the index plate [5].

SUBTASK 28-22-21-420-049

- (8) Do this task: Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-804.

SUBTASK 28-22-21-370-004

- (9) Do this task to apply protective finishes to the bare metal areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective coating to the rear spar at all bare metal areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

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- (a) These are the protective finishes:
 - 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
 - 2) BMS 10-20 coating, C00307.

I. Crossfeed Valve Operational Tests

NOTE: These tests will make sure the crossfeed valve electrical operation is correct, the crossfeed valve plate alignment is correct, and that there are no fuel leaks through the rear spar.

SUBTASK 28-22-21-760-003

- (1) Do these tasks:

- (a) Crossfeed Valve Operational Test, TASK 28-22-21-710-801

NOTE: This test is done when you install the valve actuator.

- (b) Crossfeed Valve - Functional Test, TASK 28-22-00-730-802.

SUBTASK 28-22-21-790-002

- (2) Do this leak check if you have replaced the valve adapter [6]:

NOTE: The leak check is only necessary if you have done a fuel tank entry and replaced the valve adapter [6]. It is not necessary if you have replaced or aligned the index plate [5] for adjustment purposes only.

- (a) Refuel the center fuel tank to a minimum of 13,000 lb (5897 kg) (TASK 12-11-00-650-802).

NOTE: This is the fuel quantity necessary to make sure there are no leaks at the rear spar.

- (b) Make sure there are no fuel leaks at the valve adapter [6] installation on the rear spar.

- (c) Make sure there are no fuel leaks at this access door:

Number Name/Location

131AB Center Tank Access

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-21-090-003



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Remove the ground locks installed on the landing gear if they are not needed for other tasks (TASK 32-00-01-080-801).

LOM ALL

———— END OF TASK ————

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TASK 28-22-21-820-801

10. Crossfeed Valve Alignment

(Figure 405)

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: 5718A42 Supplier: 3A054 Opt Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment - Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Prepare for the Procedure

SUBTASK 28-22-21-490-004



MAKE SURE YOU INSTALL THE GROUND LOCK ASSEMBLIES IN ALL LANDING GEAR. ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-21-010-011

- (2) Go to the crossfeed valve location on the rear spar in the main landing gear wheel well (right side) (View A).

LOM 402, 404, 406 PRE SB 737-28A1207

SUBTASK 28-22-21-010-003

- (3) If not done previously, do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-801.

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207

SUBTASK 28-22-21-010-010

- (4) If not done previously, do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-804.

LOM ALL

SUBTASK 28-22-21-010-012

- (5) If not done previously, remove the index plate [5] from the adapter plate.

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E. Crossfeed Valve Alignment

SUBTASK 28-22-21-820-011

- (1) Do these steps to install the alignment tool [64] (valve alignment equipment, SPL-1771) in the valve adapter [6] (View B):
 - (a) Position the index plate and align the serrated surfaces of the index plate and adapter plate.
 - (b) Loosely install the bottom index screw [66] to the index plate [5].
 - (c) Install the alignment tool [64].
 - (d) Put the alignment tool [64] in its position with the two guide pins in the holes left by the two alignment screws [61] that you removed. (the scale [62] should be on the top of the tool).
 - (e) Make sure the spline on the alignment tool [64] engages with the spline on the shaft.

SUBTASK 28-22-21-820-012

- (2) Do these steps to align the valve adapter [6] (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

- (a) Put the tool handle in the extreme counterclockwise position.
- (b) Slowly and smoothly turn the handle to the extreme clockwise position while you note the changes in the torque necessary to turn the handle.
- (c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.
- (d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.
- (e) Put the shaft in the extreme counterclockwise position again.
- (f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.
- (g) Read the scale [62] on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

- (h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-22-21-820-013

- (3) Do these steps to align the valve adapter [6] (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587 is necessary to do this procedure.

- (a) Put the tool handle in the extreme counterclockwise position.
- (b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

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- (c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.
- (d) Turn the tool back to the extreme counterclockwise position.
- (e) Turn the shaft clockwise again at approximately the same rate that you used before.
- (f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.
- (g) Read the scale [62] on the tool at this position.
NOTE: This is the position where valve butterfly starts to engage the edge of the seal.
- (h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.
NOTE: The butterfly valve is now centered on the valve seal.
NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-22-21-820-014

- (4) Tighten the lockscrew [63] on the alignment tool [64] to keep the tool in its position on the valve adapter [6].

SUBTASK 28-22-21-820-015

- (5) Turn the index plate [5] until the actuator mounting holes in the index plate are aligned with the two upper holes for the alignment screws [61].

SUBTASK 28-22-21-820-016

- (6) Insert the two alignment screws [61] into the holes for the actuator mounting screws to hold the index plate [5] in alignment with the adapter plate (this is the final adjustment of the position of the index plate).

SUBTASK 28-22-21-820-017

- (7) Tighten the bottom index screw [66].

SUBTASK 28-22-21-820-018

- (8) Carefully remove the two alignment screws [61].

SUBTASK 28-22-21-820-019

- (9) Loosen the lockscrew [63] and carefully remove the alignment tool [64].

SUBTASK 28-22-21-820-020

- (10) Use a fine point felt pen to apply a reference mark between the index plate [5] and the adapter plate of the valve adapter [6] at one of the serrated attachment points.

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SUBTASK 28-22-21-420-050

- (11) Continue with the index plate installation procedure in this task: Engine Fuel Crossfeed Valve Adapter Installation, TASK 28-22-21-400-802.

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SUBTASK 28-22-21-420-051

- (12) Continue with the index plate installation procedure in this task: Engine Fuel Crossfeed Valve Adapter Installation, TASK 28-22-21-400-805.

LOM ALL

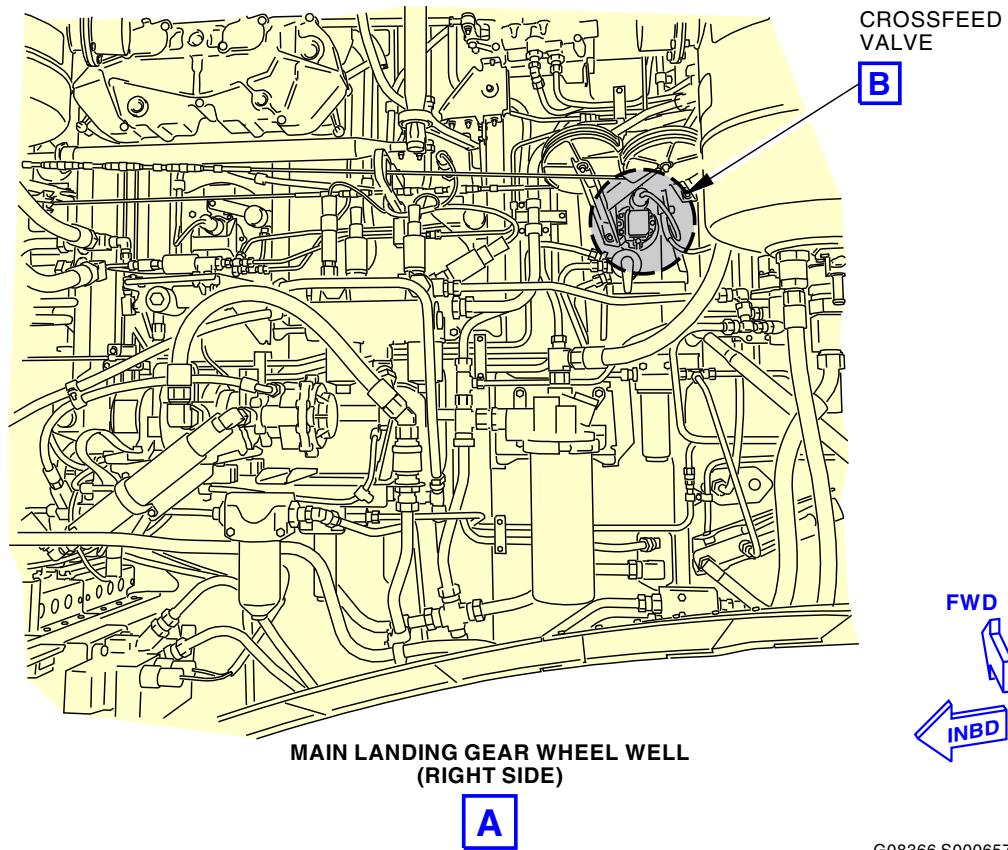
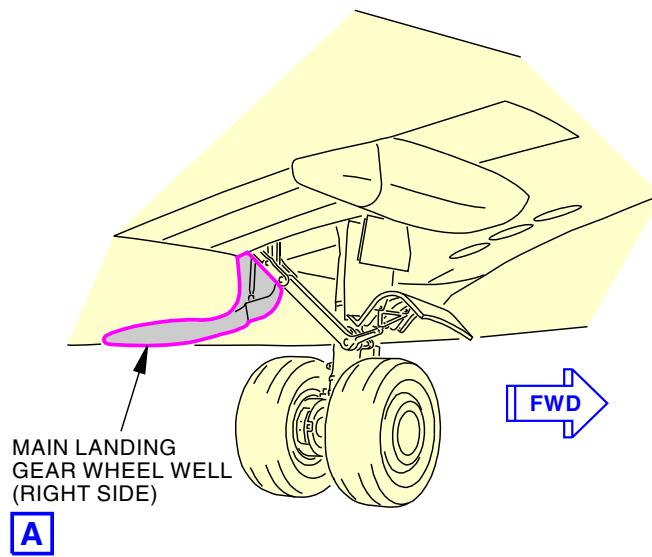
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Crossfeed Valve Alignment
Figure 405/28-22-21-990-805 (Sheet 1 of 2)

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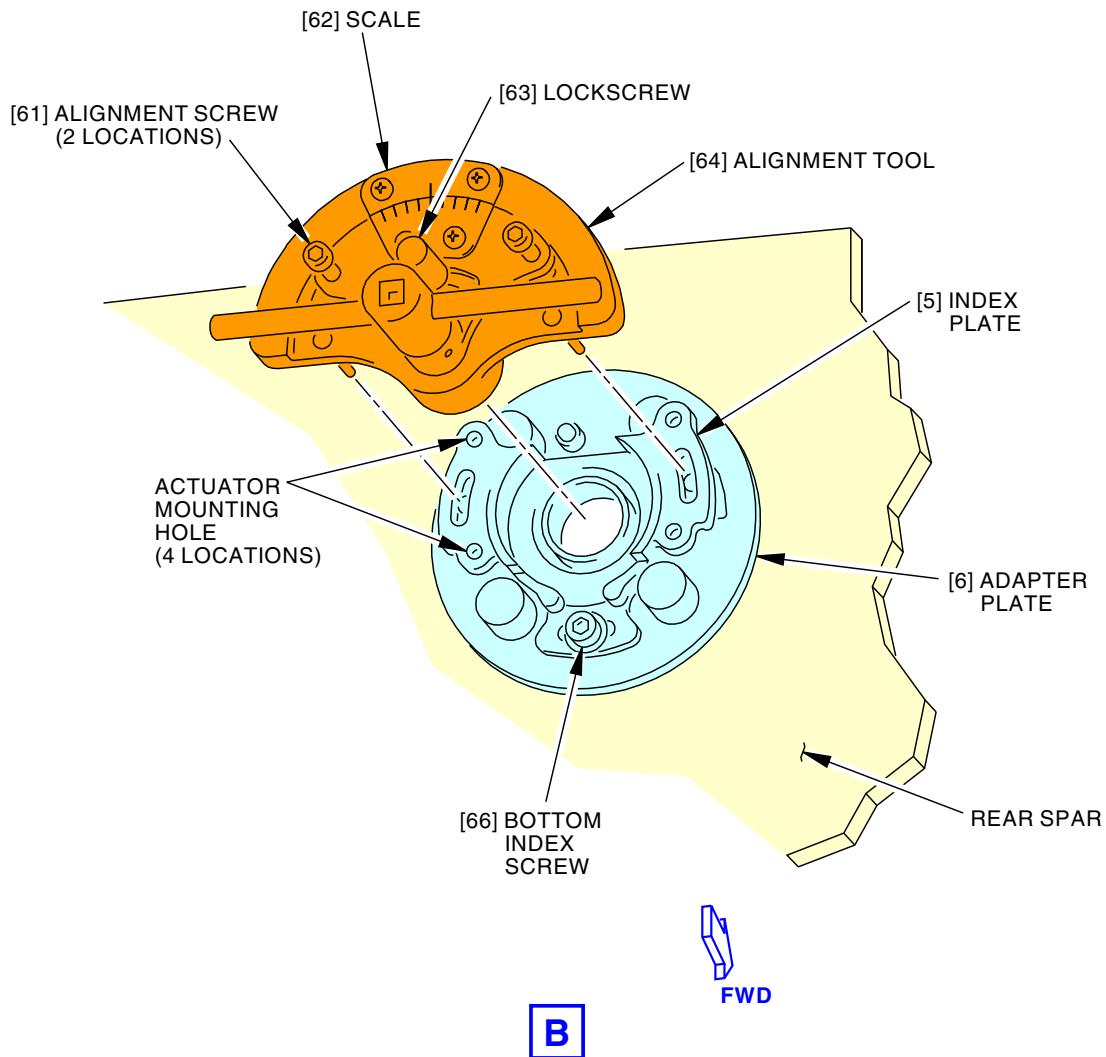
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Crossfeed Valve Alignment
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TASK 28-22-21-000-803

11. Engine Fuel Crossfeed Valve Body Removal

(Figure 406)

A. General

- (1) This task gives instructions to remove the Engine Fuel Crossfeed Valve Body.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-11-02-000-801-F00	Fuel Filter - Removal (P/B 401)
73-11-02-400-801-F00	Fuel Filter - Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-77	Air Source, Regulated - Dry Filtered, 0-50 psig
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
413	Engine 1 - Fan Cowl, Left
423	Engine 2 - Fan Cowl, Left

E. Access Panels

Number	Name/Location
131AB	Center Tank Access

F. Prepare for the Removal

SUBTASK 28-22-21-650-002

- (1) Defuel the center, No. 1 and No. 2 fuel tanks (TASK 28-26-00-650-801).

SUBTASK 28-22-21-650-006

- (2) To reduce the quantity of fuel that drains from fuel lines while in the center tank, you can do these steps to drain the fuel supply line for the left and right engines (optional) (Figure 407):
- Do these steps to make sure the engine fuel valves (spar and crossfeed) are in the correct positions:
 - Make sure the engine start levers on the control stand are in the CUTOFF position.
 - Make sure the engine START switches are in the OFF position, on the P5 overhead panel.

LOM 429-432

- The AUTO position is the OFF position.

LOM ALL

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- 3) Put a DO-NOT-OPERATE placard on the left and right engine START switches, on the P5 overhead panel.
- 4) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

- 5) On the P5 fuel system panel, set the CROSSFEED switch to the open position.
- 6) Make sure the VALVE OPEN light for the crossfeed valve comes ON bright during valve transit and then stays ON dim to show that the crossfeed valve is open.
- 7) Move the engine start levers on the control stand to the IDLE position.
NOTE: This opens the fuel spar valves.
- 8) On the P5 panel, make sure the two SPAR VALVE CLOSED lights are OFF.



WARNING

BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT LET ENGINE FUEL STAY ON YOUR SKIN. IF YOU GET FUEL ON YOUR SKIN, REMOVE IT IMMEDIATELY WITH SOAP AND WATER. THE FUEL IS POISONOUS AND CAN BE ABSORBED INTO YOUR BODY.

- (b) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.
- (c) Put a 10 gallon (38 l) fuel resistant container, STD-200, below each fuel filter drain plug.
- (d) Do the applicable steps in this task to remove the drain plug from the fuel filter: Fuel Filter - Removal, TASK 73-11-02-000-801-F00.
- (e) Let the fuel drain into the 10 gallon (38 l) fuel resistant container, STD-200.
- (f) Apply air pressure at the left engine to remove the trapped fuel in the fuel line [31].
 - 1) Supply air pressure with a regulated air source, STD-77, to a maximum of 40 psi (276 kPa), to the left engine fuel filter drain hole.
 - 2) Let the remaining fuel drain completely into the 10 gallon (38 l) fuel resistant container, STD-200, at the right engine fuel filter drain hole.
- (g) Do the applicable steps in this task to install the drain plug on the fuel filter: Fuel Filter - Installation, TASK 73-11-02-400-801-F00.
- (h) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.
- (i) Put the fuel crossfeed switch, on the P5 Overhead Panel, to the CLOSED position.
- (j) Put the engine start levers on the control stand to the CUTOFF position.
NOTE: This closes the fuel spar valves.
- (k) On the P5 panel, make sure the two SPAR VALVE CLOSED lights are dim.

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- (l) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

- (m) Remove the DO-NOT-OPERATE placards from the left and right engine START switches, on the P5 overhead panel.

SUBTASK 28-22-21-910-002



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU
DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND
DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do the fuel tank purging and entry procedure for the center tank (TASK 28-11-00-910-802).

- (a) Remove the center tank access door:

Number Name/Location

131AB Center Tank Access

(TASK 28-11-31-000-801).

G. Engine Fuel Crossfeed Valve Body Removal

SUBTASK 28-22-21-010-005



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO
FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD
CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Go into the center fuel tank to the crossfeed valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-22-21-480-003

- (2) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the crossfeed valve body [21] to collect fuel.

SUBTASK 28-22-21-020-009

- (3) Disconnect the two flexible full couplings [32] from each side of the crossfeed valve body [21] (TASK 28-22-15-000-801) (View B).

SUBTASK 28-22-21-020-010

- (4) Hold the crossfeed valve body [21] and remove the four screws [34] and washers [35] that attach the crossfeed valve body [21] to the support bracket [33] (View C).

SUBTASK 28-22-21-020-011

- (5) Disengage the crossfeed valve body [21] from the adapter shaft attached to the valve adapter [6] (View C).

SUBTASK 28-22-21-020-012

- (6) Remove the crossfeed valve body [21].

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SUBTASK 28-22-21-480-002

- (7) Put the covers on the openings in the fuel line [31] to keep unwanted materials out.

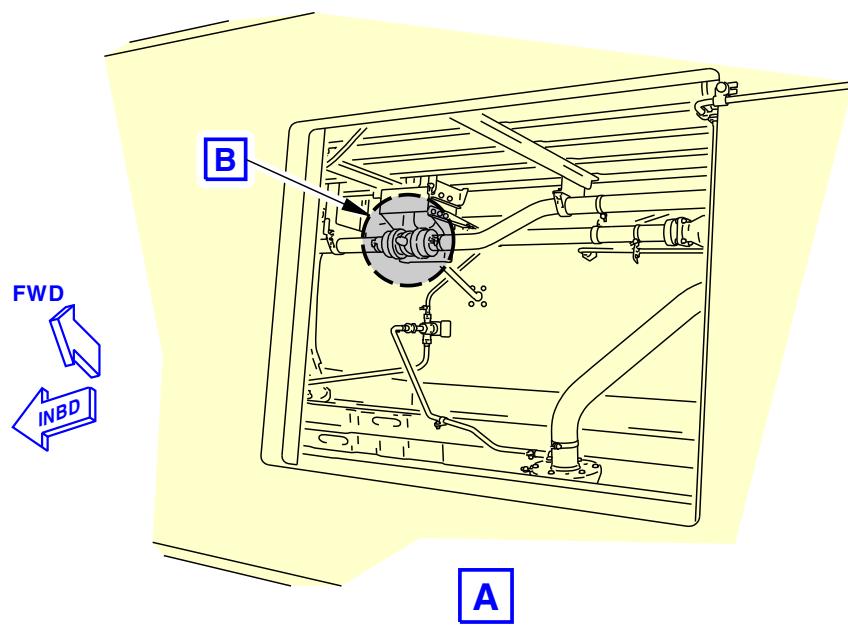
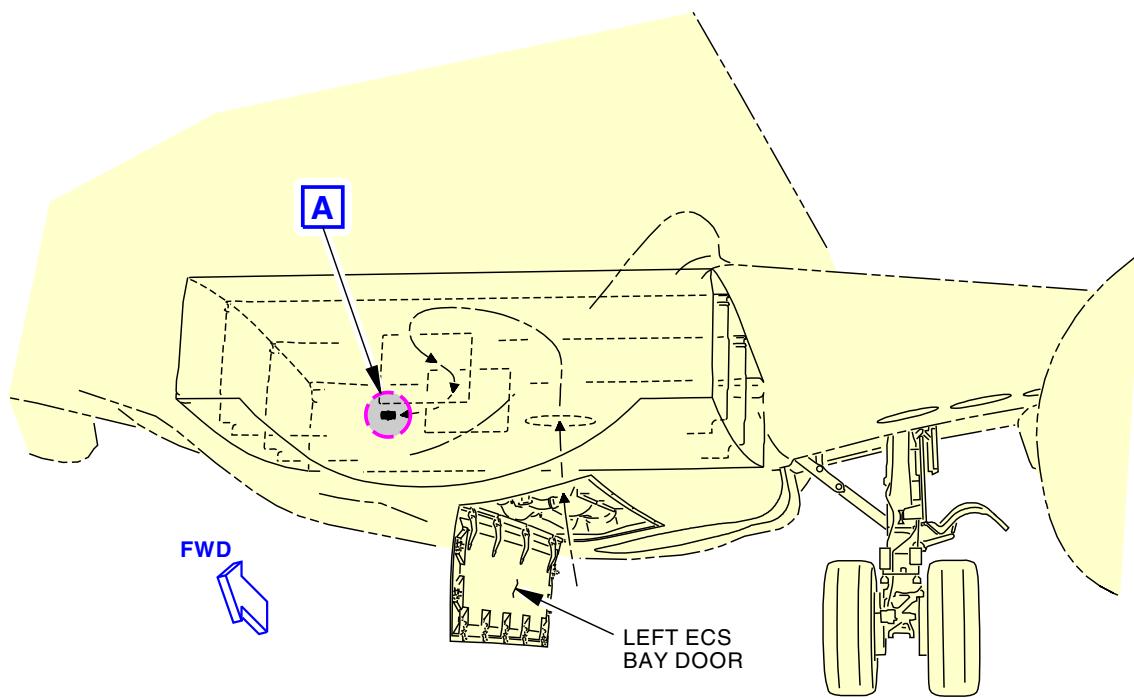
———— END OF TASK ————

— EFFECTIVITY —
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G08080 S0006572045_V3

Crossfeed Valve Body Installation
Figure 406/28-22-21-990-809 (Sheet 1 of 2)

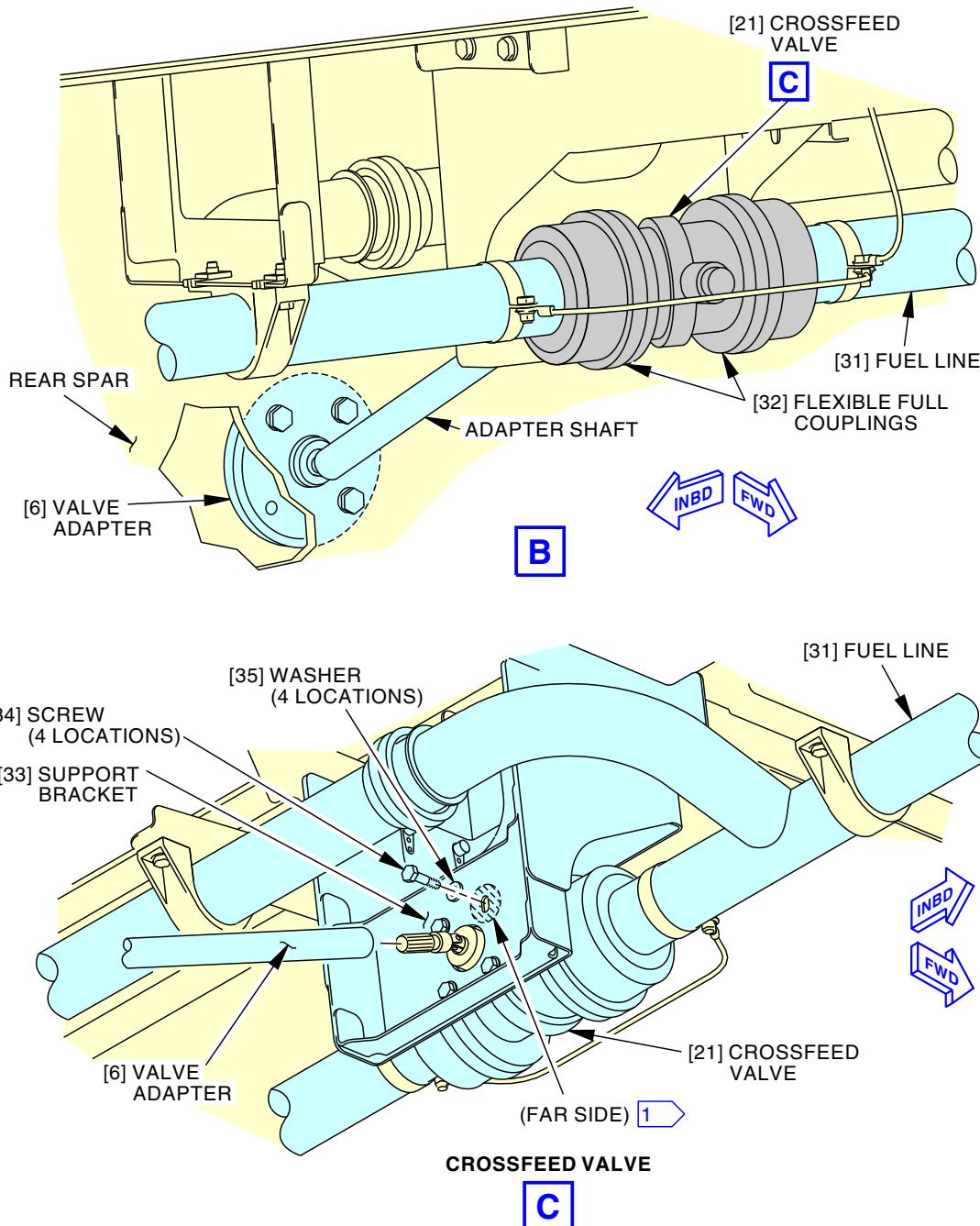
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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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- [1]** PREPARE THE AREA AROUND THE INBOARD TOP FASTENER HOLE AND THE CONTACT SURFACE OF THE VALVE BODY FOR AN UNSEALED ELECTRICAL FAYING SURFACE BOND (SWPM 20-20-00).

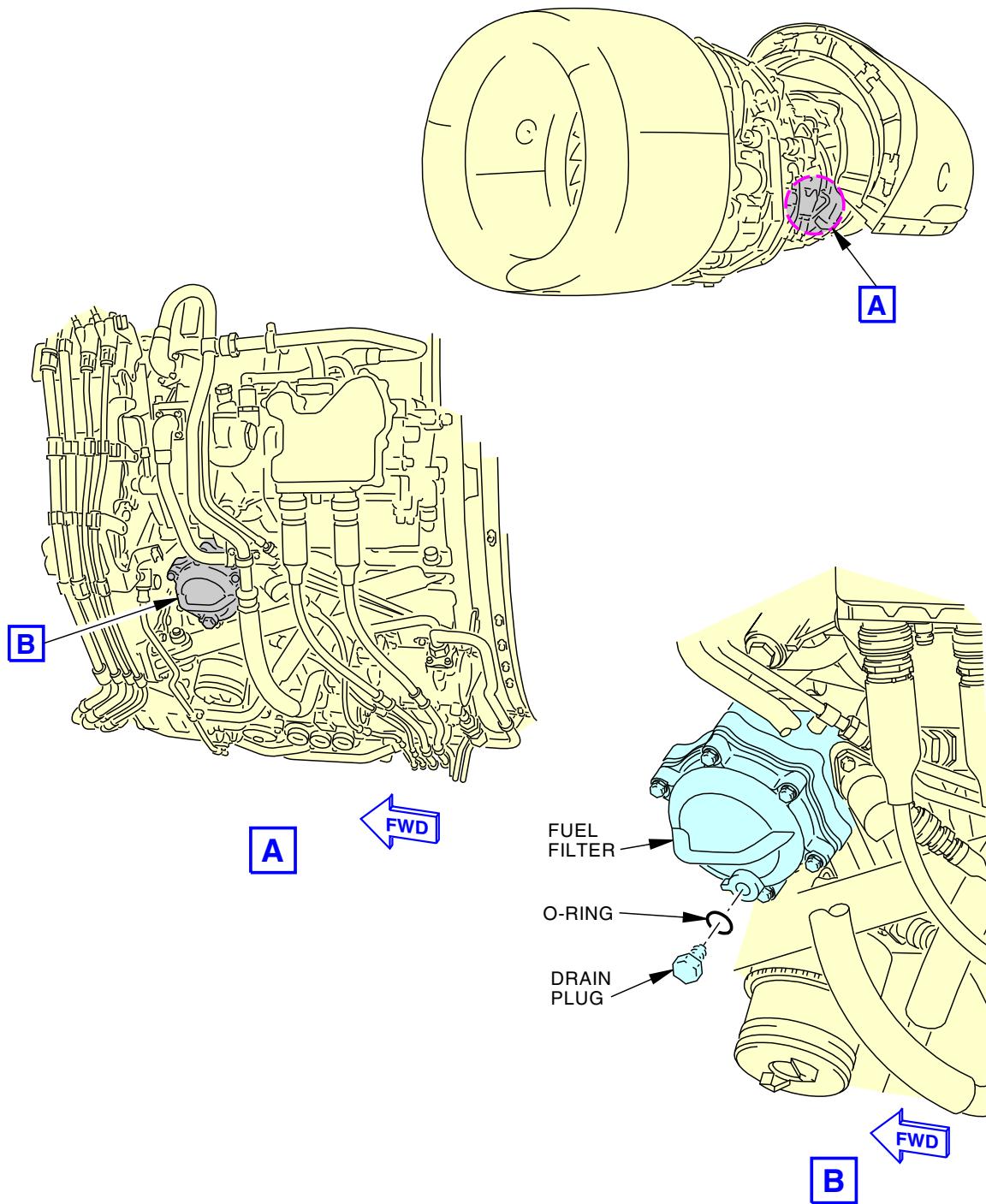
U45018 S0000196768_V2

Crossfeed Valve Body Installation
Figure 406/28-22-21-990-809 (Sheet 2 of 2)

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2247364 S0000503888_V2

Fuel Filter Drain Location
Figure 407/28-22-21-990-813

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TASK 28-22-21-400-803

12. Install the Engine Fuel Crossfeed Valve Body

(Figure 406)

A. References

Reference	Title
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-710-802	Engine Fuel Suction Feed - Operational Test (P/B 501)
28-22-00-730-802	Crossfeed Valve - Functional Test (P/B 501)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-15-710-801	Engine Fuel Feed Manifold - Leak Test (P/B 601)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

E. Access Panels

Number	Name/Location
131AB	Center Tank Access



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F. Procedure

SUBTASK 28-22-21-010-006



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Go into the center wing tank to the crossfeed valve location (TASK 28-11-00-910-802).

SUBTASK 28-22-21-020-013

- (2) Remove the covers from the fuel lines [31].

SUBTASK 28-22-21-110-007

- (3) Do these steps to prepare the inboard top fastener hole of the support bracket [33] and the contact surface of the crossfeed valve body [21] for an unsealed electrical faying surface bond (View C):



WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces of the support bracket [33] and the crossfeed valve body [21] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-21-420-052

- (4) Turn the universal joint fitting on the crossfeed valve body [21] until the index marks are aligned.

NOTE: A small misalignment of the index marks is satisfactory.

SUBTASK 28-22-21-420-053

- (5) Put the crossfeed valve body [21] into position.

SUBTASK 28-22-21-210-006



WARNING

INSTALL THE VALVE WITH THE TOP SIDE OF THE VALVE POINTED UP. THERE IS A STENCIL OF THE WORD TOP ON THE TOP SIDE. IF YOU INSTALL THE VALVE BODY INCORRECTLY, IT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (6) Make sure "TOP" shows on the top of the crossfeed valve body [21].

SUBTASK 28-22-21-420-054

- (7) Engage the universal joint fitting on the crossfeed valve body [21] into the valve adapter [6].

SUBTASK 28-22-21-420-055

- (8) Align the crossfeed valve body [21] with the support bracket [33].

SUBTASK 28-22-21-420-015

- (9) Engage the crossfeed valve body [21] with the adapter shaft attached to the valve adapter [6].

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SUBTASK 28-22-21-420-017

- (10) Install the four screws [34] and the washers [35] to attach the mounting flange on the support bracket [33] to the crossfeed valve body [21].

SUBTASK 28-22-21-765-007

- (11) Measure the bonding resistance between the crossfeed valve body [21] and the airplane structure with an electrical intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-22-21-420-056

- (12) Connect the two flexible full couplings [32] between the crossfeed valve body [21] and the fuel line [31] (TASK 28-22-15-400-801).

SUBTASK 28-22-21-410-009

- (13) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-22-21-410-003

- (14) Install this access panel:

Number Name/Location

131AB Center Tank Access

(TASK 28-11-31-400-801).

SUBTASK 28-22-21-861-002

- (15) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-22-21-710-010

- (16) Do one of these tasks:

- (a) Do a test of the engine fuel feed manifold for leakage (TASK 28-22-15-710-801).
- (b) Do an operational test for the engine fuel suction feed system (TASK 28-22-00-710-802).

SUBTASK 28-22-21-710-004

- (17) Do this task: Crossfeed Valve - Functional Test, TASK 28-22-00-730-802.

———— END OF TASK ————

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207;
AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017**

TASK 28-22-21-300-801

13. Rework the Electrical Faying Surface Bonds for the Engine Crossfeed Valve

A. General

- (1) This task contains these procedures:
 - (a) Rework the Faying Surface Bond - Actuator to Index Plate
 - (b) Rework the Faying Surface Bond - Index Plate to Adapter Plate
 - (c) Rework the Faying Surface Bond - Adapter Plate to Rear Spar
 - (d) Rework the Bonding Jumper Bond
- (2) Do this task if the measurement for the electrical bonding resistance is more than the allowed resistance value.
- (3) The motor operated valve uses two electrical bonding paths:



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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- (a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.
- (b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal faying surfaces of the actuator (at the mounting feet), index plate, and adapter plate to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by an electrical faying surface. You cannot repair or rework the faying surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

- (4) If the electrical bonding resistance is more than the maximum allowed resistance, you must disassemble the components, rework the faying surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the faying surfaces until the electrical resistance between the components is within allowable resistance values.
- (5) Because the build-up of the crossfeed valve includes several faying surface bonds, you may not know which faying surface bond is the cause of the problem. This task will help you isolate the location of the faying surface bond that needs to be reworked. The procedure does a check of the faying surface bond downstream of the bond that is in question.

B. References

Reference	Title
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Consumable Materials

Reference	Description	Specification
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right



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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

E. Rework the Faying Surface Bond - Actuator to Index Plate

(Figure 402),

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.004 ohm (4.0 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.003 ohm (3.0 milliohm).

SUBTASK 28-22-21-010-013

- (1) Do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, TASK 28-22-21-000-804.

SUBTASK 28-22-21-765-008

- (2) Do these steps to check the index plate [5] to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate faying surface bond is the cause of the problem, or if the index plate to adapter plate faying surface bond is the cause of the problem.

- (a) Remove the sealant and clean one of the contact surfaces on the index plate [5].
- (b) Measure the bonding resistance between the contact surface on the index plate [5] (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 404, View G).
- (c) Make sure the bonding resistance is 0.002 ohm (2.0 milliohms) or less.
- (d) If the bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Faying Surface Bond - Index Plate to Adapter Plate.
- (e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-21-420-057

- (3) Do this task: Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-804.

NOTE: This task will rework the faying surface bond and re-install the actuator.

SUBTASK 28-22-21-765-009

- (4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator [2] and the rear spar (SWPM 20-20-00, SWPM 20-20-10) (Figure 402, View C):

- (a) Do this measurement with the bonding jumper [13] and the electrical connector [1] disconnected.
- (b) Make sure the bonding jumper [13] does not touch the actuator [2] during the bonding measurement.
- (c) Make sure the bonding resistance is 0.004 ohm (4.0 milliohms) or less.

NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.003 ohm (3.0 milliohms).

- (d) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
- (e) If the bonding resistance is satisfactory, then continue with the steps to install the actuator [2] (TASK 28-22-21-400-804).

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

SUBTASK 28-22-21-710-007

- (5) If you have replaced the valve adapter [6] or adjusted the index plate [5], then continue with the steps in this procedure: Crossfeed Valve Operational Tests (TASK 28-22-21-400-805).

F. Rework the Faying Surface Bond - Index Plate to Adapter Plate

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.002 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-22-21-020-029

- (1) Do this procedure: Remove the Index Plate (TASK 28-22-21-000-804).

SUBTASK 28-22-21-765-010

- (2) Do these steps to check the adapter plate to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter plate faying surface bond is the cause of the problem, or if the adapter plate to rear spar faying surface bond is the cause of the problem.

- (a) Remove the sealant and clean one of the serrated contact surfaces on the valve adapter [6].
- (b) Measure the bonding resistance between the serrated contact surface on the valve adapter [6] and the rear spar (SWPM 20-20-00) (View F).
- (c) Make sure the bonding resistance is 0.0015 ohm (1.5 milliohms) or less.
NOTE: This is the repair bonding resistance value. The valve adapter installation bonding resistance value is 0.0005 ohm (0.5 milliohm).
- (d) If the bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Faying Surface Bond - Adapter Plate to Rear Spar.
- (e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-21-420-058

- (3) Do these steps to install the index plate [5]:

NOTE: These steps will re-align the crossfeed valve, rework the faying surface, and re-install the index plate.

- (a) Do this task: Crossfeed Valve Alignment, TASK 28-22-21-820-801.
- (b) Do this procedure: Install the Index Plate (Engine Fuel Crossfeed Valve Adapter Installation, TASK 28-22-21-400-805).

SUBTASK 28-22-21-765-011

- (4) During the installation, check the electrical bonding resistance between the index plate [5] and the rear spar (SWPM 20-20-00) (View G):

- (a) Make sure the bonding resistance is 0.002 ohm (2.0 milliohms) or less.
- (b) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.
- (c) If the bonding resistance is satisfactory, then continue with the procedure to install the index plate [5] (TASK 28-22-21-400-805)

SUBTASK 28-22-21-710-006

- (5) After you install the index plate [5], do this procedure: Crossfeed Valve Operational Tests (TASK 28-22-21-400-805).

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)

G. Rework the Faying Surface Bond - Adapter Plate to Rear Spar

(Figure 404)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter plate and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-22-21-020-030

- (1) Do this procedure: Remove the Valve Adapter (TASK 28-22-21-000-805).

NOTE: A fuel tank entry is necessary to rework the faying surface of the valve adapter.

SUBTASK 28-22-21-420-059

- (2) Do this procedure: Install the Valve Adapter (TASK 28-22-21-400-805).

NOTE: These steps will rework the faying surface, and re-install the valve adapter.

SUBTASK 28-22-21-765-012

- (3) During the installation, check the electrical bonding resistance between the valve adapter [6] and the rear spar (SWPM 20-20-00) (View F).

(a) Make sure the bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(b) If the bonding resistance is not satisfactory, then repeat the steps in this procedure.

(c) If the bonding resistance is satisfactory, then continue with the steps to install the valve adapter [6] (TASK 28-22-21-400-805).

SUBTASK 28-22-21-420-060

- (4) After you install the valve adapter [6], do this procedure: Install the Index Plate (TASK 28-22-21-400-805).

H. Rework the Bonding Jumper Bond

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-22-21-020-031

- (1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-22-21-420-061

- (2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-22-21-420-062

- (3) Do these steps to install the bonding jumper to the structure:



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with a cotton wiper, G00034 soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).

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AIRPLANES WITH ACTUATOR MA20A2027 OR MA30A1001 OR MA30A1017 (Continued)**

- 1) Rub dry with a clean, dry cotton wiper, G00034.
- 2) Continue to clean and dry the surface until the dry cotton wiper, G00034 stays clean.
- (b) Install the nut, washers, and the bonding jumper to the structure.
- (c) Tighten the nut to 31 ± 3 in-lb (4 ± 1 N·m).
- (d) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-10) (View C).
 - 1) Make sure the bonding resistance is 0.0015 ohm (1.5 milliohms) or less.
- (e) Apply a cap seal of sealant, A50337 (BMS 5-45 Class B) over the nut and the terminal of the bonding jumper.

SUBTASK 28-22-21-420-063

- (4) Continue with this task: Actuator of the Engine Fuel Crossfeed Valve Installation, TASK 28-22-21-400-804.

SUBTASK 28-22-21-710-008

- (5) If you have replaced the valve adapter [6] or adjusted the index plate [5], then continue with the steps in this procedure: Crossfeed Valve Operational Tests (TASK 28-22-21-400-805).

LOM ALL

————— END OF TASK ————

TASK 28-22-21-710-801

14. Crossfeed Valve Operational Test

(Figure 408 or Figure 409)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

C. Procedure

SUBTASK 28-22-21-860-006

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-22-21-860-007

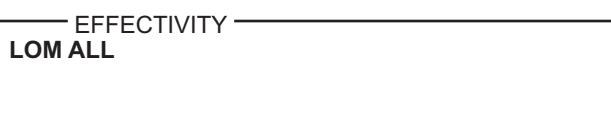
- (2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-860-008

- (3) Set the CROSSFEED VALVE switch on the overhead panel, P5, to the open position.



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SUBTASK 28-22-21-210-008

- (4) Make sure the position indication light shows these effects:
 - (a) The position indication light comes on brightly to show a change in the crossfeed valve position.
 - (b) The position indication light stays on dimly to show that the crossfeed valve is open.

SUBTASK 28-22-21-210-009

- (5) Make sure the manual override lever for the crossfeed valve is in the OPEN position.

SUBTASK 28-22-21-860-009

- (6) Set the CROSSFEED VALVE switch on the P5 panel to the closed position.

SUBTASK 28-22-21-210-010

- (7) Make sure the position indication light for the crossfeed valve shows these effects:
 - (a) The position indication light comes on brightly to show a change in the crossfeed valve position.
 - (b) The position indication light goes off to show the crossfeed valve is closed.

SUBTASK 28-22-21-210-011

- (8) Make sure the manual override lever for the crossfeed valve is in the CLOSED position.

SUBTASK 28-22-21-860-010

- (9) If it is not necessary for other tasks, do this task: Remove Electrical Power,
TASK 24-22-00-860-812.

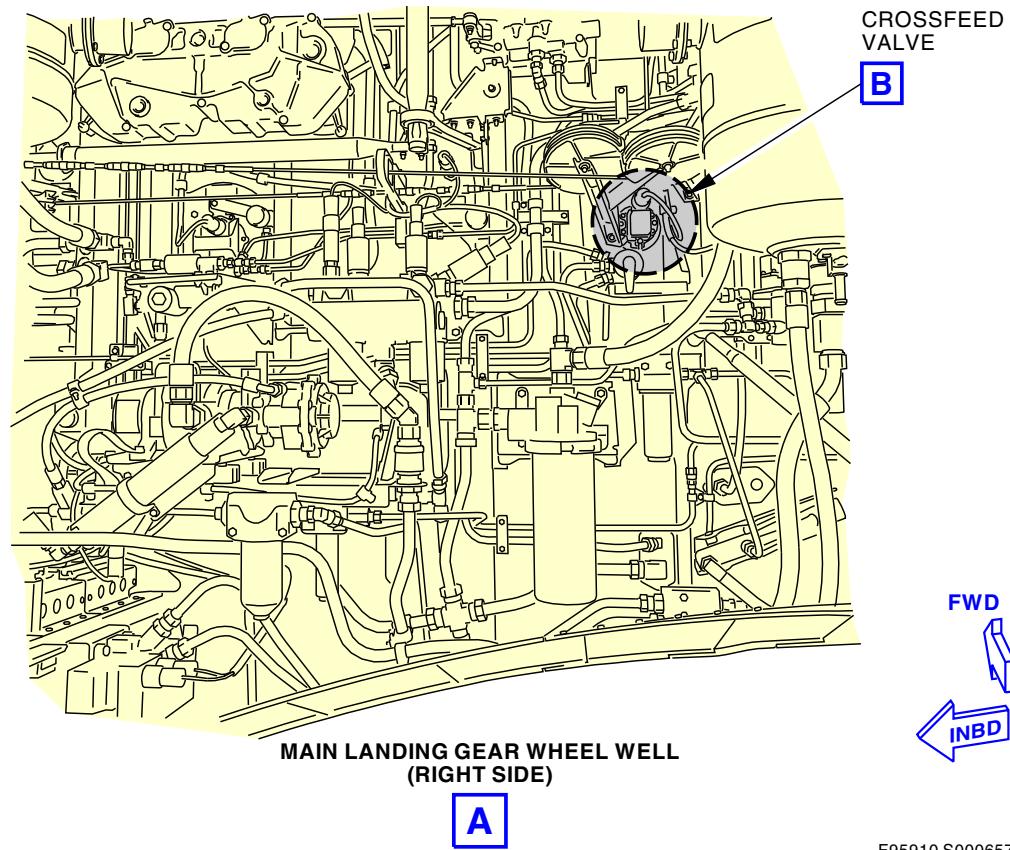
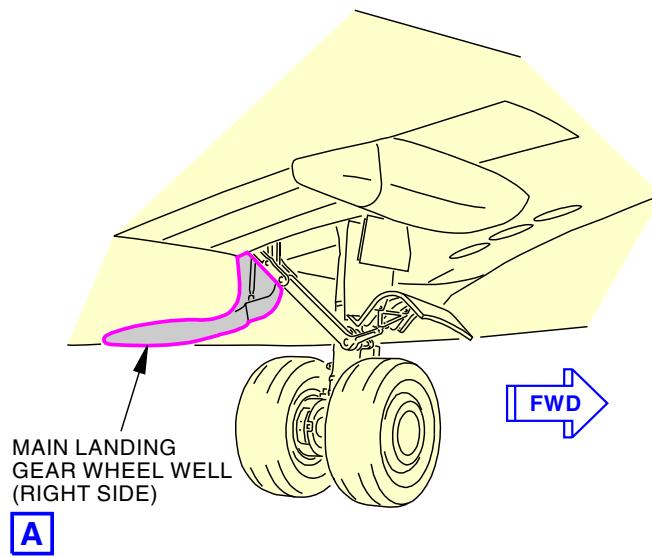
———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-22-21



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F95910 S0006572041_V2

Crossfeed Valve Actuator Installation
Figure 408/28-22-21-990-810 (Sheet 1 of 2)

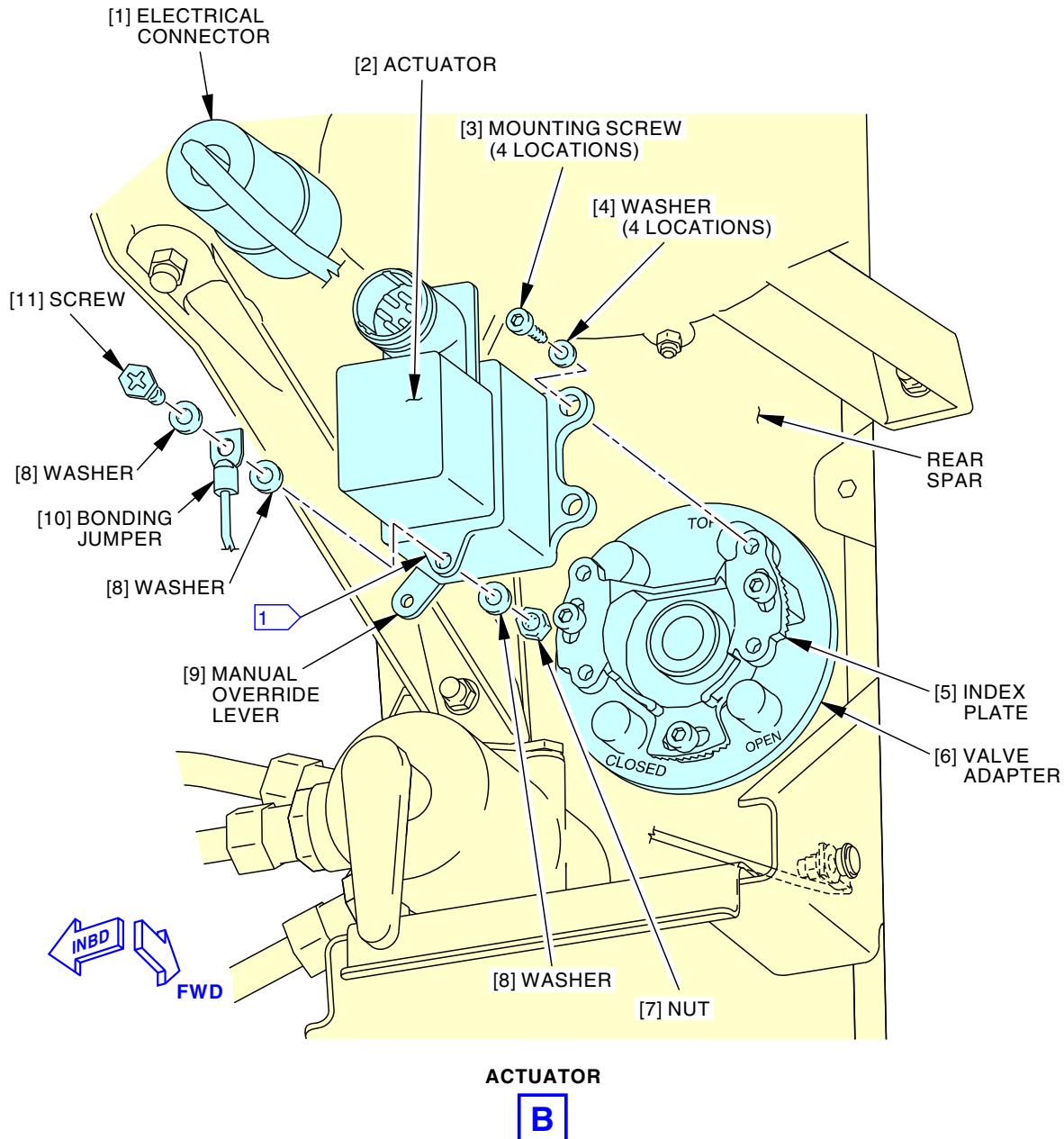
EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207

28-22-21

D633A101-LOM

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- 1** PREPARE THE FAYING SURFACE OF THE BONDING JUMPER AND BONDING JUMPER TAB FOR AN ELECTRICAL SURFACE BOND. APPLY A FILLET SEAL TO THE BONDING JUMPER TERMINAL (SWPM 20-20-00).

G07915 S0006572042_V3

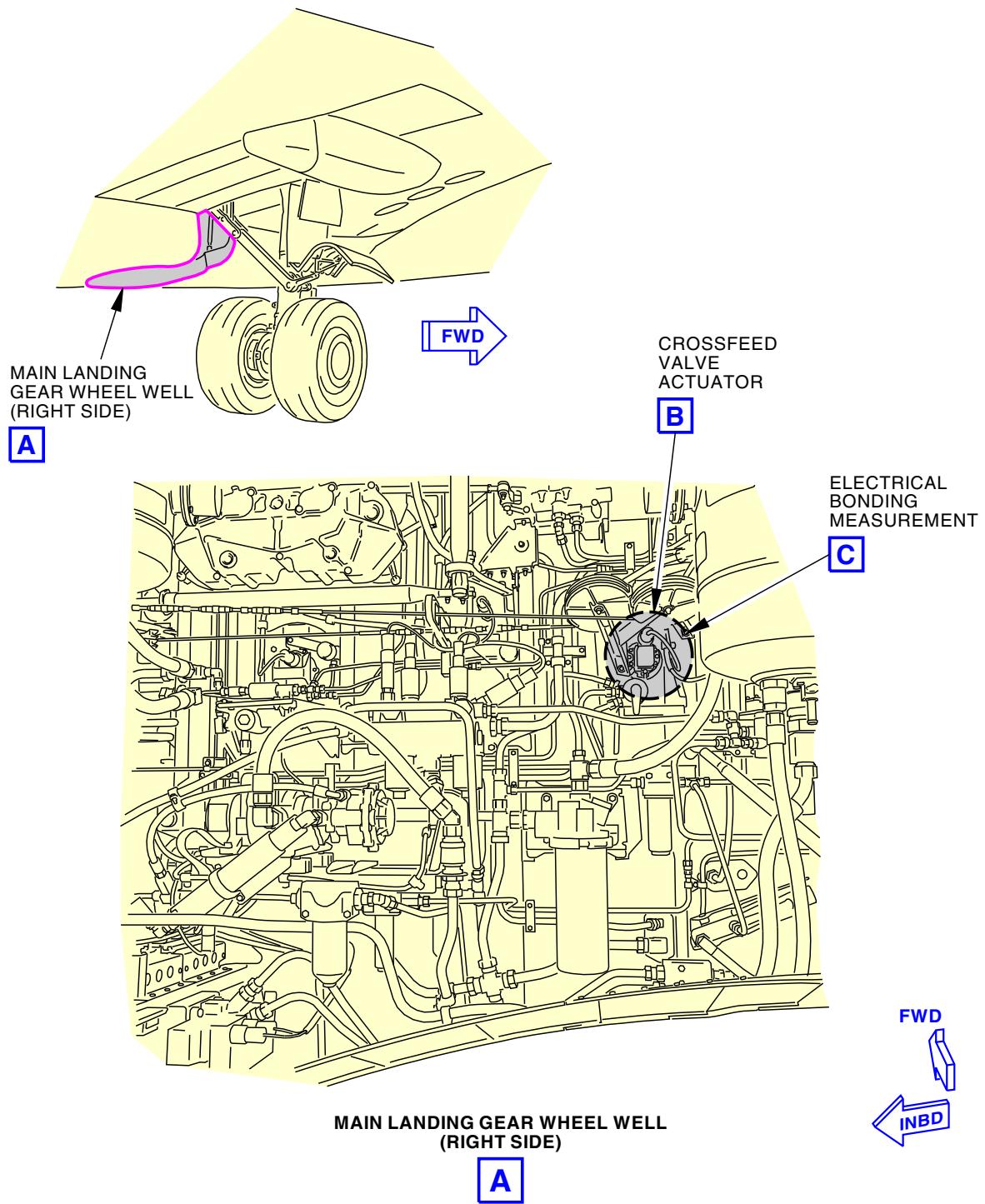
Crossfeed Valve Actuator Installation
Figure 408/28-22-21-990-810 (Sheet 2 of 2)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207

28-22-21



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U45799 S0000197069_V2

Crossfeed Valve Actuator Installation
Figure 409/28-22-21-990-811 (Sheet 1 of 4)

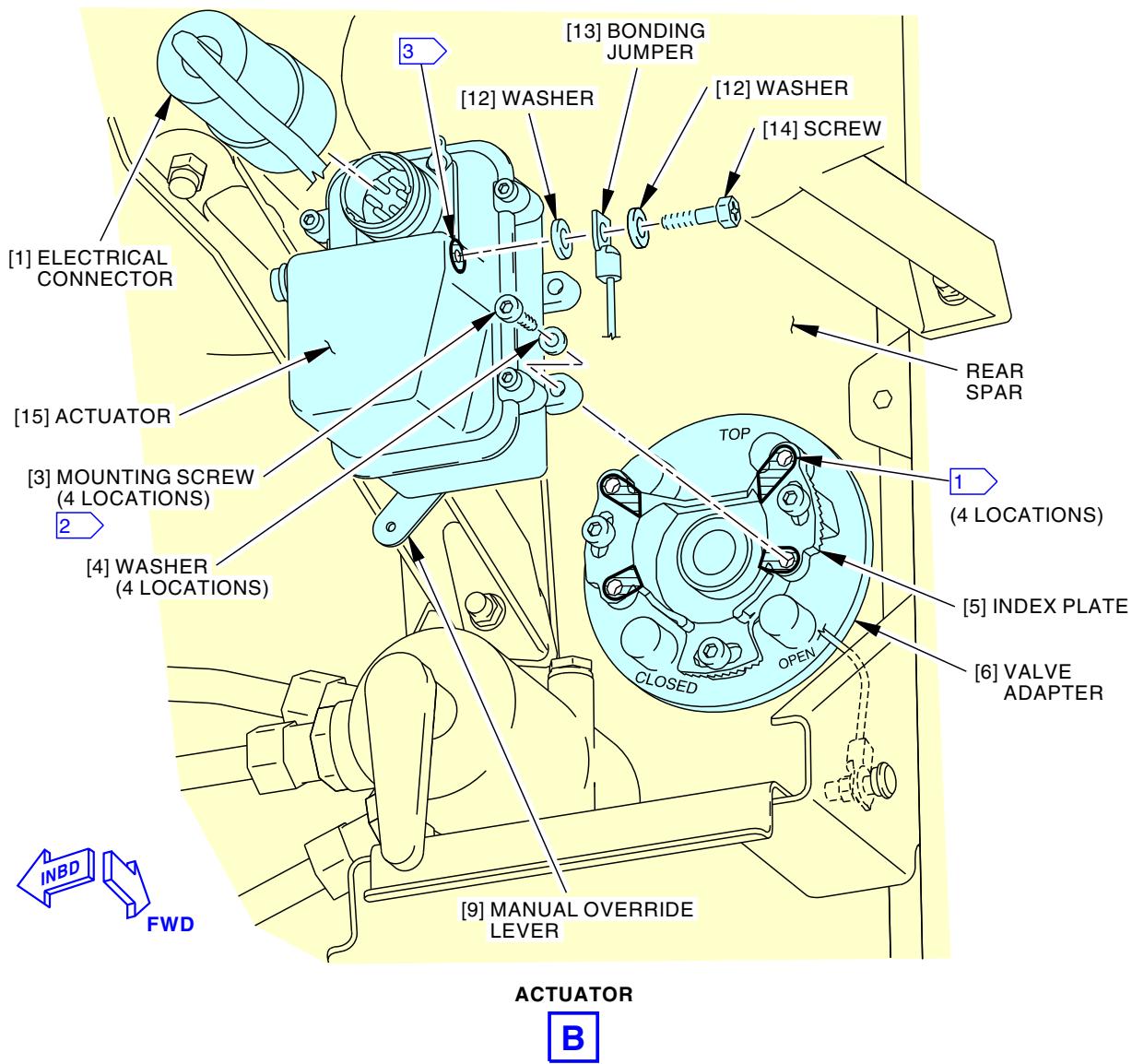
EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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- [1]** PREPARE AND INSTALL THE CONTACT SURFACES OF THE INDEX PLATE AND ACTUATOR FOOTPADS (4 LOCATIONS) WITH A FAY SEALED FAY SURFACE BOND (SWPM 20-20-00).
- [2]** APPLY SEALANT TO THE SHANK AND THREADS OF THE MOUNTING SCREWS.
- [3]** CLEAN THE CONTACT SURFACES OF THE ACTUATOR AND BONDING JUMPER. AFTER ELECTRICAL BONDING MEASUREMENT, APPLY A CAP SEAL TO THE BONDING JUMPER SCREW.

U44339 S0000195975_V7

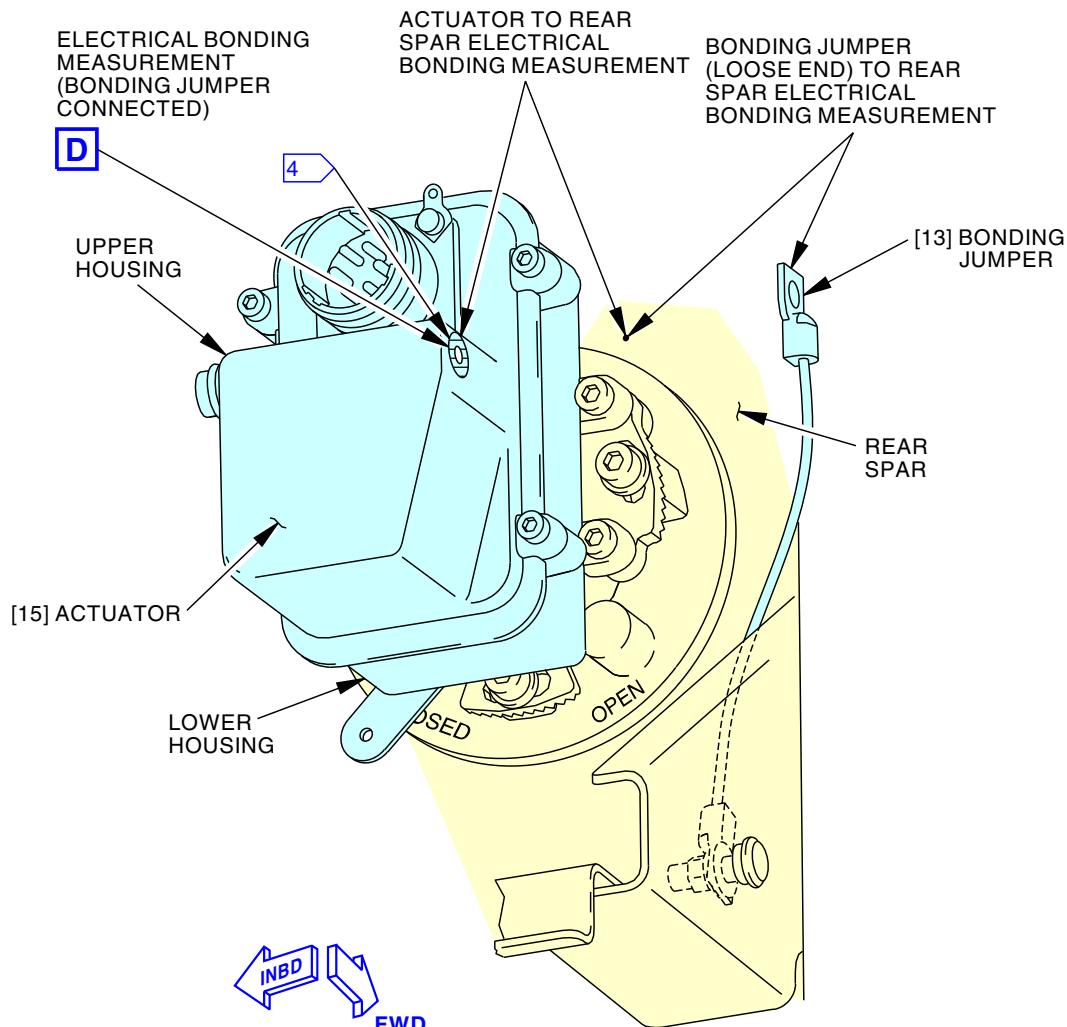
Crossfeed Valve Actuator Installation
Figure 409/28-22-21-990-811 (Sheet 2 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



ELECTRICAL BONDING MEASUREMENT
(BONDING JUMPER DISCONNECTED)

C

4 BARE METAL CONTACT SURFACE OF THE ACTUATOR AT
THE BONDING JUMPER INSTALLATION.

U45778 S0000197070_V3

Crossfeed Valve Actuator Installation
Figure 409/28-22-21-990-811 (Sheet 3 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

D633A101-LOM

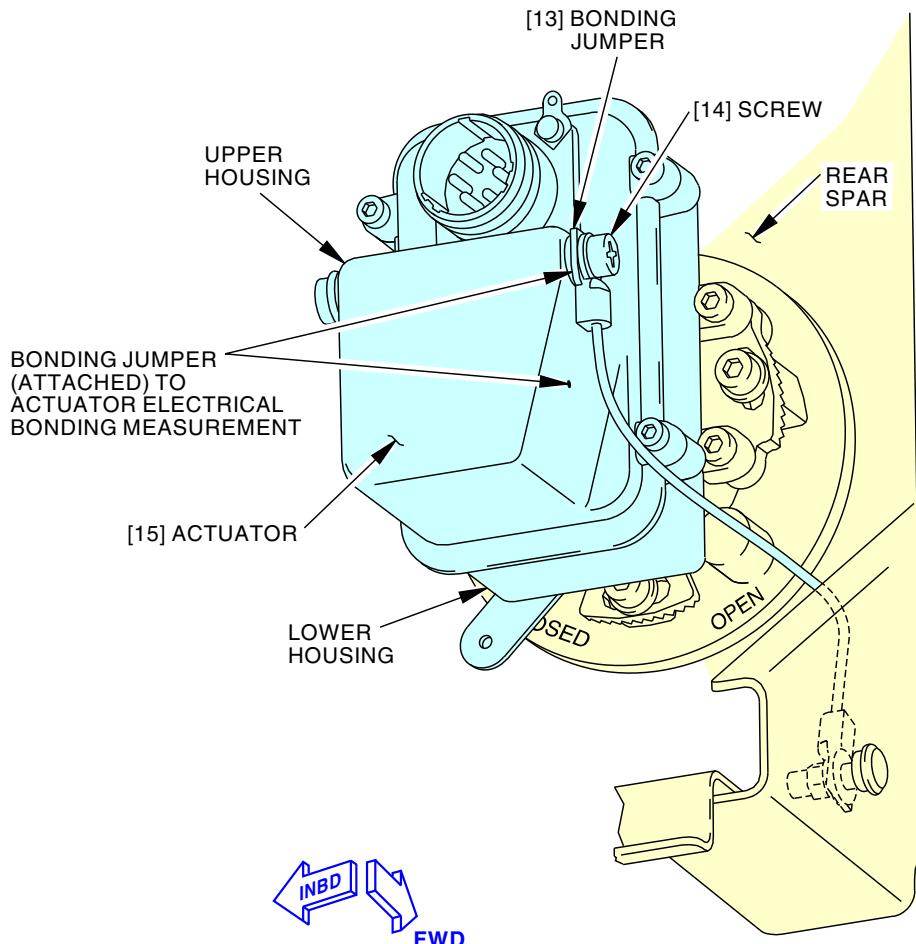
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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ELECTRICAL BONDING MEASUREMENT
(BONDING JUMPER CONNECTED)

D

U49687 S0000201352_V2

Crossfeed Valve Actuator Installation
Figure 409/28-22-21-990-811 (Sheet 4 of 4)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

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D633A101-LOM



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ENGINE FUEL CROSSFEED VALVE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance of the engine fuel crossfeed actuator.

SFAR 88

TASK 28-22-21-200-801

2. Engine Fuel Crossfeed Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-21-710-801	Crossfeed Valve Operational Test (P/B 401)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Location Zones

Zone	Area
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Prepare for the Procedure

SUBTASK 28-22-21-490-005



MAKE SURE YOU INSTALL THE GROUND LOCK ASSEMBLIES IN ALL LANDING GEAR. ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.



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SUBTASK 28-22-21-865-001

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-560-001

- (3) Go to the crossfeed valve location on the rear spar in the main landing gear wheel well (right side).

E. Electrical Bonding Measurement

SUBTASK 28-22-21-710-009

- (1) Move the manual override lever to the fully CLOSED position.

SUBTASK 28-22-21-862-003

- (2) Disconnect the electrical connector from the actuator.

SUBTASK 28-22-21-765-016

- (3) Measure the electrical bonding resistance between the crossfeed valve actuator (at the connector flange) and the spar with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00, SWPM 20-20-10) (View B).
(a) Make sure the bonding resistance is 0.005 ohm (5.0 milliohms) or less.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-21-861-003

- (1) Connect the electrical connector to the actuator.

SUBTASK 28-22-21-865-002

- (2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C00361	FUEL CROSS FEED VALVE

SUBTASK 28-22-21-710-011

- (3) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801

SUBTASK 28-22-21-090-004



OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Remove the ground locks installed on the landing gear if they are not needed for other tasks (TASK 32-00-01-080-801).

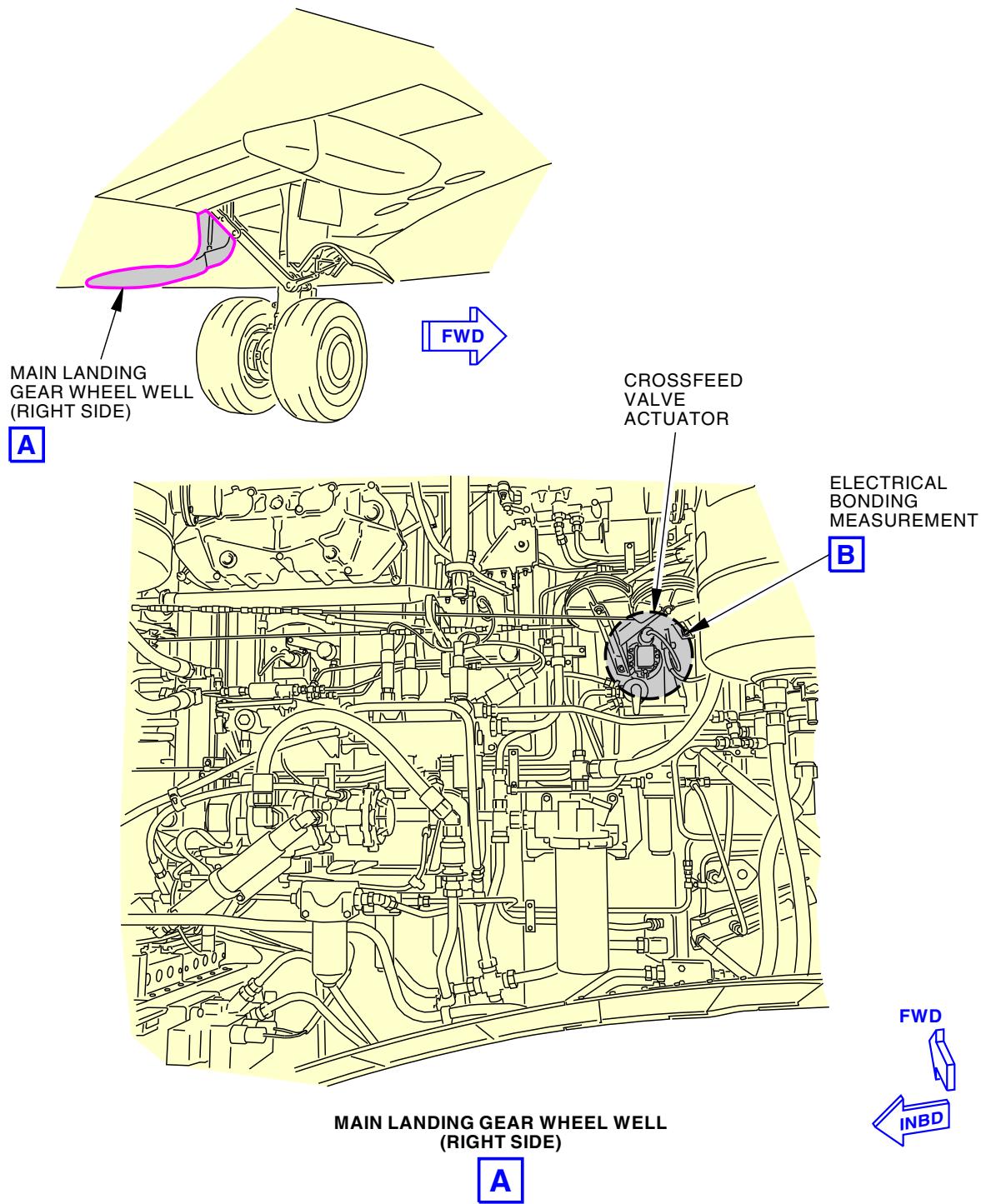
— END OF TASK —

EFFECTIVITY
LOM ALL

28-22-21



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AIRCRAFT MAINTENANCE MANUAL



1341229 S0000238399_V2

Engine Fuel Crossfeed Valve Actuator - Bonding Resistance Check
Figure 601/28-22-21-990-812 (Sheet 1 of 3)

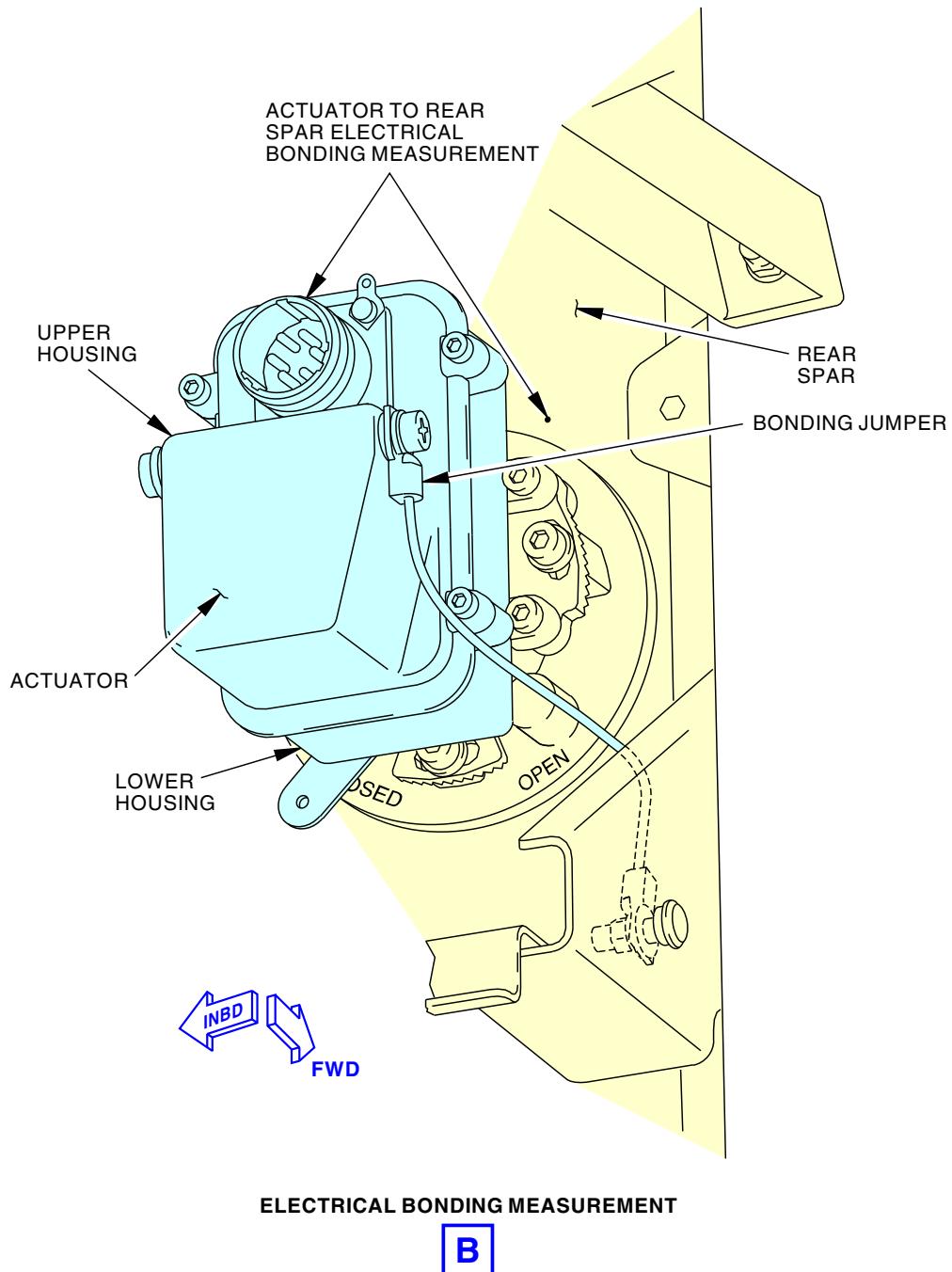
EFFECTIVITY
LOM ALL

28-22-21

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Jun 15/2018



1341290 S0000238400_V2

Engine Fuel Crossfeed Valve Actuator - Bonding Resistance Check
Figure 601/28-22-21-990-812 (Sheet 2 of 3)

EFFECTIVITY
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 402, 404, 406 POST SB 737-28A1207

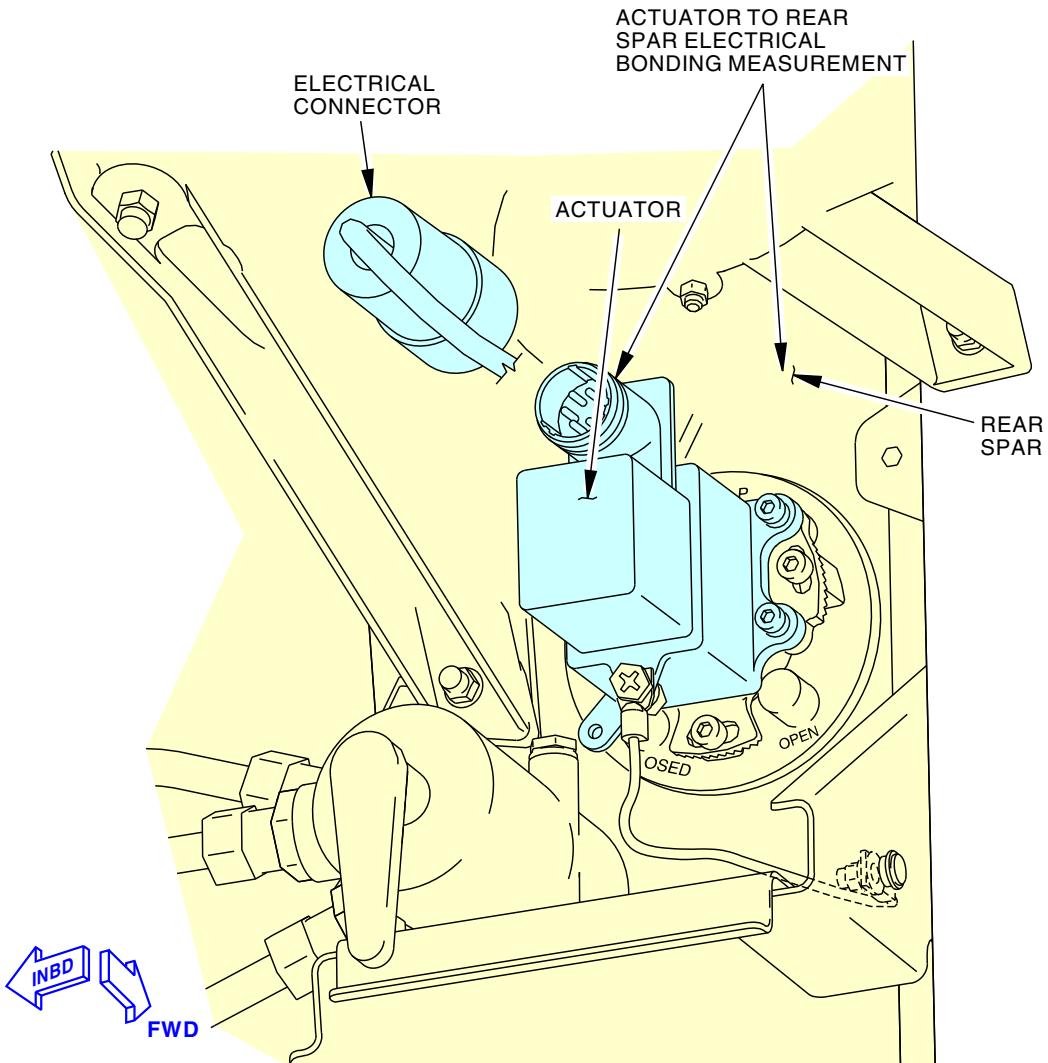
28-22-21

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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ELECTRICAL BONDING MEASUREMENT

B

1341471 S0000238410_V2

Engine Fuel Crossfeed Valve Actuator - Bonding Resistance Check
Figure 601/28-22-21-990-812 (Sheet 3 of 3)

EFFECTIVITY
LOM 402, 404, 406 PRE SB 737-28A1207

28-22-21

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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FUEL BOOST PUMP - REMOVAL/INSTALLATION

1. General

- A. There is a left forward fuel boost pump and a left aft fuel boost pump which move fuel from the No. 1 fuel tank. There is a right forward fuel boost pump and right aft boost pump which move fuel from the No. 2 fuel tank. There is a left center tank fuel boost pump and a right center tank fuel boost pump which move fuel from the center fuel tank. The left aft fuel boost pump and the right aft fuel boost pump are installed on the inboard rear spar, forward of each main landing gear door. The left forward fuel boost pump and right forward fuel boost pump are installed on the front spar, immediately outboard of the side of body rib. The left center tank fuel boost pump and the right center tank fuel boost pump are installed on the rear spar of the center section of the center fuel tank. To get access to the left center boost pump, it is necessary to remove a pogo which is part of the aileron control unit linkage in the left wheel well.
- B. Each fuel boost pump contains four parts: the motor impeller, the housing, the discharge check valve and the removal check valve.
- C. It is necessary to defuel the applicable fuel tank to remove the housing, the discharge check valve and the removal check valve. It is not necessary to defuel the applicable fuel tank to remove the motor impeller.
- D. This procedure contains these tasks:
 - (1) A removal of the motor impeller
 - (2) An installation of the motor impeller
 - (3) A priming of the fuel boost pump and override pump
 - (4) A removal of the fuel boost pump housing
 - (5) An installation of the fuel boost pump housing
 - (6) An operational test of the fuel boost pump.
- E. The procedure to remove and install the removal check valve is in TASK 28-22-51-400-801. The procedure to remove and install the discharge check valve is in TASK 28-22-61-000-801.

TASK 28-22-41-000-801

2. Motor Impeller Removal

(Figure 401, Figure 402, Figure 403, Figure 404, Figure 405, Figure 406)

A. General

- (1) This task gives instructions to remove the Motor Impeller.

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

EFFECTIVITY
LOM ALL

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Reference

Description

SPL-1769	Puller - Fuel Pump Part #: B28003-1 Supplier: 81205
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)
STD-8881	Screw - Retention (MS35275-250)

D. Consumable Materials

Reference

Description

Specification

G01505	Lockwire - Safety And Lock	NASM20995
G51372	Kit - Safety Cable, 321 CRES - 0.035 +/-0.003 Inch (1.0 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K

E. Location Zones

Zone

Area

117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Access Panels

Number

Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

G. Prepare for the Removal

SUBTASK 28-22-41-420-039



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-41-860-001

- (2) Do these steps to get access to the motor impeller [1] of the forward boost pumps:



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.

EFFECTIVITY
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WARNING

MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 28-22-41-010-008

- (3) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-41-860-061



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Do these steps:

- (a) For the No. 1 tank aft fuel boost pump.

- 1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

- (b) For the No. 1 tank forward fuel boost pump.

- 1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM ALL

EFFECTIVITY
LOM ALL

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- (c) For the No. 2 tank aft fuel boost pump.
1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM ALL

- (d) For the No. 2 tank forward fuel boost pump.
1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM ALL

- (e) For the center tank left fuel boost pump.
1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT
LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM ALL

- (f) For the center tank right fuel boost pump.
1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT
LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-41-010-001

- (5) To get access to the motor impeller [1] of the aft fuel boost pumps, go through the applicable left or right main shock strut door.

SUBTASK 28-22-41-010-002

- (6) To get access to the applicable motor impeller [1] of the center tank fuel boost pumps, do these steps:

EFFECTIVITY
LOM ALL

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- (a) Access the right center fuel boost pump in the right wheel well.
- (b) To get access to the left center tank fuel boost pump, do these additional steps (Figure 404):
 - 1) Remove the pin [28], nut [27], washer [26], bushing [24], washer [22], and bolt [23] to disconnect the pogo [21] from the power control unit [25].
NOTE: Be careful not to change the length of the pogo. If you change the length of the pogo, it will be necessary to re-adjust the length when you re-install it.
 - 2) Remove the bolts [29] and washers [30] to disconnect the bracket assembly from the power control unit [25].
 - 3) Pull the pogo [21] aft, away from the rear spar of the center tank to get access to the left center tank boost pump.
NOTE: It is not necessary to remove the bolt at the left of the pogo that attaches the pogo to the aileron feel and centering unit.

H. Motor Impeller Removal

SUBTASK 28-22-41-020-001

- (1) Disconnect the electrical connector [5] from the motor impeller [1].

SUBTASK 28-22-41-020-029

- (2) Remove and discard the lockwire, G01505 from the drain plug [6].

SUBTASK 28-22-41-020-002

- (3) Loosen but do not remove the drain plug [6].

SUBTASK 28-22-41-020-003

- (4) Remove the bonding jumpers [3] from the bonding clips [4] (two locations).

- (a) Remove any sealant applied to the bonding clips [4], bonding jumpers [3], mounting screws [12], washers [13], or nuts [14] as necessary.

SUBTASK 28-22-41-020-030

- (5) Remove and discard the safety cable kit, G51372, or lockwire, G01505, from the mounting screws [2].

SUBTASK 28-22-41-420-004

- (6) Remove the two mounting screws [2], at the 1 O'clock and 7 O'clock positions, from the fuel boost pump.

SUBTASK 28-22-41-420-001

- (7) Install the retention screws, STD-8881, at the 1 O'clock and 7 O'clock positions of the fuel boost pump.

SUBTASK 28-22-41-020-005

- (8) Remove the remaining mounting screws [2] from the fuel boost pump.

SUBTASK 28-22-41-480-001

- (9) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the motor impeller [1] to catch fuel.

SUBTASK 28-22-41-020-006

- (10) Pull the motor impeller [1] out 0.6 in. (15.2 mm) (or to the retention screws, STD-8881) from the housing [10] to let the removal check valve close.

- (a) For the No. 1 and No. 2 tank fuel boost pumps, use the puller, SPL-1769, to pull out the motor impeller [1].

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-41-020-007



WARNING

DO NOT LET FUEL SPILL. WHEN YOU REMOVE THE DRAIN PLUG, A SMALL QUANTITY OF FUEL WILL COME OUT OF THE MOTOR/IMPELLER UNIT. IF THERE IS A CONTINUOUS FLOW OF FUEL, THE VALVE IS NOT CLOSED. FUEL CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (11) Remove the drain plug [6].

SUBTASK 28-22-41-020-032

- (12) Remove and discard the o-ring [71].

SUBTASK 28-22-41-650-001

- (13) If fuel continuously drains, do these steps:

- (a) Install the motor impeller [1].
(b) Defuel the applicable fuel tank (TASK 28-26-00-650-801).

NOTE: Defuel the No. 1 tank for the forward or aft boost pump for the No. 1 tank. Defuel the center tank and the No. 1 tank for the left center tank boost pump. Defuel the center tank and the No. 2 tank for the right center tank boost pump. Defuel the No. 2 tank for the forward or aft boost pump for the No. 2 tank.

- (c) Remove the motor impeller [1].

SUBTASK 28-22-41-020-008

- (14) After the motor impeller [1] drains, remove the retention screws, STD-8881.

SUBTASK 28-22-41-020-009



CAUTION

QUICKLY REPLACE THE MOTOR IMPELLER TO PREVENT FUEL DROPS INTO THE HOUSING. DAMAGE TO EQUIPMENT CAN OCCUR.

- (15) For the boost pumps for the No. 1 or the No. 2 tank, remove the motor impeller [1] from the housing [10].

- (a) Discard the O-ring [7], O-ring [8], and O-ring [9].

SUBTASK 28-22-41-020-021



CAUTION

QUICKLY REPLACE THE MOTOR IMPELLER TO PREVENT FUEL DROPS INTO THE HOUSING. DAMAGE TO EQUIPMENT CAN OCCUR.

- (16) For the left center boost pump, remove the motor impeller [1] from the housing [10].

- (a) Discard the O-ring [7], O-ring [8], and O-ring [9].

SUBTASK 28-22-41-020-022



CAUTION

QUICKLY REPLACE THE MOTOR IMPELLER TO PREVENT FUEL DROPS INTO THE HOUSING. DAMAGE TO EQUIPMENT CAN OCCUR.

- (17) For the right center boost pump, remove the motor impeller [1] from the housing [10].

- (a) Discard the O-ring [7], O-ring [8], and O-ring [9].

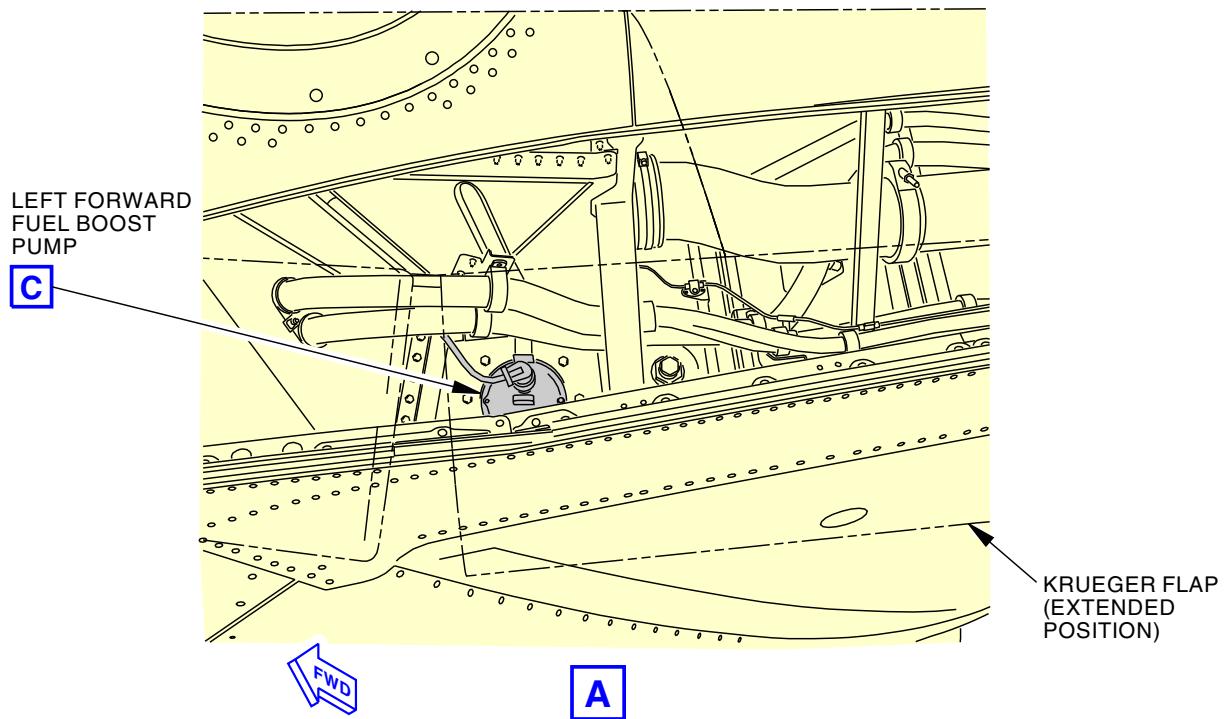
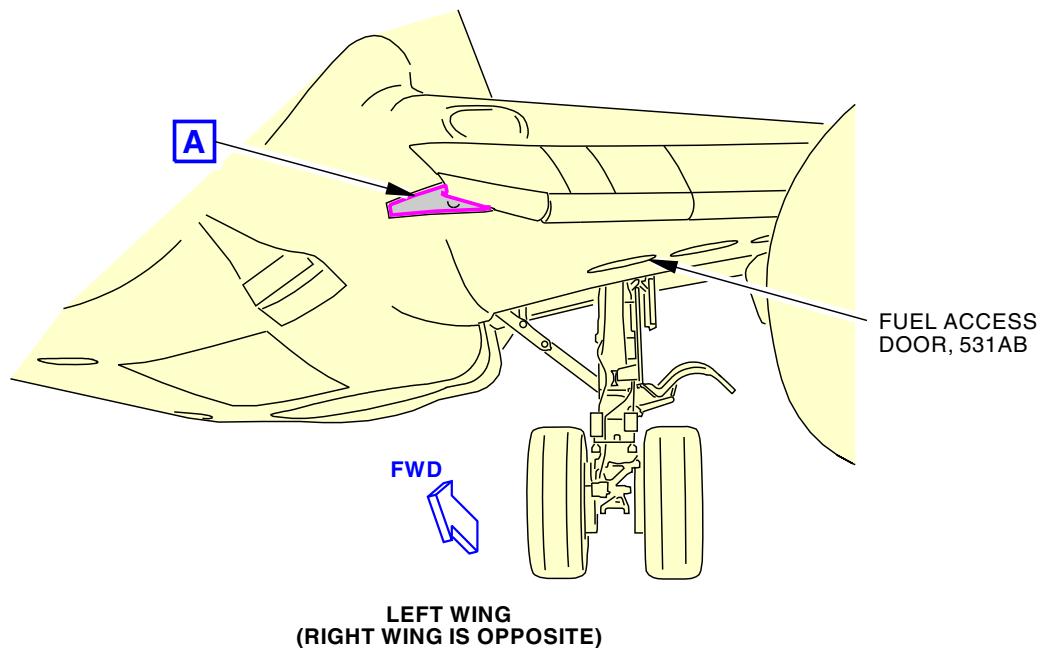
— END OF TASK —

EFFECTIVITY
LOM ALL

28-22-41



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AIRCRAFT MAINTENANCE MANUAL



F97153 S0006572058_V2

No. 1 or 2 Tank Fuel Boost Pump Installation
Figure 401/28-22-41-990-808 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

D633A101-LOM

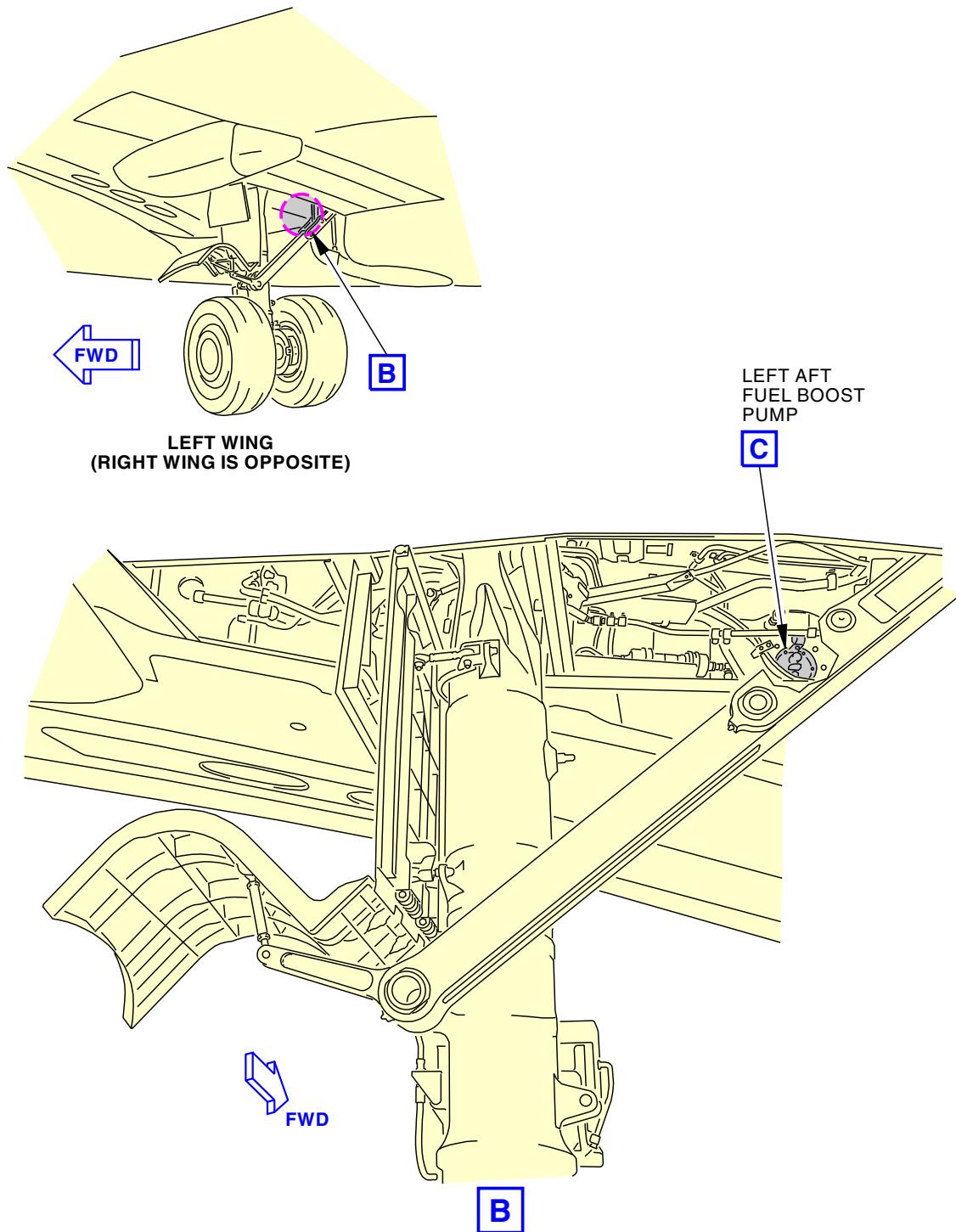
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F97700 S0006572059_V2

No. 1 or 2 Tank Fuel Boost Pump Installation
Figure 401/28-22-41-990-808 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

28-22-41

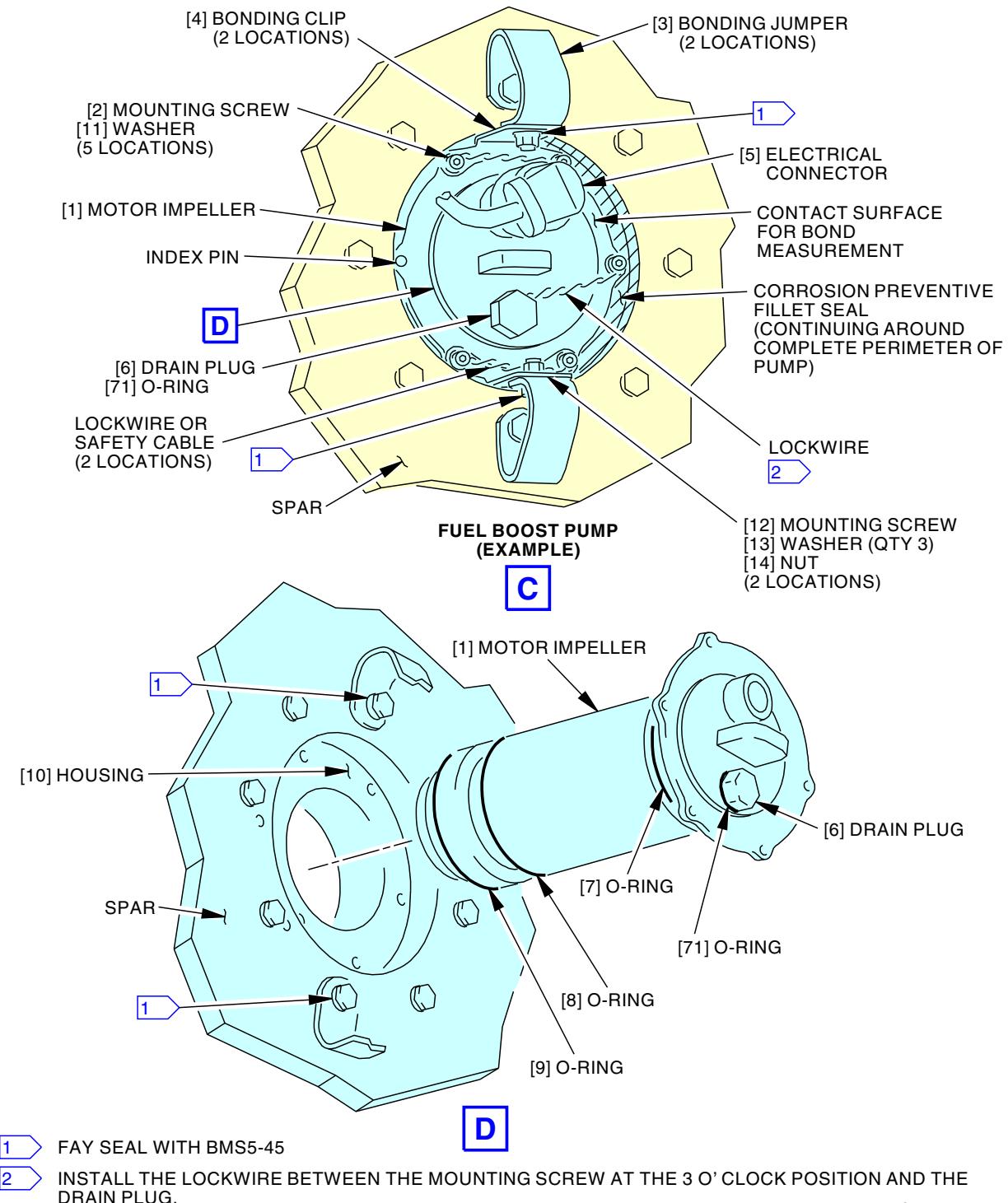
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL**



F97710 S0006572060_V5

**No. 1 or 2 Tank Fuel Boost Pump Installation
Figure 401/28-22-41-990-808 (Sheet 3 of 3)**

EFFECTIVITY	LOM ALL
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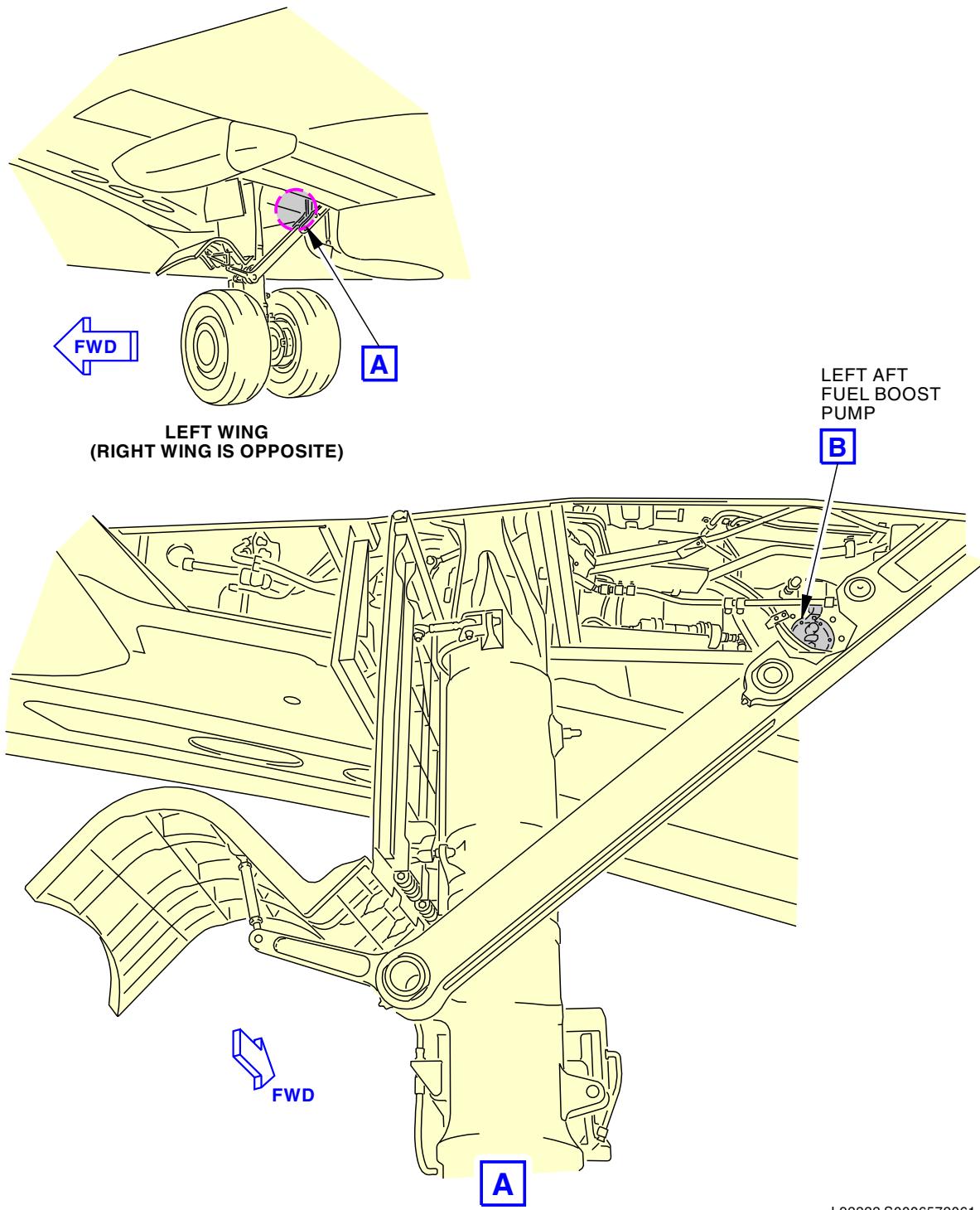
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L92222 S0006572061_V2

No. 1 or 2 Tank Aft Fuel Boost Pump Wiring Check
Figure 402/28-22-41-990-809 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-22-41

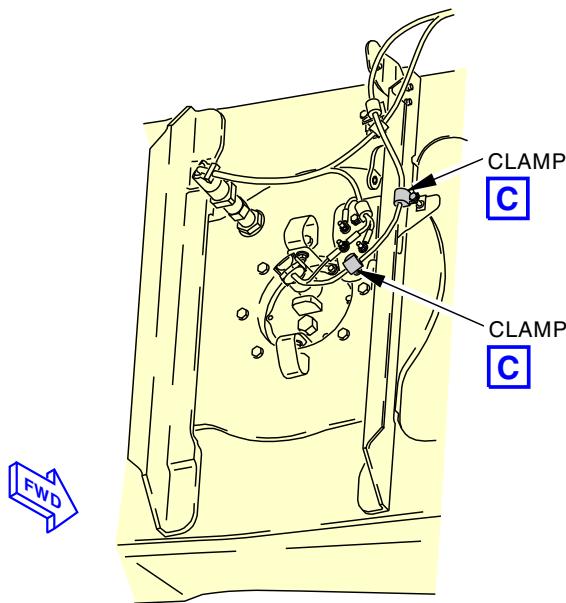
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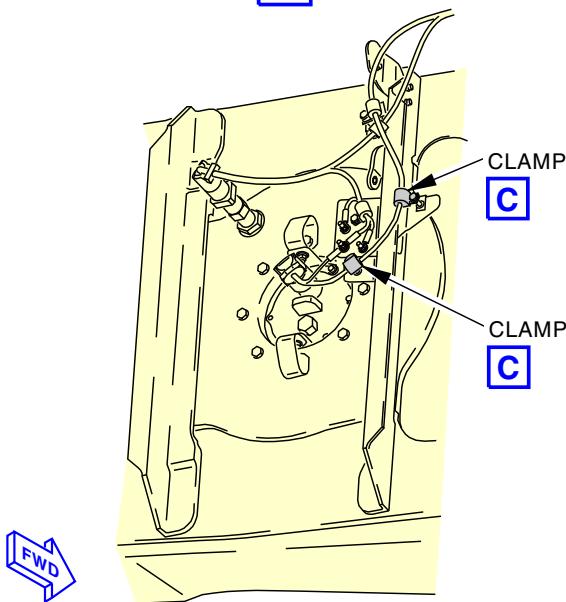


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LEFT AFT FUEL BOOST PUMP
(ALTERNATE CLAMP INSTALLATION)

B



LEFT AFT FUEL BOOST PUMP

B

L92357 S0006572062_V3

No. 1 or 2 Tank Aft Fuel Boost Pump Wiring Check
Figure 402/28-22-41-990-809 (Sheet 2 of 3)

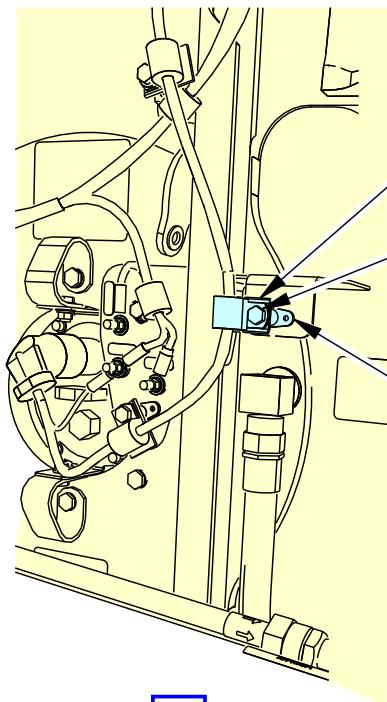
EFFECTIVITY
LOM ALL

28-22-41

D633A101-LOM

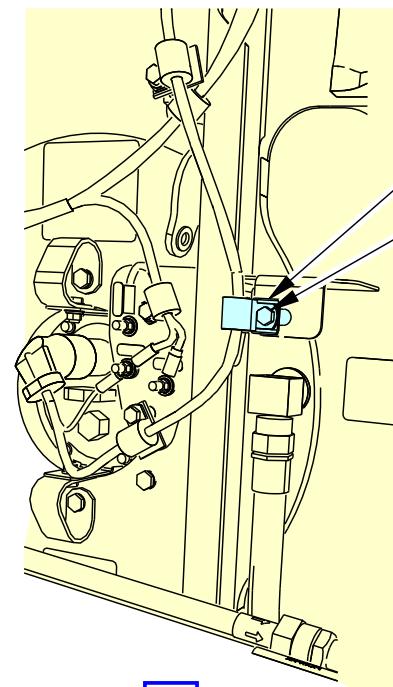
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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[15] CLAMP
(2 LOCATIONS)

[16] SCREW

[20] NUTPLATE

[15] CLAMP
(2 LOCATIONS)
[16] SCREW
[17] SPACER
[18] WASHER
[19] NUT

2881462 S0000683223_V1

No. 1 or 2 Tank Aft Fuel Boost Pump Wiring Check
Figure 402/28-22-41-990-809 (Sheet 3 of 3)

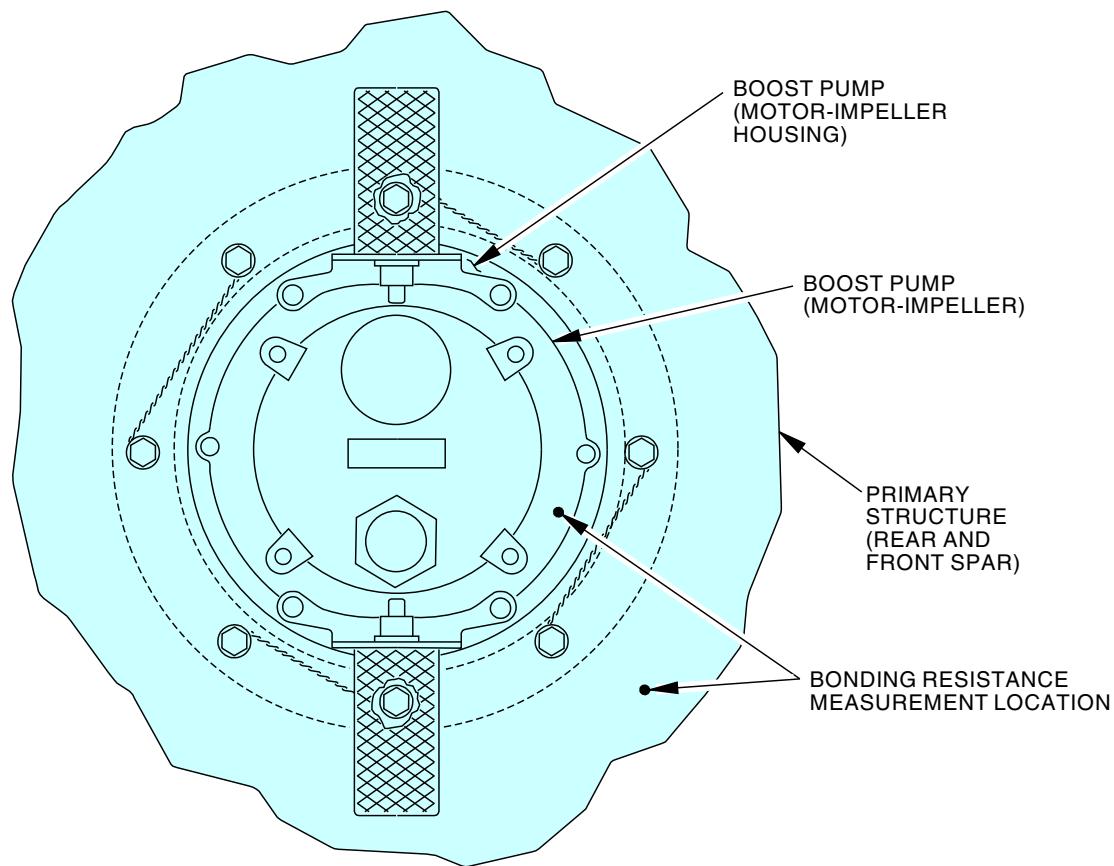
EFFECTIVITY
LOM ALL

28-22-41

D633A101-LOM



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NOTE:

MEASURE PUMP MOTOR-IMPELLER AT POINTS
INDICATED TO PRIMARY STRUCTURE $<0.0004\Omega$.

N92243 S0006572063_V3

No. 1 or No. 2 Tank Boost Pump Resistance Measurement - Probe Locations
Figure 403/28-22-41-990-810



D633A101-LOM

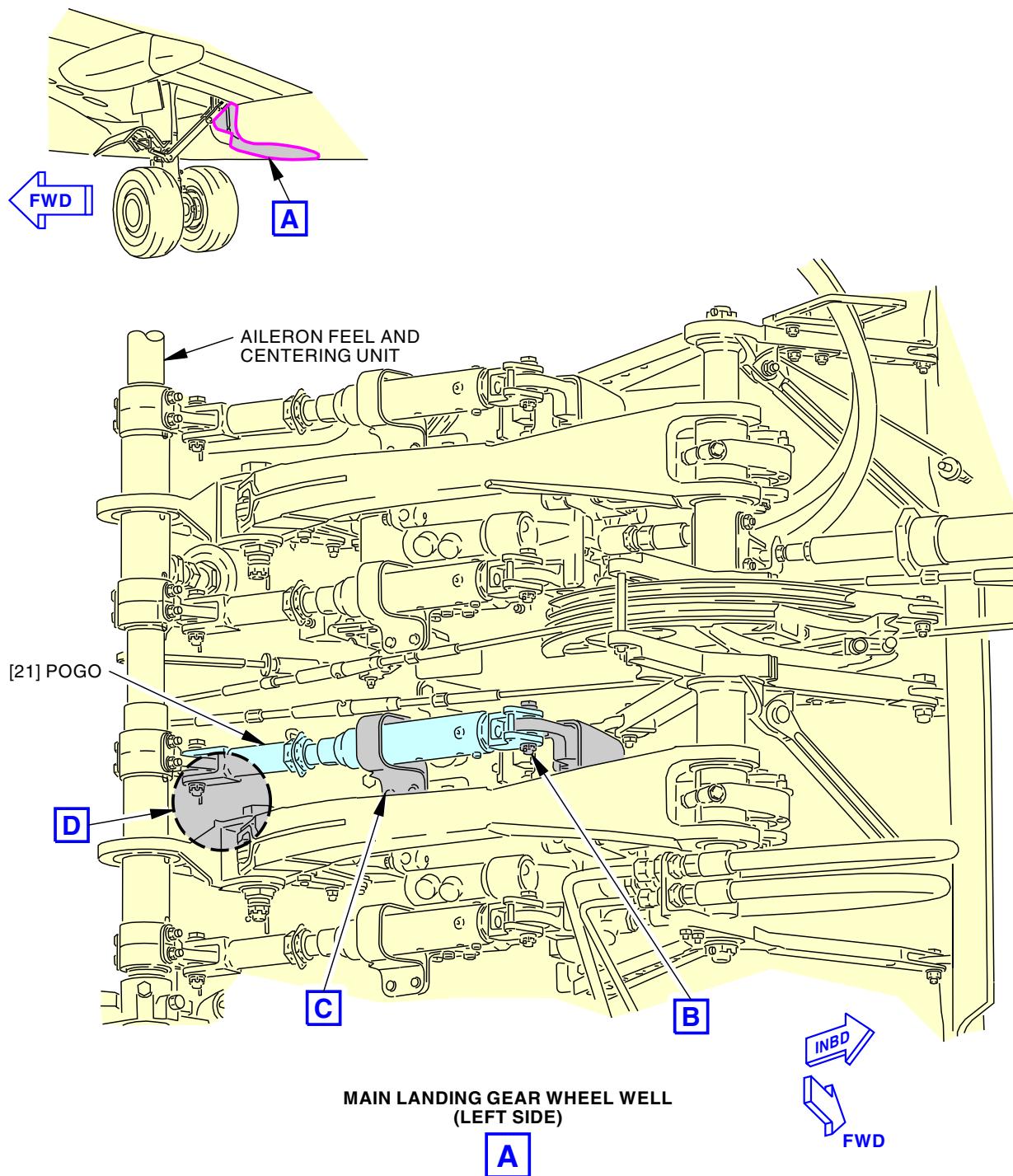
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H30756 S0006572064_V2

Left Center Tank Fuel Boost Pump Installation
Figure 404/28-22-41-990-811 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

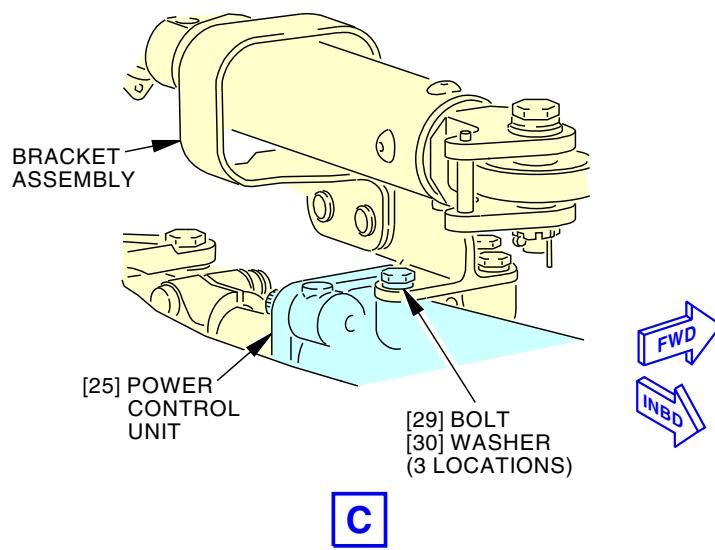
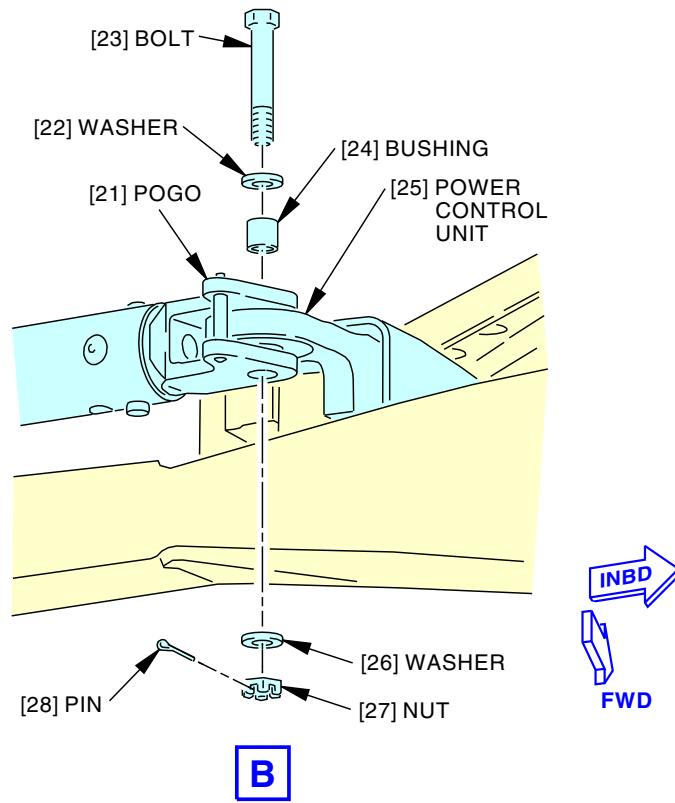
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BOEING
737-600/700/800/900
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H30758 S0006572065_V2

Left Center Tank Fuel Boost Pump Installation
Figure 404/28-22-41-990-811 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

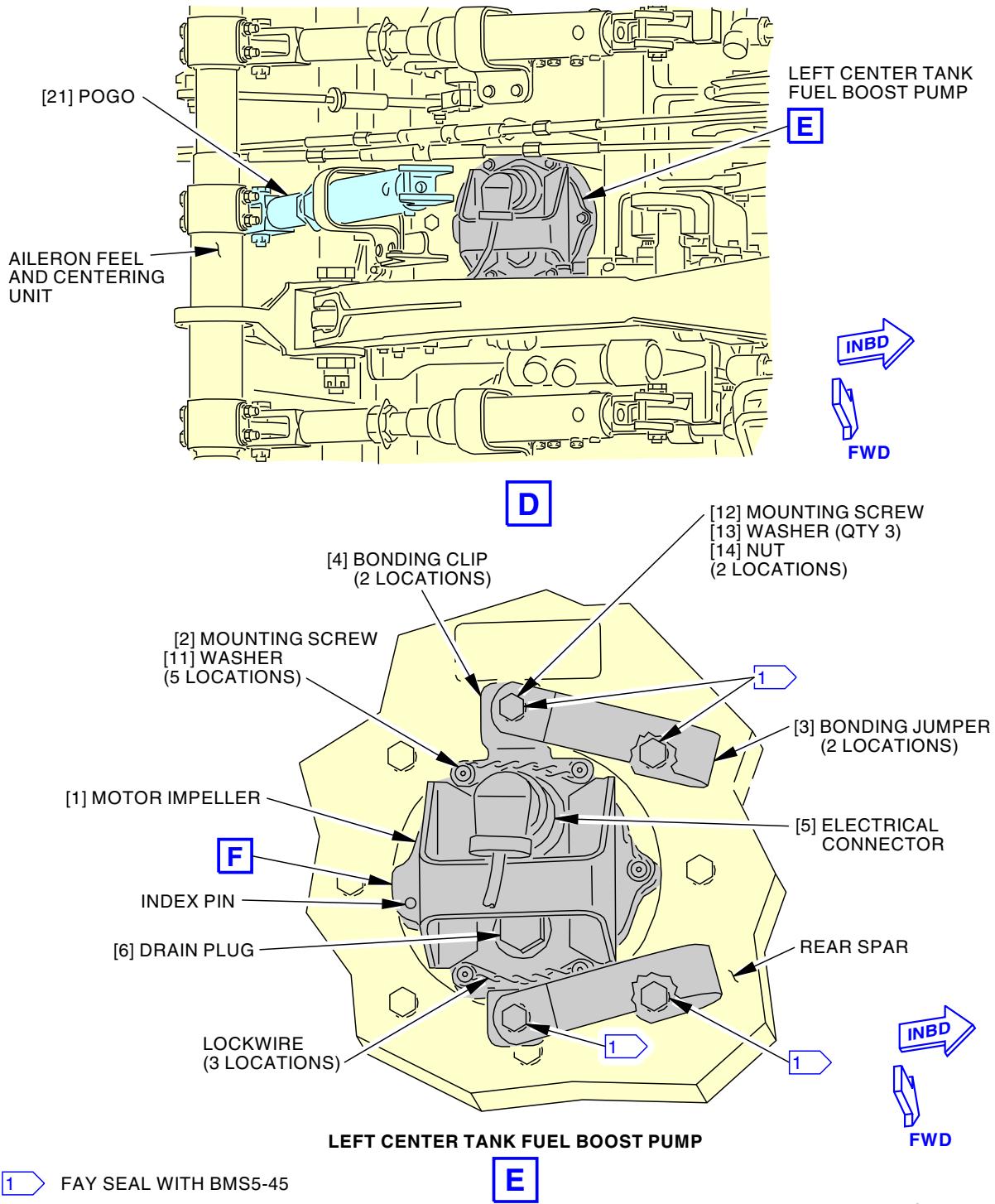
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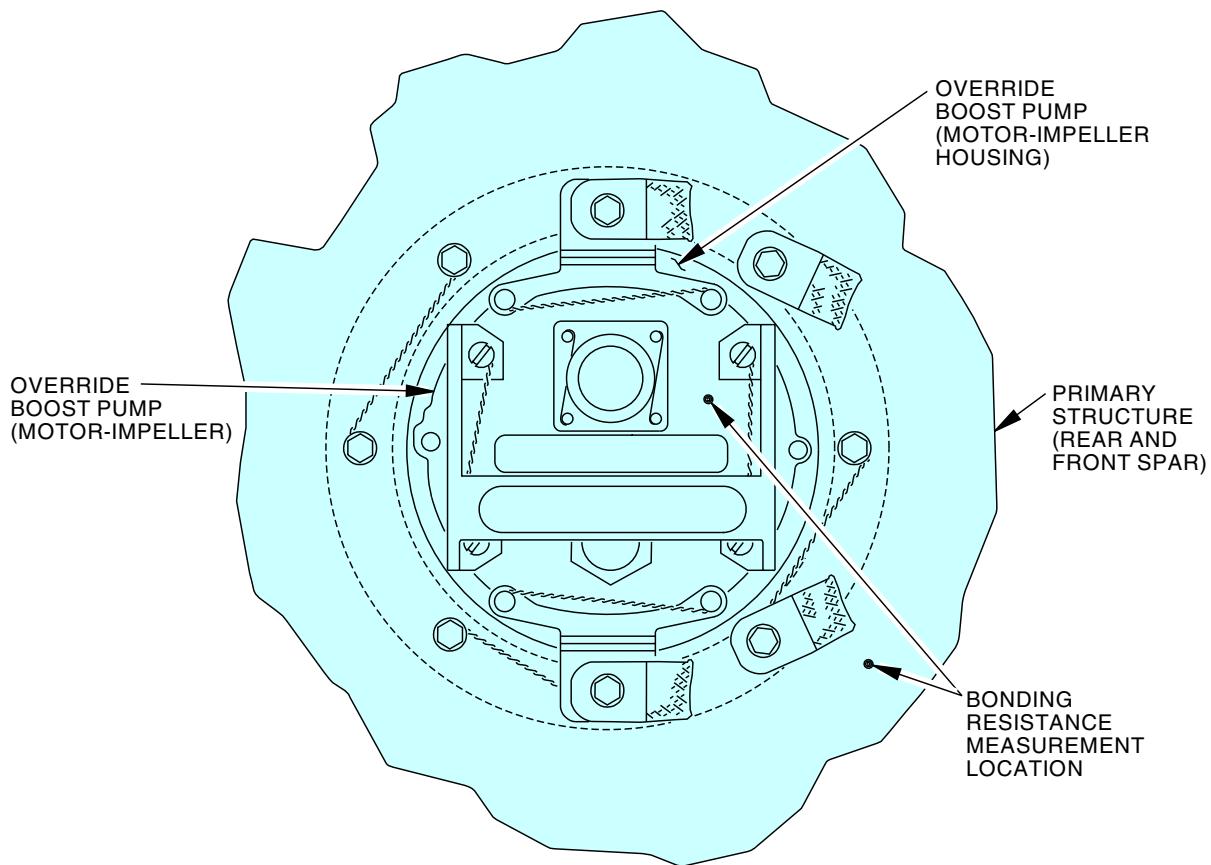
H31111 S0006572066_V4

**Left Center Tank Fuel Boost Pump Installation
Figure 404/28-22-41-990-811 (Sheet 3 of 3)**

EFFECTIVITY
LOM ALL

28-22-41

D633A101-I.QM

**NOTE:**

MEASURE IMPELLER MOTOR AT POINTS
INDICATED TO THE PRIMARY STRUCTURE
 $<0.0004\Omega$.

N92240 S0006572070_V3

Center Tank Boost Pump Resistance Measurement - Probe Locations
Figure 405/28-22-41-990-812

EFFECTIVITY
LOM ALL

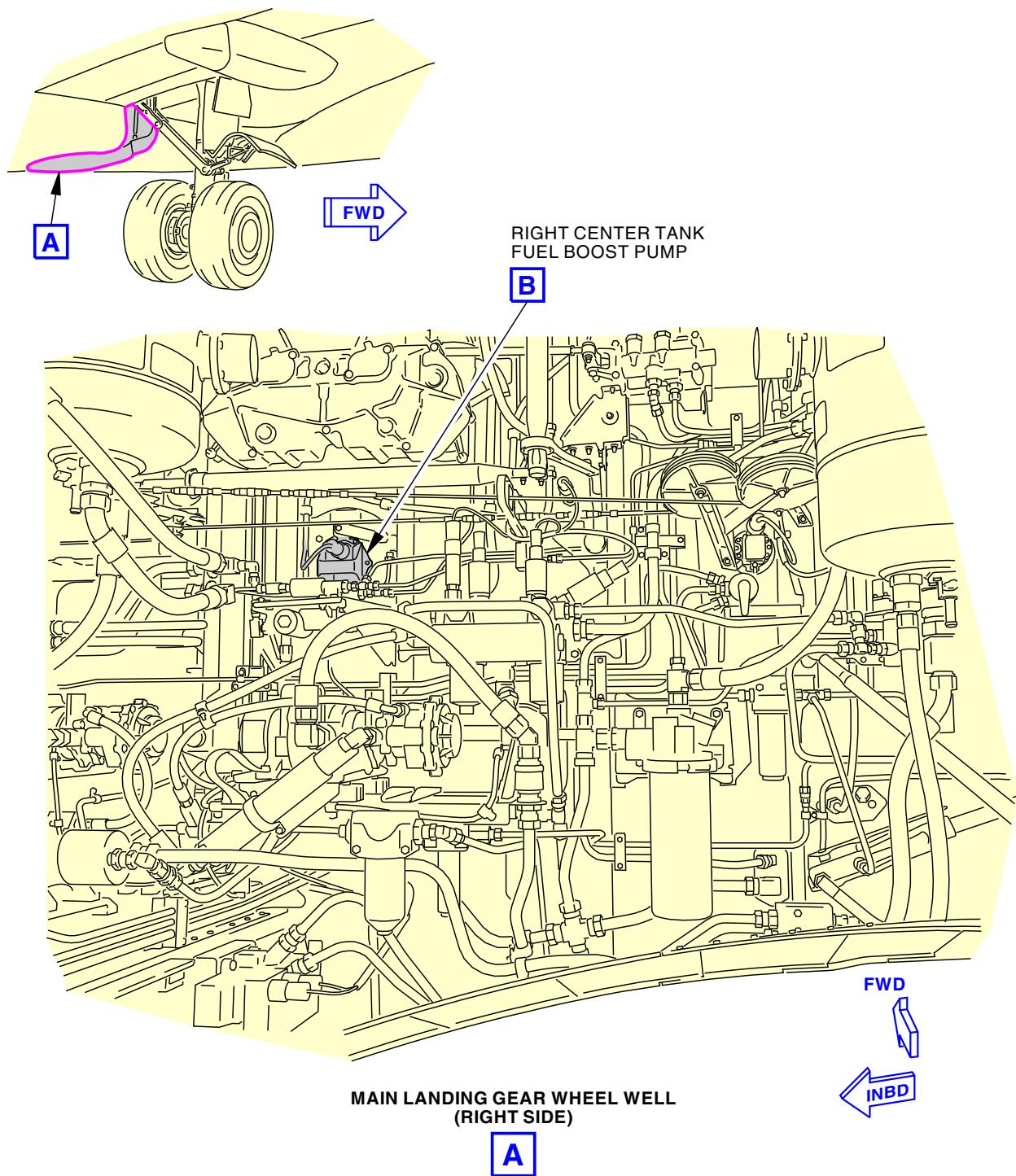
ECCN 9E991 BOEING PROPRIETARY - See title page for details

D633A101-LOM

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H31191 S0006572071_V2

Right Center Tank Fuel Boost Pump Installation
Figure 406/28-22-41-990-813 (Sheet 1 of 2)

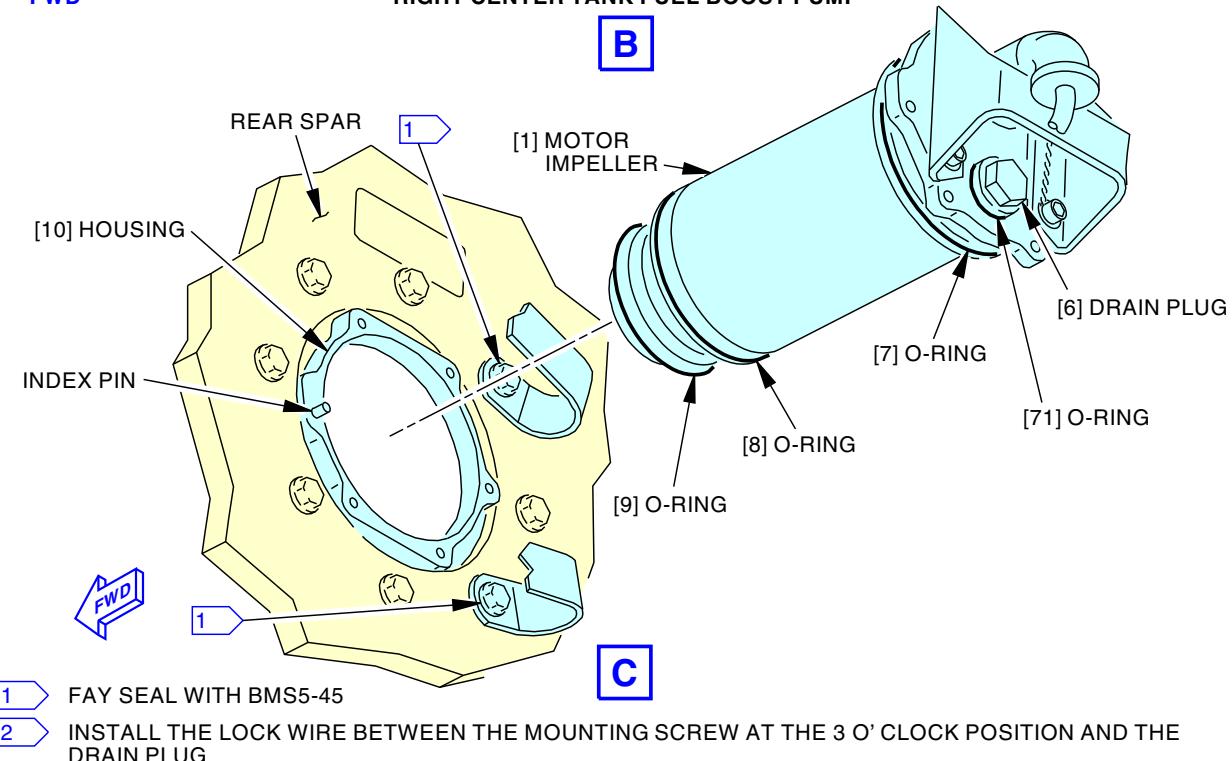
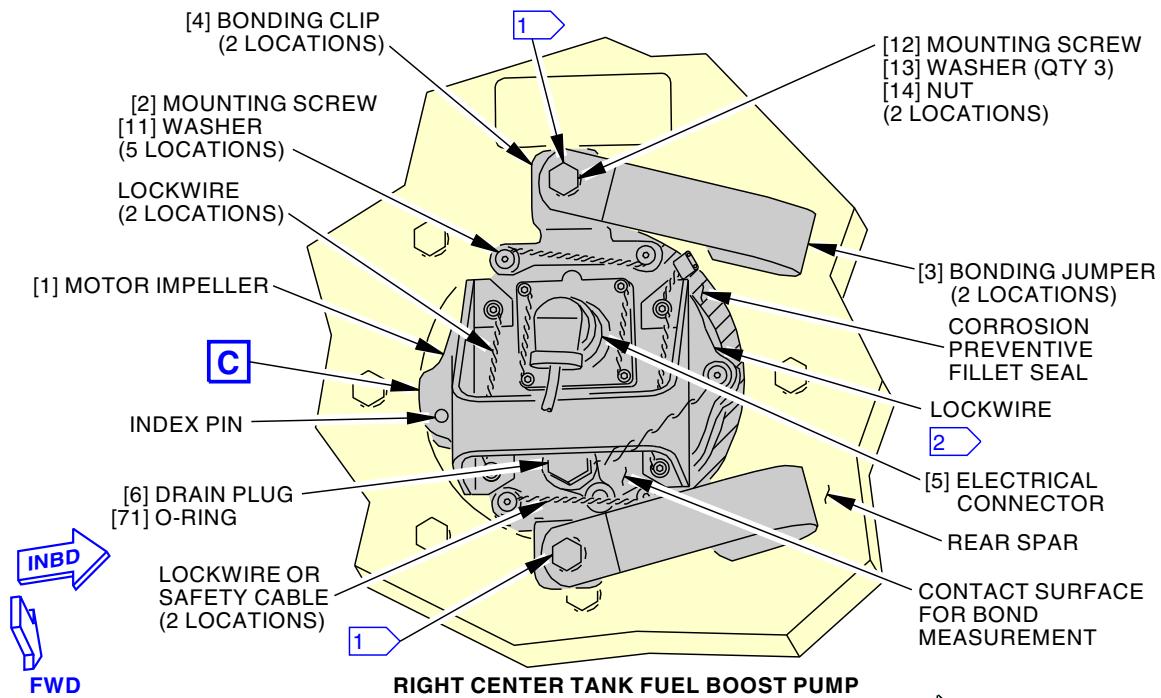
EFFECTIVITY
LOM ALL

28-22-41

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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H31288 S0006572072_V6

Right Center Tank Fuel Boost Pump Installation
Figure 406/28-22-41-990-813 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-22-41

D633A101-LOM



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TASK 28-22-41-400-801

3. Motor Impeller Installation

(Figure 401, Figure 403, Figure 404, Figure 405, Figure 406)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.
- (2) An insulation resistance test is necessary for the installation of 60B92404-6 or -7 pumps (No. 1 or No. 2 tank) without fuel pump ground fault interrupters and for 60B89004-10 or -12 pumps (center tank) without fuel pump ground fault interrupters. An insulation resistance test is not necessary for 60B92404-8 or -10 and subsequent pumps (No. 1 or No. 2 tank) or for 60B89004-14 or -16 and subsequent pumps (center tank).
- (3) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are also acceptable sealants.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
27-11-00-820-802	Pogo and Power Control Unit (PCU) Adjustment (P/B 501)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-00-200-801	Fuel Pumps - Insulation Resistance Check (P/B 601)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
AIPC 28-22-41-05	Aircraft Illustrated Parts Catalog
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-00, Section 2	Standard Wiring Practices Manual
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.





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Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01505	Lockwire - Safety And Lock	NASM20995
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G51056	Fuel - Standard Specification For Aviation Turbine Fuels (Jet A And Jet A-1)	ASTM D1655
G51372	Kit - Safety Cable, 321 CRES - 0.035 +/-0.003 Inch (1.0 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Motor impeller	28-22-41-05-030 28-22-41-05-031 28-22-41-05-034 28-22-41-05-195 28-22-41-05-335	LOM 402, 404 LOM ALL LOM 402, 404 LOM ALL LOM ALL
7	O-ring	28-22-41-05-066 28-22-41-05-200	LOM ALL LOM ALL

EFFECTIVITY
LOM ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	O-ring	28-22-41-05-064	LOM ALL
		28-22-41-05-205	LOM ALL
9	O-ring	28-22-41-05-062	LOM ALL
		28-22-41-05-210	LOM ALL
71	O-ring	28-22-41-05-060	LOM ALL
		28-22-41-05-214	LOM ALL
		28-22-41-05-354	LOM ALL

F. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

G. Prepare For Installation

SUBTASK 28-22-41-480-004



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (1) If downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-41-640-002

- (2) Apply a thin layer of grease, D00504 to the new o-ring [71].

SUBTASK 28-22-41-420-033

- (3) Install the o-ring [71] on the drain plug [6].

SUBTASK 28-22-41-420-034

- (4) Tighten the drain plug [6] to 45 ± 5 in-lb (5.1 ± 0.6 N·m).



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H. Motor Impeller Installation

LOM 402, 404 PRE SB 737-28A1197

SUBTASK 28-22-41-210-010



WARNING

MAKE SURE THAT AN INTERNAL INSPECTION OF THE ROUTING OF THE STATOR LEAD WIRES IN THE FUEL PUMP WAS DONE. INCORRECT ROUTING OF THE STATOR LEAD WIRES CAN CAUSE AN INTERNAL CHAFING CONDITION THAT CAN CAUSE AN ELECTRICAL SHORT. AN ELECTRICAL SHORT IN THE PUMP MOTOR CAN CAUSE A FIRE, OR EXPLOSION WHEN THE FUEL PUMP INLET IS OUT OF THE FUEL.

- (1) Make sure the fuel pump has been inspected for the stator lead (or internal) wire chafing condition.

NOTE: The letter T will be stamped on the identification plate of the motor impeller after the serial number if the pump has been inspected. The pumps are subject to the inspection requirements of SB 28A1197. An airworthiness directive (FAA AD 2002-19-52) expands the inspection requirement to all fuel pumps prior to installation.

NOTE: New motor-impellers, specification 60B92404-10 and subsequent (No. 1 or No. 2 tank) and specification 60B89004-16 and subsequent (center tank) can be installed, but do not have a letter T stamped on the identification plate of the motor impeller. These new motor-impellers have an internal retainer to prevent chafing of the wire bundle.

LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB 737-28A1197

SUBTASK 28-22-41-210-011



WARNING

MAKE SURE THAT AN INTERNAL INSPECTION OF THE ROUTING OF THE STATOR LEAD WIRES IN THE FUEL PUMP WAS DONE. INCORRECT ROUTING OF THE STATOR LEAD WIRES CAN CAUSE AN INTERNAL CHAFING CONDITION THAT CAN CAUSE AN ELECTRICAL SHORT. AN ELECTRICAL SHORT IN THE PUMP MOTOR CAN CAUSE A FIRE, OR EXPLOSION WHEN THE FUEL PUMP INLET IS OUT OF THE FUEL.

- (2) Make sure the fuel pump has been inspected for the stator lead (or internal) wire chafing condition.

NOTE: The letter T will be stamped on the identification plate of the motor impeller after the serial number if the pump has been inspected.

NOTE: New motor-impellers, specification 60B92404-10 and subsequent (No. 1 or No. 2 tank) and specification 60B89004-16 and subsequent (center tank) can be installed, but do not have a letter T stamped on the identification plate of the motor impeller. These new motor-impellers have an internal retainer to prevent chafing of the wire bundle.

LOM ALL

SUBTASK 28-22-41-210-007

- (3) Make sure the wire bundle for the boost pump has a clamp installed as shown in (Figure 402).

NOTE: The clamp installation is critical for the compliance of Service Bulletin 737-28A1148

- (a) If necessary, adjust the clamps [15] as shown in (Figure 402).

- 1) Loosen the screw [16], and move clamp [15] to the correct position.

EFFECTIVITY
LOM ALL

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- a) Make sure to equally distribute slack in the wire bundle on both sides of the clamp [15].
- 2) Make sure that the spacer [17] is installed between the bracket and clamp [15].
 - a) Tighten the screw [16], spacer [17], washer [18], and nut [19] while the clamp [15] is in the correct position.

**LOM 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404 POST SB
737-47-1003 OR POST SB 737-47-1002**

- 3) Make sure that the clamp [15] is installed on the raised nutplate [20].
 - a) Tighten the screw [16] while the clamp [15] is in the correct position.

LOM ALL

SUBTASK 28-22-41-110-002

28-AWL-14: CDCCL

- (4) Install a fay surface bond between the end-cap of the motor impeller [1] and the pump housing [10] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (a) Fully clean these surfaces with a clean, cotton wiper, G00034, moist with solvent, B00083, and dry them:
 - 1) The mating surface of the end-cap of the motor impeller [1].
 - 2) The mating surface of the pump housing [10].

SUBTASK 28-22-41-420-002

- (5) For the No. 1 or No. 2 tank boost pumps, install the new O-ring [7], O-ring [8], and O-ring [9] in the grooves of the motor impeller [1].

SUBTASK 28-22-41-420-018

- (6) For the left center tank boost pump, install the new O-ring [7], O-ring [8], and O-ring [9].

SUBTASK 28-22-41-420-019

- (7) For the right center tank boost pump, install the new O-ring [7], O-ring [8], and O-ring [9].

SUBTASK 28-22-41-640-001

- (8) Apply a thin layer of grease, D00504, to O-ring [7], O-ring [8], and O-ring [9].

SUBTASK 28-22-41-650-002

- (9) Put 1/2 to 1 pint of fuel, G02272 or aviation turbine fuel, G51056 into two smaller slots in the upper side of the motor impeller [1].

SUBTASK 28-22-41-980-001

- (10) Turn the motor impeller [1] to make sure fuel touches the internal parts of the fuel boost pump.

SUBTASK 28-22-41-420-003

- (11) For the boost pumps for the No. 1 or the No. 2 tank, put the motor impeller [1] into the housing [10].

NOTE: Be careful not to damage O-ring [7], O-ring [8], and O-ring [9] when you put the motor impeller [1] into the housing [10].

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-41-420-020

- (12) For the left center tank boost pump, put the motor impeller [1] into the housing [10].
NOTE: Be careful not to damage the O-ring [7], O-ring [8], and O-ring [9] when you put the motor impeller [1] into the housing [10].

SUBTASK 28-22-41-420-021

- (13) For the right center tank boost pump, put the motor impeller [1] into the housing [10].
NOTE: Be careful not to damage the O-ring [7], O-ring [8], and O-ring [9] when you put the motor impeller [1] into the housing [10].

SUBTASK 28-22-41-820-001

- (14) Turn the motor impeller [1] until the index hole aligns with the index pin in the housing [10].

SUBTASK 28-22-41-210-047

► 28-AWL-14: CDCCL

- (15) Make sure two bonding clips [4] are installed to the end-cap of the motor impeller [1].
NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

SUBTASK 28-22-41-390-012

► 28-AWL-14: CDCCL

- (16) Install a fay sealed fay surface bond between the end-cap of the motor impeller [1] and each bonding clip [4] (SWPM 20-20-00).
NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).
NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

SUBTASK 28-22-41-420-028

- (17) Install the mounting screws [2] and washers [11] on the motor impeller [1].
NOTE: Some bonding clips [4] have masking, make sure to remove the masking before installation.

SUBTASK 28-22-41-420-030

- (18) Install the lockwire, G01505, between the mounting screws [2] and drain plug [6].
NOTE: Put the lockwire on the mounting screw [2] near the 3 O'clock position.

SUBTASK 28-22-41-420-035

- (19) Install the safety cable kit, G51372 or lockwire, G01505 on the four mounting screws [2].

SUBTASK 28-22-41-420-029

- (20) Seal the mounting screws [2] with sealant, A50337, or sealant, A02315.

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SUBTASK 28-22-41-760-005

28-AWL-14: CDCCL

- (21) Prior to attachment of the bonding jumpers [3] to the bonding clips [4], do these measurements (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-14: CDCCL

- (b) Make sure the electrical bonding resistance between the end-cap of the motor impeller [1] and the bonding clip [4] is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

28-AWL-14: CDCCL

- (c) Make sure the electrical bonding resistance between the end-cap of the motor impeller [1] and the pump housing [10] is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

28-AWL-14: CDCCL

- (d) Make sure the electrical bonding resistance between the end-cap of the motor impeller [1] and the structure is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

SUBTASK 28-22-41-210-046

28-AWL-14: CDCCL

- (22) Make sure two bonding jumpers [3] are installed between the end cap of the motor impeller [1] and the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

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► 28-AWL-14: CDCCL

- (a) If the bonding jumper [3] is disconnected from the structure, verify the following for the applicable bonding jumper [3]:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

► 28-AWL-14: CDCCL

- 1) Make sure there is a fay sealed fay surface bond between each bonding jumper [3] terminal and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- a) If there is no washer between the bonding jumper [3] terminal and spar web, then install a washer between the bonding jumper [3] terminal and spar web to reduce corrosion.

<1> Make sure that the fay sealed fay surface bond apply to each surface.

NOTE: Only one bare aluminum washer P/N NAS1149D04()H or NAS1149D04()J or an equivalent between the bonding jumper terminal and spar web is permitted.

► 28-AWL-14: CDCCL

- 2) Prior to attaching the bonding jumper [3] to the bonding clip [4], do the electrical bonding resistance measurement (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-14: CDCCL

- b) Make sure the electrical bonding resistance between the loose end of the bonding jumper [3] terminal and the structure is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

► 28-AWL-14: CDCCL

- (b) If the bonding jumper [3] is not disconnected from the structure, verify the following for the applicable bonding jumper:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

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28-AWL-14: CDCCL

- 1) Prior to attaching the bonding jumper [3] to the bonding clip [4], do the electrical bonding resistance measurement (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-14: CDCCL

- b) Make sure the electrical bonding resistance between the loose end of the bonding jumper [3] terminal and the structure is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (c) Do these steps to the two bonding jumpers [3] and the bonding clips [4]:

- 1) Clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

- a) Rub dry with a clean, dry cotton wiper, G00034.

- b) Continue to clean and dry the surface until the cotton wiper, G00034 stays clean.

28-AWL-14: CDCCL

- (d) Install a fay sealed fay surface bond between each bonding clip [4] and bonding jumper [3] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- 1) Apply sealant, A50110, to the shank and threads of the two mounting screws [12].
 - 2) Apply a thin continuous layer of sealant, A50110, to both surfaces of the bonding jumpers [3] and washers [13].

- (e) Install the mounting screws [12], washers [13], and nuts [14] that attach the two bonding jumpers [3] to the bonding clips [4] (SWPM 20-20-10).

NOTE: Follow the cleaning instructions in SWPM 20-20-10 to make sure the bonding jumpers are bonded to the bonding clips.

28-AWL-14: CDCCL

- (f) Measure the electrical bonding resistance between the motor impeller [1] end-cap and the airplane structure (Figure 403), (Figure 405) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-14: CDCCL

- (2) Make sure the electrical bonding resistance is 0.0004 ohm (0.4 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (3) If the electrical bonding resistance requirement is not satisfied, do these steps:

- a) Clean all faying surfaces (jumper terminal lugs and tabs on the boost pump for the upper and lower terminal lugs) (SWPM 20-20-00, Section 2 and SWPM 20-20-10).
- b) Make sure the correct washers (bare finish) are used in the build-up adjacent to the tinned jumper lugs (AIPC 28-22-41-05).
 <1> If the correct washers are not installed, install the correct washers.
- c) Do the bonding resistance check again.

SUBTASK 28-22-41-390-002

- (23) Make sure there is a fay seal fay surface bond on the applicable locations of the bonding jumpers [3] (Figure 401, Figure 404, Figure 406).

- (a) Make sure the sealant covers the area around each jumper terminal and the fastener head to protect the conductive path between spar and the motor impeller [1].
- (b) Use sealant, A50110, for the fay seal.

LOM 404, 406, 407 PRE SB 737-28A1201; AIRPLANES WITH NO. 1 OR NO. 2 TANK BOOST PUMP 60B92404-6 OR -7 OR CENTER TANK BOOST PUMP 60B89004-10 OR -12

SUBTASK 28-22-41-760-001

- (24) For the pump that you installed, do this task: Fuel Pumps - Insulation Resistance Check, TASK 28-22-00-200-801.

NOTE: This step is not applicable for No. 1 or No. 2 tank boost pump 60B92404-10 and subsequent or center tank boost pump 60B89004-16 and subsequent.

LOM ALL

SUBTASK 28-22-41-420-007

- (25) Connect the electrical connector [5] to the motor impeller [1].

SUBTASK 28-22-41-650-003

- (26) Refuel the center or the No. 1 or No. 2 fuel tank, as applicable (TASK 12-11-00-650-802).

- (a) If it is not possible to refuel the tanks to the specified quantities, do one of the alternative procedures to prime the boost pump (TASK 28-22-41-420-801).
- (b) For the forward fuel boost pumps, refuel the No. 1 or No. 2 tanks to 500 lb (227 kg) minimum.
- (c) For the aft fuel boost pumps, refuel the No. 1 or No. 2 tanks to 500 lb (227 kg) minimum.
- (d) For the center tank fuel boost pumps, refuel the center fuel tank to 14,000 lb (6350 kg) minimum.

SUBTASK 28-22-41-710-001

- (27) For the applicable pump, do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801

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SUBTASK 28-22-41-210-002

- (28) Make sure there are no fuel leaks at the fuel boost pump.

SUBTASK 28-22-41-410-004

- (29) If the pogo [21] was removed to get access to the left center tank boost pump, do these steps (Figure 404):

NOTE: Be careful not to change the length of the pogo [21].

- (a) Connect the bracket assemblies to the power control unit [25] with bolts [29] and washers [30].

- (b) Connect the pogo [21] to the power control unit [25] with bolt [23], washer [22], bushing [24], washer [26], nut [27] and pin [28].

NOTE: You must install the bolt [23] with the bolt head up.

- (c) Make sure you can easily install and remove the rig pin A/S-4, from the rigging pin kit, SPL-1585, in the aileron bus drum (TASK 27-11-00-820-802).

- (d) If you cannot easily install and remove the rig pin A/S-4, do this task: Pogo and Power Control Unit (PCU) Adjustment, TASK 27-11-00-820-802.

NOTE: This step should not be necessary if the length of the pogo [21] was not changed while it was removed.

SUBTASK 28-22-41-480-002

- (30) If the leading edge slat actuator locks were extended, do these steps:



REMOVE THE LOCK FROM LEADING EDGE FLAP ACTUATOR CAREFULLY TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 28-22-41-860-003

- (31) If electrical power is not necessary for other tasks, do this task: Remove External Power, TASK 24-22-00-860-814.

— END OF TASK —

TASK 28-22-41-420-801

4. Fuel Boost Pump and Override Pump Priming

(Figure 401, Figure 404, Figure 406)

A. General

- (1) This task contains maintenance procedures for priming a fuel boost pump or fuel Override pump for applicable tank.

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B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995
G51056	Fuel - Standard Specification For Aviation Turbine Fuels (Jet A And Jet A-1)	ASTM D1655

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Procedure

SUBTASK 28-22-41-650-014

- (1) Refuel the center or the No. 1 or No. 2 fuel tank, as applicable (TASK 12-11-00-650-802).

NOTE: These are the minimum fuel quantities necessary to make sure the boost pumps are primed correctly.

- (a) For the forward fuel boost pumps, refuel the No. 1 or No. 2 tanks to 500 lb (227 kg) minimum.
- (b) For the aft fuel boost pumps, refuel the No. 1 or No. 2 tanks to 500 lb (227 kg) minimum.
- (c) For the center tank fuel boost pumps, refuel the center fuel tank to 14,000 lb (6350 kg) minimum.
- (d) For the applicable pump, do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.
 - 1) If the operational test is completed, the boost pump is correctly primed, no more steps are necessary.
 - 2) If the operational test is not completed, then continue.

SUBTASK 28-22-41-020-020

- (2) Do these steps to prime the boost pump through the boost pump housing drain hole:
 - (a) Remove the drain plug [6] from the applicable boost pump.
 - (b) Put approximately 1.5 pt (0.7 l) of fuel, G02272 or aviation turbine fuel, G51056, into the drain hole.
 - (c) Install the drain plug [6] on the applicable boost pump.

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- 1) Tighten the drain plug [6] to a torque of 45 ± 5 in-lb (5 ± 1 N·m).
- 2) Install MS20995C32 lockwire, G01048, or MS20995C20 lockwire, G50225, to the drain plug [6].
- (d) For the applicable pump, do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.
 - 1) If the operational test is completed, then attach the drain plug [6] with lockwire (TASK 20-10-44-400-801).
 - a) The boost pump is correctly primed.
 - b) No more steps are necessary.
 - 2) If the operational test is not completed, then continue.

SUBTASK 28-22-41-420-017

- (3) Remove the applicable boost pump impeller unit (TASK 28-22-41-000-801).
 - (a) Remove the drain plug [6].
 - (b) Put the impeller unit in a 5-gallon (19-liter) fuel resistant container, STD-1054, of fuel, G02272 or aviation turbine fuel, G51056, but keep the electrical connector on the impeller unit out of the fuel.
 - (c) Install the drain plug [6] again.
 - (d) Hold the pump in the correct direction with the open fuel slot on the top.

NOTE: This will make sure that the fuel does not drain out of the impeller unit before you install it.
 - (e) Make sure there is no fuel on the electrical connector on the impeller unit.
 - (f) Immediately install the applicable boost pump impeller unit (TASK 28-22-41-400-801).
 - (g) Tighten the drain plug [6] to a torque of 45 ± 5 in-lb (5 ± 1 N·m).
 - (h) For the applicable pump, do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.
 - 1) If the operational test is completed, then attach the drain plug [6] with lockwire (TASK 20-10-44-400-801).
 - a) The boost pump is correctly primed.
 - b) No more steps are necessary.
 - 2) If the operational test is not completed, replace the fuel boost pump housing:
 - a) Do this task: Fuel Boost Pump Housing Removal, TASK 28-22-41-000-802.
 - b) Do this task: Fuel Boost Pump Housing Installation, TASK 28-22-41-400-802.

———— END OF TASK ————

TASK 28-22-41-000-802

5. Fuel Boost Pump Housing Removal

(Figure 407)

A. General

- (1) This task gives instruction to remove the fuel boost pump housing.

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)

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Reference	Title
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-21-710-801	Crossfeed Valve Operational Test (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-42-11-000-801	Fuel Boost Pump Pressure Switch Removal (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995
G51372	Kit - Safety Cable, 321 CRES - 0.035 +/-0.003 Inch (1.0 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

E. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168

F. Prepare for the Removal

SUBTASK 28-22-41-480-005



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-22-41-650-004

- (2) Defuel the center fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-22-41-650-005

- (3) For the forward or aft boost pump housing for the No. 1 tank or for the left center boost pump housing, defuel the No. 1 tank (TASK 28-26-00-650-801).

SUBTASK 28-22-41-650-006

- (4) For the forward or aft boost pump housing for the No. 2 tank or for the right center boost pump housing, defuel the No. 2 tank (TASK 28-26-00-650-801).

SUBTASK 28-22-41-860-017

- (5) Do these steps to make sure that the crossfeed valve is closed:

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- (a) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.
- (b) Make sure that the crossfeed valve is set to the closed position and the crossfeed position indicator light is off.

SUBTASK 28-22-41-650-007

- (6) Drain and purge the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-41-860-004

- (7) To remove the forward boost pump housing for the No. 1 or the No. 2 tank, do these steps:



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.



MAKE SURE TO INSTALL THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET TO PREVENT ACCIDENTAL OPERATION OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 28-22-41-010-003

- (8) To remove the forward or aft fuel boost pump housing in the No. 1 tank, remove this access door:

(TASK 28-11-31-000-801)

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

or remove this access door:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168

SUBTASK 28-22-41-010-004

- (9) To remove the center tank fuel boost pump housing, do these steps:



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

- (b) Remove this access panel:

(TASK 28-11-31-000-801)

Number Name/Location

131AB Center Tank Access

SUBTASK 28-22-41-020-010

- (10) Do this task: Motor Impeller Removal, TASK 28-22-41-000-801.

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SUBTASK 28-22-41-940-001



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (11) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

G. Fuel Boost Pump Housing Removal

SUBTASK 28-22-41-010-005

- (1) Go into the center fuel tank.

SUBTASK 28-22-41-020-024

- (2) Remove the nut [61] and O-ring [60] to remove the ejector pump pressure line [62], if installed.

SUBTASK 28-22-41-020-015

- (3) Remove the nut [55] and O-ring [54] to remove the pressure sensor line [53].

- (a) Make sure that the pressure sensor line [53] is drained.

NOTE: This will help to prevent the collection of water in the pressure sensor line. Water can freeze and cause damage to the pressure sensor line. You can loosen the connection for the pressure sensor line at the pressure switch (TASK 28-42-11-000-801) to help remove the fuel and water from the pressure sensor line. You may have to flush the pressure sensor line to remove all the water.

SUBTASK 28-22-41-020-011

- (4) Disconnect the discharge check valve [41] from the housing [10].



CAUTION

DO NOT DISCONNECT THE COUPLING. FUEL WILL FLOW INTO THE CENTER TANK. DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Remove the screws [59], washers [58], and nuts [52] from the discharge check valve [41].
(b) Remove the O-rings [57].

SUBTASK 28-22-41-210-003

- (5) Disconnect the removal check valve [43] from the housing [10].

- (a) Remove the screws [44], washers [45], and nuts [46] from the removal check valve [43].
(b) Remove the O-ring [42].

SUBTASK 28-22-41-020-012

- (6) Disconnect the bonding jumpers [3] from the spar on the wing.

SUBTASK 28-22-41-020-013

- (7) For the No. 1 tank or No. 2 tank boost pumps, disconnect the vapor discharge port [50] from the housing [10].

- (a) Remove the flexible full coupling [51] from the vapor discharge port [50].
(b) Remove the screws [64] and washers [65] from the vapor discharge port [50].
(c) Remove the flapper valve [67] and the O-rings [66].

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SUBTASK 28-22-41-020-033



CAUTION

DO NOT USE METAL TOOLS. METAL TOOLS CAN CAUSE DAMAGE TO THE PART YOU WILL DO WORK ON OR ADJACENT PARTS.

- (8) Remove the fillet seal from the edge of the housing [10].

SUBTASK 28-22-41-020-023

- (9) Remove and discard the safety cable kit, G51372 or lockwire, G01505 from the mounting bolts [48] and mounting bolts [68].

SUBTASK 28-22-41-020-016

- (10) Hold up the housing [10] from the inner side of the center fuel tank.

SUBTASK 28-22-41-020-017

- (11) Remove the mounting bolts [48] and washers [47] from out of the center fuel tank.

SUBTASK 28-22-41-020-031

- (12) Remove the mounting bolts [68], washers [69], and flat washers [70] from out of the center fuel tank.

NOTE: The housing and center tank are held together with a fay seal. A non-metallic tool may be necessary to help remove the housing.

SUBTASK 28-22-41-020-018

- (13) Remove the gasket [49].

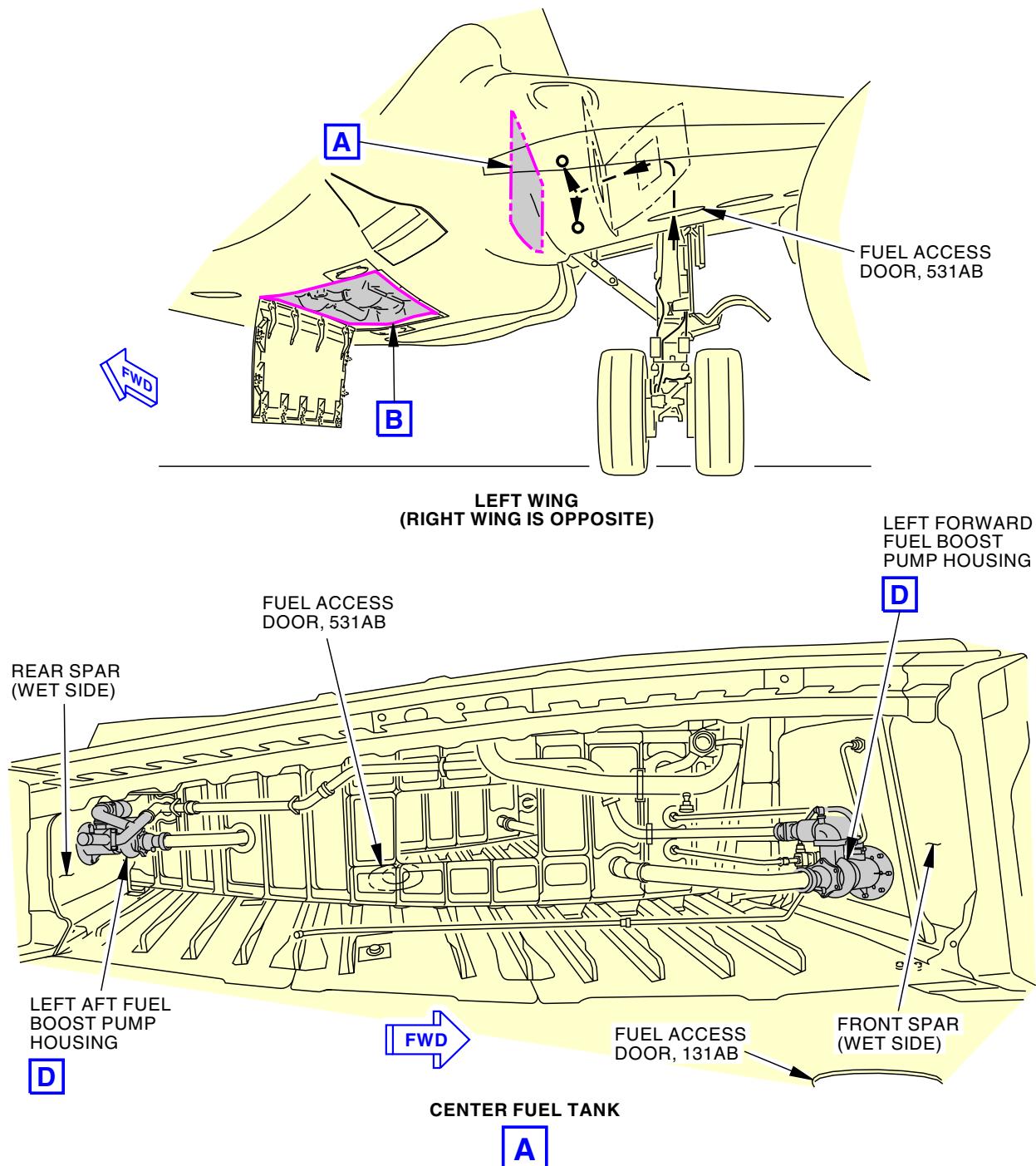
SUBTASK 28-22-41-020-019

- (14) Remove the housing [10] from the center fuel tank.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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F99300 S0006572078_V2

**Fuel Boost Pump Housing Installation
Figure 407/28-22-41-990-815 (Sheet 1 of 4)**

EFFECTIVITY
LOM ALL

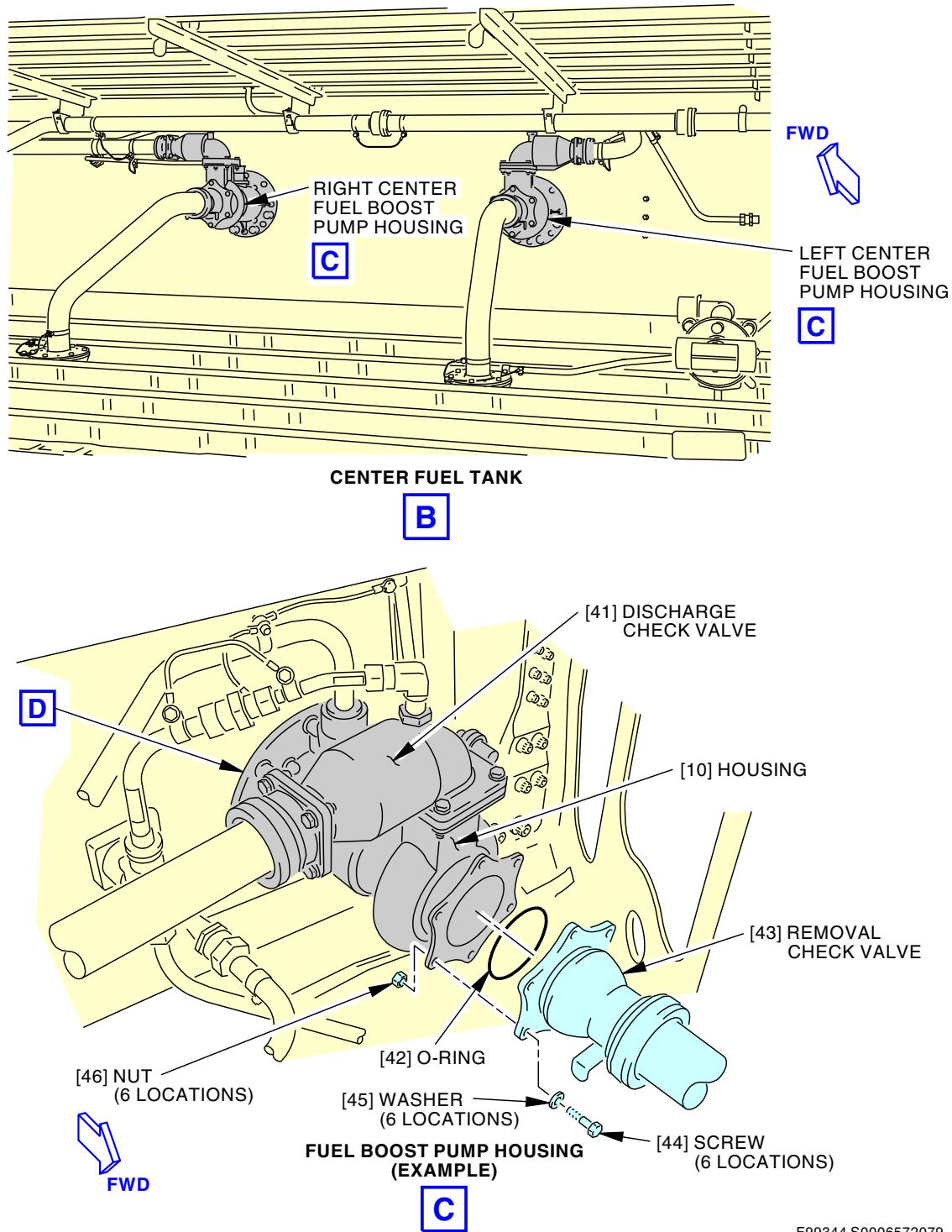
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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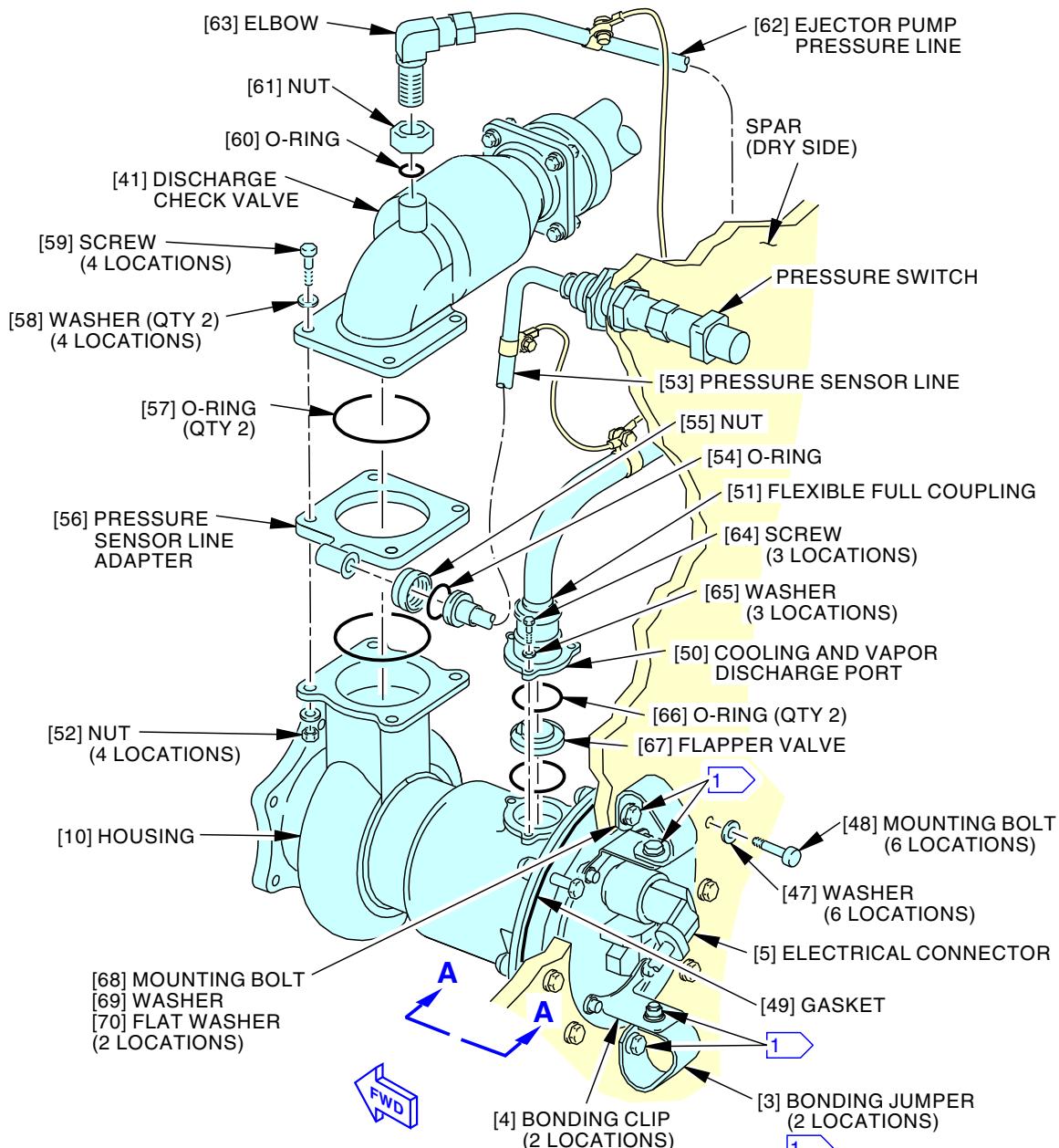


F99344 S0006572079_V3

Fuel Boost Pump Housing Installation
Figure 407/28-22-41-990-815 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

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**FUEL BOOST PUMP HOUSING
(EXAMPLE)**

1 FAY SEAL WITH BMS 5-45

D

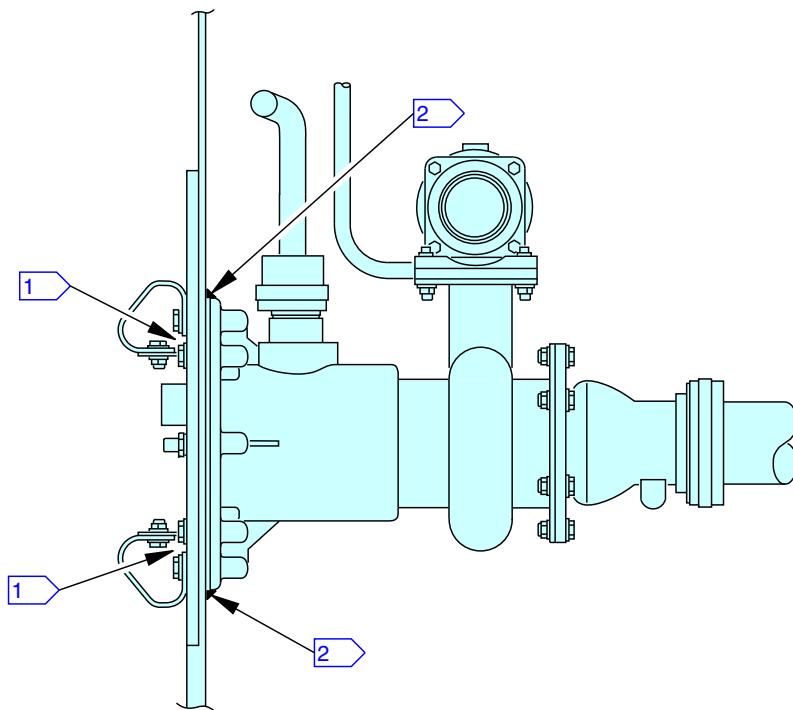
G00588 S0006572080_V7

**Fuel Boost Pump Housing Installation
Figure 407/28-22-41-990-815 (Sheet 3 of 4)**

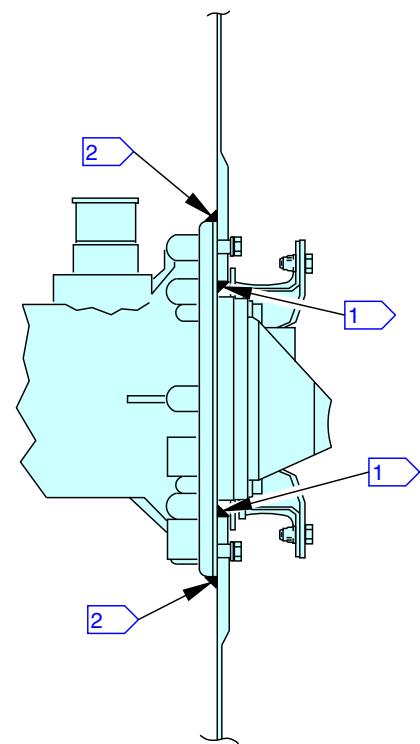
EFFECTIVITY
LOM ALL

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**NO. 1 OR NO. 2 TANK
BOOST PUMP SEALING**
A-A



**CENTER TANK BOOST
PUMP SEALING**
A-A

- 1** FILLET SEAL WITH BMS 5-142
- 2** FILLET SEAL WITH BMS5-45

N72636 S0006572084_V3

Fuel Boost Pump Housing Installation
Figure 407/28-22-41-990-815 (Sheet 4 of 4)

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TASK 28-22-41-400-802

6. Fuel Boost Pump Housing Installation

(Figure 407)

A. General

- (1) This task gives instruction to install the fuel boost pump housing.
- (2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) The sealant, A50153, and sealant, A50110 are also acceptable sealants.
- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-93-910-801	Final Cleaning Prior to Fuel Tank Sealing (Series 93) (P/B 201)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation
SWPM 20-20-10 Paragraph 1.E	Surface Cleaning Methods

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659





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D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01505	Lockwire - Safety And Lock	NASM20995
G51372	Kit - Safety Cable, 321 CRES - 0.035 +/-0.003 Inch (1.0 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	Housing	28-22-41-05-070	LOM ALL
		28-22-41-05-235	LOM ALL
		28-22-41-05-375	LOM ALL
42	O-ring	28-22-51-05-040	LOM ALL
		28-22-51-05-140	LOM ALL
		28-22-51-05-180	LOM ALL
49	Gasket	28-22-41-05-140	LOM ALL
		28-22-41-05-280	LOM ALL
		28-22-41-05-250	LOM ALL
50	Vapor discharge port	28-22-41-05-082	LOM ALL
		28-22-41-05-250	LOM ALL
		28-22-41-05-390	LOM ALL
54	O-ring	28-22-15-05-065	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428
		28-22-15-05-125	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428
		28-22-71-05-062	LOM ALL
57	O-ring	28-22-71-05-062	LOM ALL
		28-22-71-05-255	LOM ALL
		28-22-71-05-335	LOM ALL
60	O-ring	28-22-71-05-276	LOM ALL
		28-22-71-05-360	LOM ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
66	O-ring	28-22-41-05-084	LOM ALL
		28-22-41-05-255	LOM ALL
		28-22-41-05-395	LOM ALL

F. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

G. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168

H. Fuel Boost Pump Housing Installation

SUBTASK 28-22-41-210-009



WARNING

MAKE SURE THAT AN INTERNAL INSPECTION OF THE ROUTING OF THE STATOR LEAD WIRES IN THE FUEL PUMP WAS DONE. INCORRECT ROUTING OF THE STATOR LEAD WIRES CAN CAUSE AN INTERNAL CHAFING CONDITION THAT CAN CAUSE AN ELECTRICAL SHORT. AN ELECTRICAL SHORT IN THE PUMP MOTOR CAN CAUSE A FIRE, OR EXPLOSION WHEN THE FUEL PUMP INLET IS OUT OF THE FUEL.

- (1) Make sure that the fuel pump has been inspected for the stator lead (or internal) wire chafing condition.

NOTE: The letter T will be stamped on the identification plate of the motor impeller after the serial number if the pump has been inspected. The pumps are subject to the inspection requirements of SB 28A1197. An airworthiness directive (FAAAD 2002-19-52) expands the inspection requirement to all fuel pumps prior to installation.

NOTE: New motor-impellers, specification 60B92404-10 and subsequent (No. 1 or No. 2 tank) and specification 60B89004-16 and subsequent (center tank) can be installed, but do not have a letter T stamped on the identification plate of the motor impeller. These new motor-impellers have an internal retainer to prevent chafing of the wire bundle.

SUBTASK 28-22-41-940-003



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Go into the fuel tank (TASK 28-11-00-910-802).



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SUBTASK 28-22-41-100-002



CAUTION

DO NOT USE METAL TOOLS. METAL TOOLS CAN CAUSE DAMAGE TO THE PART YOU WILL DO WORK ON OR ADJACENT PARTS.

- (3) Clean the contact surfaces between the spar and the housing [10] with a cotton wiper, G00034, soaked with solvent, B00148 (TASK 20-30-93-910-801).

NOTE: If the surface is not clean, then the sealant will not bond correctly.

- (a) Rub dry with a clean, dry cotton wiper, G00034.

- (b) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

SUBTASK 28-22-41-100-003

- (4) Clean both surfaces of the new gasket [49]. Do the Cleaning Procedure 1 - Abrasives Applied Manually procedures of the SWPM 20-20-10 Paragraph 1.E.

NOTE: Be careful not to damage the rubber seal on the gasket.

SUBTASK 28-22-41-820-002

- (5) Align the housing [10] with the spar of the wing.

SUBTASK 28-22-41-420-008

- (6) Put the gasket [49] between the housing [10] and the spar.

SUBTASK 28-22-41-390-013

28-AWL-14: CDCCL

- (7) Apply a fillet sealed fay surface bond between the pump housing [10] and the gasket [49] and between the gasket [49] and the structure inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

SUBTASK 28-22-41-420-024

- (8) Do these steps to install the bonding jumpers [3] to the structure with the two longer mounting bolts [68]:

28-AWL-14: CDCCL

- (a) Apply a fay sealed fay surface bond to the mating surfaces between the bonding jumpers [3] and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

28-AWL-14: CDCCL

- (b) Prior to attaching the bonding jumpers [3] to the structure, do the electrical bonding resistance measurement (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- 1) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-14: CDCCL

- 2) Make sure the electrical bonding resistance between the loose end of the bonding jumpers [3] terminal and the structure is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (c) Clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - 1) Rub dry with a clean, dry cotton wiper, G00034.
 - 2) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

- (d) Apply sealant, A50110, to the shank and threads of the mounting bolts [68].

- (e) Apply a thin continuous layer of sealant, A50110, to both surfaces of the bonding jumpers [3], washers [69], and flat washers [70].

- (f) Install the mounting bolts [68], washers [69], and flat washers [70] in the locations with the bonding jumpers [3] (SWPM 20-20-10).

NOTE: Make sure that the washer [69] is installed between the mounting bolt and bonding jumper.

- (g) Make sure that a sealant squeeze out is extended to the bare area of the structure.

- 1) Make sure that sealant is continuously squeezed out along the edges of the contact surfaces.
- 2) If there are gaps, bubbles or voids in a sealant squeezed out, then disassemble and apply more sealant.
- 3) Shape a squeezed out sealant into a fillet seal.
- 4) As an option, remove an extra squeezed out sealant.

NOTE: Make sure that sealant that remains is flush with the mating part edges.

SUBTASK 28-22-41-420-009

- (9) Do these steps to install the mounting bolts [48] and washers [47].

- (a) Apply sealant to the shank and threads of the mounting bolts [48].

- 1) Use sealant, A50110, for the wet installation of the mounting bolts [48].

- (b) Install the mounting bolts [48] and washers [47] in the locations without the bonding jumpers [3].

SUBTASK 28-22-41-420-010

- (10) Install safety cable kit, G51372 or lockwire, G01505, on the mounting bolts [48] and mounting bolts [68].

SUBTASK 28-22-41-390-008

- (11) Apply a cap seal of sealant, A50110, to the mounting bolts [48].

SUBTASK 28-22-41-420-023

- (12) Do these steps to connect the removal check valve [43] at the housing [10]:

- (a) Clean the contact surfaces of the removal check valve [43] and housing [10] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

- 1) Rub dry with a clean, dry cotton wiper, G00034.

- 2) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

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- (b) Lubricate the new O-ring [42] with grease, D00504, and install it on the housing [10].
- (c) Put the removal check valve [43] on the housing [10].
- (d) Install the screws [44], washers [45], and nuts [46] that attach the removal check valve [43] to the housing [10].

SUBTASK 28-22-41-420-015

- (13) Do these steps to connect the discharge check valve [41] at the housing [10]:
 - (a) Clean the contact surfaces of the housing [10] and discharge check valve [41] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - 1) Rub dry with a clean, dry cotton wiper, G00034.
 - 2) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.
 - (b) Lubricate the new O-rings [57] with grease, D00504.
 - (c) Install the O-ring [57] on the housing [10].
 - (d) Put the pressure sensor line adapter [56] on the housing [10].
 - (e) Install the O-ring [57] on the pressure sensor line adapter [56].
 - (f) Install the screws [59], washers [58], and nuts [52] that attach the discharge check valve [41] to the housing [10].

SUBTASK 28-22-41-760-004

- (14) Measure the electrical bonding resistance between the discharge check valve [41] and the removal check valve [43].
 - (a) Use the intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (b) Make sure that the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-22-41-420-011

- (15) Do these steps to connect the ejector pump pressure line [62] (not on all pumps) at the discharge check valve [41]:
 - (a) Put the nut [61] on the elbow [63].
 - (b) Install the new O-ring [60] on the elbow [63].
 - (c) Install the elbow [63] on the discharge check valve [41].
 - (d) Install the ejector pump pressure line [62] on the elbow [63].
 - (e) Tighten the nut [61].
 - (f) Install lockwire on the nut [61].

SUBTASK 28-22-41-420-012

- (16) Do these steps to connect the pressure sensor line [53] at the pressure sensor line adapter [56]:
 - (a) Put the nut [55] on the ferrule.
 - (b) Put the ring on the ferrule between the ferrule and the nut [55].
 - (c) Install the new O-ring [54] in the coupling body.
 - (d) Install the nut [55] onto the coupling body.
 - (e) Install lockwire on the nut [55].

SUBTASK 28-22-41-420-022

- (17) For the No. 1 tank and No. 2 tank boost pumps, do these steps to connect the vapor discharge port [50] at the housing [10]:

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- (a) Lubricate the new O-rings [66] with grease, D00504.
- (b) Install the flapper valve [67] and O-rings [66] on the housing [10].
- (c) Install the screws [64] and washers [65] to attach the vapor discharge port [50] at the housing [10].

SUBTASK 28-22-41-420-013

- (18) For the No. 1 tank or No. 2 tank boost pumps, install the flexible full coupling [51] to attach the cooling and vapor discharge line to the cooling and vapor discharge port [50] (TASK 28-22-15-400-801).

SUBTASK 28-22-41-760-006

► 28-AWL-14: CDCCL

- (19) Measure the bonding resistance between the pump housing [10] and the structure in the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-14: CDCCL

- (b) Make sure that the resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

SUBTASK 28-22-41-390-003

► 28-AWL-14: CDCCL

- (20) Apply a fillet seal of sealant, A00767, or equivalent around the entire perimeter of the gasket [49] and the pump housing [10] interface to the structure inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

SUBTASK 28-22-41-390-004

► 28-AWL-14: CDCCL

- (21) Apply a fillet seal of sealant, A00247 or equivalent around the entire perimeter of the gasket [49] and the pump housing [10] interface to the structure outside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on CDCCLs.

NOTE: This is applicable to Airworthiness Limitation 28- AWL-14.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-41-410-001

- (1) For the center tank left and right fuel boost pumps, install this access panel:

Number Name/Location

131AB Center Tank Access

(TASK 28-11-31-000-801).

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SUBTASK 28-22-41-410-002

- (2) For the No. 1 tank fuel boost pumps, install this access door:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168

or close this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168

(TASK 28-11-31-000-801).

SUBTASK 28-22-41-650-008

- (3) Refuel the center or No. 1 or No. 2 fuel tanks (TASK 12-11-00-650-802).

- For the forward fuel boost pumps, refuel the No. 1 or No. 2 fuel tank to 500 lb (227 kg) minimum.
- For the aft fuel boost pumps, refuel the No. 1 or No. 2 fuel tanks to 500 lb (227 kg) minimum.
- For the center tank fuel boost pumps, refuel the center fuel tank to 14,000 lb (6350 kg) minimum.

SUBTASK 28-22-41-210-004

- (4) Make sure that there are no fuel leaks at the spar where you installed the fuel boost pump.

SUBTASK 28-22-41-420-016

- (5) Do this task: Motor Impeller Installation, TASK 28-22-41-400-801.

SUBTASK 28-22-41-480-003

- (6) If the leading edge slat actuator locks were installed, do these steps:

- Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.



MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

———— END OF TASK ————

TASK 28-22-41-710-801

7. Fuel Boost Pump Operational Test

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

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Zone Area

531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

C. Access Panels

Number Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

D. Prepare for the Test

SUBTASK 28-22-41-860-060



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Do these steps:

- (a) For the No. 1 tank aft fuel boost pump.
1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406			
D	2	C00826	FUEL BOOST PUMP TANK 1 AFT

LOM ALL

- (b) For the No. 1 tank forward fuel boost pump.
1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD
LOM 402, 404, 406			
D	2	C00827	FUEL BOOST PUMP TANK 1 FWD

LOM ALL

- (c) For the No. 2 tank aft fuel boost pump.

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- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM ALL

- (d) For the No. 2 tank forward fuel boost pump.

- 1) Close these circuit breakers:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM ALL

- (e) For the center tank left fuel boost pump.

- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT
LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM ALL

- (f) For the center tank right fuel boost pump.

- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT
LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-41-410-008

- (2) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

E. Fuel Boost Pump Operational Test

SUBTASK 28-22-41-650-010

- (1) Make sure that the fuel tank for the applicable fuel boost pump has the fuel quantity as follows:

EFFECTIVITY	
LOM ALL	

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- (a) No. 1 tank - 500 lb (227 kg) of fuel (or more).
- (b) No. 2 tank - 500 lb (227 kg) of fuel (or more).
- (c) Center fuel tank - 1000 lb (454 kg) of fuel (or more).
- (d) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-22-41-860-024



WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND

EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
 - (a) Immediately set the applicable fuel pump switch(es) to the OFF position if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-41-860-009

- (3) Put the applicable fuel boost pump switch, on the fuel management control panel, on the P5 overhead panel, to the ON position.
 - (a) For the No. 1 tank aft fuel boost pump, the switch is FUEL PUMP TANK 1 - AFT.
 - (b) For the No. 1 tank forward fuel boost pump, the switch is FUEL PUMP TANK 1 - FWD.
 - (c) For the Left center tank fuel boost pump, the switch is FUEL PUMP CTR TANK - LEFT.
 - (d) For the No. 2 aft fuel boost pump, the switch is FUEL PUMP TANK 2 - AFT.
 - (e) For the No. 2 forward fuel boost pump, the switch is FUEL PUMP TANK 2 - FWD.
 - (f) For the Right center tank fuel boost pump, the switch is FUEL PUMP CTR TANK - RIGHT switch.

SUBTASK 28-22-41-280-001

- (4) Listen and make sure that the applicable fuel boost pump operates.
 - (a) To operate the left or right center fuel boost pump, you must be in the flight compartment to continuously monitor for the amber LOW PRESSURE light.

SUBTASK 28-22-41-210-005

- (5) Make sure that the applicable LOW PRESSURE light, on the fuel management panel, on the P5 panel, goes off.
 - (a) For the left or right center fuel boost pump, if the amber LOW PRESSURE light stays on, set the applicable FUEL PUMP CTR TANK - LEFT or RIGHT switch, on the P5 overhead panel, to the OFF position.

SUBTASK 28-22-41-860-010

- (6) Put the applicable fuel boost pump switch to the OFF position.

SUBTASK 28-22-41-280-002

- (7) Listen and make sure that the applicable fuel boost pump does not operate.

SUBTASK 28-22-41-210-006

- (8) For the No. 1 or No. 2 tank fuel boost pumps, make sure that the applicable LOW PRESSURE light comes on.

EFFECTIVITY
LOM ALL

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SUBTASK 28-22-41-210-008

- (9) For the center tank fuel boost pumps, make sure that the applicable LOW PRESSURE light stays off.

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

28-22-41



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FUEL BOOST PUMP - ADJUSTMENT/TEST

1. General

- A. This procedure contains the following task:
- (1) An operational test of the Ground Fault Interrupter (GFI).

TASK 28-22-41-720-802

2. Ground Fault Interrupter (GFI) - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has one or more steps that are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to that it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

- (2) This task is only applicable for Ground Fault Interrupter (GFI) relay. For Universal Fault Interrupter (UFI) relay, follow the manufacturer's test instructions.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Test

SUBTASK 28-22-41-860-059

- (1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-22-41-010-007

- (2) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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SUBTASK 28-22-41-860-050



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

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- (4) Make sure that the boost pump switches are in the positions shown in Table 501.

Table 501/28-22-41-993-803

SWITCH/CONTROL	POSITION	LOCATION
FUEL PUMP TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP CTR TANK - LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP CTR TANK - RIGHT	OFF	P5 OVERHEAD PANEL
FUEL PUMP TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP TANK 2 - FWD	OFF	P5 OVERHEAD PANEL

SUBTASK 28-22-41-650-012

- (5) Make sure that the fuel tank for the applicable fuel boost pump has the fuel quantity as follows:
- (a) No. 1 tank - 500 lb (227 kg) of fuel (or more).
 - (b) No. 2 tank - 500 lb (227 kg) of fuel (or more).
 - (c) Center fuel tank - 2000 lb (907 kg) of fuel (or more).
 - (d) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

F. Ground Fault Interrupter (GFI) Relay Operational Test

SUBTASK 28-22-41-860-052



DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
- (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-41-860-053

- (2) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the ON position.
- (a) For the No. 1 tank aft fuel boost pump, the switch is FUEL PUMP TANK 1 - AFT.
 - (b) For the No. 1 tank forward fuel boost pump, the switch is FUEL PUMP TANK 1 - FWD.
 - (c) For the left center tank fuel boost pump, the switch is FUEL PUMP CTR TANK - LEFT.
 - (d) For the No. 2 aft fuel boost pump, the switch is FUEL PUMP TANK 2 - AFT.
 - (e) For the No. 2 forward fuel boost pump, the switch is FUEL PUMP TANK 2 - FWD.
 - (f) For the right center tank fuel boost pump, the switch is FUEL PUMP CTR TANK - RIGHT switch.

SUBTASK 28-22-41-280-017

- (3) Listen and make sure that the applicable fuel boost pump operates.

SUBTASK 28-22-41-210-036

- (4) Make sure that the applicable LOW PRESSURE light, on the P5 overhead panel, goes off.

EFFECTIVITY
 LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
 450-999; LOM 404, 406, 407 POST SB 737-28A1201

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- (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-41-860-054



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Push the applicable GFI relay TEST button in the P91 or P92 power distribution panel.

NOTE: It is recommended that you use your finger to push the TEST button to prevent damage.

- (a) Open the applicable power distribution panel to get access to the applicable GFI relays.

- 1) These GFI relays are found in the upper left corner of the P91 panel:

- a) For the No. 1 tank forward fuel boost pump, the relay is R19
- b) For the No. 2 aft fuel boost pump, the relay is R20
- c) For the left center tank fuel boost pump, the relay is R54.

- 2) These GFI relays are found in the upper left corner of the P92 panel:

- a) For the No. 1 tank aft fuel boost pump, the relay is R18
- b) For the No. 2 forward fuel boost pump, the relay is R21
- c) For the right center tank fuel boost pump, the relay is R55.

SUBTASK 28-22-41-210-043

► 28-AWL-20: ALI

- (6) Make sure that the RESET button on the applicable GFI relay has moved out, and shows a white band.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to expose a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

► 28-AWL-20: ALI

- (a) For the No. 1 tank aft fuel boost pump, the relay is R18, found on the P92 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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► 28-AWL-20: ALI

- (b) For the No. 1 tank forward fuel boost pump, the relay is R19, found on the P91 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

► 28-AWL-20: ALI

- (c) For the left center tank fuel boost pump, the relay is R54, found on the P91 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

► 28-AWL-20: ALI

- (d) For the No. 2 aft fuel boost pump, the relay is R20, found on the P91 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

► 28-AWL-20: ALI

- (e) For the No. 2 forward fuel boost pump, the relay is R21, found on the P92 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

► 28-AWL-20: ALI

- (f) For the right center tank fuel boost pump, the relay is R55, found on the P92 panel.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

SUBTASK 28-22-41-280-018

► 28-AWL-20: ALI

- (7) Listen and make sure that the applicable fuel boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-20.

SUBTASK 28-22-41-210-037

- (8) For the No. 1 or No. 2 tank fuel boost pumps, make sure that the applicable LOW PRESSURE light comes on.

SUBTASK 28-22-41-210-038

- (9) For the center tank fuel boost pumps, make sure that the applicable LOW PRESSURE light comes on.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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SUBTASK 28-22-41-860-055

- (10) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the OFF position.

SUBTASK 28-22-41-710-002

- (11) To make sure that the applicable fuel boost pump does not operate when the GFI circuit turns off the relay, do the subsequent steps:
- (a) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the ON position.
 - (b) Listen and make sure that the applicable fuel boost pump does not operate.
 - (c) For the No. 1 or No. 2 tank fuel boost pumps, make sure that the applicable LOW PRESSURE light is on.
 - (d) For the center tank fuel boost pumps, make sure that the applicable LOW PRESSURE light comes on.
 - (e) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the OFF position.

SUBTASK 28-22-41-860-056

- (12) Push the applicable RESET button on the applicable GFI relay in.

NOTE: It is recommended that you use your finger to push the RESET button to prevent damage.

- (a) Make sure that the RESET button does not move back out and the white band does not show.

SUBTASK 28-22-41-860-057

- (13) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-22-41-280-019

- (14) Listen and make sure that the applicable fuel boost pump operates.

SUBTASK 28-22-41-210-040

- (15) Make sure that the applicable LOW PRESSURE light, on the P5 overhead panel, goes off.
- (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 28-22-41-860-058

- (16) Put the applicable fuel boost pump switch on the fuel management control panel, on the P5 overhead panel, to the OFF position.

SUBTASK 28-22-41-280-020

- (17) Listen and make sure that the applicable fuel boost pump does not operate.

SUBTASK 28-22-41-210-041

- (18) For the No. 1 or No. 2 tank fuel boost pumps, make sure that the applicable LOW PRESSURE light comes on.

SUBTASK 28-22-41-210-042

- (19) For the center tank fuel boost pumps, make sure that the applicable LOW PRESSURE light stays off.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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SUBTASK 28-22-41-410-007



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (20) Close the P91 and P92 power distribution panels.

SUBTASK 28-22-41-410-005

- (21) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

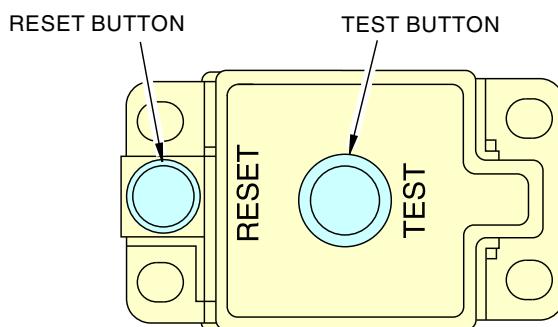
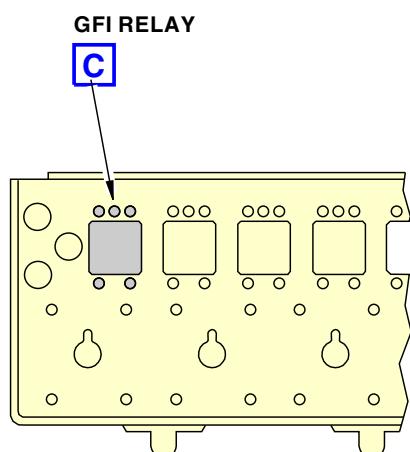
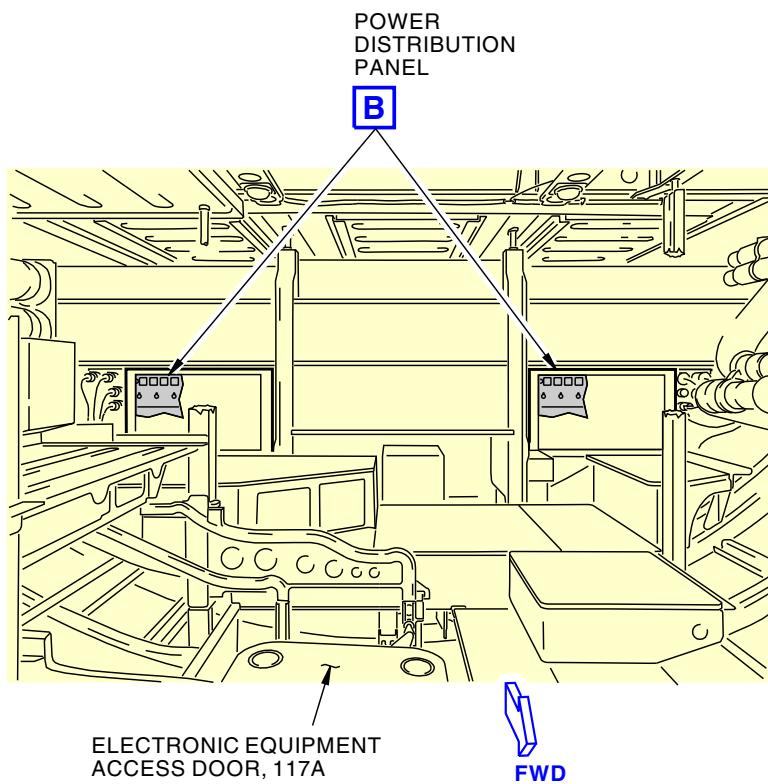
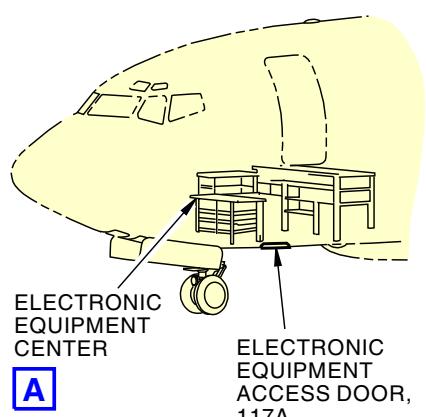
———— END OF TASK ————

— EFFECTIVITY —
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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Ground Fault Interrupter (GFI) Relay Location
Figure 501/28-22-41-990-816

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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TASK 28-22-41-700-801

3. Fuel Boost Pump Output Pressure Check

A. General

- (1) This inspection determines the output pressure of each pump. Low output pressure can lead to intermittent performance and fault messages.

B. References

Reference	Title
28-42-11-000-801	Fuel Boost Pump Pressure Switch Removal (P/B 401)
28-42-11-420-801	Fuel Boost Pump Pressure Switch Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-21846	Test Equipment - Pressure Output, Fuel Boost Pump Part #: A28018-1 Supplier: 81205

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Fuel Boost Pump Output Pressure Check

SUBTASK 28-22-41-020-034

- (1) Remove the pressure switch for the applicable fuel boost pump (TASK 28-42-11-000-801).

SUBTASK 28-22-41-400-001

- (2) Install the pressure output test equipment, SPL-21846, in place of the pressure switch that was removed.

SUBTASK 28-22-41-010-009

- (3) To get access to the P91 and P92 panel, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 28-22-41-860-062



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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(WARNING PRECEDES)



WARNING

MAKE SURE THAT YOU DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Remove the safety tag and close the applicable circuit breakers for the applicable fuel boost pump:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

SUBTASK 28-22-41-700-001

- (5) Set the applicable fuel boost pump switch on the fuel management panel, on the P5 overhead panel, to the ON position.

(a) Make sure that there are no leaks prior to continuing.

1) If leaks are present, correct the issue before continuing with this task.

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201



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- 2) If no leaks are present, continue with the task.

SUBTASK 28-22-41-970-001

- (6) Observe and record the pressure output of the applicable fuel boost pump.

Fuel Boost Pump Position	Pressure Range	Observed Pressure
Left Aft	20-30 psi	
Left Forward	20-30 psi	
Right Aft	20-30 psi	
Right Forward	20-30 psi	

SUBTASK 28-22-41-860-063

- (7) Set the applicable fuel boost pump switch on the fuel management panel, on the P5 overhead panel, to the OFF position..

SUBTASK 28-22-41-860-064



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

MAKE SURE THAT YOU DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (8) Open the applicable circuit breaker and install safety tags for the applicable fuel boost pump:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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LOM 402; LOM 404, 406 POST SB 737-28A1201 (Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 407 POST SB 737-28A1201

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402; LOM 404, 406 POST SB 737-28A1201

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 404, 406, 407 POST SB 737-28A1201

SUBTASK 28-22-41-000-001

- (9) Remove the pressure output test equipment, SPL-21846.

SUBTASK 28-22-41-420-040

- (10) Install the removed pressure switch for the applicable fuel boost pump
(TASK 28-42-11-420-801).

SUBTASK 28-22-41-800-001

- (11) Repeat the Fuel Boost Pump Pressure Check procedure for the remaining fuel boost pumps.

SUBTASK 28-22-41-800-002

- (12) Review the results.

NOTE: If the pressure measurements are out of range, these are the possible causes:

- The pump pressure is bypassing within the housing assembly.
- The pump pressure is bled off due to a leak internal to the fuel tank.
- The boost pump has mechanical degradation.
- Follow your company guidelines to determine your next maintenance action.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-41-410-009

- (1) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

EFFECTIVITY
LOM 402, 411, 412, 415, 416, 420, 422-434, 437-447,
450-999; LOM 404, 406, 407 POST SB 737-28A1201

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FUEL SYSTEM MODULE, P5-2 - REMOVAL/INSTALLATION

1. General

- A. This procedure contains three tasks:
- (1) Removal of the Fuel System Module, P5-2
 - (2) Installation of the Fuel System Module, P5-2
 - (3) Operational Test of the Fuel System Module, P5-2.

TASK 28-22-43-020-801

2. Fuel System Module, P5-2 Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel System Module, P5-2.

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Prepare for the Removal

SUBTASK 28-22-43-860-029

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
B	7	C00361	FUEL CROSS FEED VALVE
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-22-43-860-035

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS
C	11	C01275	MASTER CAUTION ANNUNCIATOR CONT 1
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

EFFECTIVITY
LOM ALL

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(Continued)

F/O Electrical System Panel, P6-3

Row Col Number Name

E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND
---	---	--------	--------------------------------

SUBTASK 28-22-43-860-032

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row Col Number Name

C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

SUBTASK 28-22-43-010-001

- (4) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A	Electronic Equipment Access Door
------	----------------------------------

SUBTASK 28-22-43-860-001



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	1	C00827	FUEL BOOST PUMP TANK 1 FWD
---	---	--------	----------------------------

LOM 402, 404, 406

D	2	C00827	FUEL BOOST PUMP TANK 1 FWD
---	---	--------	----------------------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	3	C00828	FUEL BOOST PUMP TANK 2 AFT
---	---	--------	----------------------------

LOM 402, 404, 406

D	4	C00828	FUEL BOOST PUMP TANK 2 AFT
---	---	--------	----------------------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT
---	---	--------	-------------------------------

LOM 402, 404, 406

D	6	C00845	FUEL BOOST PUMP CTR TANK LEFT
---	---	--------	-------------------------------



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LOM 402, 404, 406 (Continued)

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
---	---	--------	----------------------------

LOM 402, 404, 406

D	2	C00826	FUEL BOOST PUMP TANK 1 AFT
---	---	--------	----------------------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
---	---	--------	----------------------------

LOM 402, 404, 406

D	4	C00829	FUEL BOOST PUMP TANK 2 FWD
---	---	--------	----------------------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT
---	---	--------	--------------------------------

LOM 402, 404, 406

D	6	C00846	FUEL BOOST PUMP CTR TANK RIGHT
---	---	--------	--------------------------------

LOM ALL

E. Fuel System Module, P5-2 Removal

SUBTASK 28-22-43-020-001

- (1) Loosen the six quick-release fasteners on the baseplate of the P5-2 module.

SUBTASK 28-22-43-020-002

- (2) Disconnect the connectors D626, D628, and D616 from the rear of the P5-2 module.

SUBTASK 28-22-43-020-004

- (3) Loosen the release screw to loosen the clamp that holds the fuel temperature indicator in its position.

SUBTASK 28-22-43-020-005

- (4) Remove the fuel temperature indicator from the P5-2 module.

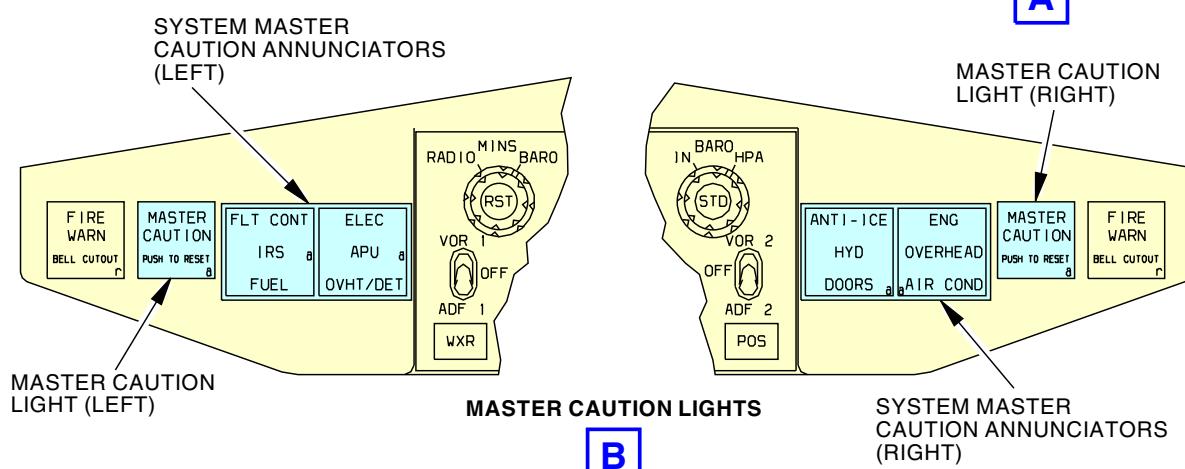
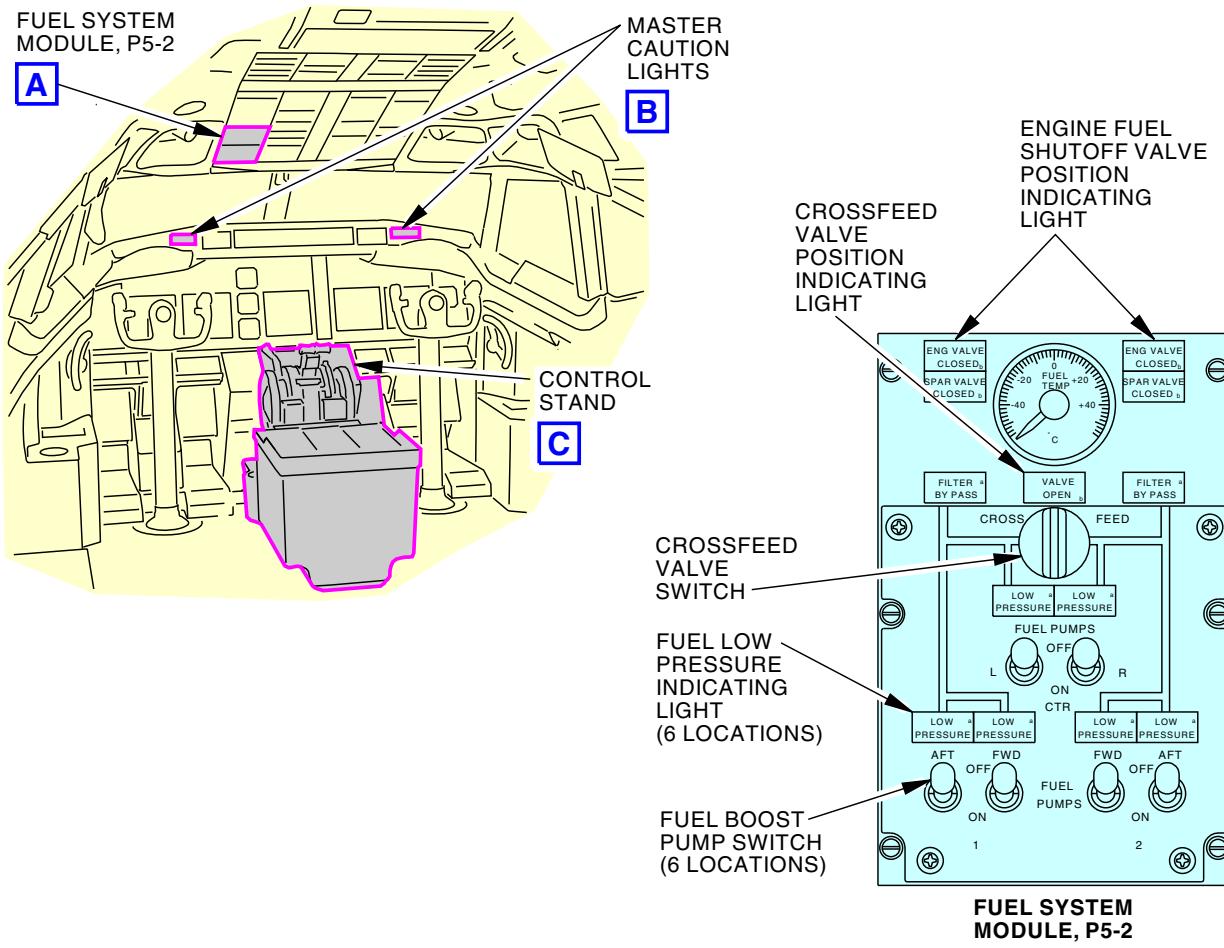
SUBTASK 28-22-43-020-003

- (5) Remove the P5-2 module from the P5 panel.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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L01109 S0006572090_V2

Fuel System Module, P5-2
Figure 401/28-22-43-990-803 (Sheet 1 of 3)

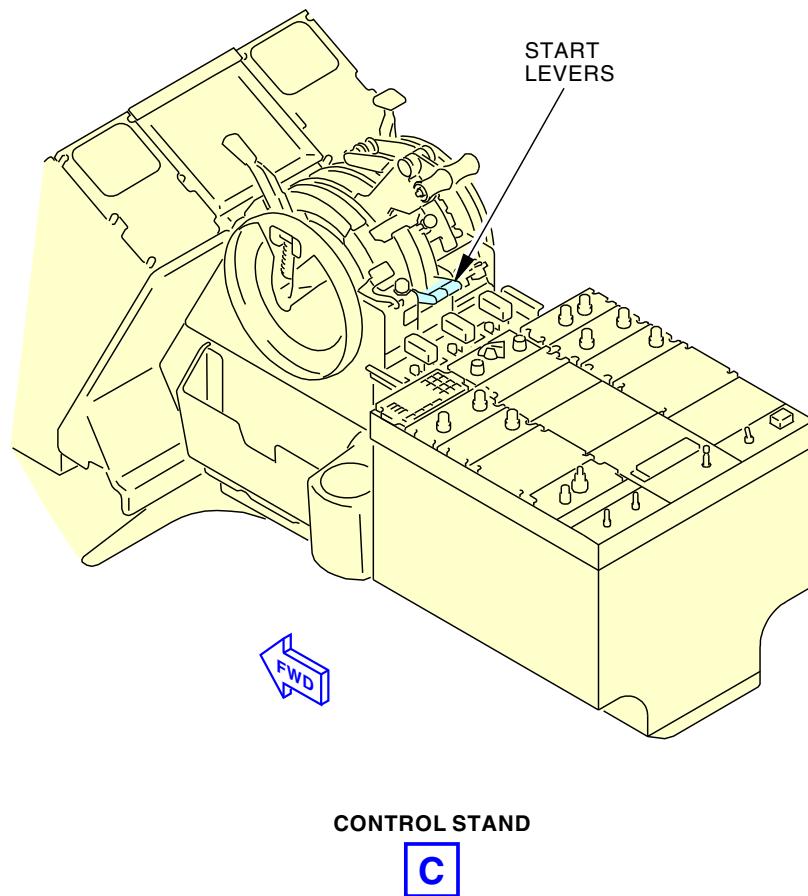
EFFECTIVITY
LOM ALL

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L01111 S0006572091_V2

Fuel System Module, P5-2
Figure 401/28-22-43-990-803 (Sheet 2 of 3)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-456

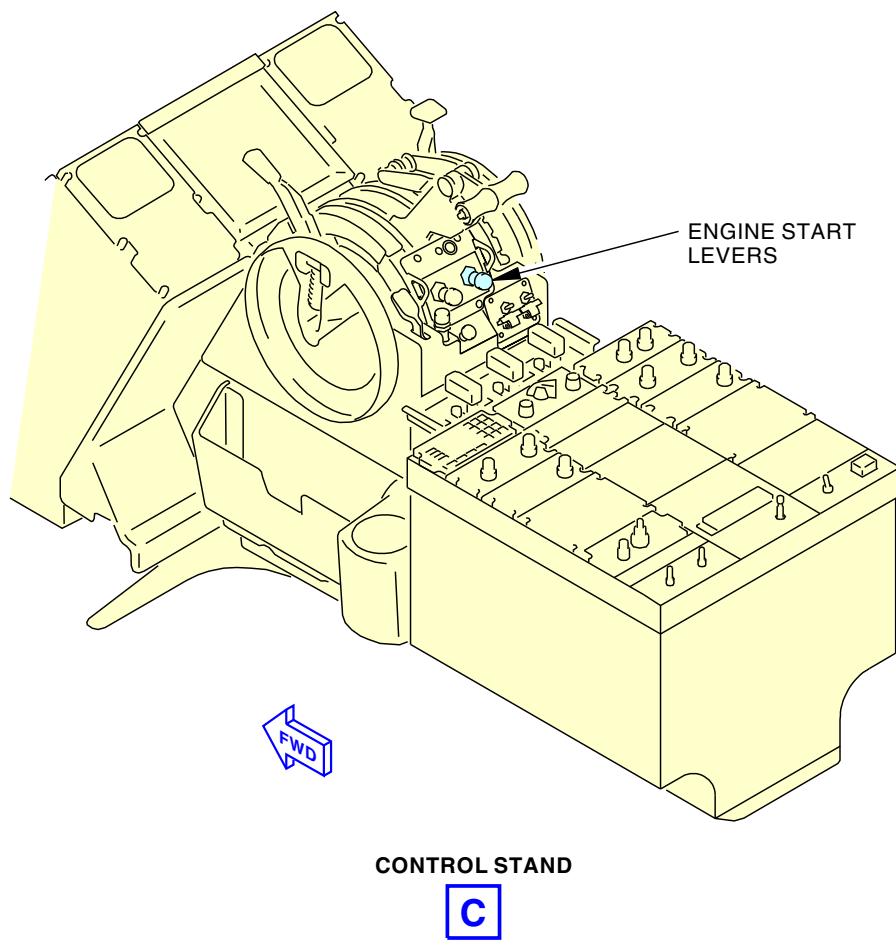
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2425231 S0000560599_V1

Fuel System Module, P5-2
Figure 401/28-22-43-990-803 (Sheet 3 of 3)

EFFECTIVITY
LOM 462-999

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-22-43-420-801

3. Fuel System Module, P5-2 Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel System Module, P5-2.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Fuel System Module, P5-2 Installation

SUBTASK 28-22-43-420-001

- (1) Move the P5-2 module near its position in the P5 panel.

SUBTASK 28-22-43-420-004

- (2) Put the fuel temperature indicator in its position in the P5-2 panel.

SUBTASK 28-22-43-420-005

- (3) Tighten the release screw to tighten the clamp that holds the fuel temperature indicator in its position.

SUBTASK 28-22-43-420-002

- (4) Connect the connectors D616, D626, and D628 to the P5-2 module.

SUBTASK 28-22-43-420-003

- (5) Install the P5-2 module in its position with the six quick-release fasteners on the baseplate.

D. Fuel System Module, P5-2 Installation Test

SUBTASK 28-22-43-710-001

- (1) Do this task: Fuel System Module P5-2 Operational Test, TASK 28-22-43-710-801.

———— END OF TASK ————

TASK 28-22-43-710-801

4. Fuel System Module P5-2 Operational Test

(Figure 401, Figure 402)

A. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
28-22-41-710-801	Fuel Boost Pump Operational Test (P/B 401)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
WDM 76-21-11	Wiring Diagram Manual
WDM 76-21-21	Wiring Diagram Manual

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left



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(Continued)

Zone	Area
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
413	Left Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2

D. Prepare for Test

SUBTASK 28-22-43-860-003

- (1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 28-22-43-860-004

 WARNING	WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.
 WARNING	DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00827 FUEL BOOST PUMP TANK 1 FWD
LOM 402, 404, 406	D	2	C00827 FUEL BOOST PUMP TANK 1 FWD
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	3	C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406	D	4	C00828 FUEL BOOST PUMP TANK 2 AFT

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406	D	2	C00826 FUEL BOOST PUMP TANK 1 AFT

EFFECTIVITY
LOM ALL

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LOM 402, 404, 406 (Continued)

(Continued)

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM ALL

SUBTASK 28-22-43-860-034



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) Make sure that these circuit breakers are open and have safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-43-860-036

- (4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row Col Number Name

A 7 C00355 FUEL TEMP IND

B 3 C00360 FUEL SPAR VALVE ENG 2

EFFECTIVITY
LOM ALL

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(Continued)

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
B	7	C00361	FUEL CROSS FEED VALVE
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-22-43-860-033

- (5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS
C	11	C01275	MASTER CAUTION ANNUNCIATOR CONT 1
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

SUBTASK 28-22-43-860-012

- (6) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

E. Fuel System Module P5-2 Operational Test

SUBTASK 28-22-43-710-002

- (1) Make sure that the SPAR VALVE CLOSED light for engine No. 1, on the P5-2 module, is dimly on.

SUBTASK 28-22-43-860-007

- (2) Make sure that the ENG VALVE CLOSED indication light for engine No. 1, on the P5-2 module, is dimly on.

SUBTASK 28-22-43-710-003

- (3) Move the engine start lever 1 to the IDLE position.
(a) Do not set the engine START switches, on the P5 overhead panel, to the ON position.

SUBTASK 28-22-43-710-004

- (4) Make sure that the SPAR VALVE CLOSED light for Engine No. 1 comes on bright while the valve goes from the closed to the open position.

SUBTASK 28-22-43-710-005

- (5) Make sure that the SPAR VALVE CLOSED light for Engine No. 1 goes off a maximum of six seconds after you moved the engine start lever 1 to the IDLE position.

SUBTASK 28-22-43-860-015

- (6) Make sure that the ENG VALVE CLOSED light for Engine No. 1 comes on bright after you move the engine start lever 1 to the IDLE position.

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SUBTASK 28-22-43-760-001

- (7) Do these steps to make sure that the ENG VALVE CLOSED light for Engine No. 1 is off when the High Pressure Shutoff Valve (HPSOV) is open and the engine start lever is in IDLE position:

- (a) To get access to the Hydro-Mechanical Unit (HMU) found at approximately 8 o'clock, open this access panel:

(TASK 71-11-02-010-801-F00)

Number Name/Location

413 Left Fan Cowl, Engine 1

- (b) Disconnect connector DP1207 at the Hydro-Mechanical Unit (HMU) and jumper pin 1 to pin 2 in DP1207 (WDM 76-21-11).

NOTE: On P5-2 modules part number 233A3202-1 and -2, it is necessary to attach a jumper between pins 1 and 2 to cause the ENG VALVE CLOSED light to go off.

On P5-2 modules part number 233A3202-3 and subsequent, the ENG VALVE CLOSED light goes off when you disconnect connector DP1207.

- (c) Make sure that the ENG VALVE CLOSED light for Engine No. 1, on the P5-2 panel, is off.

- (d) Remove the jumper from connector DP1207 and re-connect DP1207 to the HMU.

- (e) Make sure that the ENG VALVE CLOSED light for Engine No. 1, on the P5-2 panel, is on bright.

- (f) Close this access panel:

(TASK 71-11-02-410-801-F00)

Number Name/Location

413 Left Fan Cowl, Engine 1

SUBTASK 28-22-43-860-017

- (8) Move the engine start lever 1 to the CUTOFF position.

SUBTASK 28-22-43-760-002

- (9) Make sure that the SPAR VALVE CLOSED light for Engine No. 1 is dimly on.

SUBTASK 28-22-43-710-007

- (10) Make sure that the SPAR VALVE CLOSED light for Engine No. 2 is dimly on.

SUBTASK 28-22-43-860-008

- (11) Make sure that the ENG VALVE CLOSED indication light for engine No. 2, on the P5-2 module, is dimly on.

SUBTASK 28-22-43-710-008

- (12) Move the engine start lever 2 to the IDLE position.

SUBTASK 28-22-43-710-009

- (13) Make sure that the SPAR VALVE CLOSED light for Engine No. 2 comes on bright while the valve goes from the closed to the open position.

SUBTASK 28-22-43-710-010

- (14) Make sure that the SPAR VALVE CLOSED light for Engine No. 2 goes off a maximum of six seconds after you moved the engine start lever 2 to the IDLE position.

SUBTASK 28-22-43-710-028

- (15) Make sure that the ENG VALVE CLOSED light for Engine No. 2 comes on bright after you move the engine start lever 2 to the IDLE position.

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SUBTASK 28-22-43-760-003

- (16) Do these steps to make sure that the ENG VALVE CLOSED light for Engine No. 2 is off when the HPSOV is open and the engine start lever is in IDLE position:

- (a) To get access to the HMU found at approximately 8 o'clock, open this access panel:

(TASK 71-11-02-010-801-F00)

Number Name/Location

423 Left Fan Cowl, Engine 2

- (b) Disconnect connector DP1207 at the HMU and jumper pin 1 to pin 2 in DP1207 (WDM 76-21-21).

NOTE: On P5-2 modules part number 233A3202-1 and -2, it is necessary to attach a jumper between pins 1 and 2 to cause the ENG VALVE CLOSED light to go off. On P5-2 modules part number 233A3202-3 and subsequent, the ENG VALVE CLOSED light goes off when you disconnect connector DP1207.

- (c) Make sure that the ENG VALVE CLOSED light for Engine No. 2, on the P5-2 panel, is off.

- (d) Remove the jumper from connector DP1207 and re-connect DP1207 to the HMU.

- (e) Make sure that the ENG VALVE CLOSED light for Engine No. 2, on the P5-2 panel, is on bright.

- (f) Close this access panel:

(TASK 71-11-02-410-801-F00)

Number Name/Location

423 Left Fan Cowl, Engine 2

SUBTASK 28-22-43-860-022

- (17) Move the engine start lever 2 to the CUTOFF position.

SUBTASK 28-22-43-760-004

- (18) Make sure that the SPAR VALVE CLOSED light for Engine No. 2 is dimly on.

SUBTASK 28-22-43-710-012

- (19) Make sure that the fuel temperature needle, on the P5-2 module, is not against the lower stop or the upper stop.

SUBTASK 28-22-43-710-013

- (20) Make sure that the VALVE OPEN indication light for the crossfeed valve is off.

SUBTASK 28-22-43-710-014

- (21) Set the FUEL CROSSFEED VALVE switch to the OPEN position.

SUBTASK 28-22-43-710-015

- (22) Make sure that the VALVE OPEN indication light for the crossfeed valve is on bright while the valve goes from the closed position to the open position.

SUBTASK 28-22-43-710-016

- (23) Make sure that the VALVE OPEN light for crossfeed valve position becomes dim a maximum of six seconds after you set the FUEL CROSSFEED VALVE switch to the OPEN position.

SUBTASK 28-22-43-710-017

- (24) Set the FUEL CROSSFEED VALVE switch to the CLOSED position.

SUBTASK 28-22-43-710-018

- (25) Make sure that the LOW PRESSURE lights for each of these boost pumps are on:

- (a) TANK 1 - AFT

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- (b) TANK 1 - FWD
- (c) TANK 2 - AFT
- (d) TANK 2 - FWD.

SUBTASK 28-22-43-710-020

- (26) Do a test of the master caution system annunciator:
- (a) Put the FUEL PUMP CTR TANK - LEFT switch, on the P5 overhead panel, to the ON position.
 - (b) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - LEFT switch, on the P5 overhead panel, comes on.
 - (c) After approximately 15 seconds, put the FUEL PUMP CTR TANK - LEFT switch, on the P5 overhead panel, to the OFF position.
 - (d) Make sure that the FUEL light, on the P7 glare shield, on the master caution system annunciator, is on.
 - (e) Push the MASTER CAUTION annunciator light on the P7 glare shield.
 - (f) Make sure that the FUEL light, on the master caution annunciator, goes off.
 - (g) Push the FUEL light on the master caution systems annunciator.
 - (h) Make sure that the FUEL light, on the master caution systems annunciator, comes on.
 - (i) Put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 overhead panel, to the ON position.
 - (j) Make sure that the amber LOW PRESSURE lights for the FUEL PUMP CTR TANK - RIGHT switch, on the P5 overhead panel, comes on.
 - (k) After approximately 15 seconds, put the FUEL PUMP CTR TANK - RIGHT switch, on the P5 overhead panel, to the OFF position.
 - (l) Make sure that the FUEL light, on the P7 glare shield, on the master caution system annunciator, is on.
 - (m) Push the MASTER CAUTION annunciator light on the P7 glare shield.
 - (n) Make sure that the FUEL light, on the master caution annunciator, goes off.
 - (o) Push the FUEL light on the master caution systems annunciator.
 - (p) Make sure that the FUEL light, on the master caution systems annunciator, comes on.

SUBTASK 28-22-43-710-029

- (27) Do a test of the FILTER BYPASS lights to make sure that the FILTER BYPASS lights come on and go off as expected (TASK 73-21-00-700-804-F00).

SUBTASK 28-22-43-860-009



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (28) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-22-43-410-001

- (29) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-22-43-710-030

- (30) Do this task: Fuel Boost Pump Operational Test, TASK 28-22-41-710-801.

F. Put the Airplane Back to Its Usual Condition

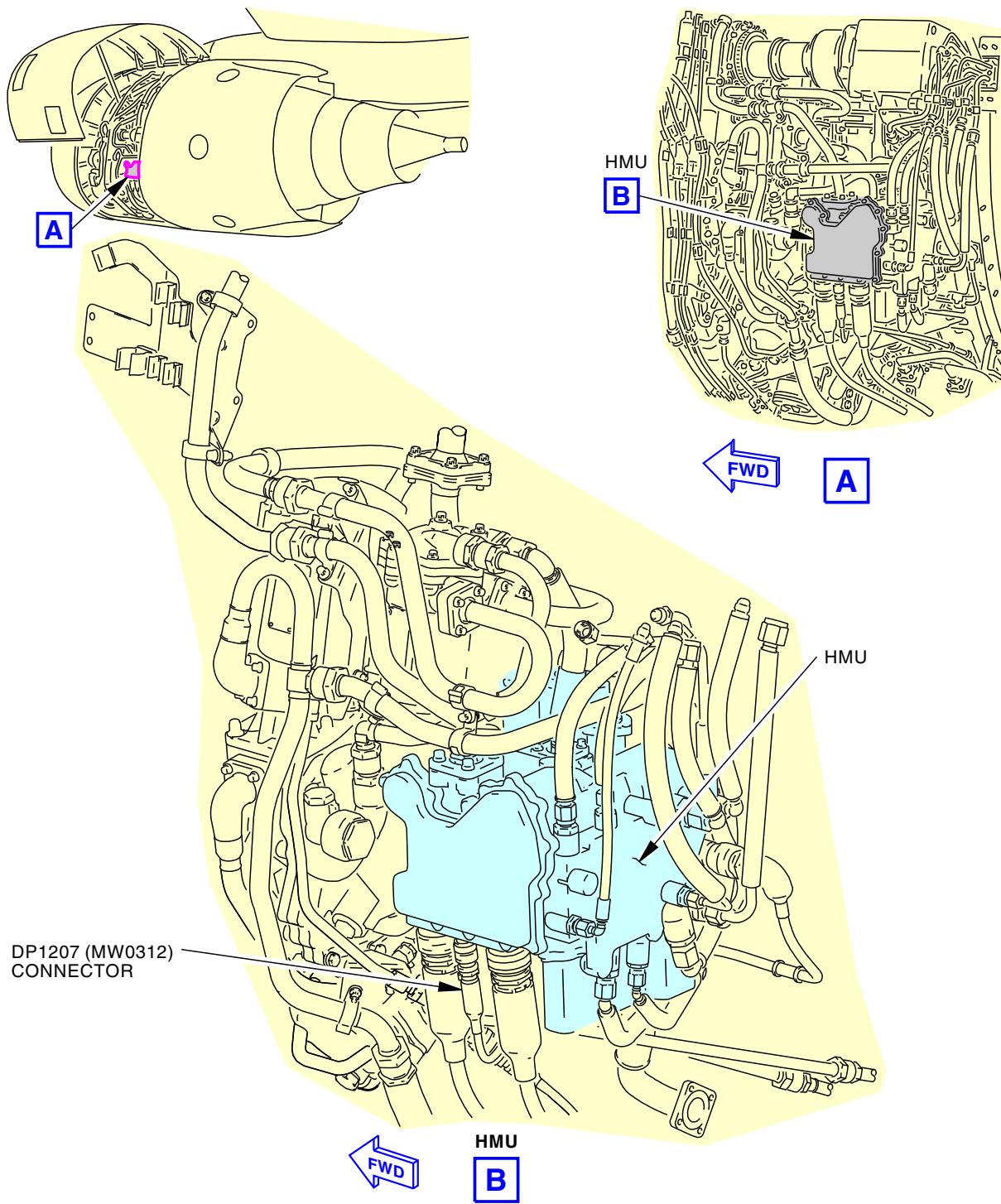
SUBTASK 28-22-43-860-010

- (1) Remove external power from the airplane if it is not necessary for other tasks (TASK 24-22-00-860-814).

———— END OF TASK ————

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Hydromechanical Unit (HMU) Location
Figure 402/28-22-43-990-804

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BOOST PUMP REMOVAL CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the removal check valve
 - (2) An installation of the removal check valve.
- B. A removal check valve attaches to each of the six fuel boost pumps. The fuel boost pumps are installed on the front and rear spars. The removal check valve is designed to allow the removal of the motor impeller without defueling the fuel tank.

TASK 28-22-51-000-801

2. Removal Check Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the removal check valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-22-21-710-801	Crossfeed Valve Operational Test (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168

E. Prepare for the Removal

SUBTASK 28-22-51-650-001

- (1) Defuel the center fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-22-51-650-005

- (2) If you are scheduled to remove the removal check valve for a boost pump in the No. 1 tank or for the left boost pump in the center tank, defuel the No. 1 tank.

SUBTASK 28-22-51-650-006

- (3) If you are scheduled to remove the removal check valve for a boost pump in the No. 2 tank or for the right boost pump in the center tank, defuel the No. 2 tank.

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SUBTASK 28-22-51-860-001

- (4) Do these steps to make sure that the crossfeed valve is closed:
 - (a) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.
 - (b) Make sure that the crossfeed valve is set to the closed position and the crossfeed position indicator light is off.

SUBTASK 28-22-51-650-004



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Drain and purge the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-51-010-001

- (6) To remove the removal check valves of the fuel boost pumps in the No. 1 tank, remove this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-000-801).

SUBTASK 28-22-51-010-002

- (7) To remove the removal check valves of the fuel boost pumps in the No. 2 tank, remove this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-000-801).

SUBTASK 28-22-51-010-003

- (8) To remove the removal check valves of the center tank fuel boost pumps, remove the center tank access door:

Number Name/Location

131AB Center Tank Access
(TASK 28-11-31-000-801).

SUBTASK 28-22-51-940-001



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (9) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

F. Removal Check Valve Removal

SUBTASK 28-22-51-010-004

- (1) Go into the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-51-020-001

- (2) Disconnect the flexible half coupling [3] between the removal check valve [2] and pump inlet line (TASK 28-22-15-000-801).

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SUBTASK 28-22-51-020-002

- (3) Remove all fittings from the length of the pump inlet line that connects to the removal check valve [2] (TASK 28-22-15-000-801).

SUBTASK 28-22-51-020-003

- (4) Move the pump inlet line away from the removal check valve [2].

SUBTASK 28-22-51-020-004

- (5) Remove the screws [4], washers [5], and nuts [7] from the flange of the removal check valve [2].

SUBTASK 28-22-51-020-005

- (6) Remove the O-ring [6].

SUBTASK 28-22-51-020-006

- (7) Remove the removal check valve [2].

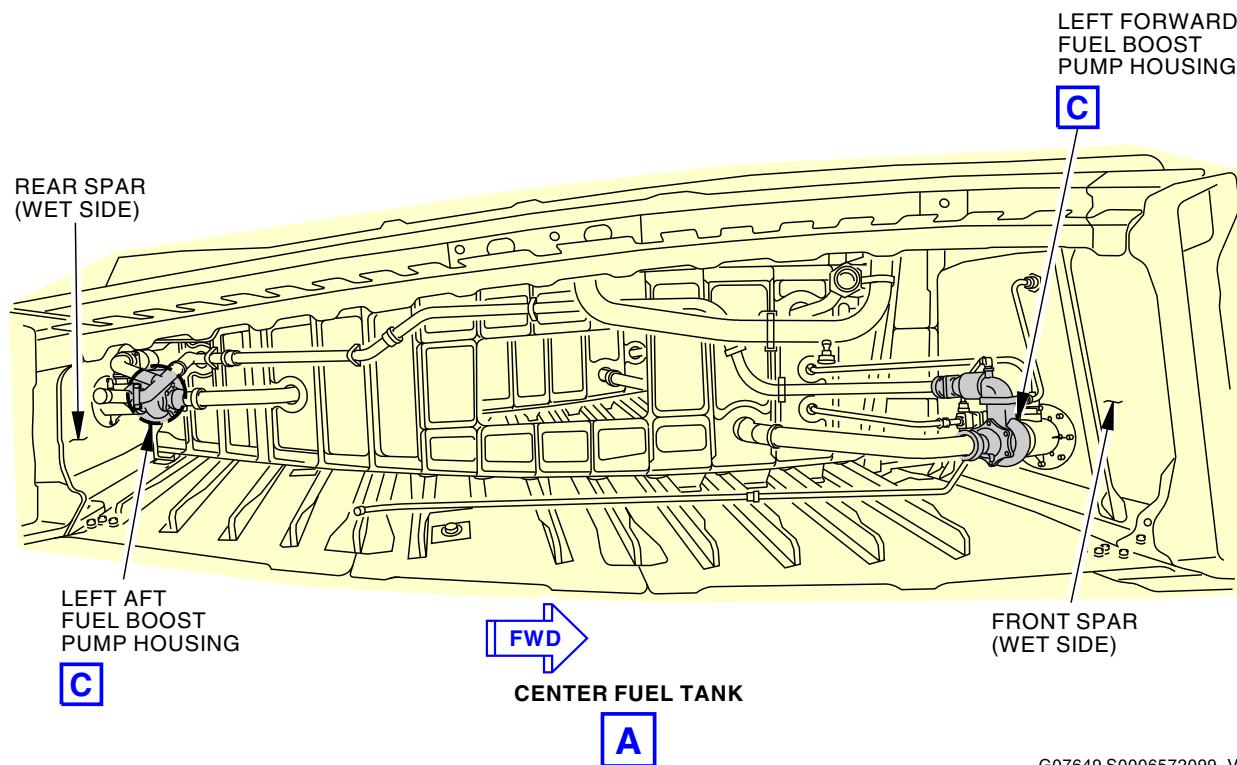
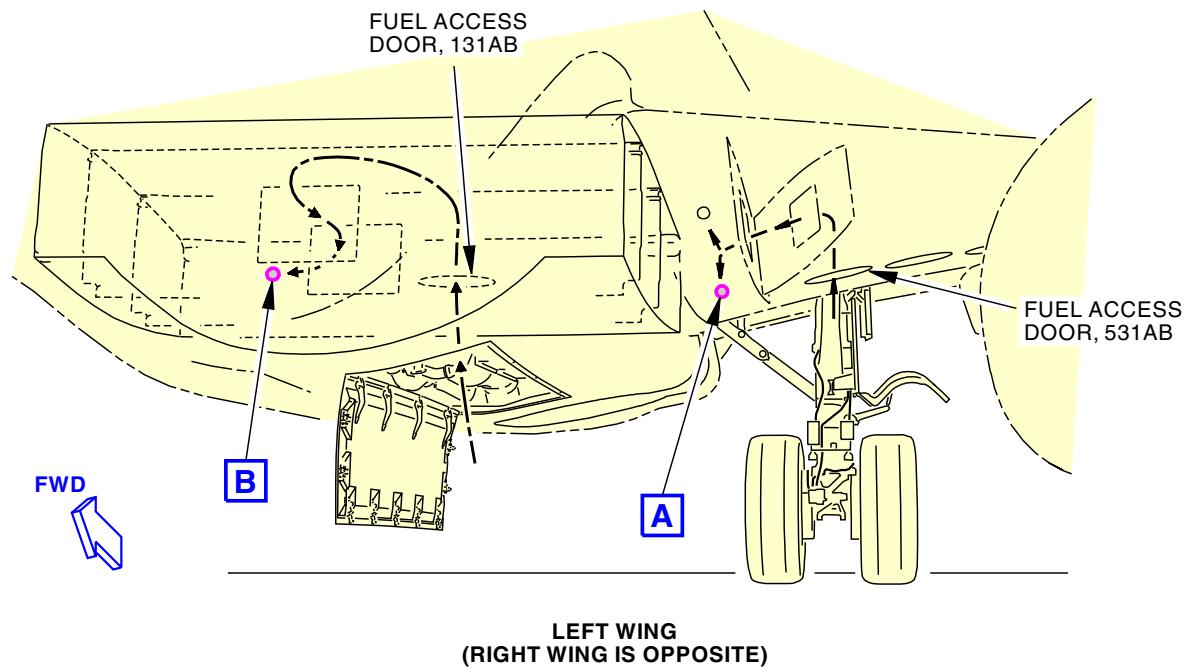
———— END OF TASK ————

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Boost Pump Removal Check Valve Installation
Figure 401/28-22-51-990-802 (Sheet 1 of 2)

EFFECTIVITY
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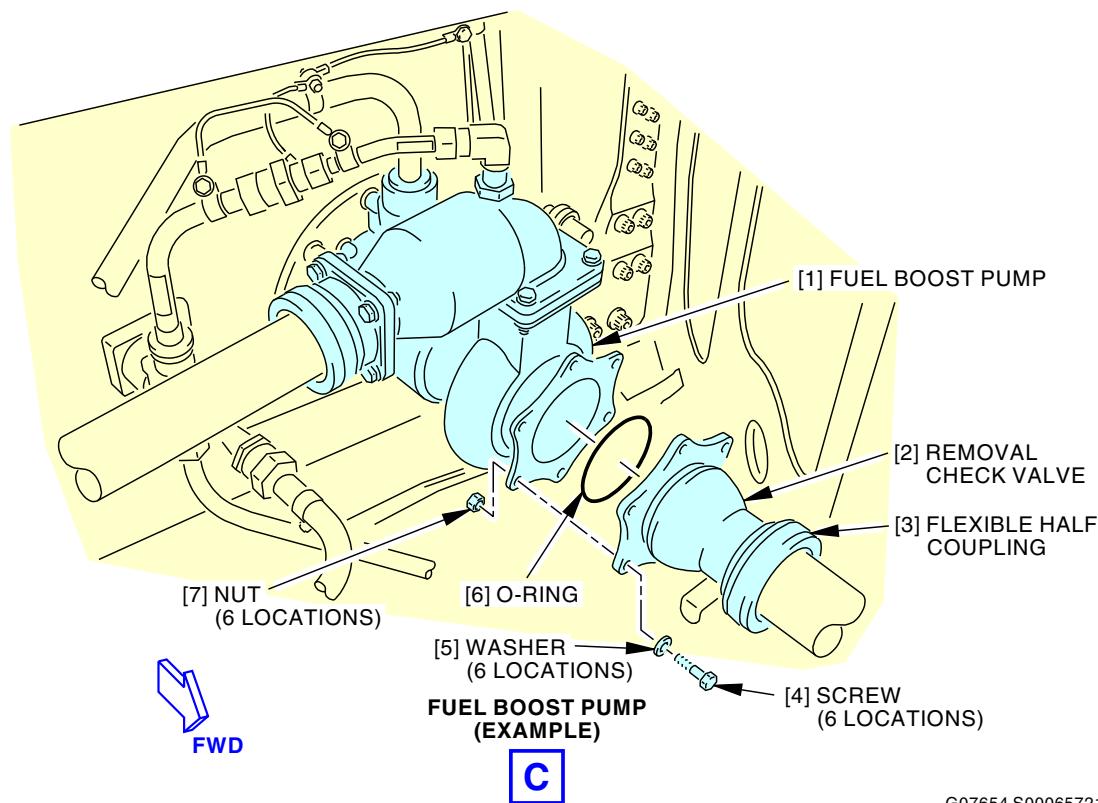
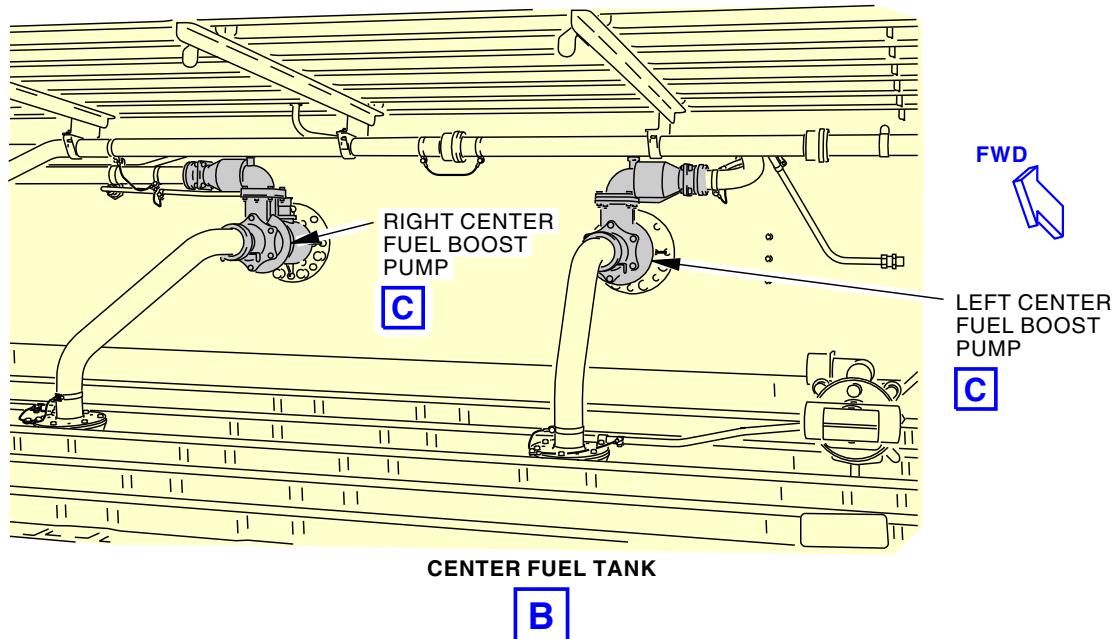
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Boost Pump Removal Check Valve Installation
Figure 401/28-22-51-990-802 (Sheet 2 of 2)

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TASK 28-22-51-400-801

3. Removal Check Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the removal check valve.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-41-000-801	Motor Impeller Removal (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1769	Puller - Fuel Pump Part #: B28003-1 Supplier: 81205

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Removal check valve	28-22-51-05-035	LOM ALL
		28-22-51-05-135	LOM ALL
		28-22-51-05-175	LOM ALL
6	O-ring	28-22-51-05-040	LOM ALL
		28-22-51-05-180	LOM ALL

E. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168



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G. Removal Check Valve Installation

SUBTASK 28-22-51-940-005



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Obey the purging and fuel tank entry procedures (TASK 28-11-00-910-802).

SUBTASK 28-22-51-420-001

- (2) Put a new O-ring [6] in the groove on the flange of the removal check valve.

SUBTASK 28-22-51-820-001

- (3) Align the flange of the removal check valve [2] with the flange of the fuel boost pump [1].

SUBTASK 28-22-51-420-002

- (4) Install the screws [4], washers [5], and nuts [7] with the bonding jumper on one of the screws.

SUBTASK 28-22-51-420-003

- (5) Install the flexible half coupling [3] to attach the pump inlet line and removal check valve [2] (TASK 28-22-15-400-801).

SUBTASK 28-22-51-420-004

- (6) Install all the fittings on the pump inlet line (TASK 28-22-15-400-801).

SUBTASK 28-22-51-010-005

- (7) For the removal check valves of the fuel boost pumps in the No. 1 tank, install this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-400-801).

SUBTASK 28-22-51-010-006

- (8) For the removal check valves of the fuel boost pumps in the No. 2 tank, install this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-400-801).

SUBTASK 28-22-51-010-007

- (9) For the removal check valves of the center tank fuel boost pumps, install the center tank access door.

Number Name/Location

131AB Center Tank Access
(TASK 28-11-31-400-801).

SUBTASK 28-22-51-710-001

- (10) To do an operational test of a removal valve for the No. 1 tank forward or No. 1 tank aft boost pump, do these steps:
- Add a minimum of 300 lb (136 kg) of fuel to the No. 1 tank (TASK 12-11-00-650-802).
 - Pull the motor impeller out 0.6 in. (15.2 mm) (or to the MS35275-250 screws) from the fuel boost pump [1] to let the removal check valve close (TASK 28-22-41-000-801).
 - Use the puller, SPL-1769, to pull out the motor impeller.

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- (d) Remove the drain plug.



WARNING

DO NOT LET FUEL SPILL. WHEN YOU REMOVE THE DRAIN PLUG, A SMALL QUANTITY OF FUEL WILL COME OUT OF THE MOTOR/ IMPELLER UNIT. IF THERE IS A CONTINUOUS FLOW OF FUEL, THE VALVE IS NOT CLOSED. FUEL CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) Make sure that fuel does not continuously drain from the drain port.
(f) Install the drain plug.
(g) Install the applicable boost pump impeller for the removal valve that was installed (TASK 28-22-41-000-801).

SUBTASK 28-22-51-710-003

- (11) To do an operational test of a removal valve for the No. 2 tank forward or the No. 2 tank aft boost pump, do these steps:
- Add a minimum of 300 lb (136 kg) of fuel to the No. 2 tank (TASK 12-11-00-650-802).
 - Pull the motor impeller out 0.6 in. (15.2 mm) (or to the MS35275-250 screws) from the fuel boost pump [1] to let the removal check valve close (TASK 28-22-41-000-801).
 - Use the puller, SPL-1769, to pull out the motor impeller.
 - Remove the drain plug.



WARNING

DO NOT LET FUEL SPILL. WHEN YOU REMOVE THE DRAIN PLUG, A SMALL QUANTITY OF FUEL WILL COME OUT OF THE MOTOR/ IMPELLER UNIT. IF THERE IS A CONTINUOUS FLOW OF FUEL, THE VALVE IS NOT CLOSED. FUEL CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) Make sure that fuel does not continuously drain from the drain port.
(f) Install the drain plug.
(g) Install the applicable boost pump impeller for the removal valve that was installed (TASK 28-22-41-000-801).

SUBTASK 28-22-51-710-002

- (12) To do an operational test of a removal valve for the left or right center tank, do these steps:
- Add a minimum of 14,000 lb (6350 kg) of fuel to the center tank (TASK 12-11-00-650-802).
 - Pull the motor impeller out 0.6 in. (15.2 mm) (or to the MS35275-250 screws) from the fuel boost pump [1] to let the removal check valve close (TASK 28-22-41-000-801).
 - Remove the drain plug.



WARNING

DO NOT LET FUEL SPILL. WHEN YOU REMOVE THE DRAIN PLUG, A SMALL QUANTITY OF FUEL WILL COME OUT OF THE MOTOR/ IMPELLER UNIT. IF THERE IS A CONTINUOUS FLOW OF FUEL, THE VALVE IS NOT CLOSED. FUEL CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Make sure that fuel does not continuously drain from the drain port.

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- (e) Install the drain plug.
- (f) Install the applicable boost pump impeller for the removal valve that was installed (TASK 28-22-41-000-801).

———— END OF TASK ————

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MAIN TANK FUEL BOOST PUMP BYPASS VALVE - REMOVAL/INSTALLATION

1. General

- A. There is one fuel boost pump bypass valve in each main fuel tank. The bypass valve lets suction fuel flow to the engine if the two fuel boost pumps in one of the wing tanks do not operate. Each bypass valve is found between stringers 5 and 6 at immediately outboard of the No. 1 tank wall or the No. 2 tank wall. The bypass valve is installed in the suction feed line, downstream of the filter screen.
- B. This procedure contains two tasks. The first task removes the bypass valve. The second task installs the bypass valve.
- C. The fuel boost pump bypass valve is referred to as "the bypass valve" in this procedure.

TASK 28-22-61-000-801

2. Fuel Boost Pump Bypass Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Boost Pump Bypass Valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

E. Prepare for the Removal

SUBTASK 28-22-61-480-002



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN THE NOSE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE NOSE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure that the downlock pins are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-22-61-650-001

- (2) Defuel the applicable No. 1 or No. 2 fuel tank (TASK 28-26-00-650-801).

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SUBTASK 28-22-61-650-002



WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU

IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL,
CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (3) Purge and enter the applicable No. 1 or No. 2 tank (TASK 28-11-00-910-802).

SUBTASK 28-22-61-010-001

- (4) Remove the applicable No. 1 tank or No. 2 tank access door:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

or open this access panel:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

(TASK 28-11-11-000-801).

F. Fuel Boost Pump Bypass Valve Removal

SUBTASK 28-22-61-020-001

- (1) Remove the two screws [21], nuts [19], and four washers [20] that attach the suction feed line [1] and bracket [22] to the bracket [23].

SUBTASK 28-22-61-020-005

- (2) Remove the screw [12], two washers [13], washer [15], and nut [18] from the loop clamp [14] and loop clamp [16].

NOTE: Keep the loop clamp [14] and loop clamp [16] on the water scavenge tube [24] and suction feed line [1].

SUBTASK 28-22-61-020-002

- (3) Remove the four hex head bolts [11], four washers [10], four washers [9], and four nuts [8] that attach the suction feed line [1] to the bypass valve [4].

SUBTASK 28-22-61-020-003

- (4) Remove the rigid coupling assembly [5], do this task: TASK 28-22-15-000-801.

SUBTASK 28-22-61-020-004

- (5) Remove the bypass valve [4].

(a) Discard the o-ring [3].

SUBTASK 28-22-61-480-001

- (6) Put covers on the open ends of the suction feed line [1] and suction feed line [2] to keep unwanted material out.

(a) Discard the o-ring [7] and lockwire [6].

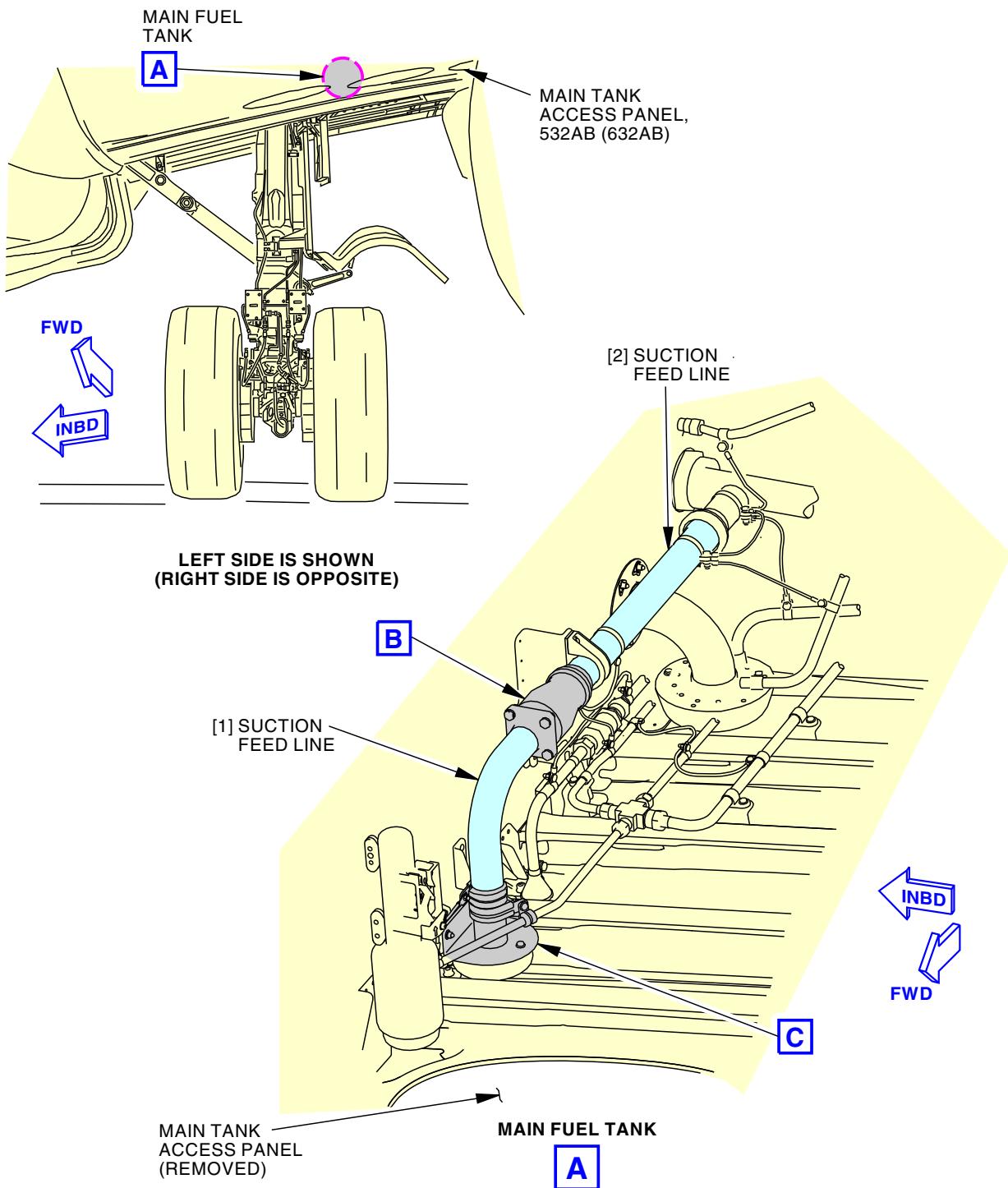
— END OF TASK —

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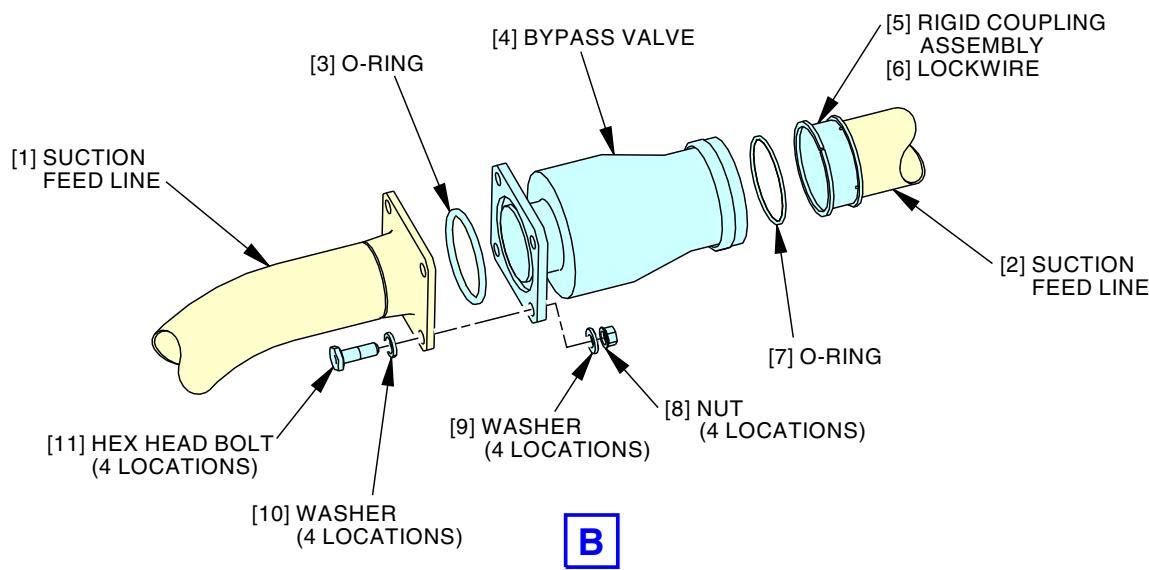
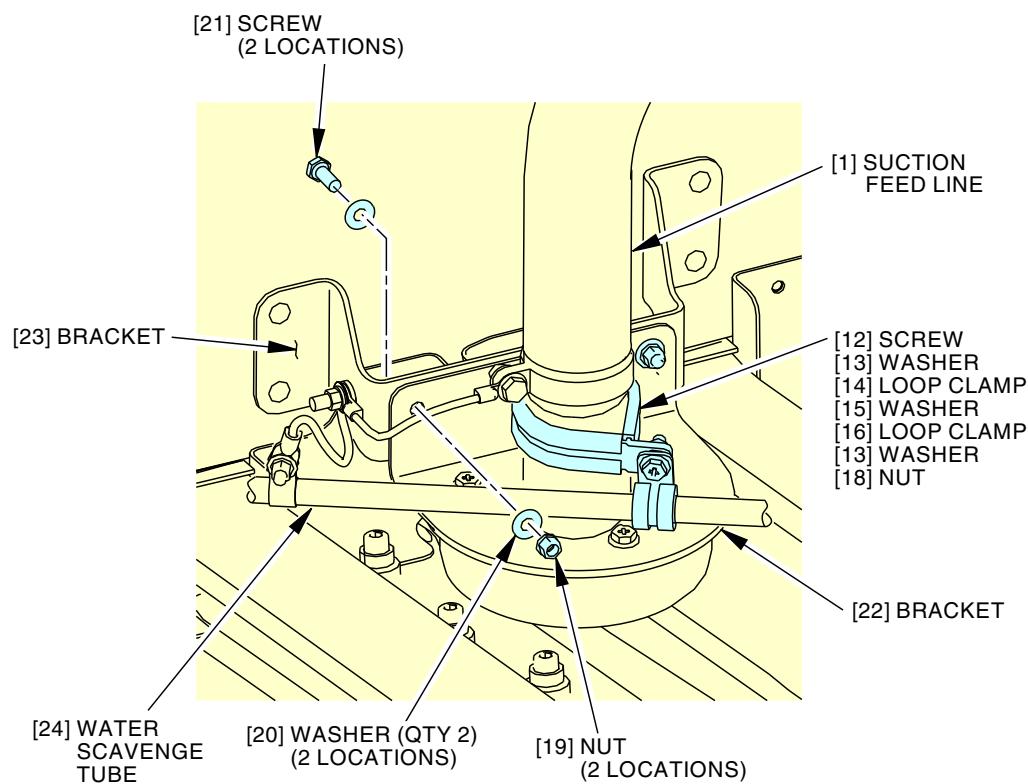
Main Tank Fuel Boost Pump Bypass Valve Installation
Figure 401/28-22-61-990-802 (Sheet 1 of 2)

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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B

C

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Main Tank Fuel Boost Pump Bypass Valve Installation
Figure 401/28-22-61-990-802 (Sheet 2 of 2)

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TASK 28-22-61-400-801

3. Fuel Boost Pump Bypass Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel Boost Pump Bypass Valve.

B. References

Reference	Title
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-802	Engine Fuel Suction Feed - Operational Test (P/B 501)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-15-710-801	Engine Fuel Feed Manifold - Leak Test (P/B 601)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-11-51-01-325	LOM 402, 404, 406
		28-11-51-01A-255	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-08-255	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-15-250	LOM 458-999
		28-11-51-16-250	LOM 458-999
		28-11-51-01-320	LOM 402, 404, 406
4	Bypass valve	28-11-51-01A-390	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-08-385	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-15-850	LOM 458-999
		28-11-51-16-835	LOM 458-999
		28-11-51-01-280	LOM 402, 404, 406
		28-11-51-01-285	LOM 402, 404, 406
7	O-ring	28-11-51-01A-220	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-08-220	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-457
		28-11-51-15-225	LOM 458-999
		28-11-51-16-225	LOM 458-999

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E. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216
632AB	Main Tank Access Door - Wing Station 216

G. Prepare for the Installation

SUBTASK 28-22-61-080-001

- (1) Remove the covers from the open ends of the suction feed line [1] and suction feed line [2].

H. Fuel Boost Pump Bypass Valve Installation

SUBTASK 28-22-61-420-001

- (1) Install the rigid coupling assembly [5] to attach the bypass valve [4] to the suction feed line [2], do this task: TASK 28-22-15-400-801.
 - (a) Install a new o-ring [7].

SUBTASK 28-22-61-420-002

- (2) Attach the bypass valve [4] to the suction feed line [1] as follows:
 - (a) Apply a thin layer of grease, D00504 to the new o-ring [3].
 - (b) Put the o-ring [3] in the groove of the bypass valve [4].
 - (c) Align the bypass valve [4] mounting holes with the suction feed line [1] mounting holes.
 - (d) Install the four hex head bolts [11], four washers [10], four washers [9], and four nuts [8] through the flanges to attach the bypass valve [4] to the suction feed line [1].

SUBTASK 28-22-61-420-003

- (3) Install the two screws [21], four washers [20], and two nuts [19] to attach the suction feed line [1] and bracket [22] to the bracket [23].

SUBTASK 28-22-61-420-004

- (4) Install the screw [12], washer [13], loop clamp [14], washer [15], loop clamp [16], washer [13], and nut [18] to attach the water scavenge tube [24] to the suction feed line [1].

I. Fuel Boost Pump Bypass Valve Installation Test

SUBTASK 28-22-61-410-001

- (1) Install this access door:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

or close this access door:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

(TASK 28-11-11-400-801).

SUBTASK 28-22-61-710-001

- (2) Do one of these tasks to do a test of the bypass valve for leaks:

(a) Engine Fuel Feed Manifold - Leak Test, TASK 28-22-15-710-801



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(b) Engine Fuel Suction Feed - Operational Test, TASK 28-22-00-710-802

———— END OF TASK ——

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BOOST PUMP DISCHARGE CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. A discharge check valve is installed on each fuel boost pump in all three tanks. The discharge check valve prevents the flow of fuel back through the fuel boost pump.
- B. This procedure contains two tasks. The first task removes the discharge check valve. The second task installs the discharge check valve.

TASK 28-22-71-000-801

2. Discharge Check Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Discharge Check Valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-21-710-801	Crossfeed Valve Operational Test (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168

E. Prepare for the Removal

SUBTASK 28-22-71-650-001

- (1) Defuel the center fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-22-71-860-002

- (2) For the discharge check valves for the center tank boost pumps, also defuel the No. 1 tank and the No. 2 tank (TASK 28-26-00-650-801).

SUBTASK 28-22-71-650-002

- (3) For the discharge check valves for the No. 2 tank boost pumps, defuel the No. 2 tank (TASK 28-26-00-650-801).

NOTE: You can move the fuel to the No. 1 tank to do this if it has sufficient capacity for the fuel.



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SUBTASK 28-22-71-650-003

- (4) For the discharge check valve for the No. 1 tank boost pumps, defuel the No. 1 tank (TASK 28-26-00-650-801).

NOTE: You can move the fuel to the No. 2 tank to do this if it has sufficient capacity for the fuel.

SUBTASK 28-22-71-860-003

- (5) Do these steps to make sure that the crossfeed valve is closed:

- Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.
- Make sure that the crossfeed valve is set to the closed position and the crossfeed position indicator light is off.

SUBTASK 28-22-71-650-004

- (6) Drain and purge the center fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-71-010-001

- (7) To remove the discharge check valve of the fuel boost pumps in the No. 1 tank, remove this access panel:

Number Name/Location

531AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-000-801).

SUBTASK 28-22-71-010-002

- (8) To remove the discharge check valve of the fuel boost pumps in the No. 2 tank, remove this access panel:

Number Name/Location

631AB Center Tank Access Door - Wing Station 168
(TASK 28-11-31-000-801).

SUBTASK 28-22-71-010-003

- (9) To remove the discharge check valve of the center tank fuel boost pumps, remove this access panel:

Number Name/Location

131AB Center Tank Access
(TASK 28-11-31-000-801).

SUBTASK 28-22-71-940-001



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (10) Obey the fuel tank entry precautions (TASK 28-11-00-910-802).

F. Discharge Check Valve Removal

SUBTASK 28-22-71-020-001

- (1) Do these steps to remove the elbow [18]:

- Disconnect the ejector pump pressure line [21] at the B-nut [20] that is connected to the elbow [18].
- Loosen the nut [15].

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- (c) Remove the elbow [18].
- (d) Discard the O-ring [14].

SUBTASK 28-22-71-020-002

- (2) Remove the nut [2], the nut [5], the ring [4], and the O-ring [3] at the pressure sensor line [1].

SUBTASK 28-22-71-020-003

- (3) Remove the screws [22], the washers [17], the nuts [16] and O-ring [24] from the valve flange [19].

NOTE: This disconnects the discharge check valve [13] from the pump discharge line [23].

SUBTASK 28-22-71-020-004

- (4) Remove the bolts [12], washers [11], and nuts [6] from the discharge check valve [13].

SUBTASK 28-22-71-020-005

- (5) Remove the discharge check valve [13].

SUBTASK 28-22-71-020-006

- (6) Remove the O-ring [8] and O-ring [10].

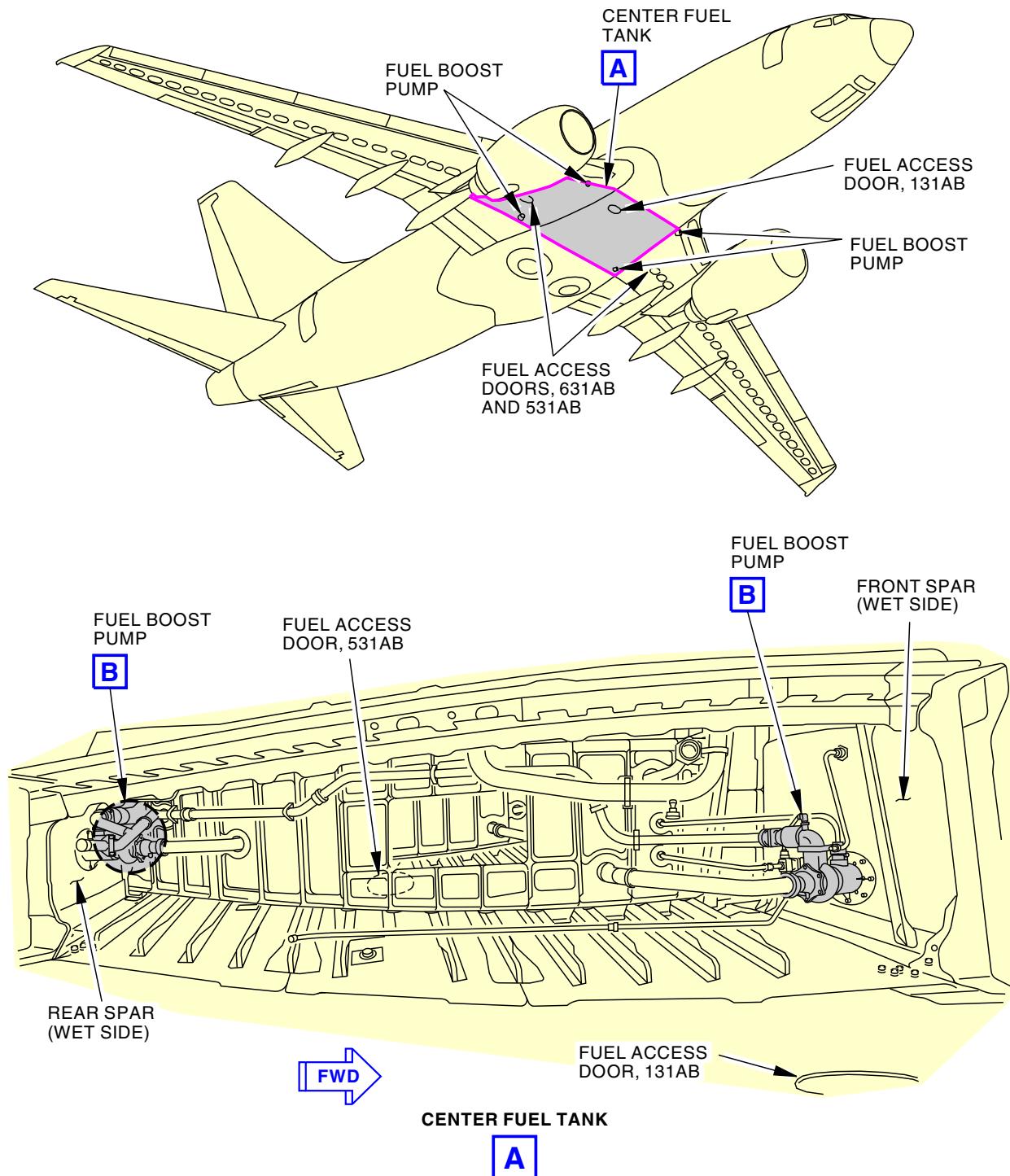
———— END OF TASK ———

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Boost Pump Discharge Check Valve Installation
Figure 401/28-22-71-990-802 (Sheet 1 of 2)

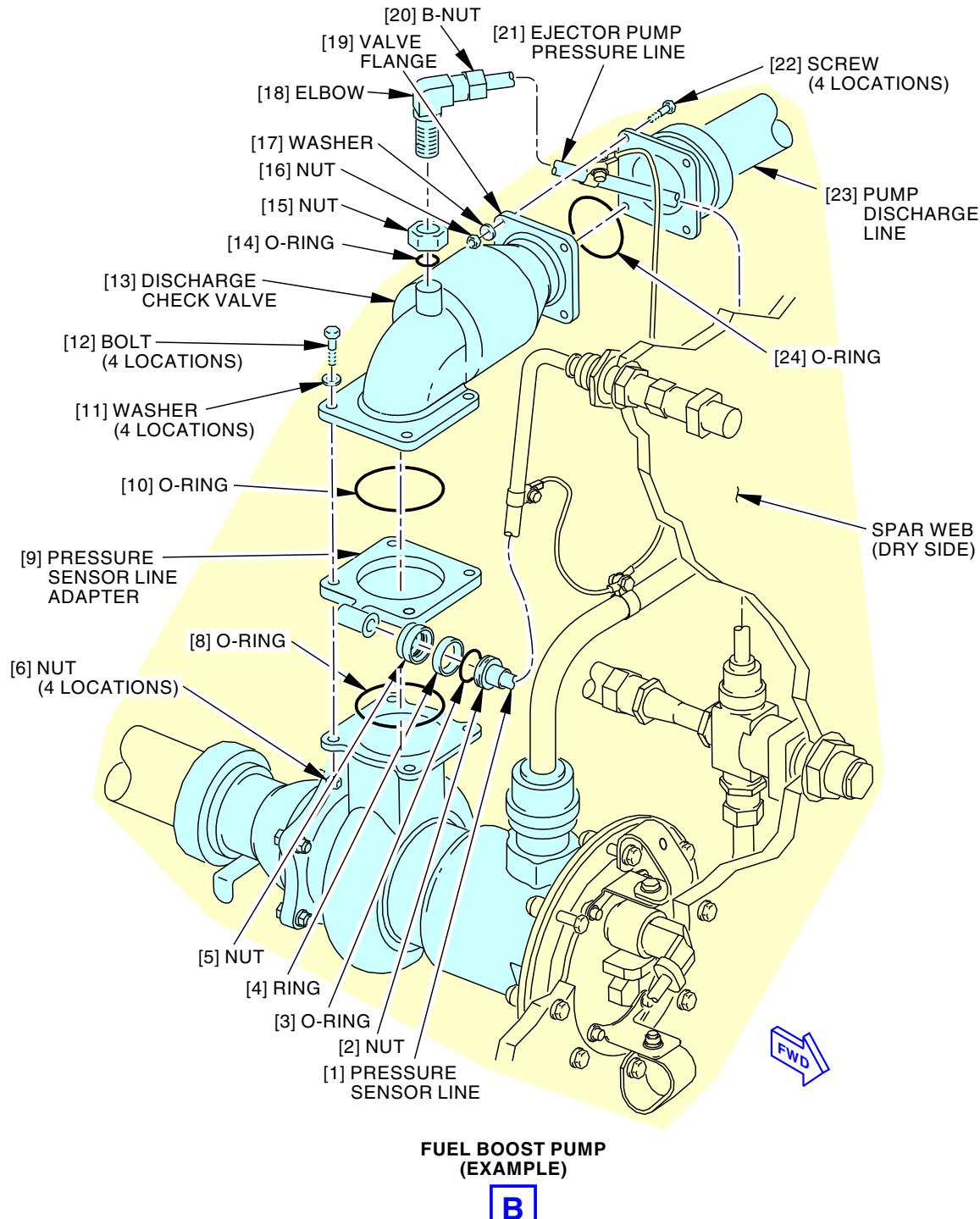
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Boost Pump Discharge Check Valve Installation
Figure 401/28-22-71-990-802 (Sheet 2 of 2)

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TASK 28-22-71-400-801

3. Discharge Check Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Discharge Check Valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-22-15-05-065	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428
		28-22-15-05-125	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428
		28-22-15-05-126	LOM 429-434, 437-447, 450-999
8	O-ring	28-22-71-05-062	LOM ALL
		28-22-71-05-255	LOM ALL
		28-22-71-05-335	LOM ALL
10	O-ring	28-22-71-05-062	LOM ALL
		28-22-71-05-255	LOM ALL
		28-22-71-05-335	LOM ALL
13	Discharge check valve	28-22-71-05-060	LOM ALL
		28-22-71-05-250	LOM ALL
		28-22-71-05-330	LOM ALL
14	O-ring	28-22-71-05-276	LOM ALL
		28-22-71-05-360	LOM ALL
24	O-ring	28-22-71-05-040	LOM ALL
		28-22-71-05-230	LOM ALL
		28-22-71-05-310	LOM ALL

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
131AB	Center Tank Access



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(Continued)

Number	Name/Location
531AB	Center Tank Access Door - Wing Station 168
631AB	Center Tank Access Door - Wing Station 168

F. Discharge Check Valve Installation

SUBTASK 28-22-71-940-004



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Go into the fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-22-71-420-001

- (2) Install the pressure sensor line adapter [9] and O-ring [8] on the boost pump housing.

SUBTASK 28-22-71-420-002

- (3) Put a new O-ring [10] in the groove of the discharge check valve [13] that attaches to the housing.

SUBTASK 28-22-71-820-001

- (4) Align the discharge check valve [13] with the housing and the pump discharge line [23].

SUBTASK 28-22-71-420-003

- (5) Install the four bolts [12], washers [11], and nuts [6] to attach the discharge check valve [13] to the boost pump housing.

SUBTASK 28-22-71-420-004

- (6) Put a new O-ring [24] in the valve flange [19] that attaches to the pump discharge line [23].

SUBTASK 28-22-71-420-005

- (7) Install the four screws [22], washers [17] and nuts [16] to attach the pump discharge line [23] to the discharge check valve [13].

SUBTASK 28-22-71-420-006

- (8) Connect the ejector pump pressure line [21] to the discharge check valve [13].

- (a) Install the nut [15] on the elbow [18].
- (b) Install a new O-ring [14] on the elbow [18].
- (c) Install the nut [15] on the coupling body.
- (d) Install lockwire on the nut [15].

SUBTASK 28-22-71-420-007

- (9) Connect the pressure sensor line [1] to the discharge check valve [13].

- (a) Install the ferrule on the pressure sensor line [1].
- (b) Put a nut [2] on the pressure sensor line adapter [9].
- (c) Put a ring [4] on the pressure sensor line adapter [9] between the ferrule and the nut [2].
- (d) Install a new O-ring [3] in the coupling body.
- (e) Install the nut [2] on the coupling body.
- (f) Install lockwire on the nut [2].

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-71-410-001

- (1) For the discharge check valve of the fuel boost pumps in the center tank, install this access panel:

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access

(TASK 28-11-31-400-801).

SUBTASK 28-22-71-010-004

- (2) For the discharge check valve of the fuel boost pumps in the No. 1 tank, install this access panel:

<u>Number</u>	<u>Name/Location</u>
531AB	Center Tank Access Door - Wing Station 168

(TASK 28-11-31-400-801).

SUBTASK 28-22-71-010-005

- (3) For the discharge check valve of the fuel boost pumps in the No. 2 tank, install this access panel:

<u>Number</u>	<u>Name/Location</u>
631AB	Center Tank Access Door - Wing Station 168

(TASK 28-11-31-400-801).

———— END OF TASK ————

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APU FUEL FEED SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has an operational test for the APU fuel feed system.

LOM 412, 415, 423, 424, 450-452

- B. This procedure also has a task to do an insulation resistance test of the APU DC fuel pump.

LOM ALL

- C. A procedure to pressurize the APU fuel line to do a test for leaks is found in (TASK 28-25-04-790-801).
D. A procedure to pressurize the shroud for the APU fuel line is found in (TASK 28-25-05-790-801).

TASK 28-25-00-710-801

2. Operational Test - APU Fuel Feed System

(Figure 501)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

C. Prepare for Test

SUBTASK 28-25-00-860-001

- (1) Make sure that electrical power is available (TASK 24-22-00-860-811).

SUBTASK 28-25-00-860-002

- (2) Make sure that the APU FIRE switch, on the P8 fire protection panel, is in the NORMAL position.

SUBTASK 28-25-00-860-003

- (3) Make sure that the APU master control switch, on the P5 overhead panel, is in the OFF position.

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-00-650-001

- (4) Make sure there is a minimum of 500 lb (227 kg) of fuel in the No. 1 tank.

NOTE: This will prevent the APU DC Boost Pump from dry running.

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SUBTASK 28-25-00-910-002



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

D. Test APU Fuel Feed System

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-00-860-023

- (1) To get access to the P91 and P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-25-00-860-013

- (2) Do these steps to do a test of the APU DC boost pump:

- (a) Make sure that the boost pump switches are in the OFF position as shown in this table:

Table 501/28-25-00-993-802

SWITCH/CONTROL	POSITION	LOCATION
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL

LOM ALL

SUBTASK 28-25-00-860-004

- (3) Make sure that the manual override handle, on the actuator of the APU fuel shutoff valve, is in the CLOSED position (Figure 501).

NOTE: The actuator is installed on the rear spar of the center fuel tank, at approximately two feet to the left of the airplane centerline.

SUBTASK 28-25-00-860-005

- (4) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
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LOM 412, 415, 423, 424, 450-452

A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP
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LOM 412, 415, 423, 424, 450-452 (Continued)

Standby Power Control Unit, M01720

Row Col Number Name

LOM ALL

B	4	C00169	SW HOT BAT BUS
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SUBTASK 28-25-00-860-006

- (5) Set the APU master switch, on the P5 overhead panel, to the ON position.

NOTE: Do not set the APU master switch to the start position. This will start the APU.

SUBTASK 28-25-00-210-001

- (6) Make sure that the manual override handle, on the APU fuel shutoff valve, moves to the open position in less than ten (10) seconds.

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-00-710-002

- (7) Listen to make sure that the APU DC boost pump is on.

NOTE: The APU DC boost pump is found on the rear spar of the No. 1 tank immediately outboard of the main landing gear door through the door below.

- (a) This is the panel:

Number Name/Location

551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel
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LOM ALL

SUBTASK 28-25-00-860-007



WARNING

DO NOT TURN THE FIRE SWITCH. IF YOU TURN THE FIRE SWITCH, THE CONTENTS OF THE FIRE BOTTLE CAN ACCIDENTALLY RELEASE. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (8) Pull the APU FIRE switch, on the P8 fire protection panel, to the FIRE position.

SUBTASK 28-25-00-210-002

- (9) Make sure that the manual override handle, on the APU fuel shutoff valve, moves to the closed position.

SUBTASK 28-25-00-710-001

- (10) Make sure that the APU fault light, on the P5 overhead panel, comes on to show fire shutdown.

SUBTASK 28-25-00-860-008

- (11) Push the APU FIRE switch to the NORMAL position.

SUBTASK 28-25-00-860-014

- (12) Set the APU master switch to OFF and then set the APU master switch to ON again.

NOTE: Do not set the APU master switch to the start position. This will start the APU.

SUBTASK 28-25-00-210-003

- (13) Make sure that the manual override handle, on the APU fuel shutoff valve, moves to the open position.

SUBTASK 28-25-00-210-004

- (14) Make sure that the APU FAULT light, on the P5 overhead panel, goes off.

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E. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-00-860-009

- (1) Set the APU start switch, on the P5 overhead panel, to the OFF position.

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-00-860-012

- (2) Do these steps:

- (a) Make sure that the boost pump switches are in the positions shown in this table:

Table 502/28-25-00-993-003

SWITCH/CONTROL	POSITION	LOCATION
FUEL PUMP - TANK 1 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 1 - FWD	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK LEFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - CTR TANK RIGHT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - AFT	OFF	P5 OVERHEAD PANEL
FUEL PUMP - TANK 2 - FWD	OFF	P5 OVERHEAD PANEL



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (b) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

- (c) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

LOM ALL

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SUBTASK 28-25-00-210-005

- (3) Make sure that the manual override handle, on the APU fuel shutoff valve, moves to the closed position.

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-00-710-003

- (4) Listen to make sure that the APU DC boost pump is off.

NOTE: The APU DC boost pump is found on the rear spar of the No. 1 tank immediately outboard of the main landing gear door through the access panel below.

- (a) This is the panel:

Number

Name/Location

551DB

Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam
Outboard Attach Pin Access Panel

LOM ALL

———— END OF TASK ————

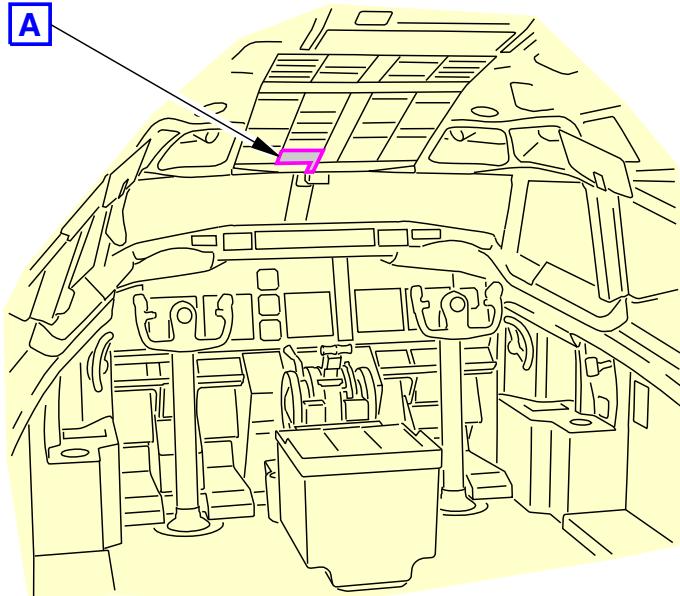


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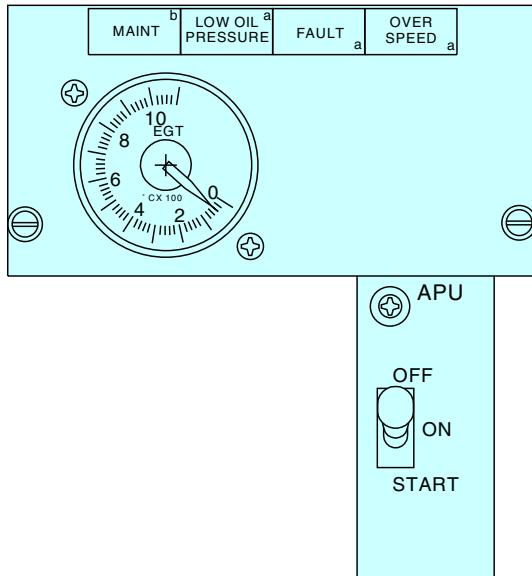


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APU START SWITCH
AND INDICATORS



FLIGHT COMPARTMENT



APU START SWITCH AND INDICATORS



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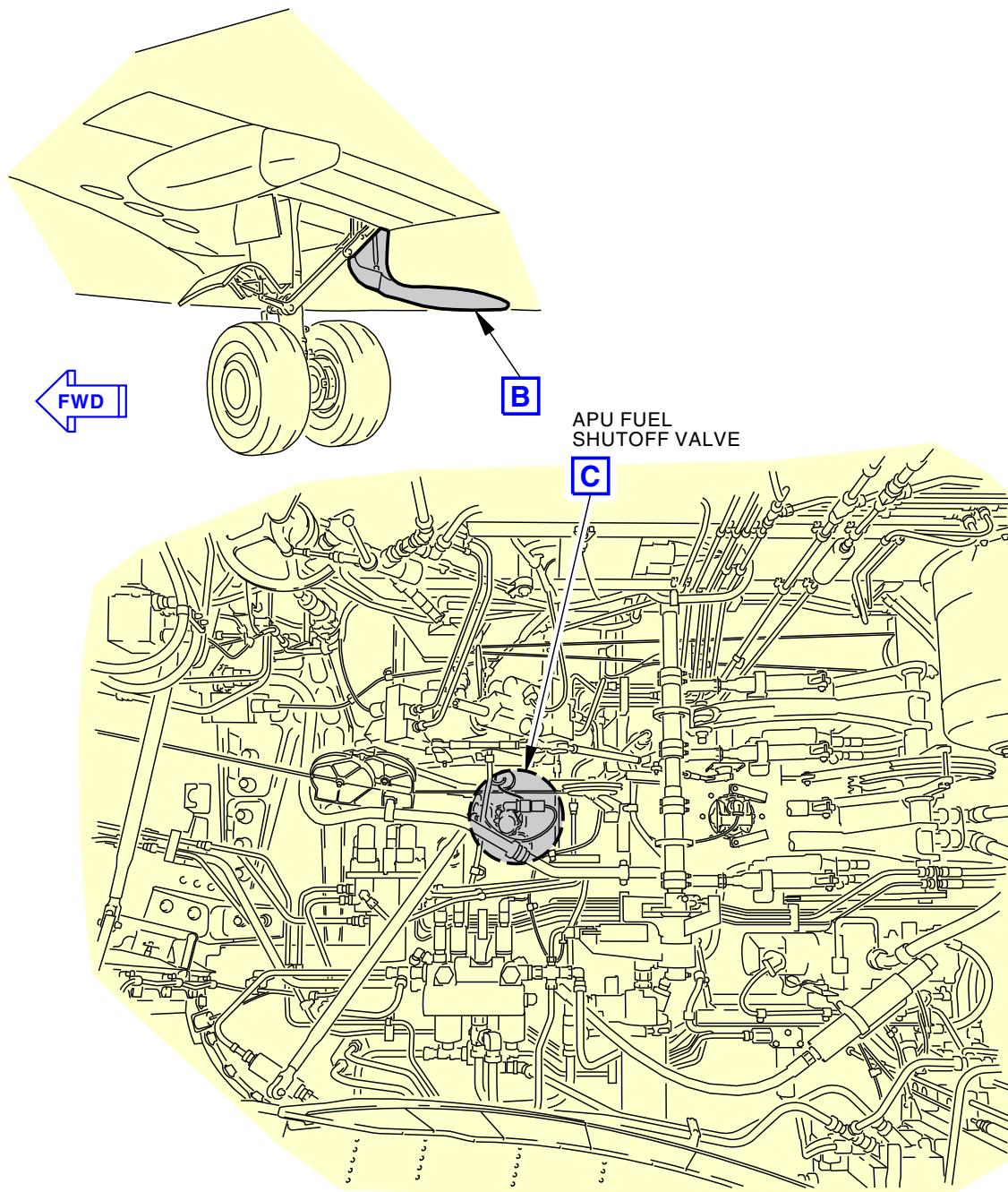
APU Fuel Feed System Test
Figure 501/28-25-00-990-802 (Sheet 1 of 3)

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MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)

B

FWD
INBD

G07924 S0006572121_V2

APU Fuel Feed System Test
Figure 501/28-25-00-990-802 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

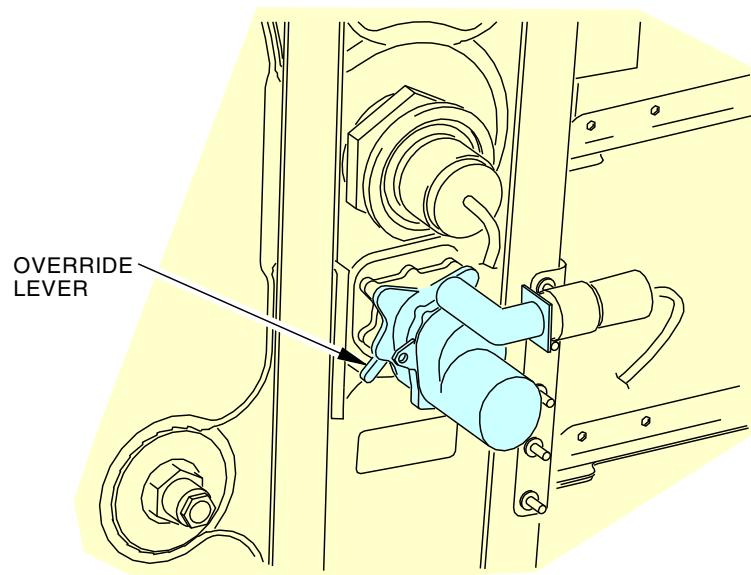
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BOEING
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APU FUEL SHUTOFF VALVE

C

G07925 S0006572122_V2

APU Fuel Feed System Test
Figure 501/28-25-00-990-802 (Sheet 3 of 3)

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LOM 412, 415, 423, 424, 450-452

TASK 28-25-00-760-801

3. APU DC Fuel Pump - Insulation Resistance Test

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.
- NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.
- (2) This task does an insulation resistance test of the APU DC fuel pump.
- (3) If this task is done because a circuit breaker or GFI has opened for the APU DC fuel pump, you must complete and pass this test before you reset the circuit breaker or GFI.
- (4) When you use the megohmmeter, COM-10724, it is recommended that the megohmmeter be insulated from any metal work stands. It is also recommended that protective clothing (rubber gloves, insulated shoes, etc.) be worn when you make these measurements. The megohmmeter should be plugged into a grounded receptacle to reduce the possibility of electrical shock.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-25-01-000-801	APU DC Boost Pump Impeller Removal (P/B 401)
28-25-01-400-801	APU DC Boost Pump Impeller Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-60-01	Cleaning of Electrical Connectors

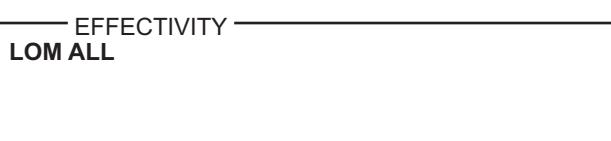
C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-10724	Megohmmeter (10-50 VDC, 50-100 VDC, 100-500 VDC, 500-1090 VDC, 50 k Ohms - 200 T Ohms, +/-3% Basic Accuracy) Part #: 1864-9700 Supplier: 62015

D. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5



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LOM 412, 415, 423, 424, 450-452 (Continued)

E. Prepare for the Insulation Resistance Test

SUBTASK 28-25-00-860-022



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE

LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-25-00-860-019

- (2) Make sure that this circuit breaker is open and has safety tag:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP

F. APU DC Fuel Pump Wire Terminal Assembly Inspection

NOTE: It is necessary to do these procedures at the APU DC fuel pump: APU DC Fuel Pump Wire Terminal Assembly Inspection, APU DC Fuel Pump Continuity Check, Initial Insulation Resistance Test, and the Final Insulation Resistance Test.

SUBTASK 28-25-00-010-001

- (1) Get access to the APU DC fuel pump

SUBTASK 28-25-00-210-006

- (2) Do a visual inspection of the wire terminal assembly.

NOTE: Also do these visual inspections at the airplane side of the wire terminal assembly and repair as necessary.

- (a) Look for these conditions:

- 1) Indication that fuel has leaked from the wire terminal assembly.
 - 2) Indication that the terminal assembly or wire insulation is discolored because of too much heat.
 - a) Clean the wire bundle caps (SWPM 20-60-01).

- 3) Indication of damage to the wire terminal assembly, for example:

- a) bulges
 - b) bent flanges
 - c) broken screws
 - d) medium to heavy corrosion damage.

SUBTASK 28-25-00-760-001

- (3) If the visual check shows the APU DC fuel pump is okay, do this procedure: APU DC Fuel Pump Continuity Check.

SUBTASK 28-25-00-020-001

- (4) If the visual check shows that the fuel pump is not okay, replace the APU DC fuel pump:

- (a) APU DC Boost Pump Impeller Removal, TASK 28-25-01-000-801
 - (b) APU DC Boost Pump Impeller Installation, TASK 28-25-01-400-801.

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LOM 412, 415, 423, 424, 450-452 (Continued)

SUBTASK 28-25-00-760-002

- (5) Do the continuity/resistance checks for the replacement fuel pump.
 - (a) Start with this procedure: APU DC Fuel Pump Continuity Check.

G. APU DC Fuel Pump Continuity Check

SUBTASK 28-25-00-020-002

- (1) Disconnect the electrical connector from the APU DC fuel pump (impeller).

SUBTASK 28-25-00-760-003

- (2) Use an intrinsically safe approved bonding meter, COM-1550, and measure the resistance between pin 2 on the electrical connector and the bonding jumper on the APU DC fuel pump.

NOTE: The measurement between pin 2 and the bonding jumper is a continuity check, not a bonding resistance check.

SUBTASK 28-25-00-760-004

- (3) If the resistance is less than 5 ohms, do this procedure: Initial Insulation Resistance Test.

SUBTASK 28-25-00-760-005

- (4) If the resistance is more than 5 ohms, do these steps:
 - (a) Replace the APU DC fuel pump (TASK 28-25-01-000-801, TASK 28-25-01-000-801).
 - (b) Do the continuity/resistance checks for the replacement APU DC fuel pump.

- 1) Start with this procedure: APU DC Fuel Pump Continuity Check.

H. Initial Insulation Resistance Test

SUBTASK 28-25-00-760-006

- (1) Use the instructions given with the megohmmeter, COM-10724, to calibrate the equipment.

28-AWL-18: CDCCL

- (a) Make sure the megohmmeter, COM-10724, has 10 VDC and 45 VDC voltage supply options with a maximum short circuit current of 5 milliamperes.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-25-00-760-007

- (2) RESISTANCE TEST WITH THE APU DC FUEL PUMP REMOVED FROM THE AIRPLANE;

Do these steps to do a test of the insulation resistance:

- (a) Remove the APU DC fuel pump impeller (TASK 28-25-01-000-801).
- (b) Do this procedure on the removed pump, within two hours: Final Insulation Resistance Test.

SUBTASK 28-25-00-760-008

- (3) RESISTANCE TEST WITH THE APU DC FUEL PUMP INSTALLED ON THE AIRPLANE;

Do these steps to do a test of the insulation resistance (initial test):

NOTE: These steps are done at 10 VDC to prevent arcing or overheat in a flammable leakage zone when high voltage is applied to a pump with low insulation resistance. The results of the 10 VDC test will tell you if it is safe to the 45 VDC test with the pump installed.

- (a) Disconnect the electrical connector from the APU DC fuel pump (impeller).

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LOM 412, 415, 423, 424, 450-452 (Continued)



USE THE SPECIFIED EQUIPMENT. OTHER EQUIPMENT CAN CAUSE AN EXPLOSION OR FIRE.

WARNING

- (b) Do these steps to connect the megohmmeter, COM-10724, for the 10 VDC test:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

- 1) Connect the megohmmeter, COM-10724, into a grounded receptacle.
 - a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the megohmmeter, COM-10724, is grounded.
- 2) Connect the + UNKNOWN probe to the pump connector pin ground (pin 2).
- 3) Connect the - UNKNOWN probe to the pump connector pin 1.
- 4) Set the multiplier dial to the lowest range (100K).

28-AWL-18: CDCCL

- 5) Set the TEST VOLTAGE switches to 10V.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 6) Set the measure switch to the MEASURE position.

- (c) Do these steps to measure the resistance at the APU DC fuel pump:

- 1) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-18: CDCCL

- 2) Measure the resistance between the ground (pin 2) and the pump power circuit pin (pin 1) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: If the APU DC fuel pump resistance is very high, the megohmmeter, COM-10724, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms.

- 3) Make a record of the resistance measured between pin 2 and pin 1.

- 4) Set the function switch to the DISCHARGE position.

- (d) Do an analysis of the test results:

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28-AWL-18: CDCCL

- 1) If the resistance measured between the ground (pin 2) and the power circuit pin on the pump connector (pin 1) is more than 1 megohm, do this procedure: Final Insulation Resistance Check.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 2) If the resistance measured between pin 3 and pin 1 is less than or equal to 1 megohm, do these steps:
 - a) Replace the APU DC fuel pump impeller (TASK 28-25-01-000-801, TASK 28-25-01-400-801).
 - b) Do the continuity/resistance checks again for the replacement APU DC fuel pump.

<1> Start with this procedure: APU DC Fuel Pump Continuity Check.

I. Final Insulation Resistance Test

SUBTASK 28-25-00-760-009

- (1) Do these steps to connect the megohmmeter, COM-10724, for the 45 VDC check:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

NOTE: The megohmmeter, COM-10724, must have a 45 VDC voltage supply option.

- (a) Calibrate the megohmmeter, COM-10724, if it is necessary.
- (b) Connect the megohmmeter, COM-10724, into a grounded receptacle.
 - 1) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the megohmmeter, COM-10724, is grounded.

- (c) Connect the + UNKNOWN probe to the pump connector pin ground (pin 2).
- (d) Connect the - UNKNOWN probe to the pump connector pin 1.
- (e) Set the multiplier dial to the lowest range (1M).

28-AWL-18: CDCCL

- (f) Set the TEST VOLTAGE switches to 45V.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- (g) Set the measure switch to the MEASURE position.

SUBTASK 28-25-00-760-010

- (2) Do these steps to measure the resistance at the APU DC fuel pump:

- (a) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

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28-AWL-18: CDCCL

- (b) Measure the resistance between the ground (pin 2) and the power circuit pin (pin 1) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: If the APU DC pump resistance is very high, the megohmmeter, COM-10724, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the megohmmeter value is more than 100 megohms.

- (c) Make a record of the resistance measured between pin 2 and pin 1.
(d) Set the function switch to the DISCHARGE position.

SUBTASK 28-25-00-760-011

- (3) Do an analysis of the test results:

28-AWL-18: CDCCL

- (a) Make sure the resistance measured between the ground (pin 2) and the power circuit pin on the pump connector (pin 1) is more than 100 megohm.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

- 1) If the insulation resistance test is satisfactory, do these steps:

- a) If the impeller was removed for the test, re-install the impeller (TASK 28-25-01-400-801).
- b) If the impeller was not removed for the test, connect the electrical connector for the APU DC fuel pump (impeller) and do an operational test (TASK 28-25-00-710-801).

- (b) If any resistance measured between pin 2 and pin 1 is 100 megohm or less, do these steps:

- 1) Replace the APU DC fuel pump (impeller).
 - a) APU DC Boost Pump Impeller Removal, TASK 28-25-01-000-801
 - b) APU DC Boost Pump Impeller Installation, TASK 28-25-01-400-801.
- 2) Do the continuity/resistance checks again for the replacement APU DC fuel pump.
 - a) Start with this procedure: APU DC Fuel Pump Continuity Check.

- (c) If any resistance measured between pin 2 and pin 1 is between 1 and 5 megohms, it is recommended that you replace the impeller.

- 1) APU DC Boost Pump Impeller Removal, TASK 28-25-01-000-801
- 2) APU DC Boost Pump Impeller Installation, TASK 28-25-01-400-801.

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LOM 412, 415, 423, 424, 450-452 (Continued)

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-00-860-020

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP

———— END OF TASK ————

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APU DC FUEL PUMP - REMOVAL/INSTALLATION

1. General

- A. An APU DC fuel pump is installed on the rear spar of the No. 1 tank. The APU DC fuel pump supplies the APU with fuel when AC power is not available to operate the left forward fuel pump and the other engine fuel pumps are off.
- B. This procedure contains four tasks. The first task removes the motor-impeller of the APU DC fuel pump. The second task installs the motor-impeller of the APU DC fuel pump. The third task removes the housing of the APU DC fuel pump. The fourth task installs the housing of the APU DC fuel pump.

TASK 28-25-01-000-801

2. APU DC Boost Pump Impeller Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove APU DC Boost Pump Impeller.

B. References

Reference	Title
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APU DC boost pump impeller	28-25-51-08-053	LOM 412, 415, 423, 424, 450-452

E. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Prepare for the Removal

SUBTASK 28-25-01-480-001



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-25-01-860-001

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP

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G. APU DC Boost Pump Impeller Removal

SUBTASK 28-25-01-020-001

- (1) Disconnect the electrical connector [1] from the APU DC boost pump impeller [2].

SUBTASK 28-25-01-480-002

- (2) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the APU DC boost pump impeller [2] to collect fuel.

SUBTASK 28-25-01-020-002

- (3) Remove the screws [10], washers [11], and the retainer assemblies [8] to disconnect the bonding jumper [9] and remove the APU DC boost pump impeller [2].

SUBTASK 28-25-01-020-003

- (4) Remove the APU DC boost pump impeller [2].

SUBTASK 28-25-01-860-004

- (5) If fuel continuously drains, then do these steps:

NOTE: There is a removal valve on the inlet line which closes when the boost pump impeller is removed. These steps are only necessary if the removal valve does not close correctly.

- (a) Install the APU DC boost pump impeller [2] again.
- (b) Defuel the No. 1 fuel tank or transfer the fuel out of the No. 1 fuel tank (TASK 28-26-00-650-801).
- (c) Remove the APU DC boost pump impeller [2] again.

SUBTASK 28-25-01-020-013

- (6) Discard the O-ring [12].

SUBTASK 28-25-01-080-001

- (7) Remove the 5-gallon (19-liter) fuel resistant container, STD-1054.

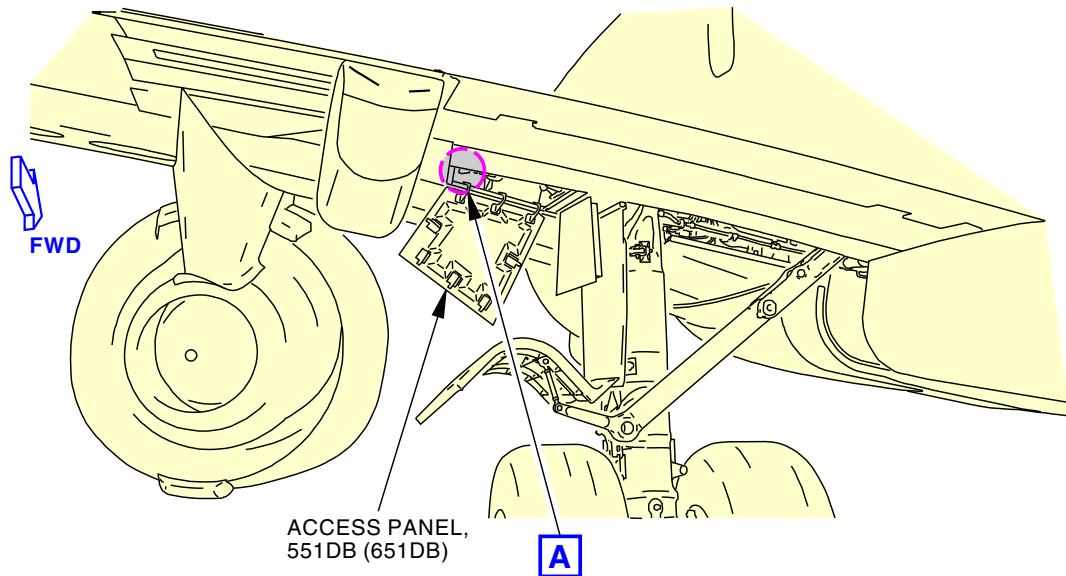
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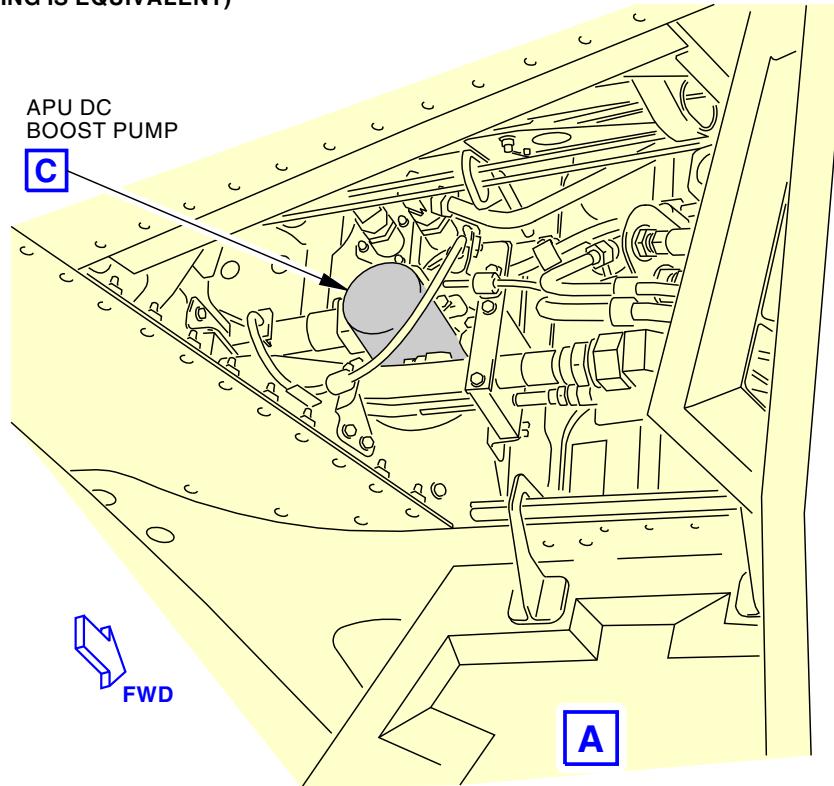
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LEFT WING
(RIGHT WING IS EQUIVALENT)



G48608 S0006572130_V3

APU DC Boost Pump Installation
Figure 401/28-25-01-990-801 (Sheet 1 of 4)

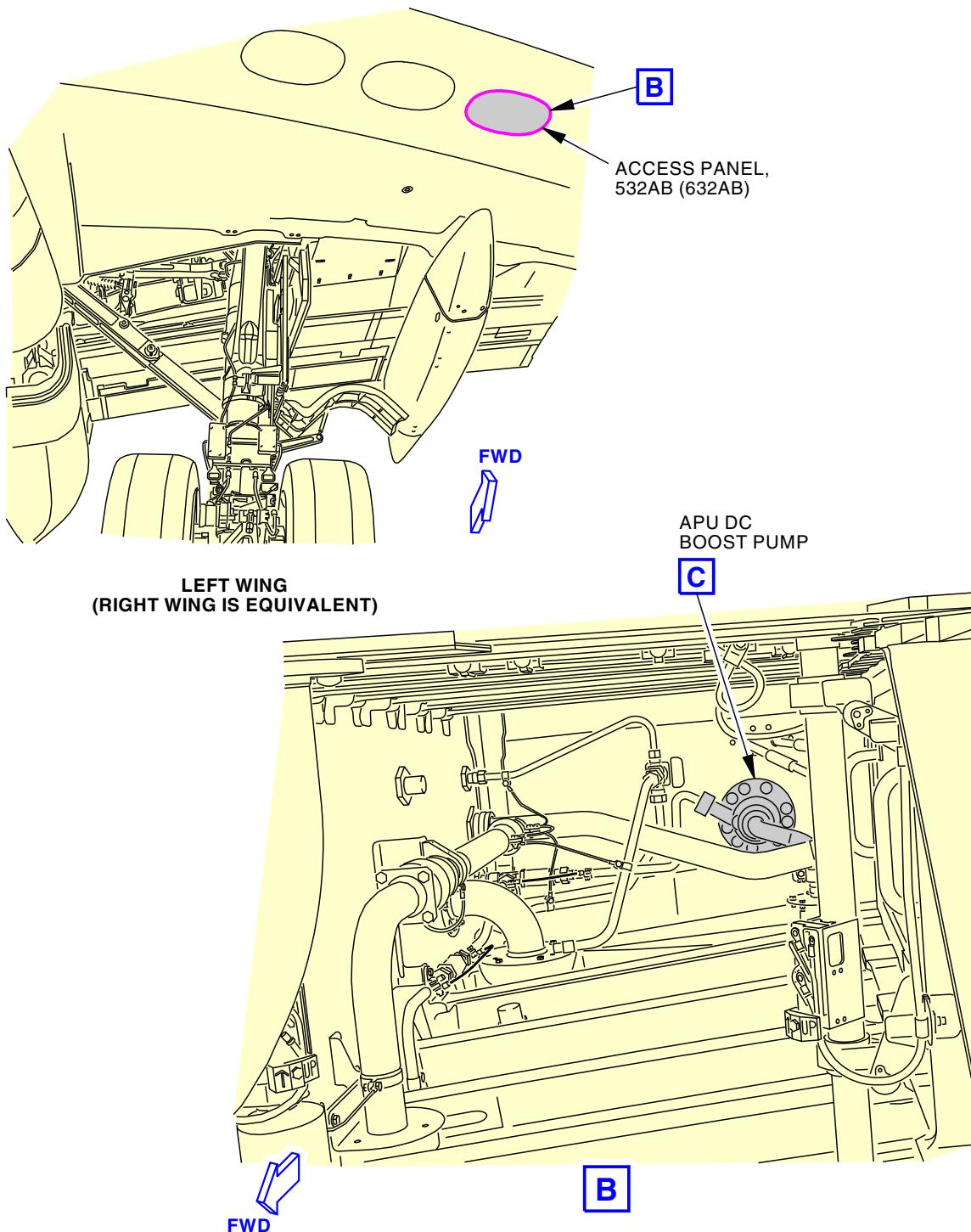
EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 403
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G48623 S0006572131_V2

APU DC Boost Pump Installation
Figure 401/28-25-01-990-801 (Sheet 2 of 4)

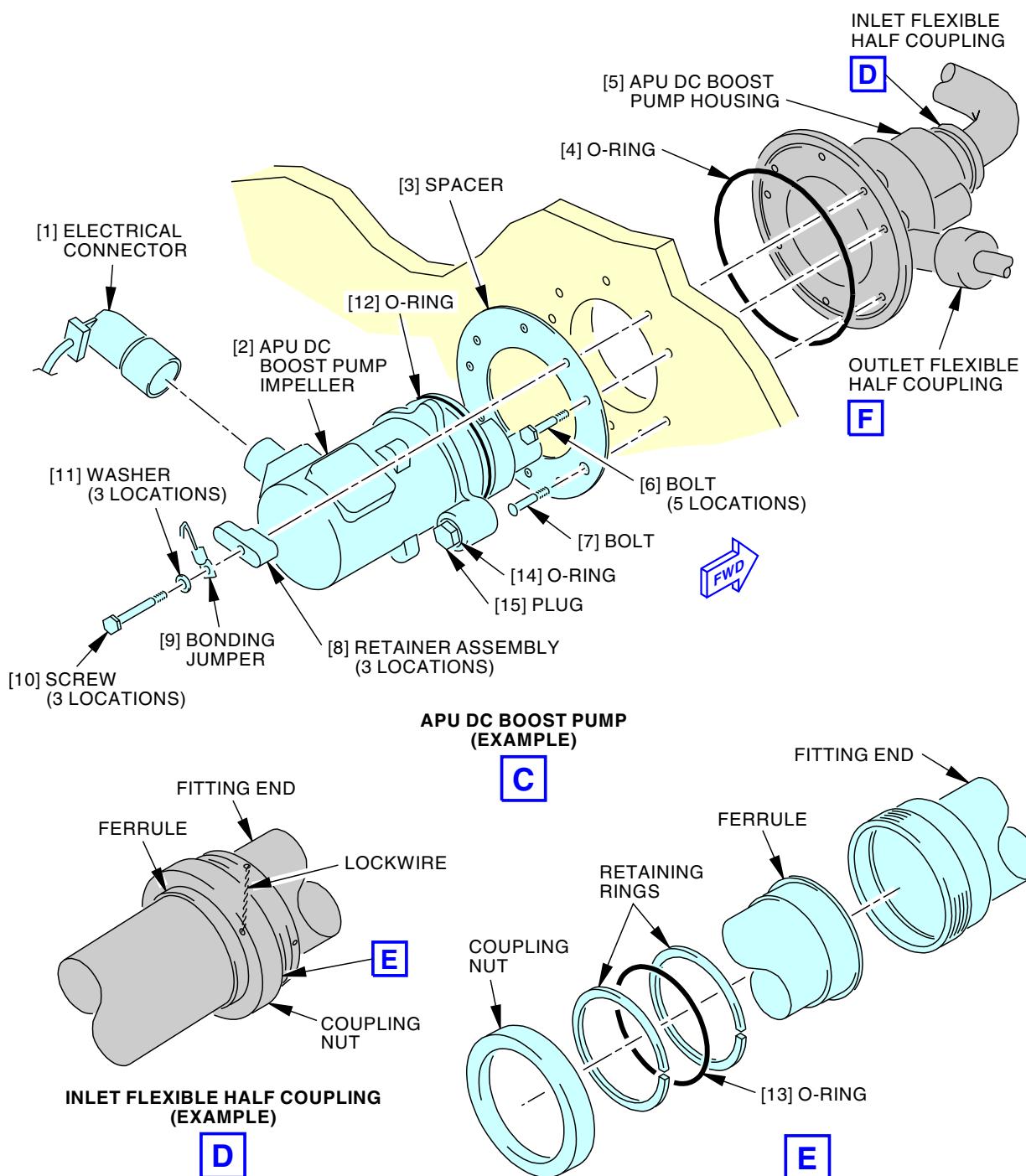
EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G48651 S0006572132_V4

APU DC Boost Pump Installation
Figure 401/28-25-01-990-801 (Sheet 3 of 4)

 EFFECTIVITY
 LOM 412, 415, 423, 424, 450-452

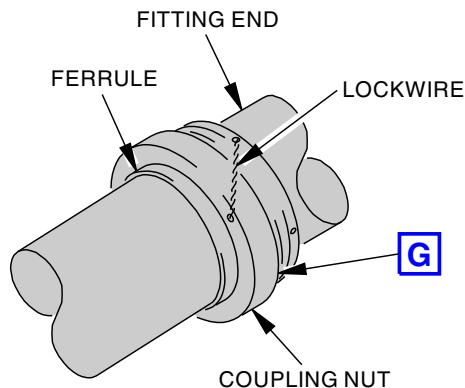
28-25-01

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

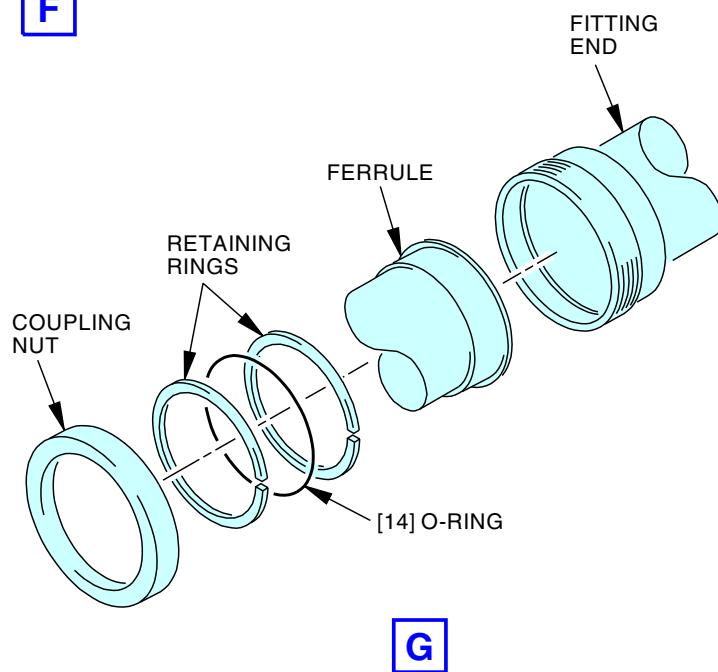


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AIRCRAFT MAINTENANCE MANUAL



OUTLET FLEXIBLE HALF COUPLING
(EXAMPLE)

F



2131005 S0000460745_V2

APU DC Boost Pump Installation
Figure 401/28-25-01-990-801 (Sheet 4 of 4)

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01

D633A101-LOM

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TASK 28-25-01-400-801

3. APU DC Boost Pump Impeller Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the APU DC Boost Pump Impeller.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-25-00-710-801	Operational Test - APU Fuel Feed System (P/B 501)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APU DC boost pump impeller	28-25-51-08-053	LOM 412, 415, 423, 424, 450-452
12	O-ring	28-25-51-08-090	LOM 412, 415, 423, 424, 450-452

F. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01



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G. APU DC Boost Pump Impeller Installation

SUBTASK 28-25-01-420-001

- (1) Apply a thin layer of grease, D00504 to the new O-ring [12].
 - (a) Install the new O-ring [12] on the APU DC boost pump impeller [2].

SUBTASK 28-25-01-420-002

- (2) Align and install the APU DC boost pump impeller [2] in the housing of the APU DC fuel pump on the rear spar of the No. 1 tank.

SUBTASK 28-25-01-420-013

► 28-AWL-14: CDCCL

- (3) if the APU DC boost pump impeller [2] is removed and reinstalled or replaced, the following design features must be verified:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

► 28-AWL-14: CDCCL

- (a) Install a fay sealed fay surface bond between the retainer assembly [8] (retaining clip) of the APU DC boost pump impeller [2] and the bonding jumper [9] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

► 28-AWL-14: CDCCL

- (b) Make sure a fillet sealed fay surface bond is applied between the bonding jumper [9] and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

SUBTASK 28-25-01-420-014

- (4) Do these steps to attach the bonding jumper [9] to the APU DC boost pump impeller [2]:
 - (a) Install the screw [10] and washer [11] to attach the bonding jumper [9] and retainer assembly [8] to the APU DC boost pump impeller [2].

SUBTASK 28-25-01-420-004

- (5) Install the remaining screws [10], washers [11], and retainer assemblies [8] to attach the APU DC boost pump impeller [2].

SUBTASK 28-25-01-420-012

- (6) If the protective cap is installed on the boost pump, then do these steps:
 - (a) Remove the protective cap.
 - (b) Install the O-ring [14].
 - (c) Install the Plug [15].
 - 1) Tighten the plug to 110 in-lb (12 N·m).

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01



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SUBTASK 28-25-01-390-003

28-AWL-14: CDCCL

- (7) Make sure a fillet seal is applied to bonding jumper [9] terminal at the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

SUBTASK 28-25-01-220-001

28-AWL-14: CDCCL

- (8) Measure the electrical bonding resistance between the APU DC boost pump impeller [2] and the airplane structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-14: CDCCL

- (b) Make sure that the bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-14.

SUBTASK 28-25-01-220-002

- (9) Measure the bonding resistance between the retainer assemblies [8] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

- (a) Make sure that the bonding resistance is 0.002 ohm (2 milliohms) or less.

SUBTASK 28-25-01-420-005

- (10) Connect the electrical connector [1] to the APU DC boost pump impeller [2].

H. APU DC Boost Pump Impeller Installation Test

SUBTASK 28-25-01-860-002

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP

SUBTASK 28-25-01-860-003

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-25-01-710-001

- (3) To do a test of the APU DC pump, do this task: Operational Test - APU Fuel Feed System, TASK 28-25-00-710-801.

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01



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I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-01-080-002



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

———— END OF TASK ————

TASK 28-25-01-000-802

4. APU DC Fuel Pump (Housing) Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the APU DC Fuel Pump (Housing).

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01



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Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	APU DC boost pump housing	28-25-51-09-210	LOM 412, 415, 423, 424, 450-452

E. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216

G. Prepare for the Removal

SUBTASK 28-25-01-020-004

- (1) Do this task: APU DC Boost Pump Impeller Removal, TASK 28-25-01-000-801.

SUBTASK 28-25-01-650-001

- (2) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

SUBTASK 28-25-01-650-002



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) For the No. 1 tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

EFFECTIVITY	
LOM 412, 415, 423, 424, 450-452	

28-25-01



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SUBTASK 28-25-01-010-001

- (4) Remove this access panel from the No. 1 tank:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216
(TASK 28-11-11-000-801).

H. APU DC Fuel Pump (Housing) Removal

SUBTASK 28-25-01-010-002

- (1) Go into the No. 1 tank.

SUBTASK 28-25-01-020-005

- (2) Disconnect the flexible half coupling that attaches the inlet line to the APU DC boost pump housing [5] (TASK 28-22-15-000-801).

SUBTASK 28-25-01-020-006

- (3) Remove the O-ring [13] from the flexible half coupling.
(a) Discard the O-ring [13].

SUBTASK 28-25-01-020-007

- (4) Disconnect the flexible half coupling from the APU fuel discharge line (TASK 28-22-15-000-801).
(a) Remove the O-ring [14] from the flexible half coupling.

SUBTASK 28-25-01-020-008

- (5) Remove sealant at the bonding jumper [9] connection on the rear spar, out of the fuel tank.
(a) Use sealant removal tool, COM-2481, or equivalent.

SUBTASK 28-25-01-020-009

- (6) Remove sealant around the APU DC boost pump housing [5] at the rear spar, in the fuel tank.
(a) Use sealant removal tool, COM-2481, or equivalent.

SUBTASK 28-25-01-020-010

- (7) Have one person, in the fuel tank, hold the APU DC boost pump housing [5] of the APU DC fuel pump.

SUBTASK 28-25-01-020-011

- (8) From out of the fuel tank, remove the bolts [6] and bolts [7] that attach the APU DC boost pump housing [5] to the rear spar.

SUBTASK 28-25-01-020-012

- (9) Remove the APU DC boost pump housing [5] from the fuel tank.
(a) Discard the O-ring [4].

———— END OF TASK ————

TASK 28-25-01-400-802

5. APU DC Fuel Pump (Housing) Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the APU DC Fuel Pump (Housing).
(2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
(a) sealant, A50153, and sealant, A50110 are acceptable sealants.

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

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B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-93-910-801	Final Cleaning Prior to Fuel Tank Sealing (Series 93) (P/B 201)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-25-04-400-801	APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
B01013	Solvent - Final Cleaning Prior To Fuel Tank Sealing (AMM 20-30-93) - Series 93	
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	O-ring	28-25-51-09-280	LOM 412, 415, 423, 424, 450-452
5	APU DC boost pump housing	28-25-51-09-210	LOM 412, 415, 423, 424, 450-452
14	O-ring	28-25-51-08-049	LOM 412, 415, 423, 424, 450-452

F. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

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G. Access Panels

Number	Name/Location
532AB	Main Tank Access Door - Wing Station 216

H. APU DC Fuel Pump (Housing) Installation

SUBTASK 28-25-01-940-002



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-25-01-100-001

- (2) Clean the surfaces that touch at the bonding jumper [9] connection on the rear spar with Series 93 solvent, B01013 (TASK 20-30-93-910-801), out of the fuel tank.

SUBTASK 28-25-01-010-003

- (3) Go into the No. 1 tank.

SUBTASK 28-25-01-100-002

- (4) Clean the surfaces that touch between the rear spar and the APU DC boost pump housing [5] with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

SUBTASK 28-25-01-420-006

- (5) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [4].
 - (a) Install the O-ring [4] onto the APU DC boost pump housing [5].

SUBTASK 28-25-01-420-007

- (6) Put the pump APU DC boost pump housing [5], with O-ring [4], in its position on the rear spar.

SUBTASK 28-25-01-420-008

- (7) Align the APU DC boost pump housing [5] with the discharge line and the inlet line.

SUBTASK 28-25-01-420-009

- (8) Have a person, out of the fuel tank, install the bolts [6] and bolts [7] through the rear spar to attach the APU DC boost pump housing [5].

SUBTASK 28-25-01-420-010

- (9) Have the person in the fuel tank do these steps to connect the fuel lines (TASK 28-22-15-400-801):

- (a) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [13].
- (b) Install the O-ring [13] and connect the flexible half coupling between the inlet line and the APU DC boost pump housing [5] (TASK 28-25-04-400-801).
- (c) Install MS20995C32 lockwire, G01048, to the flexible half coupling (TASK 20-10-44-400-801).
- (d) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [14].
- (e) Install the O-ring [14] and connect the flexible half coupling between the discharge line and the APU DC boost pump housing [5].
- (f) Install MS20995C32 lockwire, G01048, to the flexible half coupling (TASK 20-10-44-400-801).

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

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SUBTASK 28-25-01-760-001

- (10) Measure the bonding resistance between the APU DC boost pump housing [5] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.
 - (a) Make sure that the resistance is not more than 0.005 ohm.

SUBTASK 28-25-01-390-001

- (11) Apply sealant as follows:
 - (a) Apply a fillet seal of sealant, A00767, between the APU DC boost pump housing [5] and the rear spar, in the fuel tank (TASK 28-11-00-300-803).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-01-410-001

- (1) Install this access panel for the No. 1 tank:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216
(TASK 28-11-11-400-801).

SUBTASK 28-25-01-420-011

- (2) Do this task: APU DC Boost Pump Impeller Installation, TASK 28-25-01-400-801.

SUBTASK 28-25-01-650-003

- (3) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.
 - (a) Make sure that there is no fuel leakage at the actuator installation on the rear spar.

———— END OF TASK ————

EFFECTIVITY
LOM 412, 415, 423, 424, 450-452

28-25-01



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APU FUEL SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) The removal of the actuator assembly for the APU shutoff valve.
 - (2) The installation of the actuator assembly for the APU shutoff valve.
 - (3) The operational test of the APU shutoff valve.
 - (4) The removal of the valve body assembly for the APU
 - (5) The installation of the valve body assembly for the APU.
- B. The APU shutoff valve is installed on the left wing rear spar in the wheel well. It has these primary assemblies:
 - (1) The actuator assembly
 - (2) The valve body assembly.
 - (3) The mounting adapter
- C. The APU shutoff valve actuator, V43, is also referred to as the APU fuel shutoff valve.
- D. The actuator assembly is attached with bolts to a mounting adapter. You can replace it without the replacement of the valve body assembly. These procedures are necessary to replace the valve body assembly:
 - (1) Remove the actuator assembly.
 - (2) Remove the mounting adapter.
 - (3) Defuel the center fuel tank.

TASK 28-25-02-000-801

2. APU Shutoff Valve Actuator Assembly Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Auxiliary Power Unit (APU) Shutoff Valve Actuator Assembly.

B. References

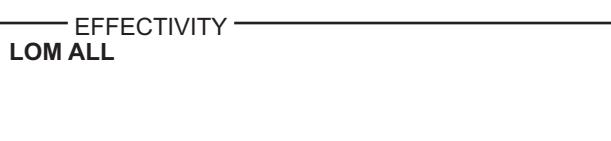
Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APU fuel shutoff valve actuator	28-25-51-07-045	LOM ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left



28-25-02



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E. Prepare for the Removal

SUBTASK 28-25-02-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-02-210-001



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

F. APU Shutoff Valve Actuator Assembly Removal

SUBTASK 28-25-02-020-001

- (1) Disconnect the electrical connector [1] from the APU fuel shutoff valve actuator [2] (Figure 401).

SUBTASK 28-25-02-020-002

- (2) Disconnect the bonding jumper [10] from the APU fuel shutoff valve actuator [2].
(a) Loosen the screw [7], washers [8], and nut [9] to disconnect the bonding jumper [10].

SUBTASK 28-25-02-020-003



HOLD THE ACTUATOR ASSEMBLY UP TO KEEP ITS WEIGHT OFF THE SHAFT. ITS WEIGHT CAN CAUSE DAMAGE TO THE SHAFT.

- (3) Hold the APU fuel shutoff valve actuator [2] up and remove the mounting screws [3].

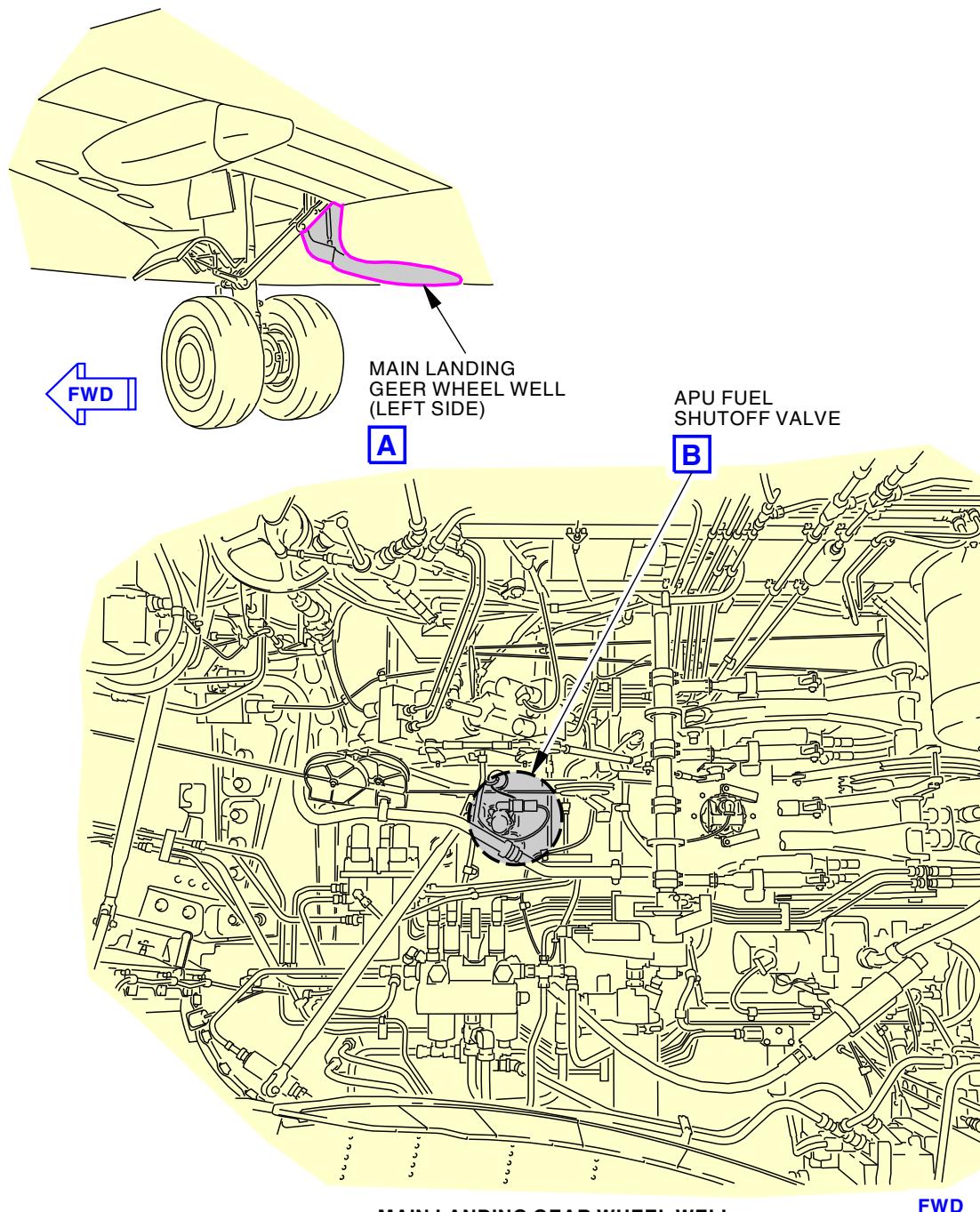
SUBTASK 28-25-02-020-004

- (4) Remove the APU fuel shutoff valve actuator [2].
(a) Carefully move the APU fuel shutoff valve actuator [2] away from the mounting adaptor [5] until the output shaft is out of the mating part.
(b) Lift the APU fuel shutoff valve actuator [2] out of the airplane.

———— END OF TASK ————

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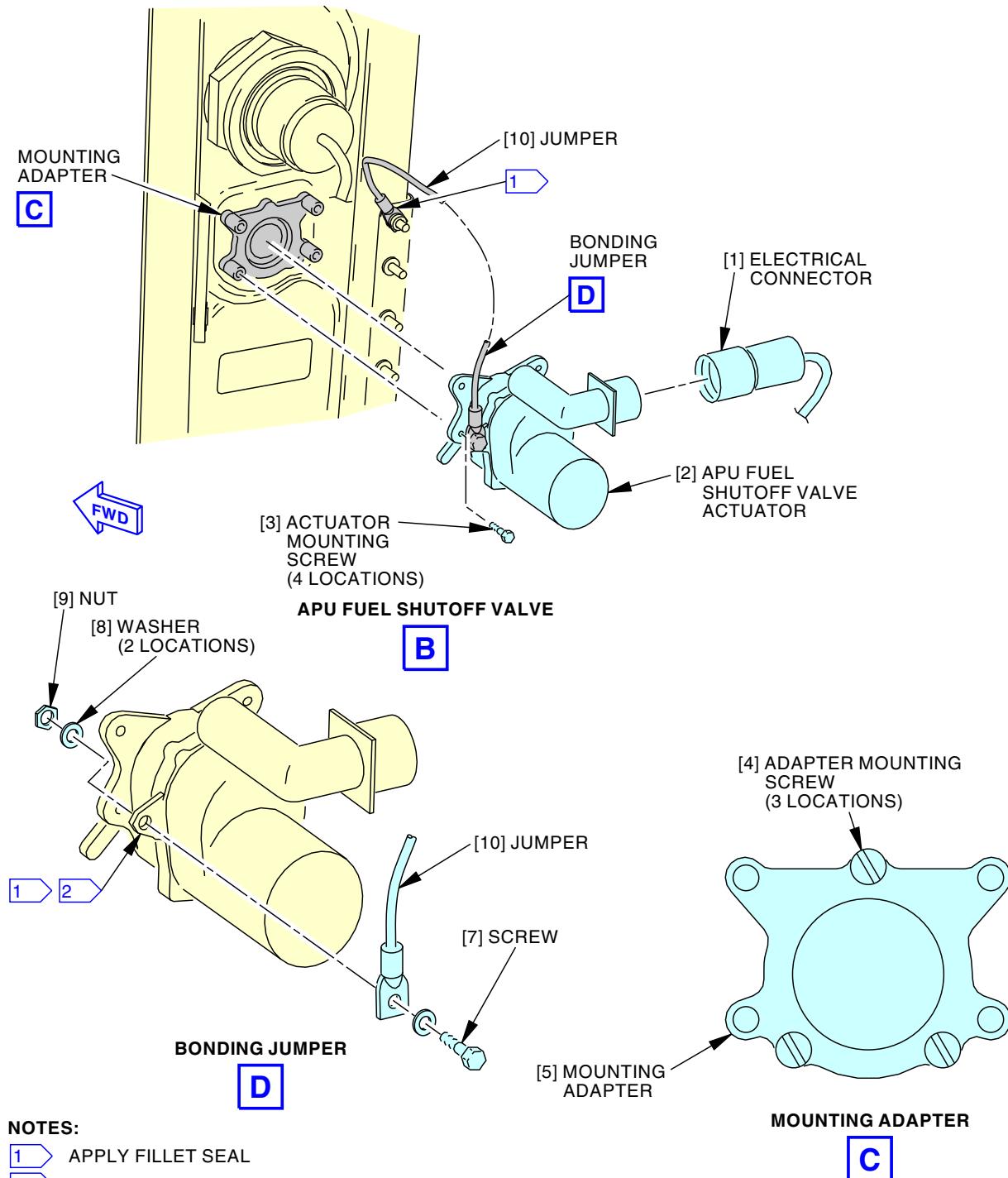


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APU Fuel Shutoff Valve Actuator Installation
Figure 401/28-25-02-990-803 (Sheet 1 of 2)EFFECTIVITY
LOM ALL**28-25-02**

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APU Fuel Shutoff Valve Actuator Installation

Figure 401/28-25-02-990-803 (Sheet 2 of 2)

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TASK 28-25-02-400-801

3. APU Shutoff Valve Actuator Assembly Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Auxiliary Power Unit (APU) Shutoff Valve Actuator Assembly.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
D00016	Grease - Aircraft, General Purpose, Wide Temperature Range	MIL-PRF-81322
G01505	Lockwire - Safety And Lock	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APU fuel shutoff valve actuator	28-25-51-07-045	LOM ALL

F. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

G. APU Shutoff Valve Actuator Assembly Installation

SUBTASK 28-25-02-940-001

- (1) Apply a thin layer of the grease, D00016, to the keyway of the output shaft.

SUBTASK 28-25-02-420-001



HOLD THE ACTUATOR ASSEMBLY UP TO KEEP ITS WEIGHT OFF THE SHAFT. ITS WEIGHT CAN CAUSE DAMAGE TO THE SHAFT.

- (2) Put the output shaft into the input shaft.

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- (a) Turn the output shaft until the keyway is aligned with the key in the input shaft.
- (b) Carefully move the output shaft into the input shaft until the actuator mounting lugs touch the mounting adapter.

SUBTASK 28-25-02-420-002

- (3) If the mounting holes on the APU fuel shutoff valve actuator [2] are not aligned with the mating holes, carefully turn the assembly to align the holes.

SUBTASK 28-25-02-420-003

- (4) Install mounting screws [3] on the APU fuel shutoff valve actuator [2] (Figure 401).
 - (a) Tighten the mounting screws [3] to a torque of 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m).
 - (b) Install lockwire, G01505, on each of the mounting screws [3] (TASK 20-10-44-400-801).

SUBTASK 28-25-02-420-004

- (5) Connect the bonding jumper [10] to the APU fuel shutoff valve actuator [2].
 - (a) Attach the bonding jumper [10] with the screw [7], washers [8], and nut [9].

SUBTASK 28-25-02-280-001

- (6) Measure the electrical bonding resistance between the APU fuel shutoff valve actuator [2] (at the jumper bonding lug) and the spar (SWPM 20-20-00, SWPM 20-20-10).
 - (a) Use an intrinsically safe approved bonding meter, COM-1550.
 - (b) Make sure that the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-25-02-760-001

- (7) Apply fillet sealant to bonding jumper, per Category 6 Bonding Jumper Installation (SWPM 20-20-10).

SUBTASK 28-25-02-420-005

- (8) Connect the electrical connector [1] to the APU fuel shutoff valve actuator [2].

H. APU Shutoff Valve Actuator Assembly Installation Test

SUBTASK 28-25-02-860-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-02-710-001

- (2) Do this task: APU Shutoff Valve Operational Test, TASK 28-25-02-710-801.

———— END OF TASK ————

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TASK 28-25-02-710-801

4. **APU Shutoff Valve Operational Test**

(Figure 401)

A. **Location Zones**

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
212	Flight Compartment - Right

B. **Access Panels**

Number	Name/Location
131AB	Center Tank Access

C. **Procedure**

SUBTASK 28-25-02-860-003

- (1) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	4	C00169	SW HOT BAT BUS

LOM 412, 415, 423, 424, 450-452

SUBTASK 28-25-02-860-006

- (2) Make sure that this circuit breaker is open and has safety tag:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	12	C00633	AUX POWER UNIT FUEL BOOST PUMP

NOTE: This will prevent the APU DC Boost Pump from dry running.

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SUBTASK 28-25-02-010-002



WARNING

DO NOT USE AIRPLANE ELECTRICAL POWER WHEN FUEL TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL VAPOR AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Make sure that this access panel is closed:

Number Name/Location

131AB Center Tank Access

SUBTASK 28-25-02-860-004

- (4) Set the battery switch to the ON position.

SUBTASK 28-25-02-710-002

- (5) Set the APU master switch to the ON position.

- (a) Make sure that the valve override handle moves to the OPEN position.

SUBTASK 28-25-02-710-003

- (6) Set the APU master switch to the OFF position.

- (a) Make sure that the valve override handle moves to the CLOSED position after a maximum of ten (10) seconds.

SUBTASK 28-25-02-860-005

- (7) Set the battery switch to the OFF position.

———— END OF TASK ————

TASK 28-25-02-000-802

5. APU Shutoff Valve Body Assembly Removal

(Figure 401, Figure 402)

A. General

- (1) This task gives instructions to remove the APU Shutoff Valve Body Assembly.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-00-730-802	Crossfeed Valve - Functional Test (P/B 501)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

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E. Access Panels

<u>Number</u>	<u>Name/Location</u>
131AB	Center Tank Access

F. Prepare for the Removal

SUBTASK 28-25-02-650-002

- (1) Defuel the center fuel tank and the No.1 tank or transfer fuel out of them (Fuel Tank Defueling, TASK 28-26-00-650-801 or Tank to Tank Fuel Transfer, TASK 28-26-00-650-802).

SUBTASK 28-25-02-650-005

- (2) If there is fuel in the No. 2 tank, make sure that the crossfeed valve is closed and has no leakage (Crossfeed Valve - Functional Test, TASK 28-22-00-730-802).
 - (a) As an alternative, you can remove fuel from the No.2 tank (Fuel Tank Defueling, TASK 28-26-00-650-801).

SUBTASK 28-25-02-650-003



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (3) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-25-02-010-001

- (4) Get access to the wing rear spar.
 - (a) Remove this access panel to get access to the center fuel tank:
(TASK 28-11-31-000-801)

Number Name/Location

131AB Center Tank Access

G. APU Shutoff Valve Body Assembly Removal

SUBTASK 28-25-02-020-005

- (1) Do this task: APU Shutoff Valve Actuator Assembly Removal, TASK 28-25-02-000-801.

SUBTASK 28-25-02-020-006

- (2) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the valve and disconnect the APU fuel line from the unions [21].

SUBTASK 28-25-02-020-007



CAUTION

DO NOT LET THE VALVE BODY ASSEMBLY FALL. YOU WILL CAUSE DAMAGE TO THE FUEL TANK SEAL.

- (3) Do these steps to remove the valve body [23]:

- (a) Remove sealant around the valve body and the spar web.
 - (b) Two persons are necessary to do this task.
 - 1) One person must be out of the tank.
 - 2) One person must be in the tank.
 - (c) The person in the tank must hold the valve body assembly up.

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- (d) The person out of the tank must remove the adapter mounting screws [4] that attach the mounting adaptor [5] to the valve body [23].
- (e) Move the valve body [23] away from the rear spar.
- (f) Remove the mounting adaptor [5].
- (g) Remove the unions [21] from the valve body [23].
- (h) Remove and discard the O-rings [22].
- (i) Remove and discard the O-ring [24] from the valve body [23].

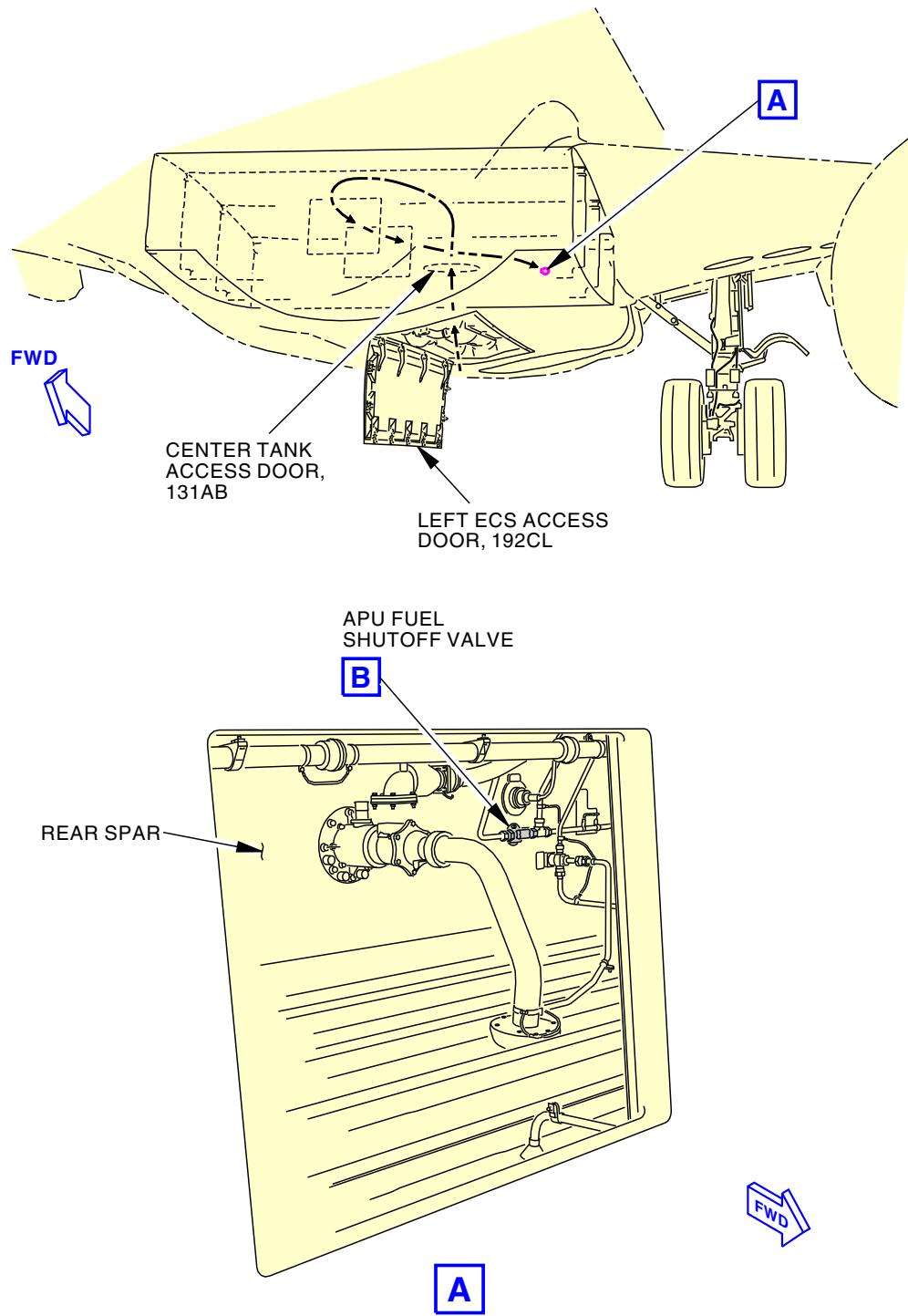
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APU Fuel Shutoff Valve Body Installation
Figure 402/28-25-02-990-804 (Sheet 1 of 2)

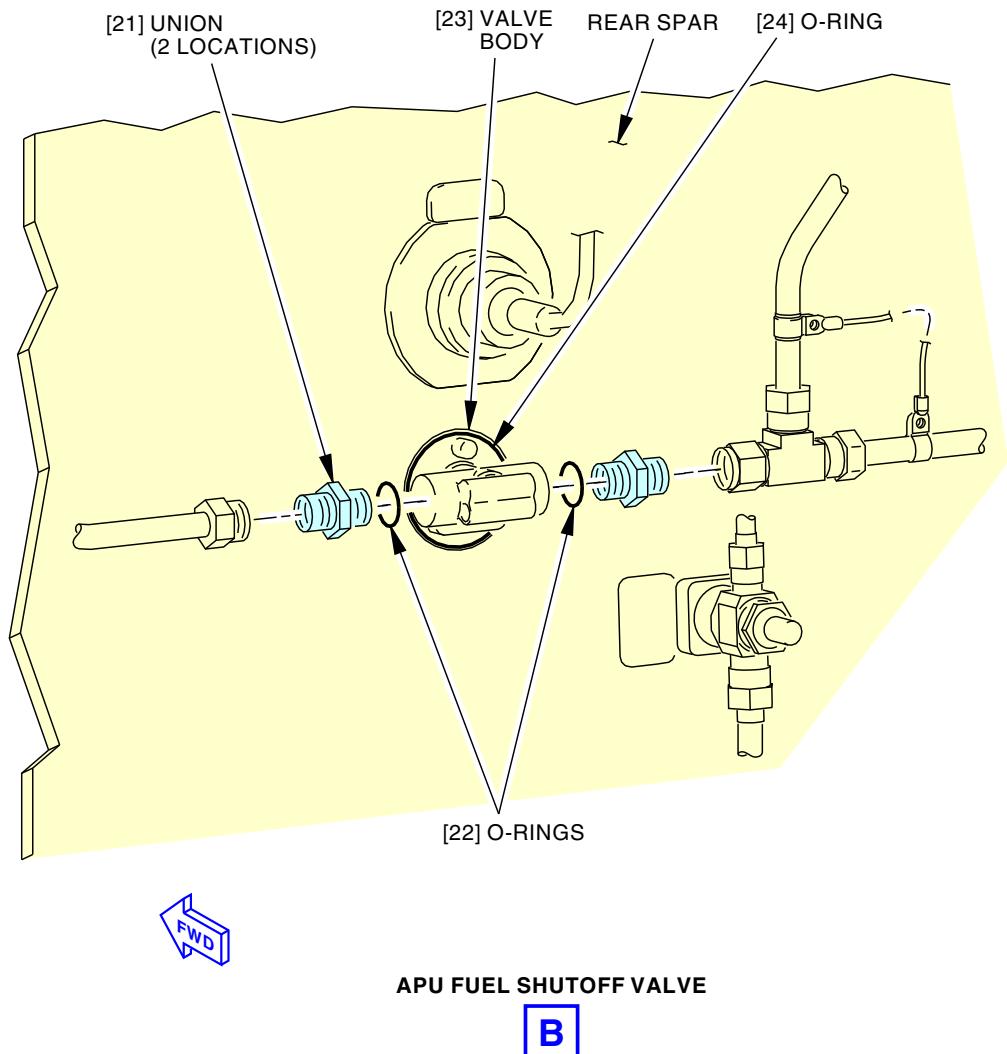
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APU Fuel Shutoff Valve Body Installation
Figure 402/28-25-02-990-804 (Sheet 2 of 2)

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TASK 28-25-02-400-802

6. APU Shutoff Valve Body Assembly Installation

(Figure 401, Figure 402)

A. General

- (1) This task gives instructions to install the APU Shutoff Valve Body Assembly.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995
G50136	Compound - Corrosion Inhibiting, Non-drying Paste	BMS3-38
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	O-rings	28-25-51-06-072	LOM ALL
23	Body	28-25-51-07-130	LOM ALL
24	O-ring	28-25-51-07-135	LOM ALL

F. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left



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G. Access Panels

Number	Name/Location
131AB	Center Tank Access

H. APU Shutoff Valve Body Assembly Installation

SUBTASK 28-25-02-160-001

- (1) Clean these surfaces with solvent, B00083, and dry them with a clean lintfree cloth.
 - (a) The O-ring groove of the valve body [23]
 - (b) The machined surfaces of the valve body [23]
 - (c) The machined surfaces of the rear spar.

SUBTASK 28-25-02-420-006

- (2) Install new O-rings [22], lightly lubricated with fuel, on the unions [21].

SUBTASK 28-25-02-420-012

- (3) Install the unions [21] in the valve body [23].

SUBTASK 28-25-02-420-007

- (4) Install the new O-ring [24], lightly lubricated with grease, D00504, in the groove on the valve body [23].

SUBTASK 28-25-02-420-008



CAUTION
DO NOT LOOSEN THE O-RING OR PUSH IT OUT OF ITS CORRECT SHAPE.
IF YOU CAUSE DAMAGE TO THE O-RING, A FUEL LEAK CAN EASILY
OCCUR.

- (5) Do these steps to install the valve body [23]:

- (a) One person out of the tank and one person in the tank are necessary for this task.
- (b) The person in the tank must put the valve body [23] in the correct position between the fittings on the APU line.
- (c) The person out of the tank must hold the valve body [23] up until it is installed.
- (d) From outside the tank, do these steps to install the mounting adaptor [5]:



WARNING

USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

- 1) Install the three mounting screws [4], wet with Cor-Ban 27L Compound, G50237 (preferred) or corrosion inhibiting material, G50136 (optional), that attach the mounting adaptor [5] to the valve body [23].
- 2) Tighten the three screws [4] to a torque of 25 in-lb (3 N·m).
- 3) Measure the electrical bonding resistance between the valve body [23] and the spar web with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00 and SWPM 20-20-10).
 - a) Make sure that the bonding resistance is 0.0005 ohm (0.5 milliohm) or less.
- 4) Install lockwire, G01505, on each of the screws [4] (TASK 20-10-44-400-801).

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SUBTASK 28-25-02-420-009

- (6) Attach the APU fuel line to the valve body [23].

SUBTASK 28-25-02-390-001

- (7) Apply a fillet seal with sealant, A50337, between the valve body [23] and the spar web, in the fuel tank.

SUBTASK 28-25-02-410-003

- (8) Install this access panel:

(TASK 28-11-31-400-801)

Number Name/Location

131AB Center Tank Access

SUBTASK 28-25-02-420-010

- (9) Do this task: APU Shutoff Valve Actuator Assembly Installation, TASK 28-25-02-400-801.

I. APU Shutoff Valve Body Assembly Installation Test

SUBTASK 28-25-02-710-004

- (1) If you did not do it as part of the actuator installation procedure, do this task: APU Shutoff Valve Operational Test, TASK 28-25-02-710-801.

———— END OF TASK ————

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APU FUEL SHUTOFF VALVE - INSPECTION/CHECK

1. **General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance between the structure and the APU fuel shutoff valve actuator.

SFAR 88

TASK 28-25-02-200-801

2. **APU Fueling Shutoff Valve Actuator - Bonding Resistance Check**

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. **Tools/Equipment**

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. **Location Zones**

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

D. **Prepare for the Procedure**

SUBTASK 28-25-02-865-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 28-25-02-490-001



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

E. Electrical Bonding Measurement

SUBTASK 28-25-02-765-001

- (1) Measure the electrical bonding resistance between the APU fueling shutoff valve actuator (at the jumper bonding lug) and the spar (SWPM 20-20-00 and SWPM 20-20-10).
- Use an intrinsically safe approved bonding meter, COM-1550.
 - Make sure the resistance is 0.010 ohm (10 milliohms) or less.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-02-865-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-02-090-001



WARNING

OBEY THE PROCEDURE FOR THE REMOVAL OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) If the downlock pins are no longer necessary, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

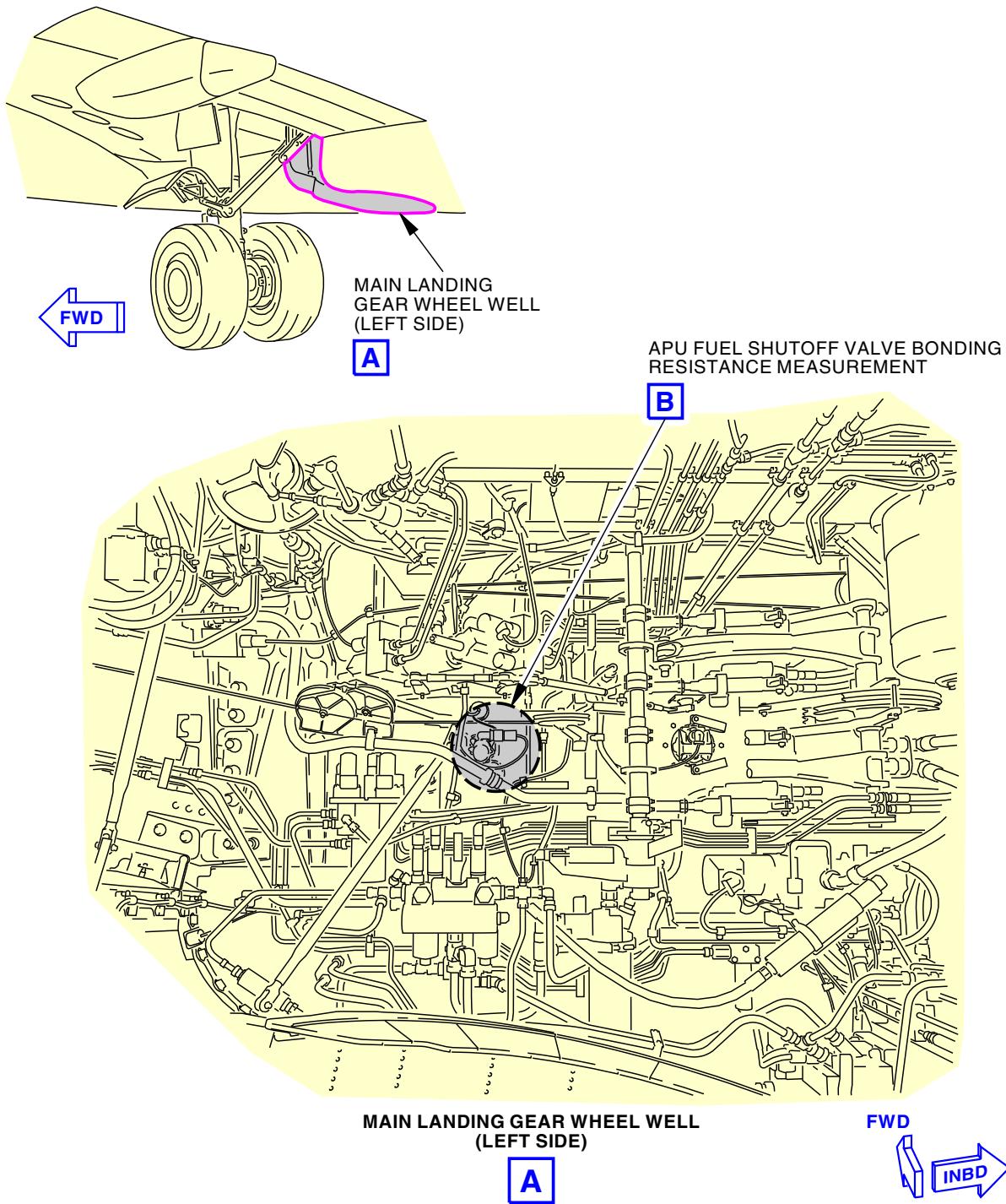
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APU Fueling Shutoff Valve Actuator - Bonding Resistance Check
Figure 601/28-25-02-990-805 (Sheet 1 of 2)

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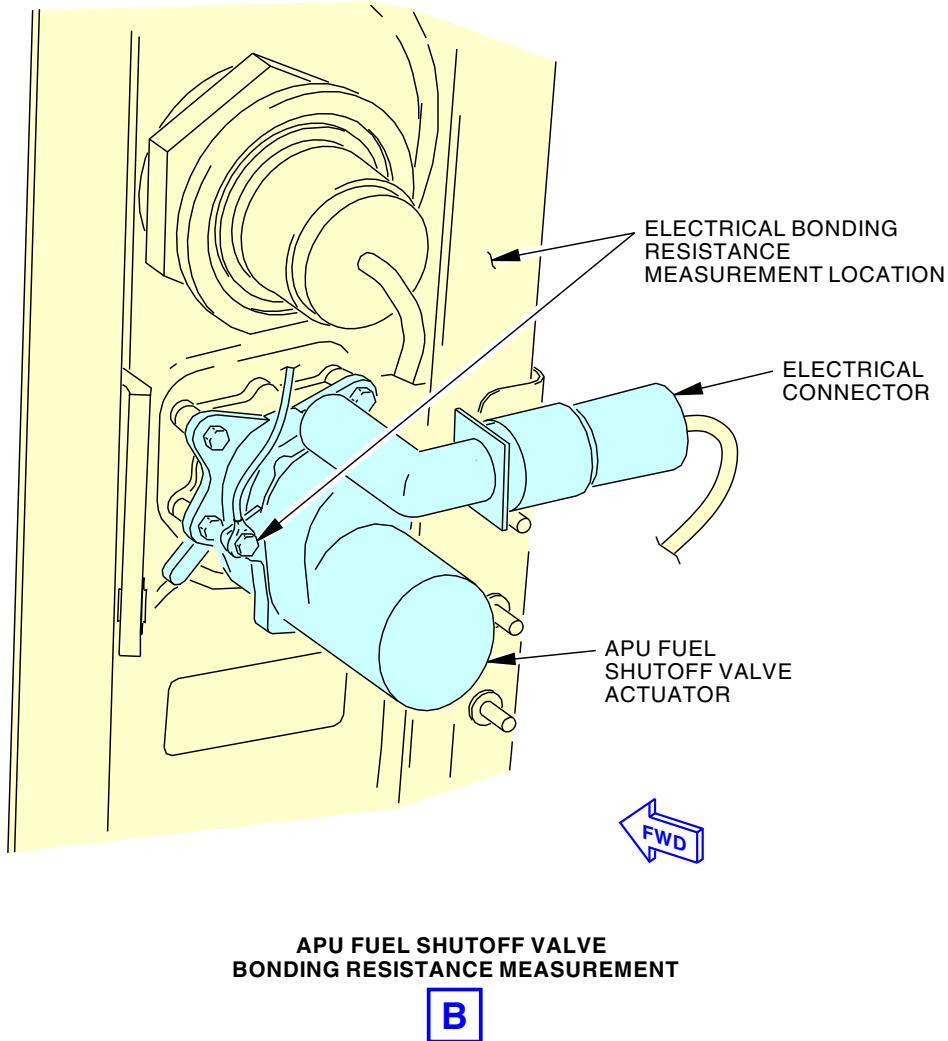
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APU Fueling Shutoff Valve Actuator - Bonding Resistance Check
Figure 601/28-25-02-990-805 (Sheet 2 of 2)

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APU FUEL FEED LINE - REMOVAL/INSTALLATION

1. General

- A. The APU fuel feed line supplies fuel to the APU from the engine fuel feed line. If the engine fuel feed pumps are not operating, the APU fuel line supplies fuel to the APU from the suction inlet in the No. 1 tank.
- B. The APU fuel feed line is referred to as the APU fuel line in this procedure.
- C. To make the removal and the installation easier, the APU fuel line is divided into two parts.
 - (1) The part that goes from the bypass inlet in the No. 1 tank to the top skin of the wing center section.
NOTE: This part of the APU fuel line has the connection with the engine fuel feed line.
 - (2) The part that goes from the top skin of the wing center section to the APU firewall.
NOTE: This part of the APU fuel line has a shroud.

TASK 28-25-04-000-801

2. APU Fuel Line (No. 1 Tank and Center Tank) Removal

Figure 401

A. General

- (1) This task gives instructions to remove the APU Fuel Line (No. 1 Tank and Center Tank).

B. References

Reference	Title
20-10-51-000-801	Flareless Tubing Assembly Removal (P/B 401)
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

E. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192

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(Continued)

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

F. Prepare for the Removal

SUBTASK 28-25-04-860-001

- (1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 28-25-04-860-002



WARNING DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (2) Defuel the No. 1 tank and the center tank (TASK 28-26-00-650-801) or transfer all the fuel from the No. 1 tank and the center tank (TASK 28-26-00-650-802).

SUBTASK 28-25-04-860-003

- (3) Do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 28-25-04-010-001

- (4) To get access to the APU fuel line, remove these access panels:

Number Name/Location

131AB Center Tank Access

531AB Center Tank Access Door - Wing Station 168

531BB Center Tank Access Door - Wing Station 192

532AB Main Tank Access Door - Wing Station 216

(TASK 28-11-11-000-801), (TASK 28-11-31-000-801).

SUBTASK 28-25-04-860-004



WARNING DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (5) For the No. 1 tank and the center tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802

G. APU Fuel Line (No. 1 Tank and Center Tank) Removal

SUBTASK 28-25-04-020-001

- (1) Remove the flareless fittings (TASK 20-10-51-000-801) and the rigid couplings (TASK 28-22-15-000-801) to disconnect the APU fuel feed line [1].

(a) Drain all fuel remaining in the APU fuel feed line [1] into a 5-gallon (19-liter) fuel resistant container, STD-1054.

(b) Discard all of the O-rings.

SUBTASK 28-25-04-020-002

- (2) Remove the bonding jumpers and clamps from the APU fuel feed line [1] (TASK 28-22-15-000-801).

SUBTASK 28-25-04-020-003

- (3) Disconnect the clamps where it is necessary (TASK 28-22-15-000-801).

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SUBTASK 28-25-04-020-004

- (4) Remove the APU fuel feed line [1] from the tank.

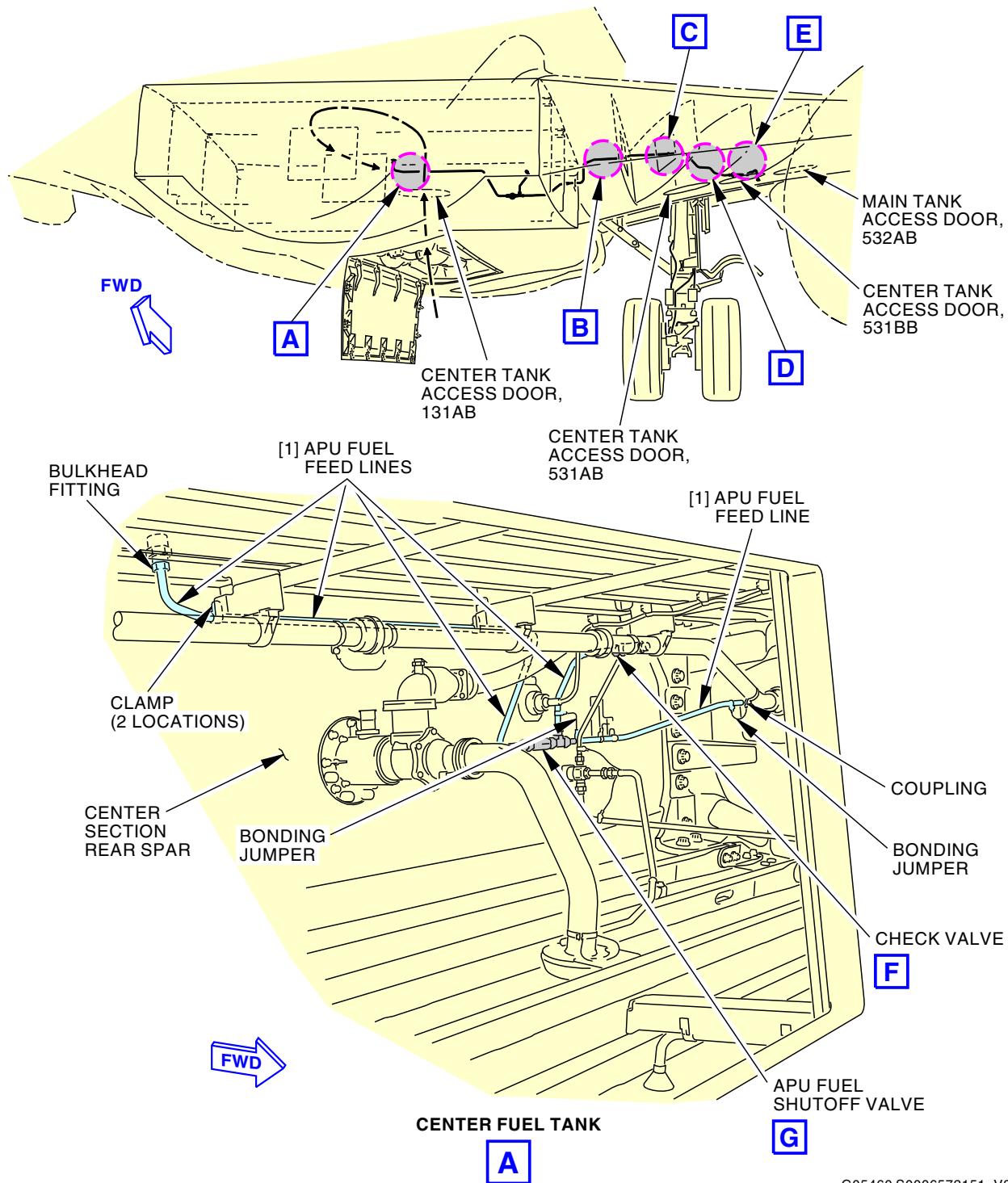
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— EFFECTIVITY —
LOM ALL

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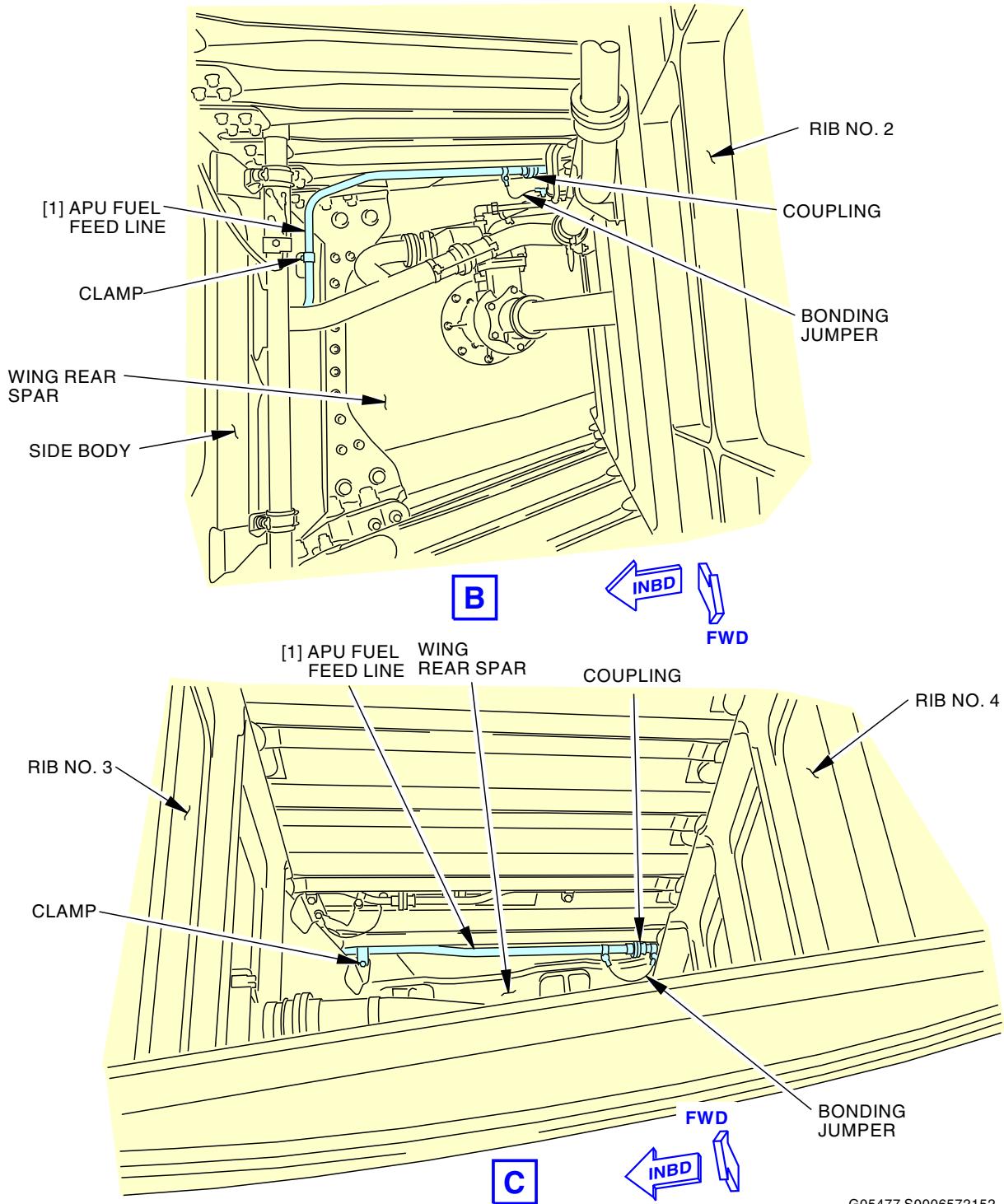


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APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 1 of 8)

EFFECTIVITY
LOM ALL

28-25-04



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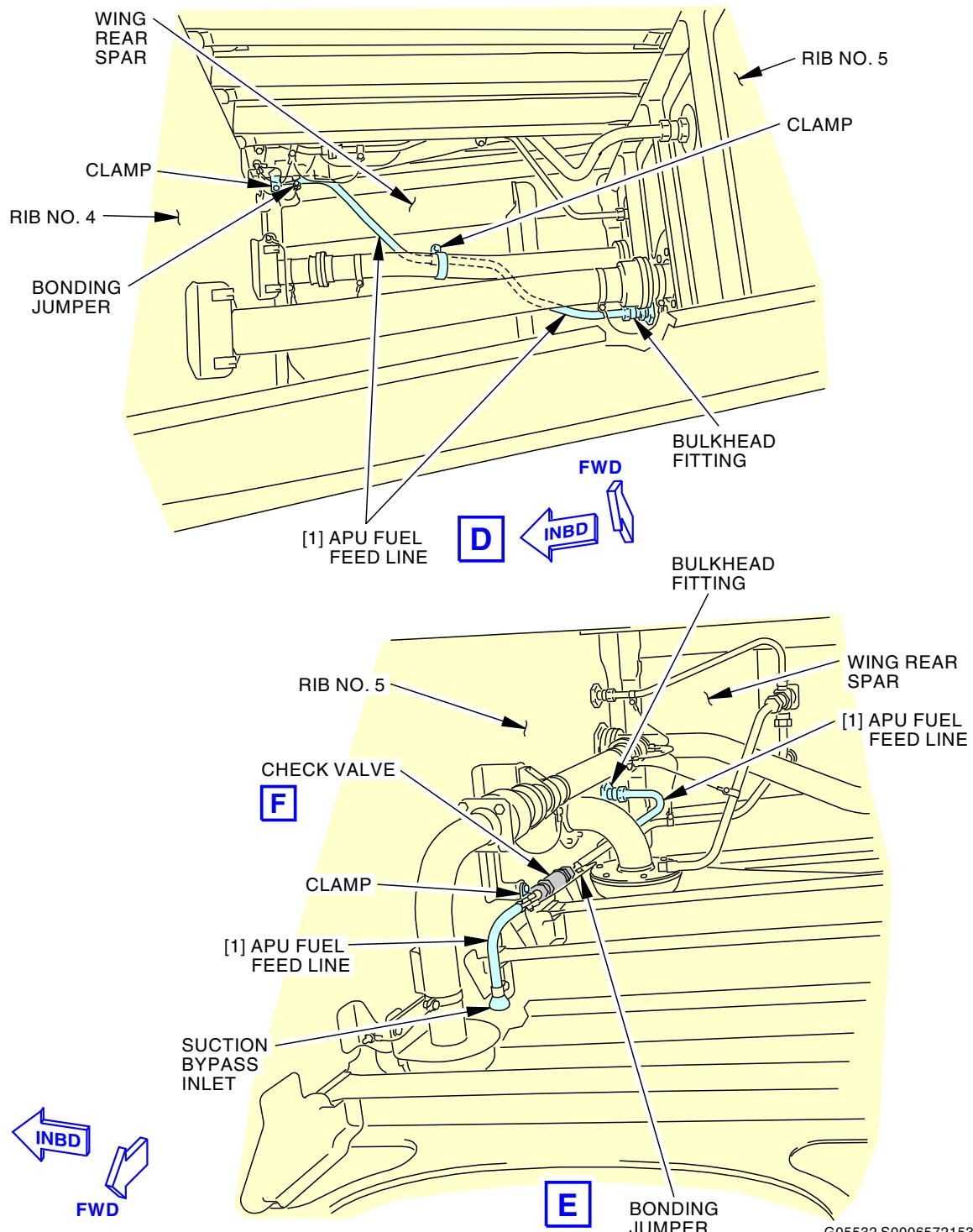
APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 2 of 8)

EFFECTIVITY
LOM ALL

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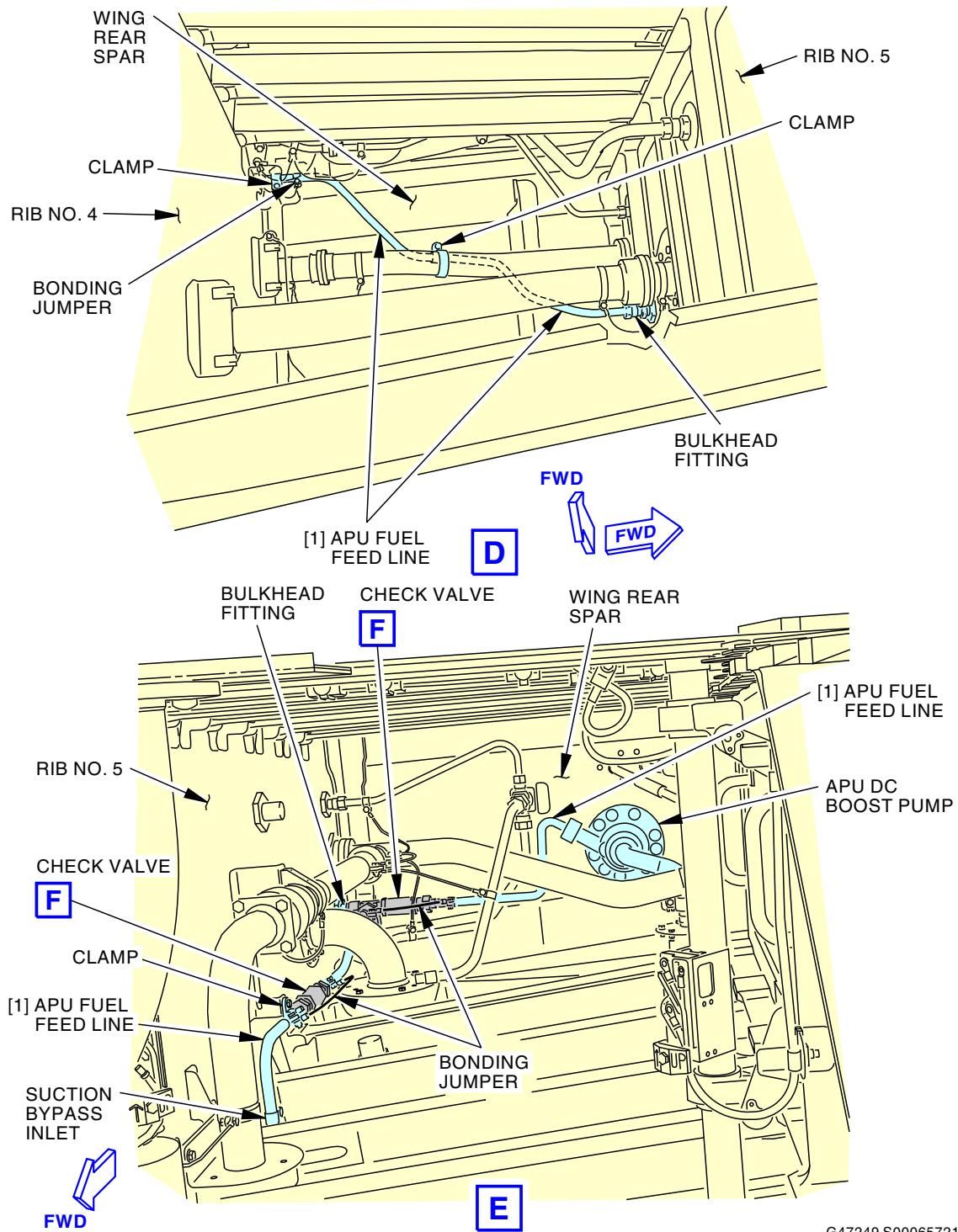
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 3 of 8)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 416, 420, 422, 425-434,
437-447, 453-999

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APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 4 of 8)

EFFECTIVITY
 LOM 412, 415, 423, 424, 450-452

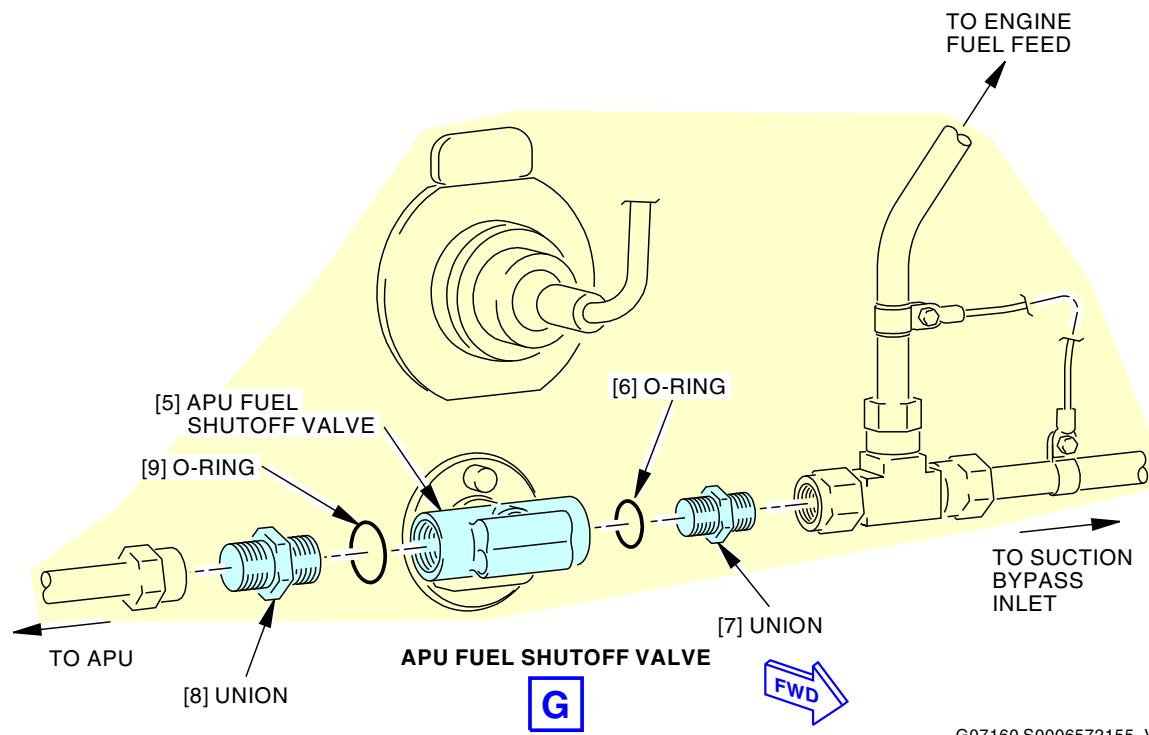
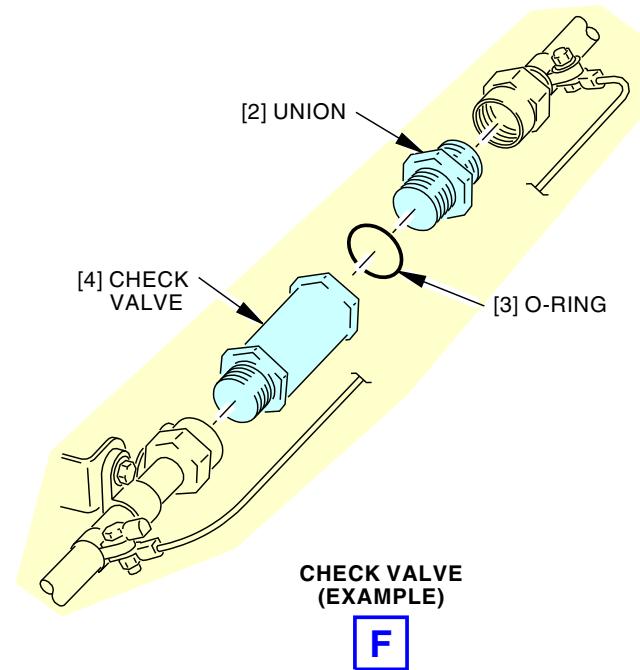
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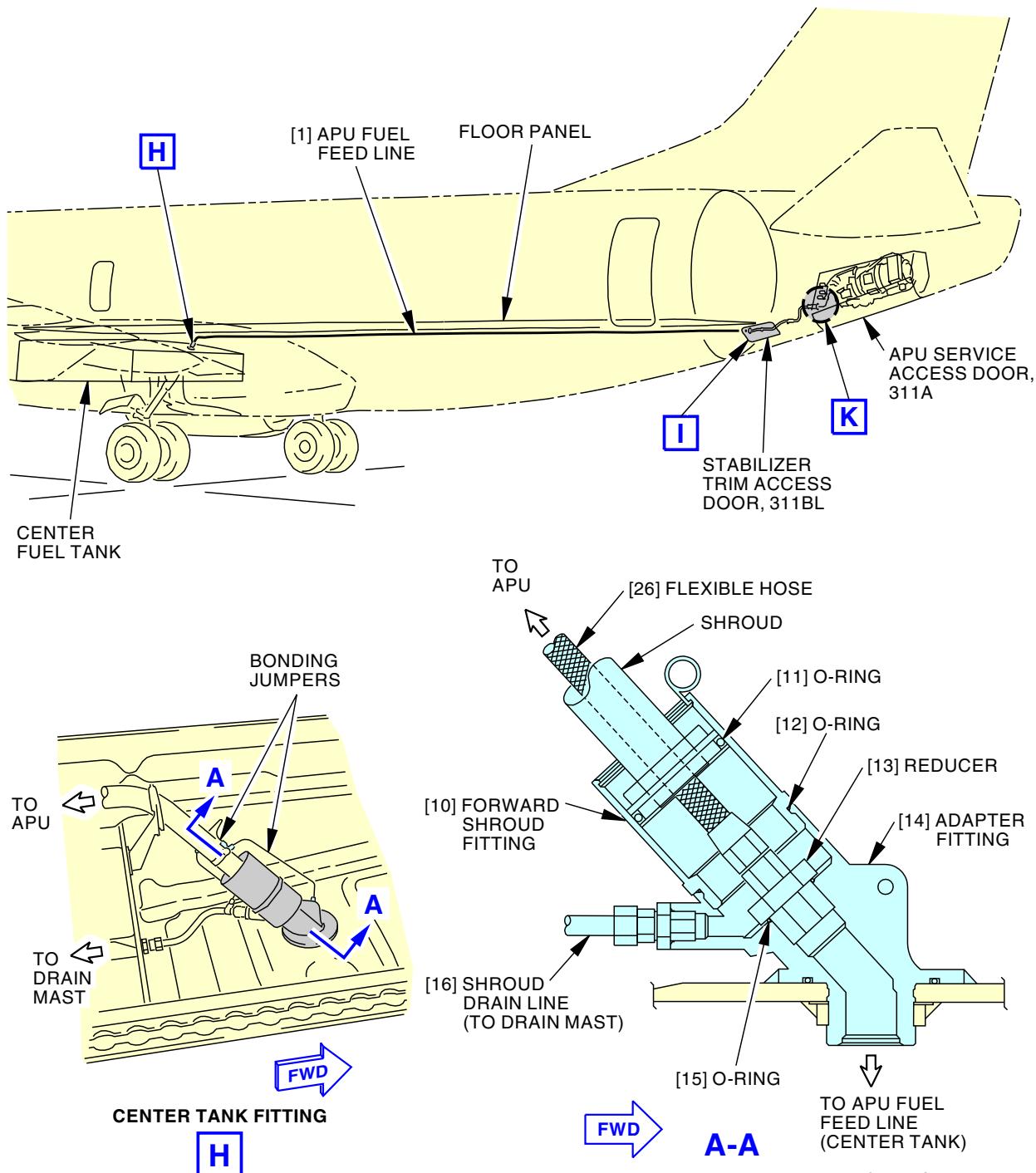
APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 5 of 8)

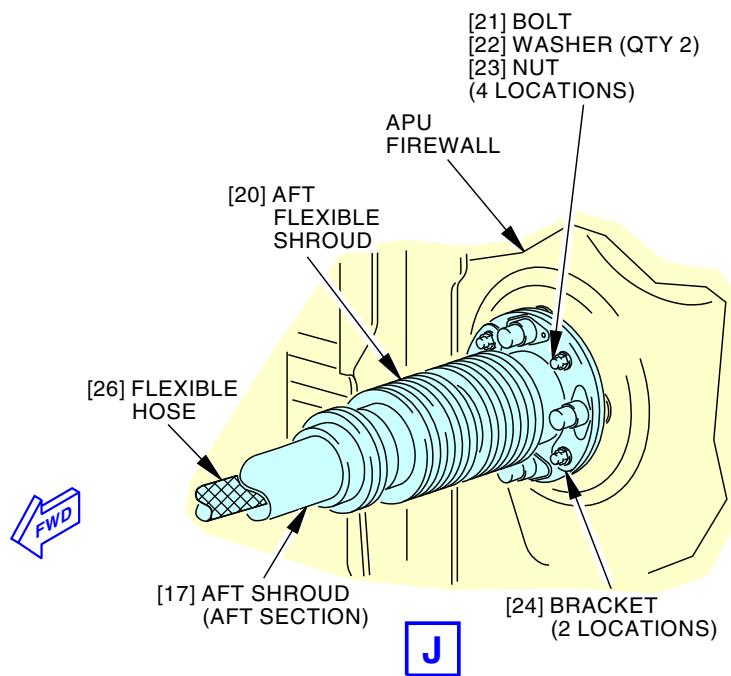
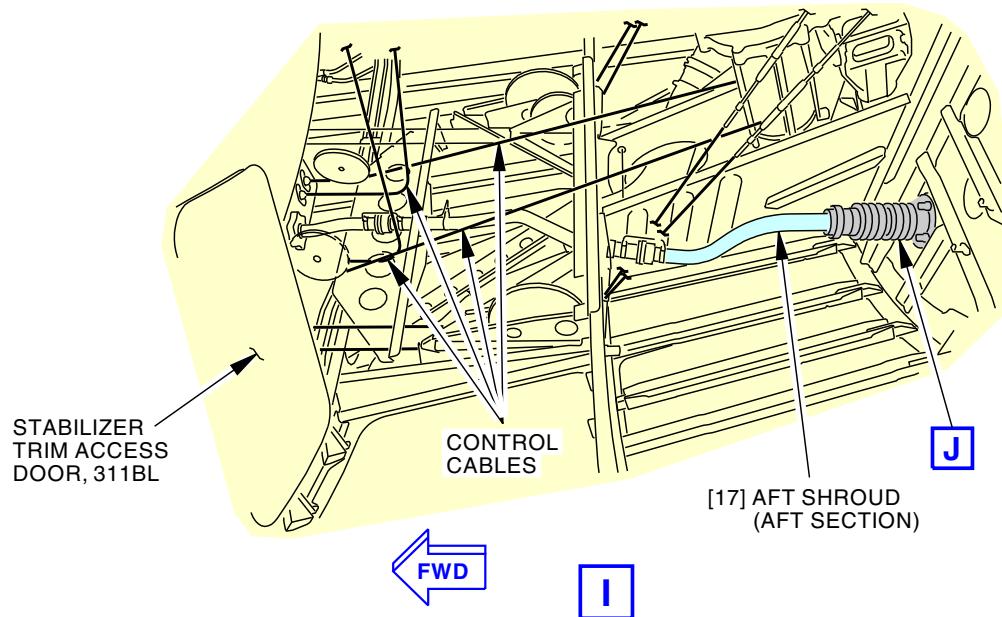
EFFECTIVITY
LOM ALL

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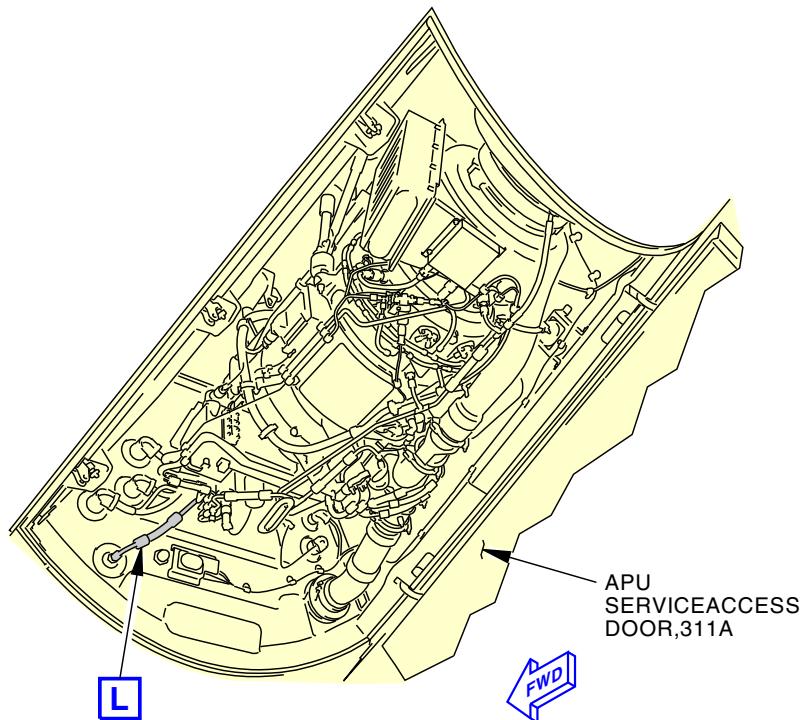
APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 7 of 8)

EFFECTIVITY
LOM ALL

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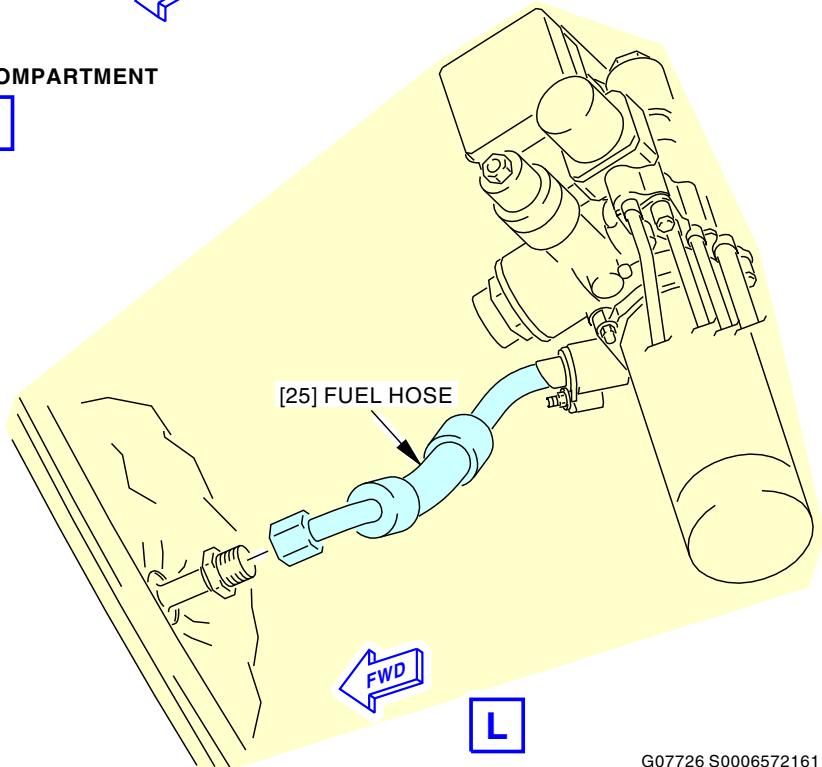


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APU SERVICE COMPARTMENT

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G07726 S0006572161_V2

APU Fuel Feed Line Installation
Figure 401/28-25-04-990-802 (Sheet 8 of 8)

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TASK 28-25-04-400-801

3. APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-51-400-804	Flareless Tubing Assembly Installation (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-22-15-700-801	Engine and APU Fuel Feed, Shroud, Fuel Vent Line and Couplings, and NEADS Lines (if installed) Dent Criteria - Inspection/Check (P/B 601)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01505	Lockwire - Safety And Lock	NASM20995

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

E. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
532AB	Main Tank Access Door - Wing Station 216



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F. APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation

SUBTASK 28-25-04-420-001

- (1) Loosely put the APU tubes in their correct position in the tank.

SUBTASK 28-25-04-420-002

- (2) Loosely connect the clamps that hold the APU fuel line to the structure or support brackets (TASK 28-22-15-400-801).

SUBTASK 28-25-04-640-001

- (3) Apply a thin layer of petrolatum grease, D00504, to the new O-rings.

SUBTASK 28-25-04-420-003

- (4) Install new O-rings in the couplings.

- (a) Inspect the couplings for wear and replace if necessary (TASK 28-22-15-700-801).

SUBTASK 28-25-04-420-004

- (5) Install the support brackets to the structure with bolts, washers, and nuts.

SUBTASK 28-25-04-420-005



CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

- (6) Install the flareless fittings (TASK 20-10-51-400-804) and rigid couplings (TASK 28-22-15-400-801) to connect the APU fuel line.

SUBTASK 28-25-04-410-001

- (7) Install lockwire, G01505, on the rigid couplings (TASK 20-10-44-400-801).

SUBTASK 28-25-04-420-006

- (8) Tighten the clamps on the APU fuel line (TASK 28-22-15-400-801).

SUBTASK 28-25-04-420-007

- (9) Install the bolts, washers and nuts to connect the bonding jumpers between APU fuel line and the support brackets (TASK 28-22-15-400-801).

SUBTASK 28-25-04-220-001

- (10) Measure the bonding resistance across the bonding jumpers (SWPM 20-20-00 and SWPM 20-20-10).

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

- (b) Make sure that the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-25-04-860-005

- (11) Remove all of the tools and equipment from the fuel tanks.

G. APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation Test

SUBTASK 28-25-04-790-001

- (1) Do this task: APU Fuel Line Leak Test (with Air), TASK 28-25-04-790-801.

H. Put Airplane Back to its Usual Condition

SUBTASK 28-25-04-410-002

- (1) Install these access panels: that you removed to get access to the APU fuel line:

Number Name/Location

131AB Center Tank Access

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<u>Number</u>	<u>Name/Location</u>
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
532AB	Main Tank Access Door - Wing Station 216

(TASK 28-11-11-400-801, TASK 28-11-31-400-801).

———— END OF TASK ————

TASK 28-25-04-000-802

4. APU Fuel Line (Center Wing Section to APU Firewall) Removal

A. General

- (1) This task gives instructions to remove the APU Fuel Line (Center Wing Section to APU Firewall).

B. References

<u>Reference</u>	<u>Title</u>
24-22-00-860-814	Remove External Power (P/B 201)
25-27-15-000-801	Carpet Removal (P/B 401)
53-21-00-000-801	Passenger Cabin Floor Panel - Removal (P/B 401)

C. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

<u>Zone</u>	<u>Area</u>
230	Subzone - Passenger Compartment - Body Station 360.00 to 663.75
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00

E. Access Panels

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

F. Prepare for the Removal

SUBTASK 28-25-04-010-002

- (1) Remove the aisle carpets at station 660 (immediately aft of the overwing emergency exit) (TASK 25-27-15-000-801).

SUBTASK 28-25-04-010-003

- (2) Remove the floor panel at Station 660 (immediately aft of the overwing emergency exit) (TASK 53-21-00-000-801) to get access to the interconnect fitting on the center tank.

SUBTASK 28-25-04-860-006

- (3) Do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 28-25-04-860-007

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

G. APU Fuel Line (Center Wing Section to APU Firewall) Removal

SUBTASK 28-25-04-020-005

- (1) Loosen the forward shroud fitting [10] from the adapter fitting [14] on the center tank (View H, Figure 401).

SUBTASK 28-25-04-020-006



WARNING

MAKE SURE YOU KEEP THE ELECTRICAL POWER OFF WHEN YOU DISCONNECT OR CONNECT THE FUEL, THE HYDRAULIC, AND THE ELECTRICAL LINES. IF YOU DO NOT, YOU CAN CAUSE INJURY TO PERSONNEL WITH THE ACCIDENTAL APPLICATION OF PRESSURIZED FLUIDS, ENERGIZING OF ELECTRICAL CIRCUITS, OR FIRE.



WARNING

YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO MAINTENANCE ON THE FUEL SYSTEM. IF YOU DO NOT GROUND AND BOND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

- (2) Do these steps to disconnect the flexible hose [26] from the center tank adapter fitting [14]:
 - (a) Loosen the forward shroud fitting [10] until it is against the reducing ferrule on the aft APU shroud.
 - (b) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the drain mast for the aft APU shroud.
 - (c) Loosen the reducer [13] on the flexible hose to disconnect the flexible hose from the center tank adapter fitting [14].
 - (d) Move the flexible hose from the adapter fitting [14].
 - (e) Remove the O-ring [12] from the shroud and discard it.
 - (f) Remove the O-ring [15] from the reducer [13] and discard it.

SUBTASK 28-25-04-010-004

- (3) Open this access door to get access to the APU aft shroud:

Number Name/Location

311BL Stabilizer Trim Access Door

SUBTASK 28-25-04-020-007

- (4) Disconnect the aft part of the aft APU shroud [17] from the aft flexible shroud [20] installed in the forward side of the APU firewall (View J, Figure 401)

SUBTASK 28-25-04-020-008

- (5) Move the aft flexible shroud [20] back to get access to disconnect the flexible hose [26] from the fitting (for the fuel hose [25]) on the forward side of the APU firewall.

SUBTASK 28-25-04-020-010

- (6) Remove the aft section of the aft APU shroud [17] (View I).

SUBTASK 28-25-04-020-011

- (7) Do these steps to remove the flexible hose [26] from the aft APU shroud:
 - (a) Hold the exposed part of the flexible hose [26] firmly.

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- (b) Pull the flexible hose [26] in the aft direction until it is completely removed from the shroud.

NOTE: This step removes the complete length of the flexible hose which you disconnected from the center tank fitting at the forward end. It may be necessary to twist and turn the flexible hose in the shroud to get it to move freely.

- (c) Move the flexible hose [26] through the opening for this access door:

Number Name/Location

311BL Stabilizer Trim Access Door

———— END OF TASK ————

TASK 28-25-04-400-803

5. APU Fuel Line (Center Wing Section to APU Firewall) Installation

A. General

- (1) This task gives instructions to install the APU Fuel Line (Center Wing Section to APU Firewall).

B. References

<u>Reference</u>	<u>Title</u>
20-10-17-400-801	O-Rings Installation (P/B 401)
20-50-11-910-801	Standard Torque Values (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
25-27-15-400-801	Carpet - Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-25-05-790-801	APU Fuel Line Shroud and Drain Line Leak Test (P/B 401)
53-21-00-400-801	Passenger Cabin Floor Panel - Installation (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
230	Subzone - Passenger Compartment - Body Station 360.00 to 663.75
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

E. APU Fuel Line (Center Wing Section to APU Firewall) Installation

SUBTASK 28-25-04-560-001

- (1) Put the flexible hose [26] through this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

SUBTASK 28-25-04-420-008

- (2) Put the forward end of the flexible hose [26] into the aft end of the aft APU shroud (Figure 401, View I).

SUBTASK 28-25-04-420-009

- (3) Continue to put the fuel line into the main shroud until the fuel line is against the adapter fitting [14] for the center tank (Figure 401, View H).

SUBTASK 28-25-04-020-012

- (4) Pull the forward shroud fitting [10] away from the adapter fitting [14].

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SUBTASK 28-25-04-420-010

- (5) Do these steps to connect the flexible hose (Figure 401, View H).
 - (a) Lubricate and install a new O-ring [12] (TASK 20-10-17-400-801).
 - (b) If the reducer [13] is not already installed in the flexible hose with a new O-ring [15], then do these steps:
 - 1) Lubricate and install a new O-ring [15] on the reducer [13] (TASK 20-10-17-400-801).
 - 2) Install the reducer [13] on the end of the flexible hose [26].
 - (c) Put the flexible hose [26] and the shroud into the forward shroud fitting [10].
 - (d) Connect the flexible hose to the adapter fitting [14] with the reducer [13].
- NOTE: Do not attach the forward shroud fitting until you complete the leak check for the fuel line.
- 1) Tighten the reducer in the adapter fitting to a standard torque (TASK 20-50-11-910-801).

SUBTASK 28-25-04-020-013

- (6) Do these steps to install the aft section of the APU aft shroud (Figure 401, View I).
 - (a) Put the aft section of the aft APU shroud [17] on the aft end of the flexible hose.
 - (b) Connect the aft section of the aft APU shroud to the adjacent section of the APU shroud (TASK 28-22-15-400-801).
 - (c) Push the aft flexible shroud [20] aft to get access to the fitting at the APU firewall for the flexible hose.
 - (d) Connect the aft end of the flexible flexible hose [26] to the fitting at the APU firewall (Figure 401).
- NOTE: Do not attach the aft APU shroud [17] to the aft flexible shroud [20] until you complete the leak check of the fuel line.
- 1) Tighten the fitting at the APU firewall to 280 ± 14 in-lb (32 ± 2 N·m).

SUBTASK 28-25-04-790-002

- (7) Do this task: APU Fuel Line Leak Test (with Air), TASK 28-25-04-790-801.

SUBTASK 28-25-04-420-012

- (8) Do these steps to connect the fuel line shroud to the center tank (Figure 401, View H).
 - (a) Engage and tighten the forward shroud fitting [10] on the center tank adapter fitting [14] to a torque of 630 in-lb (71 N·m) - 770 in-lb (87 N·m).

SUBTASK 28-25-04-420-013

- (9) Connect the coupling of the aft section of the APU shroud to the aft flexible shroud [20] (Figure 401, View J).

SUBTASK 28-25-04-790-003

- (10) Do this task: APU Fuel Line Shroud and Drain Line Leak Test, TASK 28-25-05-790-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-04-410-004

- (1) Install the floor panel at STA 660 (TASK 53-21-00-400-801).

SUBTASK 28-25-04-410-005

- (2) Install the aisle carpets (TASK 25-27-15-400-801).

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SUBTASK 28-25-04-860-015

- (3) Close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-04-860-009

- (4) Remove electrical power if it is not necessary for other tasks (TASK 24-22-00-860-814).

SUBTASK 28-25-04-410-006

- (5) Close this access panel:

Number Name/Location

311BL	Stabilizer Trim Access Door
-------	-----------------------------

———— END OF TASK ————

TASK 28-25-04-790-801

6. APU Fuel Line Leak Test (with Air)

A. General

- (1) This task does an air pressure test of the Auxiliary Power Unit (APU) fuel feed line from the APU to the bypass inlet in the No. 1 tank.

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1201	Gauge - Pressure, 0-75 PSIG (0-518 KPa)
STD-3940	Air Source - Regulated, Dry Filtered, 0-150 psig

C. Access Panels

Number Name/Location

315A	APU Cowl Door
------	---------------

D. APU Fuel Line Leak Test (with Air)

SUBTASK 28-25-04-860-010

- (1) Manually open the APU fuel shutoff valve with the override lever.

SUBTASK 28-25-04-010-011

- (2) To open the access panel, do these steps:

Number Name/Location

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

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- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 28-25-04-860-011

- (3) Disconnect the APU flex line in the APU compartment at the APU firewall (View L, Figure 401).

SUBTASK 28-25-04-860-012

- (4) Install a regulated air source, STD-3940, and pressure gauge, STD-1201, on the fitting at the APU firewall.

SUBTASK 28-25-04-790-004

- (5) Pressurize the APU fuel feed line to a maximum of 40 psig (276 kPa).

SUBTASK 28-25-04-790-005

- (6) Keep the pressure on the fuel line for minimum of 5 minutes.

SUBTASK 28-25-04-790-006

- (7) Make sure that the pressure on the fuel line does not decrease.

SUBTASK 28-25-04-790-007

- (8) If there is leakage look for indications of leakage and make the necessary repairs.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-04-780-001

- (1) Permit the pressure to decrease to zero.

SUBTASK 28-25-04-020-014

- (2) Remove the regulated air source, STD-3940, and pressure gauge, STD-1201, from the APU flex line.

SUBTASK 28-25-04-420-014

- (3) Connect the APU flex line to its fitting on the APU again (View L, Figure 401).

SUBTASK 28-25-04-840-001

- (4) Manually close the APU fuel shutoff valve with the override lever.

SUBTASK 28-25-04-410-009

- (5) To close the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Make sure that the APU cowl door insulation blanket and the oil cooler fire shield have sufficient clearance.
 - 1) Make sure that the installation of fire shield has not shifted.
 - 2) If it is necessary, hand form the insulation blanket to obtain a better clearance.

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(g) Close the APU Cowl Door, 315A.

(h) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— END OF TASK ————

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APU FUEL FEED LINE SHROUD - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the main shroud for the APU fuel-feed line
 - (2) An installation of the main shroud for the APU fuel-feed line
 - (3) A removal of the aft shroud for the APU fuel-feed line
 - (4) An installation of the aft shroud for the APU fuel-feed line
 - (a) The APU fuel-feed line shroud is referred to as the APU shroud.
 - (5) A removal of the aft flexible shroud for the APU fuel-feed line
 - (6) An installation of the aft flexible shroud for the APU fuel-feed line.
- B. The APU shroud has this routing:
 - (1) The forward end starts at the adapter fitting installed on the upper panel of the center tank (View A, Figure 401).
 - (2) The aft end of the shroud ends at the flexible shroud which is attached to the forward side of the APU firewall.
- C. To make the removal procedure easier, the APU shroud is divided into two parts. The part that goes from the top of the center tank to the forward side of the pressure bulkhead is referred to as the main shroud. The part that goes from the aft side of the pressure bulkhead to the flexible shroud is referred to as the aft shroud. The aft flexible shroud connects the fuel feed line to the APU firewall.

TASK 28-25-05-000-801

2. Main APU Fuel Feed Line Shroud Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Main APU Fuel Feed Line Shroud.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
25-27-15-000-801	Carpet Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-25-04-000-802	APU Fuel Line (Center Wing Section to APU Firewall) Removal (P/B 401)
53-21-00-000-801	Passenger Cabin Floor Panel - Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-6646	Container - Fuel Resistant

D. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
142	Aft Cargo Compartment - Right
241	Aft Passenger Compartment - Station 663.75 to Aft Pressure Bulkhead - Left



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E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Removal

SUBTASK 28-25-05-010-001

- (1) Get the access to the fitting and the parts that attach the main shroud.

NOTE: You can get access to the shroud clamps between Station 947 and Station 1016 by a different procedure. You can remove the access panels in the aft wall of the aft cargo compartment.

- (a) Remove the aisle carpets (TASK 25-27-15-000-801) between Station 616 and Station 1016.
- (b) Remove the floor panels (TASK 53-21-00-000-801) between Station 616 and Station 1016.

G. Main APU Fuel Feed Line Shroud Removal

SUBTASK 28-25-05-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-25-05-020-001



WARNING

MAKE SURE YOU KEEP THE ELECTRICAL POWER OFF WHEN YOU DISCONNECT OR CONNECT THE FUEL, THE HYDRAULIC, AND THE ELECTRICAL LINES. IF YOU DO NOT, YOU CAN CAUSE INJURY TO PERSONNEL WITH THE ACCIDENTAL APPLICATION OF PRESSURIZED FLUIDS, ENERGIZING OF ELECTRICAL CIRCUITS, OR FIRE.



WARNING

YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO MAINTENANCE ON THE FUEL SYSTEM. IF YOU DO NOT GROUND AND BOND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

- (2) Remove the flexible hose [11] from the main shroud [1].

NOTE: If you are scheduled to remove the flexible hose [11], refer to the applicable procedure (TASK 28-25-04-000-802).

- (a) Do these steps to disconnect the flexible hose [11] from the center tank adapter fitting [7] (Figure 401), view A:

- 1) Put a fuel resistant container, STD-6646, below the APU shroud drain mast to catch fuel.
- 2) Loosen the forward shroud fitting [10] until it is against the ferrule [3] on the shroud.
- 3) Disconnect the coupling nut for the flexible hose [11] from the center tank adapter fitting [7].

NOTE: When you disconnect the flexible hose [11], a small quantity of fuel will spill from the flexible hose and drain from the drain mast for the APU shroud.

- 4) Engage the forward shroud fitting [10] again and tighten it.
- 5) Move the fuel line and the shroud out of the interior of the adapter fitting [7].
- 6) Remove the O-ring [4] from the shroud and discard it.

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- (b) To get access to the aft shroud, open this access panel:
(Figure 401, view B)
- | Number | Name/Location |
|---------------|-----------------------------|
| 311BL | Stabilizer Trim Access Door |
- (c) Disconnect the aft shroud [15] from the aft flexible shroud [27].
(d) Pull the aft flexible shroud back toward the APU firewall and disconnect the APU fuel line connection at the APU firewall.
(e) Pull the flexible hose [11] through the main shroud [1] and stow the flexible hose [11] in the aft compartment.

SUBTASK 28-25-05-020-002

- (3) Do these steps to remove the main shroud [1] from the floor beams:
- Loosen and remove the clamps that attach the main shroud to the airplane structure.
 - Remove the tube couplings and bonding components so you can remove the shroud through the floor beam holes.(Fuel Line, Fitting and Coupling Removal, TASK 28-22-15-000-801)
 - Pull the main shroud [1] forward.
 - Turn the main shroud [1] until it is clear of the control cables.
 - Lift the main shroud [1] until it is clear of the floor panels.

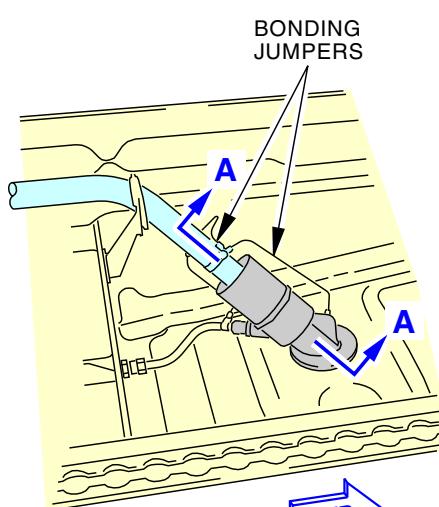
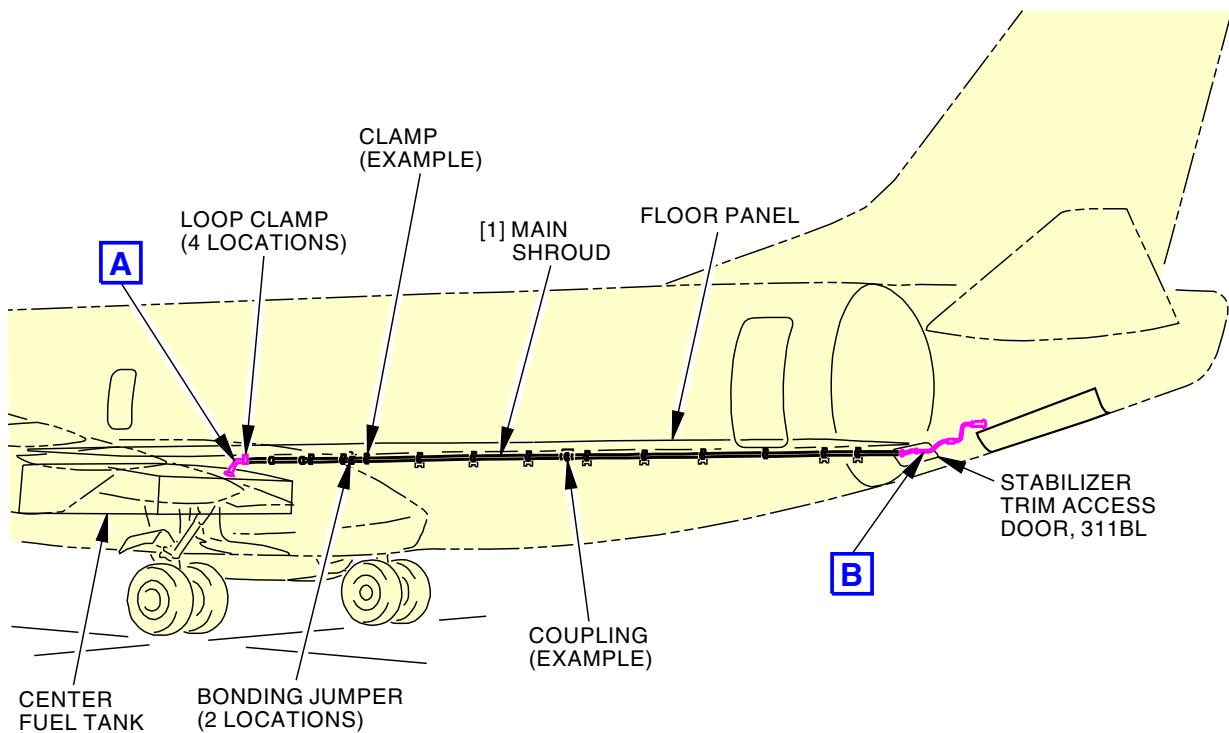
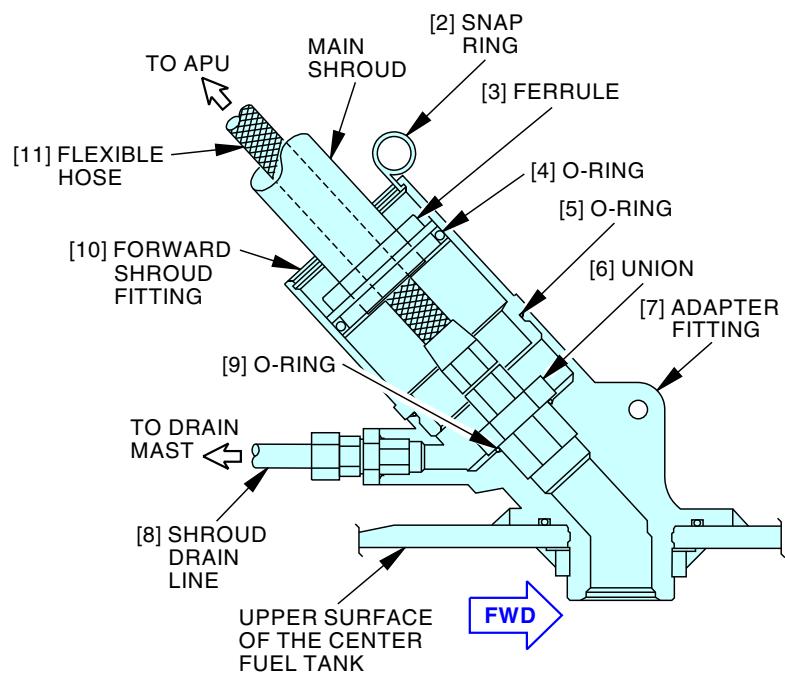
SUBTASK 28-25-05-020-003

- (4) Remove the main shroud [1] from the airplane through the aft entry door.

———— END OF TASK ————

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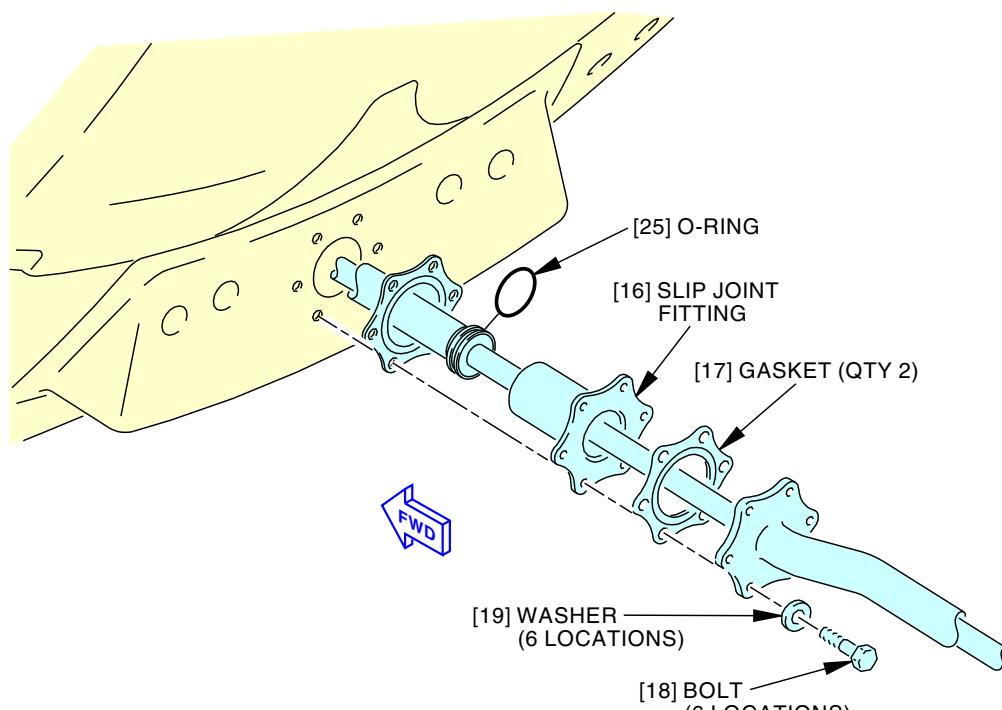
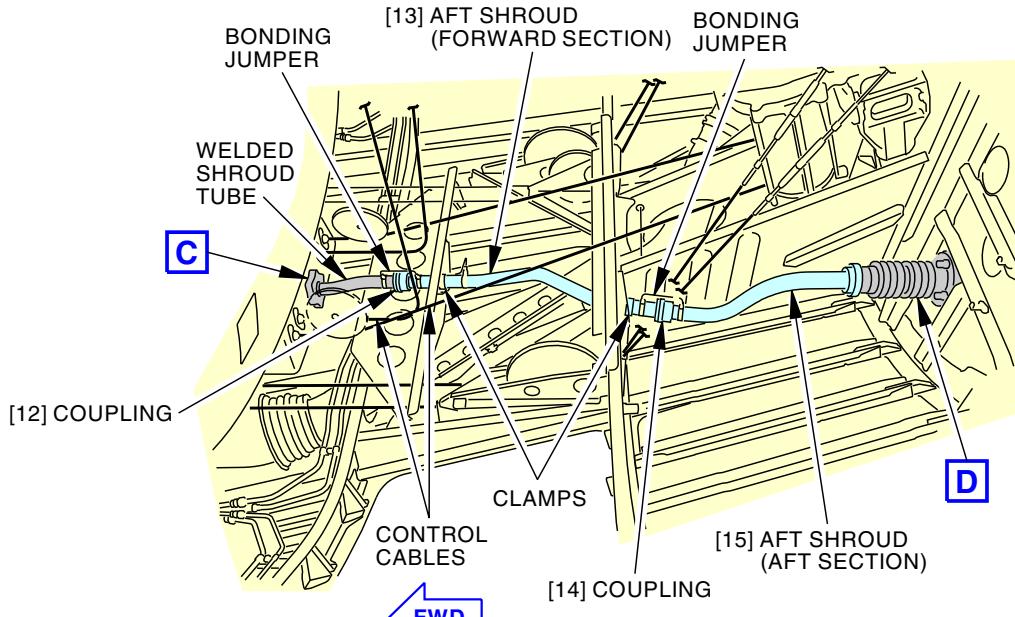

CENTER TANK FITTING
A


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APU Fuel Feed Line Shroud Installation
Figure 401/28-25-05-990-801 (Sheet 1 of 3)

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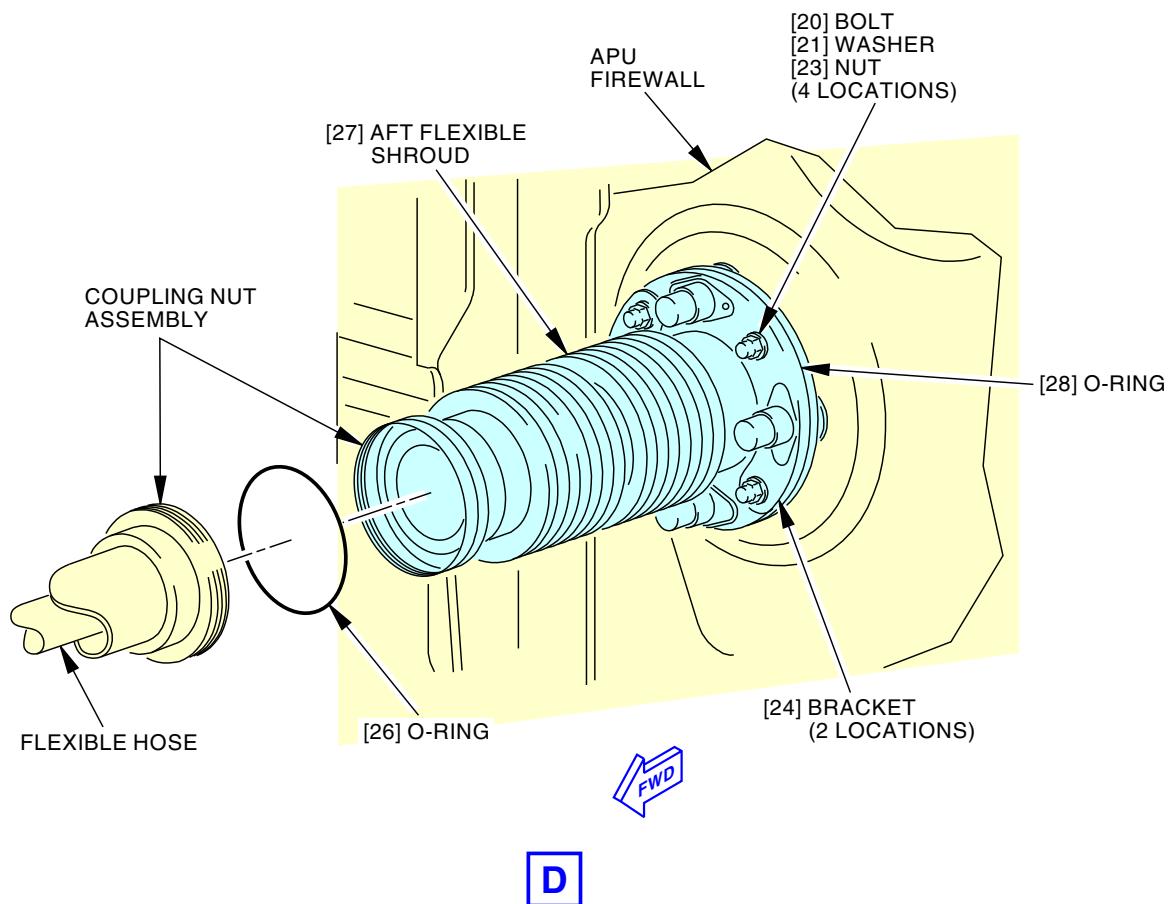
APU Fuel Feed Line Shroud Installation
Figure 401/28-25-05-990-801 (Sheet 2 of 3)

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APU Fuel Feed Line Shroud Installation
Figure 401/28-25-05-990-801 (Sheet 3 of 3)

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TASK 28-25-05-400-801

3. Main APU Fuel Feed Line Shroud Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Main APU Fuel Feed Line Shroud.

B. References

Reference	Title
25-27-15-400-801	Carpet - Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-25-04-790-801	APU Fuel Line Leak Test (with Air) (P/B 401)
53-21-00-400-801	Passenger Cabin Floor Panel - Installation (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	O-ring	28-25-04-02A-160	LOM ALL
5	O-ring	28-25-04-02A-155	LOM ALL
25	O-ring	28-25-04-05-355	LOM ALL
26	O-ring	28-25-04-03B-150	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437
		28-25-04-09-150	LOM 438-447, 450-999

D. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
142	Aft Cargo Compartment - Right
241	Aft Passenger Compartment - Station 663.75 to Aft Pressure Bulkhead - Left

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Main APU Fuel Feed Line Shroud Installation

SUBTASK 28-25-05-420-001

- (1) Do these steps to put the main shroud [1] in the correct position.
- Put the main shroud [1] through the aft entry door.
 - Put the aft end of the main shroud [1] through the opening in the passenger cabin floor above the rear spar of the center wing section.
 - Move the main shroud [1] aft through the floor beams.

SUBTASK 28-25-05-420-002

- (2) Install a new O-ring [25] on the aft end fitting of the main shroud [1].

SUBTASK 28-25-05-420-003

- (3) Put the main shroud [1] into the slip joint fitting [16] on the pressure bulkhead.

SUBTASK 28-25-05-420-005

- (4) Install the first clamp aft of the forward shroud fitting [10] for the main shroud [1].
- Turn the main shroud [1] until the shroud slips into the center tank adapter fitting [7].



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- (b) Put a new O-ring [4] on the end of the main shroud [1].
- (c) Install the clamp.

SUBTASK 28-25-05-420-006

- (5) Do these steps to install the remaining support clamps and couplings for the main shroud [1] (TASK 28-22-15-400-801):
 - (a) Loosely install the support clamps.
 - (b) Install the couplings and bonding jumpers for the main shroud [1].
 - 1) Make sure that there are new O-rings in each coupling.
 - (c) Tighten the support clamps.

SUBTASK 28-25-05-420-007

- (6) Do these steps to connect the flexible hose [11]:
 - (a) Put the flexible hose [11] through the aft shroud [13].
 - (b) Move the flexible hose [11] in the forward direction until it touches the center tank adapter fitting [7].
 - (c) Remove the forward shroud fitting [10] from the center tank adapter fitting [7] (if it is connected).
 - (d) Put a new O-ring [5] in the forward shroud fitting [10].
 - (e) Connect the coupling nut for the flexible hose [11].
 - 1) Tighten the coupling nut to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

NOTE: Do not attach the flange for the flexible shroud until you complete the fuel leak check.

SUBTASK 28-25-05-790-001

- (7) Do this task: APU Fuel Line Leak Test (with Air), TASK 28-25-04-790-801.

SUBTASK 28-25-05-420-014

- (8) Do these steps to connect the aft shroud [15] to the aft flexible shroud [27] at the APU firewall (View D, Figure 401):
 - (a) Push the aft flexible shroud [27] aft to get access to the flexible hose coupling.
 - (b) Put a new O-ring [26] on the flexible hose.
 - (c) Connect the aft APU shroud to the aft flexible shroud [27] at the APU firewall.

SUBTASK 28-25-05-420-009

- (9) Do these steps to install the forward shroud fitting [10] (View A, Figure 401):
 - (a) Engage the forward shroud fitting [10] in the center tank adapter fitting [7].
 - (b) Tighten the forward shroud fitting [10] to 660 in-lb (75 N·m) - 730 in-lb (82 N·m).

SUBTASK 28-25-05-790-002

- (10) Do this task: APU Fuel Line Shroud and Drain Line Leak Test, TASK 28-25-05-790-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-05-410-001

- (1) Install the floor panels (TASK 53-21-00-400-801).

SUBTASK 28-25-05-410-002

- (2) Install the aisle carpets (TASK 25-27-15-400-801).

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SUBTASK 28-25-05-410-003

- (3) Close this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

———— END OF TASK ————

TASK 28-25-05-000-802

4. Aft APU Fuel-Feed Line Shroud Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Aft APU Fuel-Feed Line Shroud.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-6646	Container - Fuel Resistant

D. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
142	Aft Cargo Compartment - Right
241	Aft Passenger Compartment - Station 663.75 to Aft Pressure Bulkhead - Left

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Removal

SUBTASK 28-25-05-860-003

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-25-05-010-002

- (2) Open this access door:

Number Name/Location

311BL Stabilizer Trim Access Door

G. Aft APU Fuel-Feed Line Shroud Removal

SUBTASK 28-25-05-020-004



WARNING

MAKE SURE YOU KEEP THE ELECTRICAL POWER OFF WHEN YOU DISCONNECT OR CONNECT THE FUEL, THE HYDRAULIC, AND THE ELECTRICAL LINES. IF YOU DO NOT, YOU CAN CAUSE INJURY TO PERSONNEL WITH THE ACCIDENTAL APPLICATION OF PRESSURIZED FLUIDS, ENERGIZING OF ELECTRICAL CIRCUITS, OR FIRE.

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(WARNING PRECEDES)



WARNING

YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO MAINTENANCE ON THE FUEL SYSTEM. IF YOU DO NOT GROUND AND BOND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

- (1) Do these steps to disconnect the APU fuel-feed line:
 - (a) Loosen the coupling nut assembly to disconnect the aft APU shroud from the aft flexible shroud at the APU firewall.
 - (b) Push the aft flexible shroud aft to get access to the flexible hose coupling.
 - (c) Put a fuel resistant container, STD-6646, below the flexible hose coupling to catch fuel.
 - (d) Disconnect the flexible hose coupling.

SUBTASK 28-25-05-020-005

- (2) Do these steps to remove the aft APU shroud:
 - (a) Remove the bolts [18] that connect the slip joint fitting [16] to the aft pressure bulkhead (Figure 401, View C).
 - (b) Remove the shroud support clamps that hold the aft APU shroud (TASK 28-22-15-000-801), (Figure 401, View B).
 - (c) Remove the couplings from the aft shroud to permit the shroud to go through the holes in the floor beams (TASK 28-22-15-000-801).
 - (d) Move the shroud and the seal gaskets [17] off the fuel line.
 - (e) Remove the shroud and the gaskets from the airplane through the opening for this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

— END OF TASK —

TASK 28-25-05-400-802

5. Aft APU Fuel Feed Line Shroud Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Aft APU Fuel Feed Line Shroud.

B. References

<u>Reference</u>	<u>Title</u>
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-25-04-790-801	APU Fuel Line Leak Test (with Air) (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
141	Aft Cargo Compartment - Left
142	Aft Cargo Compartment - Right
241	Aft Passenger Compartment - Station 663.75 to Aft Pressure Bulkhead - Left



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D. Access Panels

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

E. Aft APU Fuel Feed Line Shroud Installation

SUBTASK 28-25-05-420-011

- (1) Install the aft shroud.

- (a) Put the gaskets [17], slip joint fitting [16], and the welded shroud tube on the flexible hose (Figure 401), view D.
 - 1) Move these parts forward into their position at the aft pressure bulkhead.
 - 2) Feed the shroud tubes over the flexible hose, working forward to aft, until the flexible hose and the shroud can be reconnected at the flexible shroud.
 - 3) Move the shroud in the forward direction until it touches the pressure bulkhead.
- (b) Install the support clamps for the shroud (two locations) (TASK 28-22-15-400-801).
 - 1) Loosely attach the clamps to the pressure bulkhead.
- (c) Align the slip joint fitting [16], the gaskets [17], and the shroud (Figure 401), view C.
 - 1) Install the mounting bolts and the washers for the slip joint fitting [16] and the gaskets [17] (Figure 401).
- (d) Tighten the support bolts for the shroud.

SUBTASK 28-25-05-420-012

- (2) Connect the flexible hose [11] at the APU firewall.

NOTE: Do not attach the APU shroud to the flexible shroud until you complete the leak check of the fuel line.

SUBTASK 28-25-05-790-003

- (3) Do this task: APU Fuel Line Leak Test (with Air), TASK 28-25-04-790-801.

SUBTASK 28-25-05-420-015

- (4) Connect and tighten the coupling nut assembly to connect the aft shroud [15] to the aft flexible shroud at the APU firewall.

SUBTASK 28-25-05-790-004

- (5) Do this task: APU Fuel Line Shroud and Drain Line Leak Test, TASK 28-25-05-790-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-05-860-004

- (1) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812

SUBTASK 28-25-05-410-004

- (2) Close this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

———— END OF TASK ————

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TASK 28-25-05-000-803

6. Aft APU Fuel-Feed Line Flexible Shroud Removal

(Figure 401, Figure 402)

A. General

- (1) This task gives instructions to remove the aft flexible shroud.

B. References

Reference	Title
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door - Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-765	Scraper - Plastic
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
311	Area Aft of Pressure Bulkhead - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 28-25-05-860-006

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO NOT OPERATE tag, STD-858.

SUBTASK 28-25-05-860-007

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-05-010-004

- (3) To get access to the aft flexible shroud, open this access panel:

Open this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

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SUBTASK 28-25-05-010-005

- (4) If it is necessary to remove the APU cowl door, do this task: Auxiliary Power Unit (APU) Cowl Door - Removal, TASK 52-48-21-000-801.

SUBTASK 28-25-05-010-006

- (5) If it is not necessary to remove this APU cowl door, open this APU cowl door. To open this APU cowl door, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU cowl door.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (f) Disconnect the two hold-open rods from the two spring clips.

- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (h) Install the two retainer pins in the two rod ends.

SUBTASK 28-25-05-020-007

- (6) Do these steps to disconnect the four electrical connectors [1], [2], [3], [4] from the APU firewall receptacles on the 1088 bulkhead:

- (a) Disconnect the electrical connector D10436 (P2) [1].

NOTE: Be aware of the clamp that is attached onto the harness when disconnecting the electrical connector D10436 (P2).

- (b) Disconnect the electrical connector D10912 (P1) [2].

NOTE: Be aware of the clamp that is attached onto the harness when disconnecting the electrical connector D10912 (P1).

- (c) Disconnect the electrical connector D10434 (P3) [3].

- (d) Disconnect the electrical connector D11118 (P4) [4].

- (e) Install caps on the electrical connectors to prevent contamination.

SUBTASK 28-25-05-020-008



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (7) Do these steps to remove the fuel supply tube [5]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [5].

- (b) Disconnect the fuel supply tube [5] from the fitting [6] on the 1088 bulkhead.

- (c) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.

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- (d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
- (e) Loosen the nut [11] that attaches the fuel supply tube [5] to the fuel control unit.
- (f) Turn the tube retainer on the fuel supply tube [5] counterclockwise until the flange disengages from the stud.
- (g) Disconnect the fuel supply tube [5] from the fuel control unit.
- (h) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (i) Remove the fuel supply tube [5].
- (j) Remove the two packings [10] from the fuel supply tube [5].
 - 1) Discard the two packings [10].
- (k) Install caps or plugs on the fuel supply tube [5], fitting [6] and fuel control unit.
- (l) Install a protective cover on the fuel supply tube [5] to prevent contamination.
- (m) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 28-25-05-020-009

- (8) To remove the Aft APU Fuel-Feed Line Shroud, do this task: Aft APU Fuel-Feed Line Shroud Removal, TASK 28-25-05-000-802.
 - (a) Discard the O-rings [25] and [26].

G. Aft Flexible Shroud Removal

SUBTASK 28-25-05-020-010

- (1) At the forward side of the 1088 bulkhead, remove the fillet seal from the perimeter of the aft flexible shroud [27] and tube assembly [7] with a plastic scraper, STD-765.
NOTE: Use non-abrasive tools to preserve aircraft components and surface.

SUBTASK 28-25-05-020-011

- (2) At the aft side of the 1088 bulkhead, remove the bolts [8] and washers [9] that attach the APU Heat Blanket to the aft side of the APU firewall near the tube assembly [7].
 - (a) Temporarily support the tube assembly [7].

SUBTASK 28-25-05-020-012

- (3) At the forward side of the 1088 bulkhead, remove the nuts [23] and washers [21] that attach the aft flexible shroud [27] to the APU firewall.

SUBTASK 28-25-05-020-013

- (4) Remove the brackets [24] from the flange of the aft flexible shroud [27].

SUBTASK 28-25-05-010-007

- (5) Remove the aft flexible shroud [27] by sliding it forward off of the tube assembly [7].
 - (a) Remove and discard the O-ring [28].

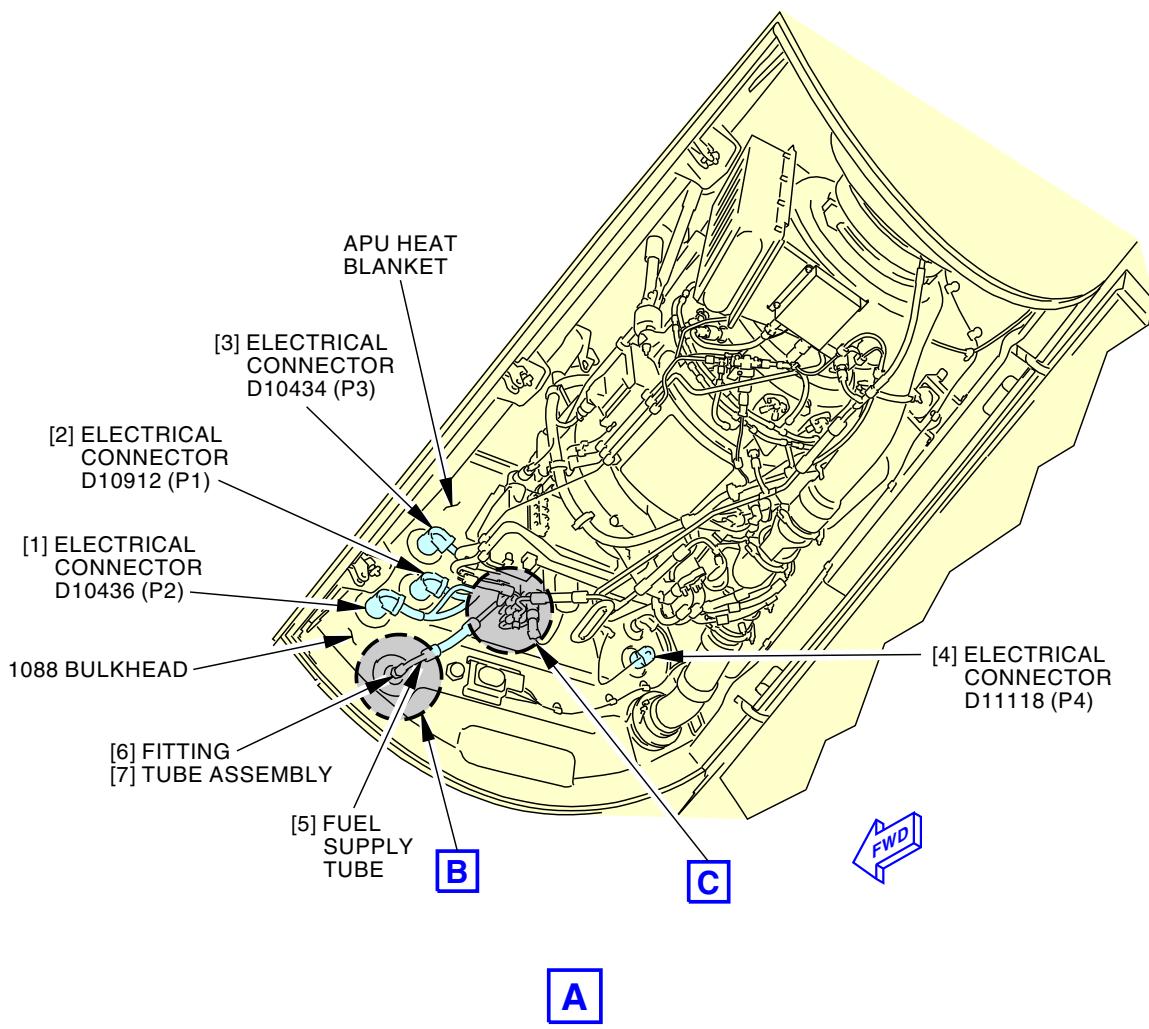
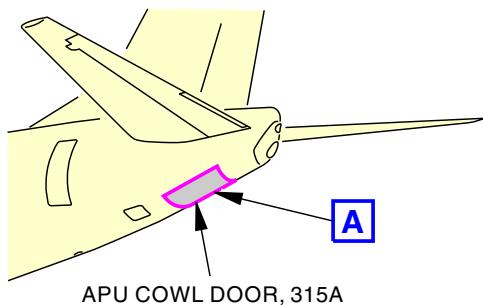
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Aft Flexible Shroud Installation
Figure 402/28-25-05-990-806 (Sheet 1 of 2)

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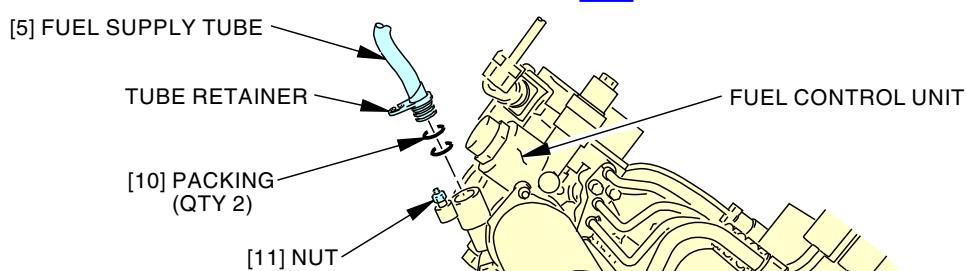
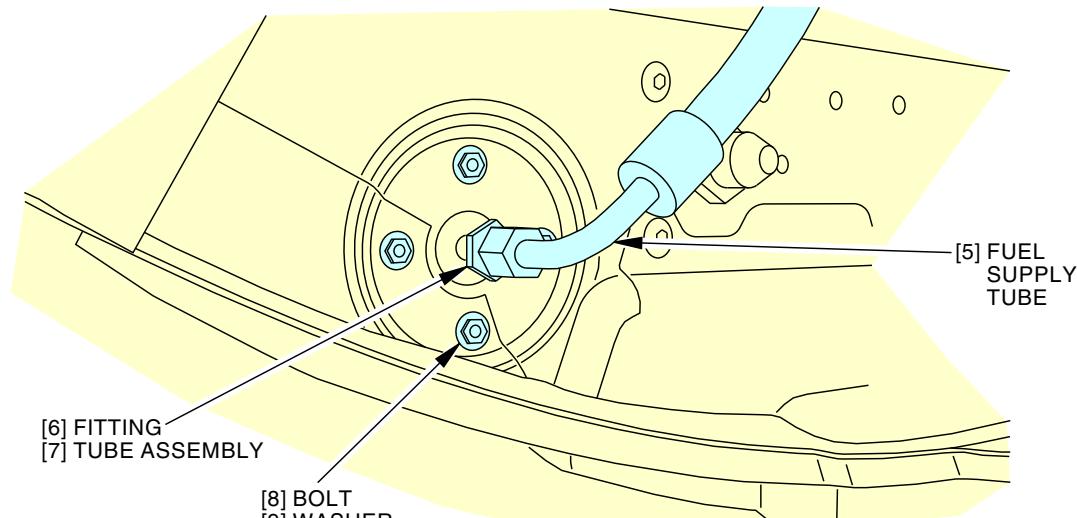
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Aft Flexible Shroud Installation
Figure 402/28-25-05-990-806 (Sheet 2 of 2)

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TASK 28-25-05-400-803

7. Aft APU Fuel-Feed Line Flexible Shroud Installation

(Figure 401, Figure 402)

A. General

- (1) This task includes the steps to install the aft flexible shroud.

B. References

Reference	Title
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G51056	Fuel - Standard Specification For Aviation Turbine Fuels (Jet A And Jet A-1)	ASTM D1655

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	Packing	49-31-11-02-015	LOM ALL
25	O-ring	28-25-04-05-355	LOM ALL
26	O-ring	28-25-04-03B-150	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437
		28-25-04-09-150	LOM 438-447, 450-999
27	Flexible shroud	28-25-04-03B-160	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437
		28-25-04-09-160	LOM 438-447, 450-999
28	O-ring	28-25-04-03B-165	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437
		28-25-04-09-165	LOM 438-447, 450-999

F. Location Zones

Zone	Area
211	Flight Compartment - Left
311	Area Aft of Pressure Bulkhead - Left
315	APU Compartment - Left
316	APU Compartment - Right



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G. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
315A	APU Cowl Door

H. Aft Flexible Shroud Installation

SUBTASK 28-25-05-410-006

- (1) Install a new O-ring [28] on the flange of the new aft flexible shroud [27].
- (2) Install the aft flexible shroud [27] by sliding it over the tube assembly [7] against the APU firewall.

NOTE: The flange of the flexible shroud will seat against the flange of the tube assembly.
Make sure that you engage the holes on the flange of the flexible shroud over the (4) bolts protruding through the APU firewall. Some alignment may be required.

SUBTASK 28-25-05-420-016

- (3) Align the brackets [24] on the flange of the aft flexible shroud [27] using the protruding bolts.

SUBTASK 28-25-05-420-017

- (4) Install the nuts [23] and washers [21] that attach the aft flexible shroud [27] to the APU firewall.
 - (a) If necessary, hold the bolts using the hex recess in the end of the bolt shank to prevent rotation during torque application.

SUBTASK 28-25-05-420-018

- (5) At the aft side of the 1088 bulkhead, remove the temporary support from the tube assembly [7].
- (6) Install the bolts [8] and washers [9] that attach the APU Heat Blanket to the aft side of the APU firewall near the tube assembly [7].

SUBTASK 28-25-05-420-019

- (7) Do these steps to install the fuel supply tube [5]:

- (a) Remove the caps or plugs from the fuel supply tube [5], fitting [6] and fuel control unit.
- (b) Lubricate the two new packings [10] with a light coat of fuel, G02272 or aviation turbine fuel, G51056.
- (c) Install the packings [10] on the fuel supply tube [5].
- (d) Connect the fuel supply tube [5] to the fuel control unit.

NOTE: Do not reinstall the old nut (shipping hardware) that was discarded. It is a different part number nut and can possibly cause fuel leakage.

- (e) Turn the tube retainer on the fuel supply tube [5] clockwise until the flange fully engages the stud.
- (f) Tighten the nut [11] to 35 in-lb (4.0 N·m) to 45 in-lb (5.1 N·m).
- (g) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
- (h) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.
 - 1) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).

SUBTASK 28-25-05-420-020

- (8) Do these steps to connect the four electrical connectors electrical connector D10436 (P2) [1], electrical connector D10912 (P1) [2], electrical connector D10434 (P3) [3] and electrical connector D11118 (P4) [4] to the APU firewall receptacles on the 1088 bulkhead:
 - (a) Remove the caps from the electrical connectors.

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- (b) Connect the electrical connector D11118 (P4) [4].
- (c) Connect the electrical connector D10434 (P3) [3].
- (d) Connect the electrical connector D10912 (P1) [2].
- (e) Connect the electrical connector D10436 (P2) [1].

SUBTASK 28-25-05-410-007

- (9) If the APU cowl door was removed, do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

NOTE: Do not close the APU cowl door at this time. Use the two hold-open rods to hold the APU cowl door open.

SUBTASK 28-25-05-210-001

- (10) Do a general visual inspection of the seven insulation panels:
 - (a) Visually examine the seven insulation panels that you can get access from the APU compartment for holes, tears, separation and damage.
 - (b) If you find holes, tears, separation or damage on the insulation panels, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.

SUBTASK 28-25-05-390-001

- (11) At the forward side of the 1088 bulkhead, apply a fillet seal to the perimeter of the aft flexible shroud [27] and tube assembly [7] with sealant, A00160.

SUBTASK 28-25-05-410-008

- (12) To install the Aft APU Fuel-Feed Line Shroud, do this task: Aft APU Fuel Feed Line Shroud Installation, TASK 28-25-05-400-802.
 - (a) Make sure that you install new O-ring [25] and new O-ring [26].
 - (b) Make sure that you do the leak checks on both sides of the firewall for all points re-connected.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-05-410-009

- (1) Close this APU cowl door. To close this APU cowl door, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU cowl door.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch

SUBTASK 28-25-05-410-010

- (2) Close this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

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SUBTASK 28-25-05-860-008

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 28-25-05-860-009

- (4) Remove the DO NOT OPERATE tag, STD-858 from the APU master switch on the P5 forward overhead panel.

———— END OF TASK ————

TASK 28-25-05-790-801

8. APU Fuel Line Shroud and Drain Line Leak Test

(Figure 403)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1782	Test Hose - Leak and Pressure, APU Fuel Line Shroud Part #: A28005-82 Supplier: 81205 Opt Part #: A28005-42 Supplier: 81205 Opt Part #: A28005-50 Supplier: 81205
SPL-1783	Adapter - Leak Test, APU Fuel Line Shroud Part #: A28005-48 Supplier: 81205
STD-1234	Air Source - Regulated, Dry Filtered, Compressed 90-130 PSIG (6.0 CFM)

C. Location Zones

Zone	Area
194	Lower Wing-To-Body Fairing - Aft of Wheel Well

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D. Pressurize the APU Shroud and Do a Check for Leaks

SUBTASK 28-25-05-910-001



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If landing gear downlocks are not installed, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-25-05-020-006

- (2) Install the adapter, SPL-1783, and test hose, SPL-1782, on the drain mast.

SUBTASK 28-25-05-420-013

- (3) Connect the compressed (90-130 PSIG, 6.0 CFM) dry filtered regulated air source, STD-1234, to the test hose, SPL-1782.

SUBTASK 28-25-05-780-001

- (4) Slowly and continuously apply pressure to the Auxiliary Power Unit (APU) shroud and drain line system until the pressure is 18 ± 1 psi (124 ± 7 kPa).
 - (a) Make sure that the pressure is stable at 18 ± 1 psi (124 ± 7 kPa).
 - (b) Remove the air pressure source and monitor the pressure for ten minutes.

NOTE: The pressure must not decrease more than 0.2 psi (1.4 kPa) during the ten minutes.

SUBTASK 28-25-05-780-002

- (5) Slowly and continuously decrease the pressure to zero.

SUBTASK 28-25-05-080-001

- (6) Do this step to remove the test equipment:
 - (a) Remove the adapter tool from the drain mast.

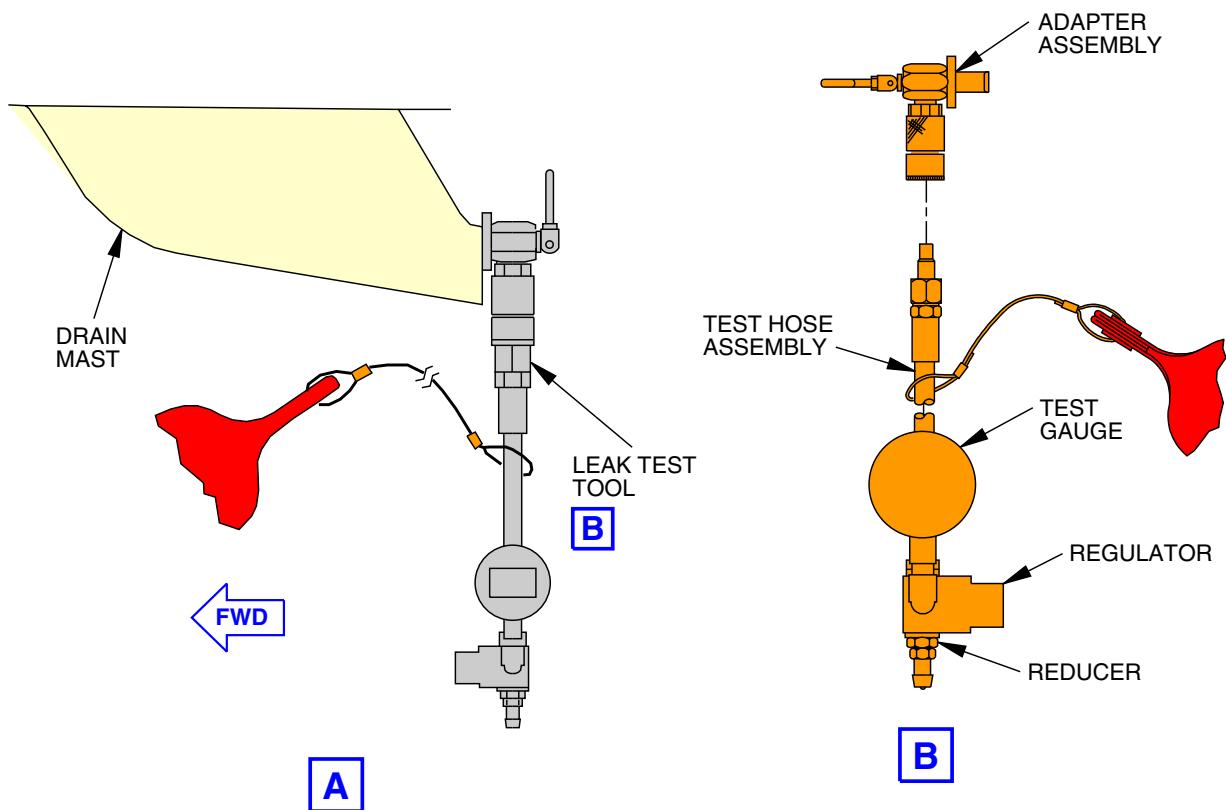
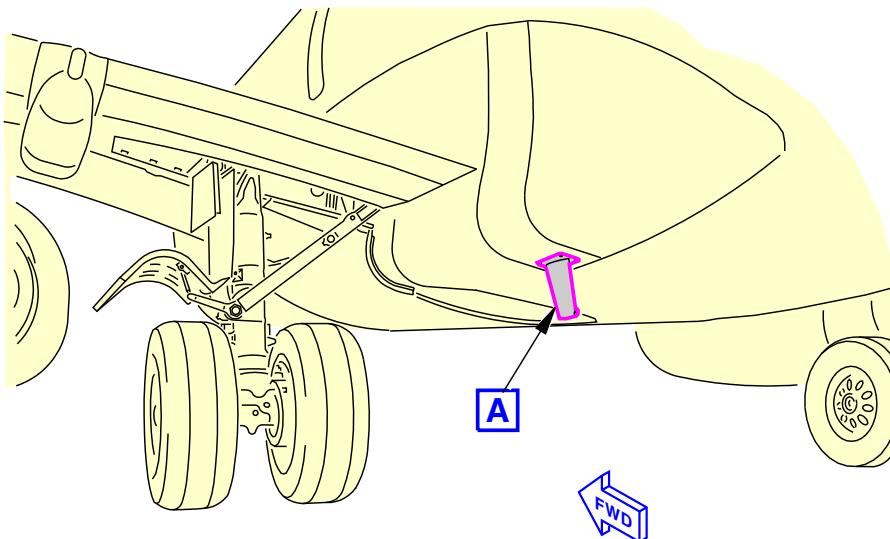
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APU Shroud Leak Test Equipment
Figure 403/28-25-05-990-805

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APU CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of the APU check valve
 - (2) The installation of the APU check valve.

TASK 28-25-06-000-801

2. APU Check Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the APU Check Valve.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-00-730-802	Crossfeed Valve - Functional Test (P/B 501)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left

D. Access Panels

Number	Name/Location
131AB	Center Tank Access

E. Prepare for the Removal

SUBTASK 28-25-06-650-001

- (1) Defuel the center fuel tank and the No. 1 tank or transfer fuel out of them (TASK 28-26-00-650-801).

SUBTASK 28-25-06-860-001

- (2) If there is fuel in the No. 2 tank, make sure that the crossfeed valve is closed and has no leakage (TASK 28-22-00-730-802).
 - (a) As an alternative, you can remove fuel from the No. 2 tank (TASK 28-26-00-650-801).

SUBTASK 28-25-06-010-001

- (3) Do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801.
 - (a) Remove this access door for the center wing section:

Number	Name/Location
131AB	Center Tank Access

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F. APU Check Valve Removal

SUBTASK 28-25-06-940-001



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (1) Do the purging and fuel tank entry procedure for the center tank (Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802).

SUBTASK 28-25-06-010-002

- (2) In the center tank, carefully loosen the couplings that attach the check valve [2] to the APU fuel feed line [1].

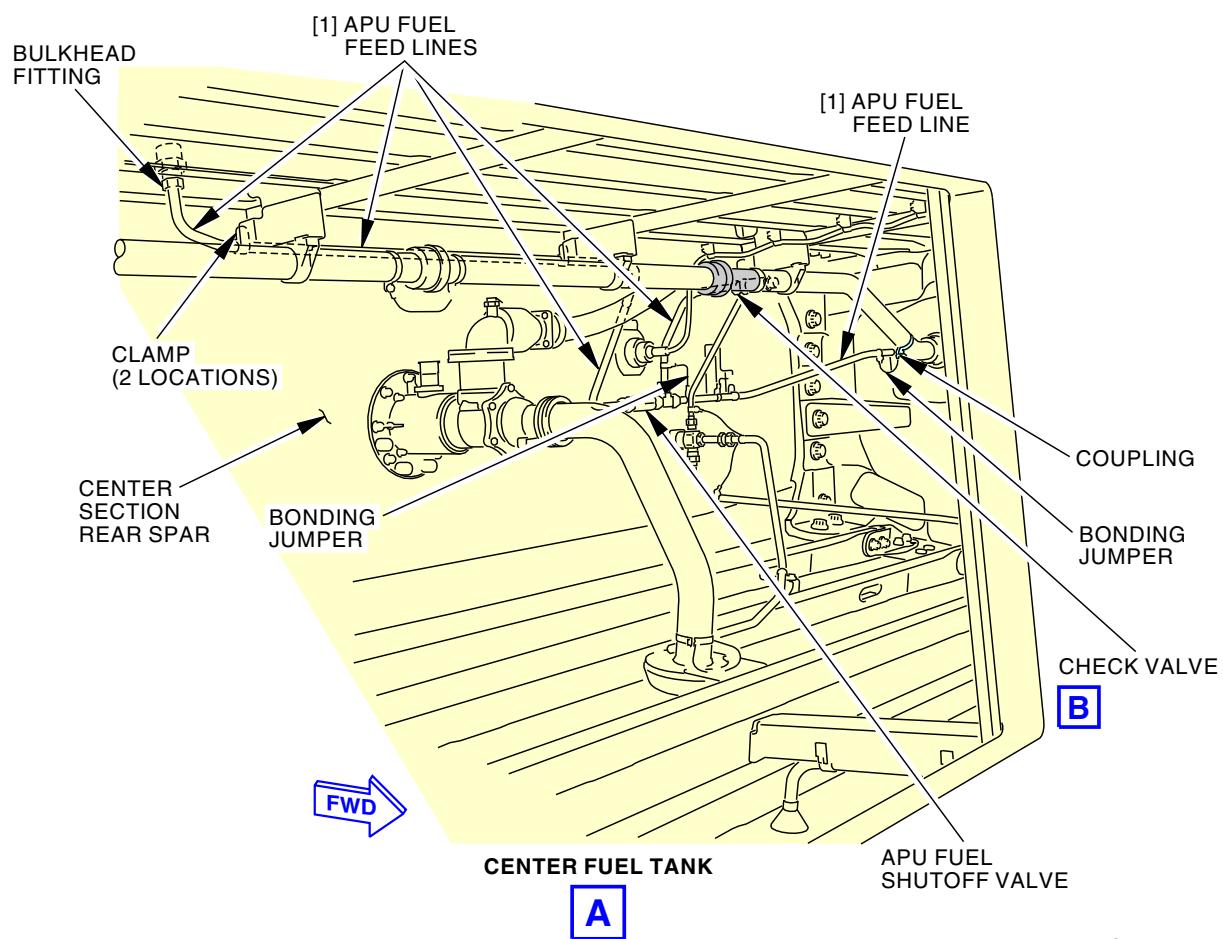
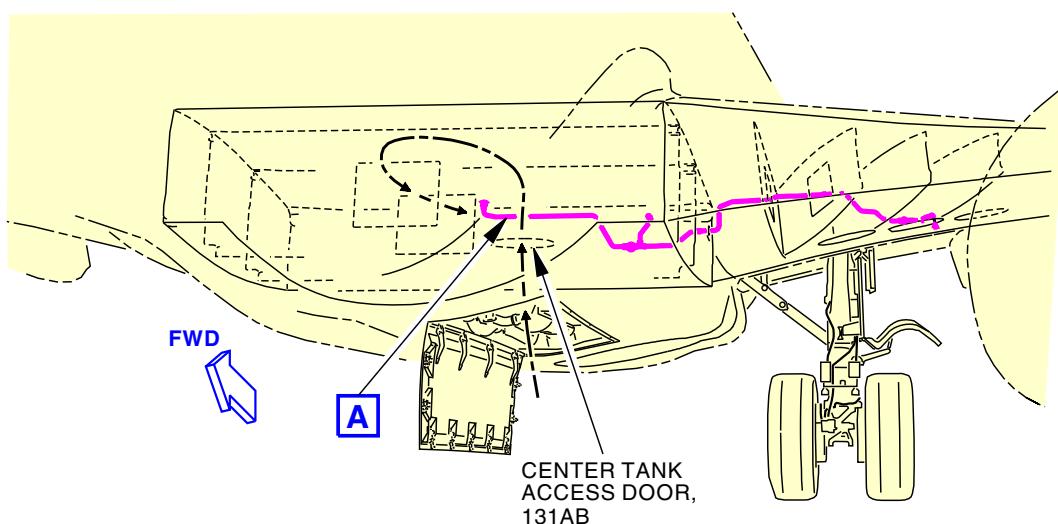
SUBTASK 28-25-06-020-001

- (3) Remove the check valve [2] and the union [3] as a set.

———— END OF TASK ——

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APU Check Valve Installation
Figure 401/28-25-06-990-802 (Sheet 1 of 2)

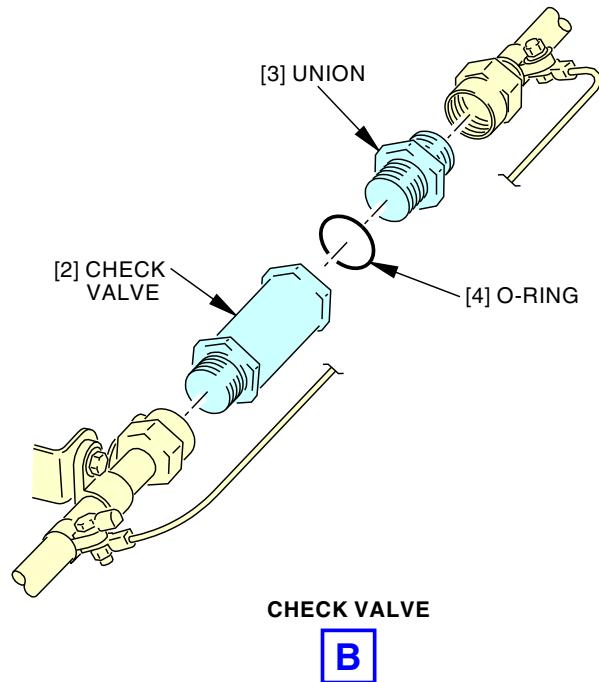
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APU Check Valve Installation
Figure 401/28-25-06-990-802 (Sheet 2 of 2)

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TASK 28-25-06-400-801

3. APU Check Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the APU Check Valve.

B. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
49-31-00-700-802	APU Fuel Supply Flow Check (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Check valve	28-22-52-03-240	LOM ALL
4	O-ring	28-22-52-03-235	LOM ALL

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left

E. Access Panels

Number	Name/Location
131AB	Center Tank Access

F. APU Check Valve Installation

SUBTASK 28-25-06-420-001

- (1) Put the check valve [2], O-ring [4], and union [3] as a set in their position between the two ends of the APU fuel line.

SUBTASK 28-25-06-420-002

- (2) Make sure that the arrow on the check valve points in the aft direction (away from the engine fuel feed manifold).

SUBTASK 28-25-06-420-003

- (3) Attach the check valve to the ends of the APU fuel line with the couplings on those ends.
(a) Tighten each of the couplings to a torque of 280 ± 14 in-lb (32 ± 2 N·m).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-06-420-004

- (1) Do the applicable steps to close the center tank (TASK 28-11-00-410-801).

SUBTASK 28-25-06-010-003

- (2) Do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801.

- (a) Install this access door for the center wing section:

Number	Name/Location
131AB	Center Tank Access

SUBTASK 28-25-06-710-001

- (3) Do this task: APU Fuel Supply Flow Check, TASK 49-31-00-700-802.

— END OF TASK —

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APU FUEL FEED LINE SHROUD DRAIN MAST - REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks:
 - (1) APU Fuel Feed Line Shroud Drain Mast - Removal
 - (2) APU Fuel Feed Line Shroud Drain Mast - Installation
- B. The APU Fuel Feed Line Shroud Drain Mast is referred to as the Drain Mast in this procedure.

TASK 28-25-07-020-801

2. APU Fuel Feed Line Shroud Drain Mast Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the APU Fuel Feed Line Shroud Drain Mast.

B. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)

C. Consumable Materials

Reference	Description	Specification
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
194	Lower Wing-To-Body Fairing - Aft of Wheel Well

E. Access Panels

Number	Name/Location
194DL	Aft Wing To Body Fairing Panel

F. Prepare for the Removal

SUBTASK 28-25-07-010-001

- (1) To get access to the drain lines that go through the drain mast, remove this access panel:

Number	Name/Location
194DL	Aft Wing To Body Fairing Panel

G. APU Fuel Feed Line Shroud Drain Mast Removal

SUBTASK 28-25-07-020-007

- (1) Remove MS20995C32 lockwire, G01048, from the coupling [6] (TASK 20-10-44-000-801).

SUBTASK 28-25-07-020-001

- (2) Disconnect the hydraulic vent line [1] and the APU fuel shroud drain line [5] from the drain mast fittings.

- (a) Remove the breather plug [17] from the coupling [6].
- (b) Discard the two o-rings [18] from the coupling [6].

SUBTASK 28-25-07-020-008

- (3) AIRPLANES WITH ALUMINUM DRAIN MAST 346A2801-5;

Disconnect bonding jumper [11], bonding jumper [16], and bonding jumper [19].

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SUBTASK 28-25-07-020-002

- (4) AIRPLANES WITHOUT ALUMINUM DRAIN MAST 346A2801-5;
Disconnect bonding jumper [11] and bonding jumper [16].

SUBTASK 28-25-07-020-003

- (5) Loosen the four bolts [3] that attach the drain mast assembly [4] to the airplane structure.

SUBTASK 28-25-07-020-004

- (6) Carefully separate the drain mast assembly [4] from the fairing with a sealant removal tool.
(a) Discard the gasket [2].
(b) Remove any remaining sealant.

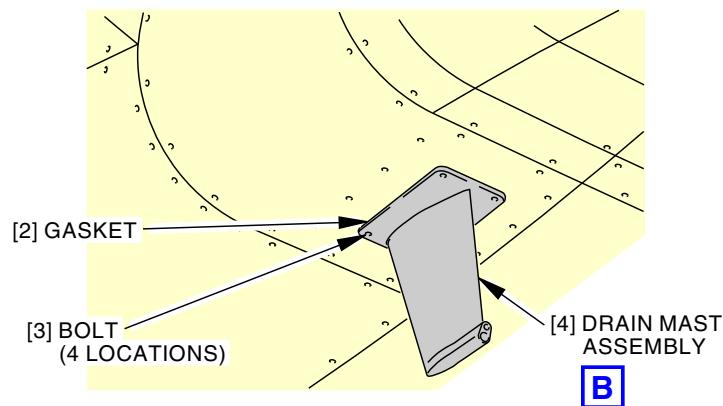
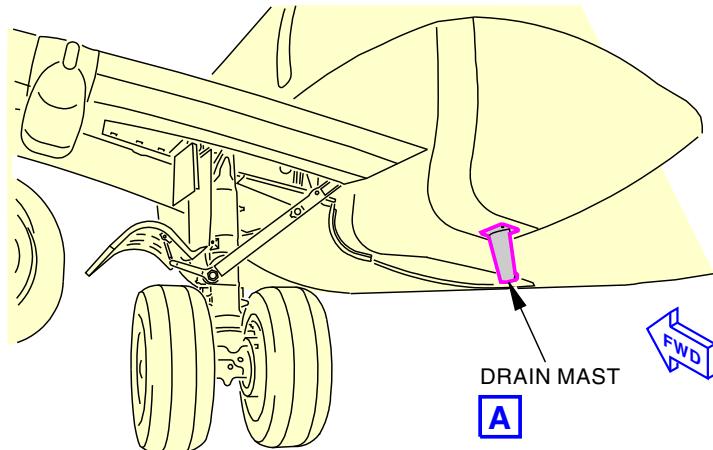
———— END OF TASK ————

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DRAIN MAST



N14475 S0006572191_V2

APU Shroud Drain Mast Installation
Figure 401/28-25-07-990-802 (Sheet 1 of 2)

EFFECTIVITY
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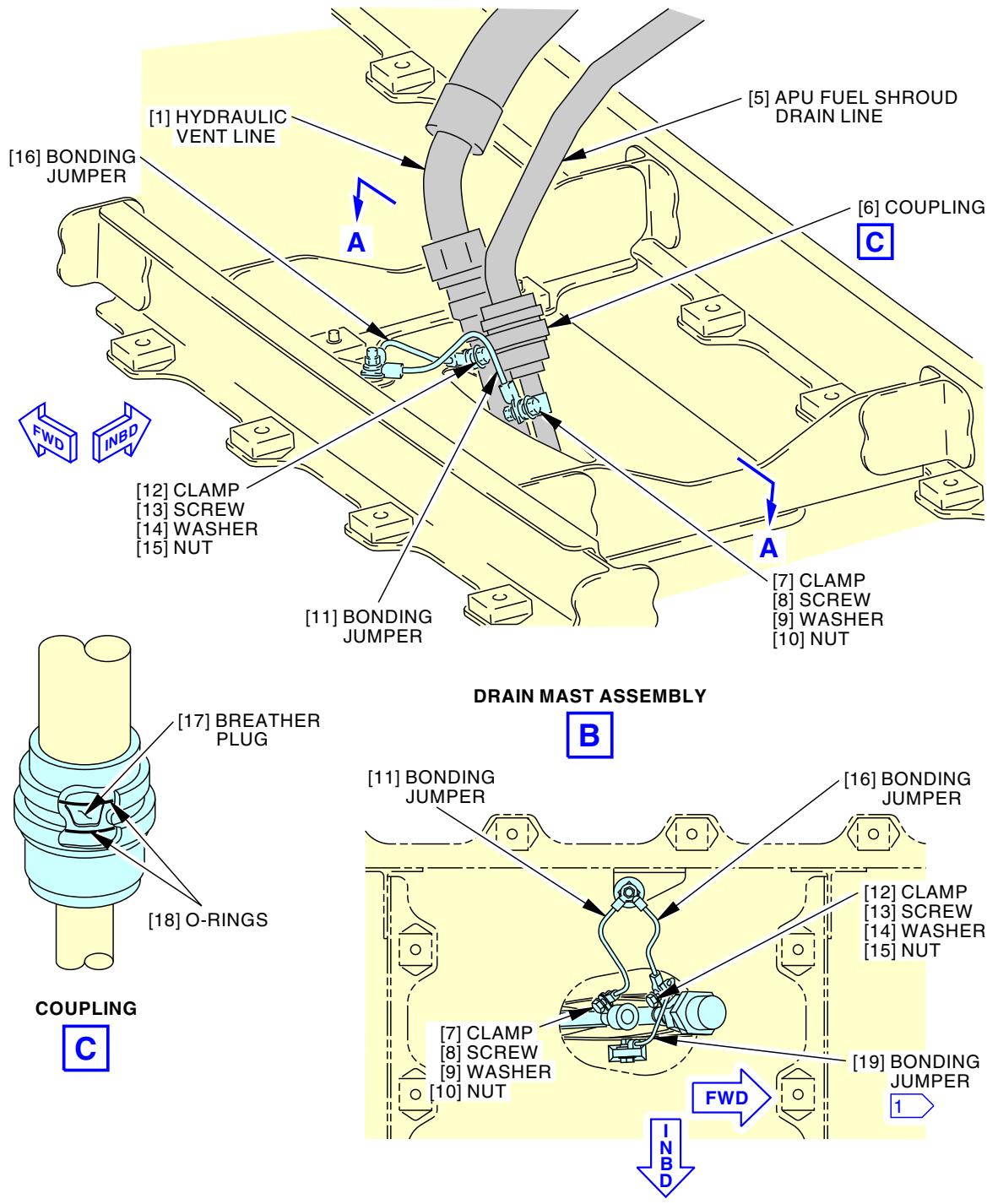
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1 AIRPLANES WITH ALUMINUM DRAIN MAST 346A2801-5.

A-A

N25816 S0006572192_V5

APU Shroud Drain Mast Installation
Figure 401/28-25-07-990-802 (Sheet 2 of 2)

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TASK 28-25-07-420-801

3. APU Fuel Feed Line Shroud Drain Mast Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the APU Fuel Feed Line Shroud Drain Mast.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-10-51 P/B 801	FLARELESS TUBING ASSEMBLY - REPAIRS
20-10-51-400-804	Flareless Tubing Assembly Installation (P/B 401)
20-50-11-910-801	Standard Torque Values (P/B 201)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-25-05 P/B 401	APU FUEL FEED LINE SHROUD - REMOVAL/INSTALLATION
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02496	Tape - Polyurethane Outdoor - 3M 8671	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	28-25-51-04-040 28-25-51-04A-050	LOM 402, 404, 406 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
4	Drain mast assembly	28-25-51-04-045 28-25-51-04A-055	LOM 402, 404, 406 LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
18	O-ring	28-25-51-20-050 28-25-51-22-125 28-25-51-23-120	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 LOM 422-434 LOM 437-447, 450-999

E. Location Zones

Zone	Area
194	Lower Wing-To-Body Fairing - Aft of Wheel Well



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F. Access Panels

Number	Name/Location
194DL	Aft Wing To Body Fairing Panel

G. APU Fuel Feed Line Shroud Drain Mast Installation

SUBTASK 28-25-07-420-001

- (1) Do these steps to install the drain mast assembly [4] in its position:
 - (a) Install a new gasket [2] on the drain mast assembly [4].
 - (b) Put the drain mast assembly [4] with the gasket [2] in its position on the fairing.
 - (c) Install the four bolts [3] and tighten them (TASK 20-50-11-910-801).

SUBTASK 28-25-07-420-003

- (2) Do these steps to connect the hydraulic vent line [1] to the drain mast assembly [4]:
 - (a) Connect the coupling for the hydraulic vent line [1] (TASK 20-10-51-400-804).
 - 1) Tighten the coupling.

SUBTASK 28-25-07-420-006

- (3) Do these steps to connect the APU fuel shroud drain line [5] to the drain mast assembly [4]:
 - (a) Apply a thin layer of grease, D00504, to the two new o-rings [18].
 - 1) Install the two new o-rings [18] in the coupling [6] for the APU fuel shroud drain line [5].
 - (b) Install the breather plug [17] in the APU fuel shroud drain line [5].
 - (c) Connect the coupling [6] for the APU fuel shroud drain line [5] (TASK 28-22-15-400-801).
 - 1) Tighten the coupling [6].
 - 2) Install MS20995C32 lockwire, G01048, on the coupling [6] (TASK 20-10-44-400-801).

SUBTASK 28-25-07-420-002

- (4) Install the clamp [7], screw [8], washer [9], nut [10], and bonding jumper [11] to the APU fuel shroud drain line [5].

SUBTASK 28-25-07-420-005

- (5) AIRPLANES WITH ALUMINUM DRAIN MAST 346A2801-5;
Install the clamp [12], screw [13], washer [14], nut [15], bonding jumper [16], and bonding jumper [19] to the hydraulic vent line [1].

SUBTASK 28-25-07-420-004

- (6) AIRPLANES WITHOUT ALUMINUM DRAIN MAST 346A2801-5;
Install the clamp [12], screw [13], washer [14], nut [15], and bonding jumper [16] to the hydraulic vent line [1].

SUBTASK 28-25-07-760-001

- (7) Do an electrical bonding check from each drain mast tube to the primary structure of the airplane (SWPM 20-20-00).
 - (a) Make sure that the resistance from each tube to primary structure is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-25-07-420-007

- (8) AIRPLANES WITHOUT ALUMINUM DRAIN MAST 346A2801-5;

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Install 3M 8671 tape, G02496, on the leading edge of the drain mast to help prevent erosion.

NOTE: Make sure that air bubbles are not entrapped. If there are small bubbles under the 3M 8671 tape, G02496, then use a pin to make a hole in the tape to release the air and rub the 3M 8671 tape, G02496, with a clean cotton wiper, G00034.

SUBTASK 28-25-07-390-001

- (9) Apply a fillet seal of sealant, A02315, around clamp [7] and clamp [12] (TASK 51-31-00-390-804).

SUBTASK 28-25-07-390-002

- (10) Apply a fillet seal of sealant, A02315, around the flange of the drain mast assembly [4] (TASK 51-31-00-390-804).

LOM 437, 438

H. APU Fuel Feed Line Shroud Drain Mast Installation Test

SUBTASK 28-25-07-160-001

- (1) Use a cotton wiper, G00034, to rub all fluid off of the drain mast assembly [4] of the APU fuel shroud drain line [5].

SUBTASK 28-25-07-210-001

- (2) Monitor the drain mast assembly [4] of the APU fuel shroud drain line [5] for fuel leaks.

SUBTASK 28-25-07-960-001

- (3) Repair or replace the APU fuel shroud drain line [5] (PAGEBLOCK 20-10-51/801, PAGEBLOCK 28-25-05/401), if:
 - (a) Fuel leaks more than 1 drop/minute.
 - (b) Fuel flows from the drain mast.

LOM ALL

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-07-010-002

- (1) Install this access panel that was removed to get access to the drain lines that go through the drain mast.

Number Name/Location

194DL Aft Wing To Body Fairing Panel

———— END OF TASK ————

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DEFUELING - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Precautions and Limits for the Defuel Operation
- (2) A task to defuel the fuel tanks
- (3) A task to transfer fuel from one tank to a different tank.

NOTE: For steps to remove (purge) air from the engine fuel feed system refer to Fuel Tank Closure, TASK 28-11-00-410-801.

- B. If the heat exchanger for the hydraulic system is above the surface of the fuel, it can become too hot.
- C. You can defuel all of the tanks at the same time. You can also defuel only one of the tanks. If you defuel only one tank, make sure the fuel and the fuel fumes in the other tanks do not go into the tank you defueled.
- D. When thunderstorms or lightning are within a 10 mile (16 kilometer) radius of the immediate area, the defueling procedure should stop.
- E. Strong wind conditions can cause a build-up of static electricity. Large charges of static electricity can develop on support equipment while parked as a result of the movement of dust particles and air currents during strong wind conditions. Strong wind conditions also cause the unwanted movement of items or equipment which can hit the airplane or injure persons. Wind gusts can damage the airplane structure. Defueling procedures should stop if strong wind conditions are present.
- F. You must carefully do all of these safety precautions:
- (1) The safety precautions for defueling in this manual
 - (2) The safety precautions that the airport tells you to do
 - (3) The safety precautions that the airline tells you to do.
- G. If you do not obey these safety precautions, a fire or an accident can easily occur.
- H. Do not operate an engine driven or electric motor driven pump in the hydraulic system if the No. 1 tank or the No. 2 tank has less than 1675 pounds (760 kilograms) of fuel (TASK 29-11-00-860-801).
- I. Low Pressure light Illumination During Defueling and Fuel Transfer
- (1) Very high flow conditions can occur during defueling and fuel transfer operations. The high flow condition can decrease the back-pressure in the refuel manifold. The lack of back-pressure can reduce the output pressure of the fuel pumps to a level where the LOW PRESSURE light comes on. During these high flow conditions the LOW PRESSURE light does not indicate that a pump is running dry or that the pump has failed.
NOTE: Back-pressure is in relation to any configuration that can cause low fuel flow to the pumps. A low back-pressure condition can occur even if there is a significant amount of fuel in the tanks during defueling or transferring fuel from tank to tank.
 - (2) To monitor pump performance during high flow conditions it is necessary to monitor the pump low pressure indication and the fuel quantity indication. If the pump LOW PRESSURE light comes on (steady on) and the fuel quantity for the tank does not continue to decrease, it is possible that the pump is running dry or that the pump has failed. The pump switch must be selected off and remain off until you can evaluate and repair the cause of the no-transfer condition.

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TASK 28-26-00-600-801

2. Precautions and Limits for the Defuel Operation

A. General

- (1) If the center tank has more than 1000 lb (454 kg) of fuel, you must fill the No. 1 tank and the No. 2 tank fully.

NOTE: This requirement is applicable to the fuel configuration for flight. Any quantity of fuel can be added to the center tank or transferred from the No. 1 or No. 2 tank for ground maintenance (TASK 28-26-00-650-802).

B. References

Reference	Title
49-11-00-710-802	APU Operation Limits (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-11-00-860-803	APU Emergency Shutdown (P/B 201)

C. Location Zones

Zone	Area
500	Left Wing
600	Right Wing

D. APU Operations During Defueling - Limits and Precautions

SUBTASK 28-26-00-860-063

- (1) If the APU is operating during defueling, do these steps:



WARNING OBEY THE PRECAUTIONS FOR APU OPERATION WHEN YOU OPERATE THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU OPERATE THE APU INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Obey the limits and operation for the operation of the APU (TASK 49-11-00-710-802, TASK 49-11-00-860-801).
- (b) You can start the APU during defueling if the start is an initial start or a restart after a normal shutdown.
- (c) You can shut down the APU (manual or automatic) during the defueling operation.



WARNING IF THERE IS A PROTECTIVE AUTOMATIC SHUTDOWN OF THE APU OR A FAILURE TO START CONDITION, DO NOT TRY TO START THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU TRY TO START THE APU, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) If there is a protective automatic shutdown or failure to start condition on the APU, do one of these two steps:
- 1) Complete the defuel operation before you try to start the APU again.
 - 2) Stop the defuel operation.
 - a) Disconnect the fuel hose(s) from the airplane fueling adapter(s) before you start the APU again.

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WARNING

STOP THE FUELING OPERATION AND FOLLOW THE SAFETY PRECAUTIONS IF AN APU FIRE OCCURS DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU DO NOT OBEY, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (e) If an APU fire occurs, do these steps in this sequence:
- 1) Stop the defueling operation.
 - 2) Make sure the APU shuts down automatically.
 - a) If it does not shut down automatically, do this task: APU Emergency Shutdown, TASK 49-11-00-860-803.
 - 3) Discharge the APU fire bottles (TASK 49-11-00-860-803).
 - 4) Tell persons onboard the airplane and Airport Fire Services.



WARNING

STOP THE FUELING OPERATION AND FOLLOW THE SAFETY PRECAUTIONS IF YOU SPILL FUEL DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU DO NOT OBEY, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (f) If fuel spillage occurs, do these steps:
- 1) Stop the defueling operation.
 - 2) Tell a person onboard the airplane.
 - 3) Unload the APU and shut it down (TASK 49-11-00-860-802).
 - a) Do not start the APU until the spilled fuel is removed and there is no further risk of spilled fuel or vapors.



WARNING

MAKE SURE THAT FUELING VEHICLES ARE NOT PARKED IN THE EXHAUST FLOW OF THE ENGINES OF THIS AIRPLANE, OR ADJACENT AIRPLANES. THE HOT EXHAUST CAN CAUSE A FIRE OR EXPLOSION.

- (g) Make sure that fueling vehicles are in a position that prevents risk of coming in the path of the APU exhaust stream.
- NOTE: The APU exhaust stream can interfere with the fueling vehicles for other airplanes.

———— END OF TASK ————

TASK 28-26-00-650-801

3. Fuel Tank Defueling

(Figure 201, Figure 202)

A. General

- (1) There are three different procedures that you can use to defuel the fuel tanks:
 - (a) Defuel through the pressure fueling receptacle with the airplane boost pumps and the defueling (suction) pump on the refuel truck. This procedure defuels some or all of the tanks at the same time. It is the fastest procedure to defuel the tanks.
 - (b) Defuel through the pressure fueling receptacle with the airplane boost pumps only.
 - (c) Defuel through the pressure fueling receptacle with the defueling (suction) pump on the fuel truck only. This procedure can be used only on the No. 2 tank. Use this procedure only if it is necessary. It is a very slow procedure to be used only in emergencies.

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- (2) With pressure defueling (boost pumps operate), or with pressure and suction together, you can defuel all of the fuel tanks to the level of the sump drain valves.
- (3) The airplane usually must have the correct attitude (0 degree wing roll, 1.14 degree pitch nose down) to defuel it correctly.
- (4) To completely defuel the center tank, do these steps:
 - (a) Adjust the airplane to 0-degree roll, +2 degrees pitch, nose up, if it is possible.
NOTE: This will minimize the quantity of fuel that remains in the center tank.
 - (b) Make sure the No. 1 tank has sufficient capacity available for the fuel to be scavenged from the center tank.
NOTE: The scavenge systems operates only when the No. 1 tank fuel quantity is less than 5000 lb (2268 kg).
 - (c) Operate the forward No. 1 fuel boost pump to supply the motive flow during fuel scavenging.
- (5) If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

B. References

Reference	Title
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
20-40-11-760-801	Electrical Bonding (P/B 201)
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-21-11-000-801	Fueling Receptacle Removal (P/B 401)
28-21-11-400-801	Fueling Receptacle Installation (P/B 401)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
33-18-00-710-802	Master Dim and Test - Operational Test (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D50248	Oil - Instrument, Aircraft, Low Volatility	MIL-PRF-6085 (Supersedes MIL-L-6085)

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50



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E. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15
621GB	Refuel Access Panel - Slat Station 143.27

F. Defuel through the Pressure Fueling Receptacle With the Airplane Boost Pumps and the Defueling (Suction) Pump on the Fuel Truck

NOTE: It is necessary to operate the boost pumps.

SUBTASK 28-26-00-860-064



WARNING

OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions (TASK 28-26-00-600-801).

SUBTASK 28-26-00-860-051



CAUTION

DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN A SUFFICIENT QUANTITY OF FUEL IN THE APPLICABLE TANK. DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do not operate an engine-driven or electric motor-driven pump in the hydraulic system if the No. 1 tank or the No. 2 tank has less than 1675 lb (760 kg) of fuel (TASK 29-11-00-860-801).

SUBTASK 28-26-00-860-001

- (3) Bond the fueling vehicle to the airplane (TASK 20-40-11-760-801).

SUBTASK 28-26-00-860-002

- (4) Connect the electrical power to the airplane (TASK 24-22-00-860-811).

NOTE: If you are not scheduled to defuel the No. 1 tank fully, you can use the APU to supply electrical power. You must have a minimum quantity of fuel in the No. 1 tank to use the APU (TASK 49-11-00-860-801). Also, the APU can be shutdown while defueling.

SUBTASK 28-26-00-860-003

- (5) Make sure all circuit breakers for the fuel system on the P6 panel are closed.

SUBTASK 28-26-00-710-002

- (6) Do the master dim and test system operational test (TASK 33-18-00-710-802).

NOTE: Make sure the fuel pump low pressure lights are operative.

SUBTASK 28-26-00-860-004

- (7) If you are scheduled to defuel the No. 1 tank or the center tank, do these steps:

- (a) Set the crossfeed valve switch on the P5 panel to OPEN.
- (b) Make sure the valve position light is on dim (blue).

SUBTASK 28-26-00-010-001

- (8) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-020-001

- (9) Remove the cap on the fueling receptacle (if installed).

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SUBTASK 28-26-00-480-002



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (10) Do an inspection of the fueling receptacle before you connect the defueling hose nozzle:
- Make sure that the fueling receptacle is clean, not damaged and there are no fuel leaks.
 - Make sure that the screws, lugs, and slots are not loose or damaged.
 - If there is a problem with the fueling receptacle, replace the fueling receptacle (TASK 28-21-11-000-801 and TASK 28-21-11-400-801).



CAUTION

MAKE SURE THAT THE HOSE NOZZLE AND HOSE-END CONTROL VALVE ARE IN THE CORRECT CONFIGURATION. REFER TO THE SUPPLIER'S MAINTENANCE MANUAL FOR PROCEDURES. IF YOU DO NOT, IT COULD CAUSE DAMAGE TO THE AIRPLANE.

- Connect defueling hose nozzle to the fueling receptacle.

SUBTASK 28-26-00-860-005

- (11) Open the shutoff handle on the defueling hose nozzle.

NOTE: The defueling nozzle must have a filter screen.

SUBTASK 28-26-00-860-006

- (12) Make sure the two spar valves are closed.

SUBTASK 28-26-00-860-007

- (13) Make sure the switches for the fueling shutoff valves on the P15 panel are in the CLOSED position.

SUBTASK 28-26-00-860-008

- (14) Make sure the valve position lights are off.

SUBTASK 28-26-00-970-001

- (15) Make sure you know the correct quantity of fuel in the tanks.

- Write the fuel quantity for the tank or the tanks that you are scheduled to defuel.
- Hold the test switch on the P15 panel in the TEST GAGES position for one second.

NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

- Release the switch.
- Make sure the indicator goes back to its initial value with a tolerance of \pm 10 pounds (\pm 10 kilograms).

SUBTASK 28-26-00-010-002

- (16) Open this access panel:

(Figure 202)

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Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

SUBTASK 28-26-00-860-009

- (17) Open the defueling valve.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

SUBTASK 28-26-00-860-010

- (18) Set the crossfeed valve control on the P5 panel to open the crossfeed valve.

NOTE: If you are scheduled to defuel the No. 2 tank (right side), it is not necessary to open or to close the crossfeed valve.

- (a) Make sure the valve position light is on dim (blue).

SUBTASK 28-26-00-860-055



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (19) Obey these fuel pump limitations during the pump operation:

- (a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
- (b) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on unless there is a reduced back-pressure condition.

NOTE: When you defuel or transfer with minimum back-pressure to the pumps, it is possible for the LOW PRESSURE light(s) to come on. In this case, monitor tank quantity and set the pump switch to OFF if tank quantity is not changing.

- 1) If one LOW PRESSURE light comes on because of a reduced back-pressure condition, do these steps:
 - a) Put the applicable fuel boost pump switch to OFF and continue defueling.
 - b) If the remaining LOW PRESSURE light for the fuel boost pump switch for the tank comes on, monitor the tank quantity.
 - c) If the fuel quantity for the tank does not change, then immediately set the fuel boost pump switch to OFF.
 - d) For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
 - e) If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).
- 2) If two LOW PRESSURE lights for the fuel boost pump switches in the tank come on at the same time, do these steps:
 - a) For the No. 1 or No. 2 tanks, put the AFT fuel boost pump switch to OFF and continue to monitor the tank quantity.
 - b) For the center tank, put one of the fuel boost pump switches to OFF and continue to monitor the tank quantity.

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- c) If the fuel quantity in the tank does not change, immediately put the remaining fuel boost pump switch to OFF.
 - d) For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
 - e) If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).
- (c) If the automatic shutoff system for the center tank boost pump turns off the center tank boost pump(s) because of a reduced back-pressure condition, and no passengers on board or will leave at least 2000 lb (907 kg) in the center tank, do these steps:
- 1) On the P5 Overhead Panel, set the switches for all main tank boost pumps to the OFF position.
 - 2) Open the indicated circuit breakers and install safety tags:
- F/O Electrical System Panel, P6-3**
- | <u>Row</u> | <u>Col</u> | <u>Number</u> | <u>Name</u> |
|------------|------------|---------------|--------------------------------------|
| C | 3 | C01637 | BOOST PMP CTR TNK L AUTO SHUT OFF-DC |
| C | 7 | C01638 | BOOST PMP CTR TNK R AUTO SHUT OFF-DC |
- 3) Continue from where you were last in the fuel transfer procedure.
- (d) Do these steps to defuel an airplane with passengers on board:
- 1) Do not let the fuel quantity in a main fuel tank become less than 2000 lb (907 kg).
 - 2) If the automatic shutoff system for the center tank boost pump is disabled, do not let the fuel quantity in the center fuel tank become less than 2000 lb (907 kg).

SUBTASK 28-26-00-860-011

- (20) On the P5 panel, set the switches for the fuel boost pumps to the positions shown in this table:

Table 201/28-26-00-993-801

	SWITCH POSITION FOR DEFUELING		
	TANK NO. 1	TANK NO. 2	CENTER TANK
FUEL PUMPS AFT 1	ON	OFF	OFF
FUEL PUMPS FWD 1	ON	OFF	OFF
FUEL PUMPS AFT 2	OFF	ON	OFF
FUEL PUMPS FWD 2	OFF	ON	OFF
FUEL PUMPS L CTR	OFF	OFF	ON
FUEL PUMPS R CTR	OFF	OFF	ON

SUBTASK 28-26-00-650-001

- (21) Start the defueling pump on the refuel truck.

SUBTASK 28-26-00-650-002

- (22) Defuel the applicable tank until the fuel quantity indicator shows the specified quantity of fuel in the tank.
- (a) You can also defuel the tank until the applicable boost pump LOW PRESSURE light goes on.
 - (b) Set the applicable boost pump switches to OFF.

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SUBTASK 28-26-00-860-012

- (23) On the P5 panel, set the switch for the fuel crossfeed valve to CLOSE.
 - (a) Make sure the position light is bright when the valve position changes.
 - (b) Make sure the position light goes off when the valve is closed.

SUBTASK 28-26-00-860-013

- (24) Stop the defueling pump on the fuel truck.

SUBTASK 28-26-00-860-014

- (25) Close the defueling valve.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

SUBTASK 28-26-00-860-062

- (26) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

SUBTASK 28-26-00-410-001

- (27) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
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621EB	Defuel Access Panel - Slat Station 95.15
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SUBTASK 28-26-00-860-015

- (28) Close the fuel shutoff handle on the hose nozzle.

SUBTASK 28-26-00-080-001

- (29) Disconnect the nozzle of the defueling hose from the fueling receptacle.

SUBTASK 28-26-00-080-007

- (30) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-40-11-760-801).

SUBTASK 28-26-00-420-001

- (31) Put the cap on the fueling receptacle (if installed).

SUBTASK 28-26-00-410-002

- (32) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
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621GB	Refuel Access Panel - Slat Station 143.27
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SUBTASK 28-26-00-860-016

- (33) If it is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-26-00-680-001

- (34) Do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.



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G. Defuel through Pressure Fueling Receptacle With the Airplane Boost Pump Only

SUBTASK 28-26-00-860-065



WARNING

OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions (TASK 28-26-00-600-801).

SUBTASK 28-26-00-860-052



CAUTION

DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN A SUFFICIENT QUANTITY OF FUEL IN THE APPLICABLE TANK. DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do not operate an engine-driven or electric motor-driven pump in the hydraulic system if the No. 1 tank or the No. 2 tank has less than 1675 lb (760 kg) of fuel (TASK 29-11-00-860-801).

SUBTASK 28-26-00-480-006

- (3) Electrically ground the airplane and the fueling vehicle (TASK 20-40-11-910-801).

SUBTASK 28-26-00-860-017

- (4) Bond the fueling source to the airplane (TASK 20-40-11-760-801).

SUBTASK 28-26-00-860-018

- (5) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

NOTE: If you are not scheduled to defuel the No. 1 tank fully, you can use the APU to supply electrical power. You must have a minimum quantity of fuel in the No. 1 tank to use the APU (TASK 49-11-00-860-801). Also, the APU can be shutdown while defueling.

SUBTASK 28-26-00-860-019

- (6) Make sure all circuit breakers for the fuel system on the P6 panel are closed.

SUBTASK 28-26-00-860-020

- (7) If you are scheduled to defuel the No. 1 tank or the center tank, do these steps:

- Set the crossfeed valve switch on the P5 panel to OPEN.
- Make sure the valve position light is dim (blue).

SUBTASK 28-26-00-010-003

- (8) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-020-002

- (9) Remove the cap on the fueling receptacle (if installed).

SUBTASK 28-26-00-480-004



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (10) Do an inspection of the fueling receptacle before you connect the defueling hose nozzle:

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- (a) Make sure that the fueling receptacle is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws, lugs, and slots are not loose or damaged.
- (b) If there is a problem with the fueling receptacle, replace the fueling receptacle (TASK 28-21-11-000-801 and TASK 28-21-11-400-801).



MAKE SURE THAT THE HOSE NOZZLE AND HOSE-END CONTROL VALVE ARE IN THE CORRECT CONFIGURATION. REFER TO THE SUPPLIER'S MAINTENANCE MANUAL FOR PROCEDURES. IF YOU DO NOT, IT COULD CAUSE DAMAGE TO THE AIRPLANE.

- (c) Connect defueling hose nozzle to the fueling receptacle.

SUBTASK 28-26-00-860-021

- (11) Open the shutoff handle on the defueling hose nozzle.

NOTE: The defueling nozzle must have a filter screen.

SUBTASK 28-26-00-860-022

- (12) Make sure the two spar valves are closed.

SUBTASK 28-26-00-860-023

- (13) Make sure the switches for the fueling shutoff valves on the P15 panel are in the CLOSED position.

SUBTASK 28-26-00-860-024

- (14) Make sure the valve position lights are off.

SUBTASK 28-26-00-970-002

- (15) Make sure you know the correct quantity of fuel in the tanks.

- (a) Write the fuel quantity for the tank or the tanks that you are scheduled to defuel.
- (b) Hold the test switch on the P15 panel in the TEST GAGES position for one second.

NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

- (c) Release the switch.
- (d) Make sure the indicator goes back to its initial value with a tolerance of \pm 10 pounds (\pm 10 kilograms).

SUBTASK 28-26-00-010-004

- (16) Open this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

(Figure 202).

SUBTASK 28-26-00-860-025

- (17) Open the defueling valve.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

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SUBTASK 28-26-00-860-026

- (18) On the P5 panel, set the switch for the crossfeed valve to OPEN.

NOTE: If you are scheduled to defuel the No. 2 tank (right side), it is not necessary to open or to close the crossfeed valve.

- (a) Make sure the valve position light is on dim (blue).

SUBTASK 28-26-00-860-056



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (19) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

- (a) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on unless there is a reduced back-pressure condition.

NOTE: When you defuel or transfer fuel with minimum back-pressure to the pumps, it is possible for the LOW PRESSURE light(s) to come on. In this case, monitor tank quantity and set the pump switch to OFF if tank quantity is not changing.

- 1) If one LOW PRESSURE light comes on because of a reduced back-pressure condition, do these steps:
 - a) Put the applicable fuel boost pump switch to OFF and continue defueling.
 - b) If the remaining LOW PRESSURE light for the fuel boost pump switch for the tank comes on, monitor the tank quantity.
 - c) If the fuel quantity for the tank does not change, then immediately set the fuel boost pump switch to OFF.
 - d) For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
 - e) If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).
- 2) If two LOW PRESSURE lights for the fuel boost pump switches in the tank come on at the same time, do these tasks:
 - a) For the No. 1 or No. 2 tanks, put the AFT fuel boost pump switch to OFF and continue to monitor the tank quantity.
 - b) For the center tank, put one of the fuel boost pump switches to OFF and continue to monitor the tank quantity.
 - c) If the fuel quantity in the tank does not change, immediately put the remaining fuel boost pump switch to OFF.
 - d) For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
 - e) If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).

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- (b) If the automatic shutoff system for the center tank boost pump turns off the center tank boost pump(s) because of a reduced back-pressure condition, and no passengers on board or will leave at least 2000 lb (907 kg) in the center tank, do these steps:

- 1) On the P5 Overhead Panel, set the switches for all main tank boost pumps to the OFF position.
- 2) Open the indicated circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

- 3) Continue from where you were last in the fuel transfer procedure.

- (c) Do these steps to defuel an airplane with passengers on board:
- 1) Do not let the fuel quantity in a main fuel tank become less than 2000 lb (907 kg).
 - 2) If the automatic shutoff system for the center tank boost pump is disabled, do not let the fuel quantity in the center fuel tank become less than 2000 lb (907 kg).

SUBTASK 28-26-00-860-027

- (20) On the P5 panel, set the switches for the fuel boost pumps to the positions shown in this table:

Table 202/28-26-00-993-802

	SWITCH POSITION FOR DEFUELING		
	TANK NO. 1	TANK NO. 2	CENTER TANK
FUEL PUMPS AFT 1	ON	OFF	OFF
FUEL PUMPS FWD 1	ON	OFF	OFF
FUEL PUMPS AFT 2	OFF	ON	OFF
FUEL PUMPS FWD 2	OFF	ON	OFF
FUEL PUMPS L CTR	OFF	OFF	ON
FUEL PUMPS R CTR	OFF	OFF	ON

SUBTASK 28-26-00-650-003

- (21) Defuel the applicable tank until the fuel quantity indicator shows the specified quantity of fuel in the tank.

SUBTASK 28-26-00-860-028

- (22) Close the crossfeed valve with the applicable switch on the P5 panel.

SUBTASK 28-26-00-860-029

- (23) Close the defueling valve.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

SUBTASK 28-26-00-860-061

- (24) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC

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(Continued)

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

SUBTASK 28-26-00-410-003

- (25) Close this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

SUBTASK 28-26-00-860-030

- (26) Close the fuel shutoff handle on the hose nozzle.

SUBTASK 28-26-00-080-003

- (27) Disconnect the nozzle of the defueling hose from the fueling receptacle.

SUBTASK 28-26-00-420-002

- (28) Put the cap on the fueling receptacle (if installed).

SUBTASK 28-26-00-080-008

- (29) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-40-11-760-801).

SUBTASK 28-26-00-860-031

- (30) If electrical power is not necessary for other tasks, (TASK 24-22-00-860-812)

SUBTASK 28-26-00-680-002

- (31) Do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.

H. Defuel the No. 2 Tank through Pressure Fueling Receptacles With the Fuel Truck Defueling (Suction) Pump Only

NOTE: This defueling procedure can only be used on the No. 2 tank. Use it only in an emergency when you cannot use electrical power on the airplane. The defueling nozzle must have a filter screen.

NOTE: The recommended procedures for defueling are given above: (1) Defuel through the Pressure Fueling Receptacle With the Airplane Boost Pumps and the Defueling (Suction) Pump on the Fuel Truck (2) Defuel through Pressure Fueling Receptacle With the Airplane Boost Pump Only.

SUBTASK 28-26-00-860-053



CAUTION

DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN A SUFFICIENT QUANTITY OF FUEL IN THE APPLICABLE TANK. DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do not operate an engine-driven or electric motor-driven pump in the hydraulic system if the No. 1 tank or the No. 2 tank has less than 1675 lb (760 kg) of fuel (TASK 29-11-00-860-801).

SUBTASK 28-26-00-860-032

- (2) Electrically ground the airplane and the fuel truck (TASK 20-40-11-910-801).

SUBTASK 28-26-00-010-005

- (3) Open this access panel:

(Figure 202)

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Number **Name/Location**

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-020-003

- (4) Remove the cap on the fueling receptacle (if installed).

SUBTASK 28-26-00-480-005



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Do an inspection of the fueling receptacle before you connect the defueling hose nozzle:

- (a) Make sure that the fueling receptacle is clean, not damaged and there are no fuel leaks.
 1) Make sure that the screws, lugs, and slots are not loose or damaged.
(b) If there is a problem with the fueling receptacle, replace the fueling receptacle (TASK 28-21-11-000-801 and TASK 28-21-11-400-801).



CAUTION

MAKE SURE THAT THE HOSE NOZZLE AND HOSE-END CONTROL VALVE ARE IN THE CORRECT CONFIGURATION. REFER TO THE SUPPLIER'S MAINTENANCE MANUAL FOR PROCEDURES. IF YOU DO NOT, IT COULD CAUSE DAMAGE TO THE AIRPLANE.

- (c) Connect defueling hose nozzle to the fueling receptacle.

SUBTASK 28-26-00-860-034

- (6) Open the shutoff handle on the hose nozzle.

SUBTASK 28-26-00-010-006

- (7) Open this access panel:

(Figure 202)

Number **Name/Location**

621EB Defuel Access Panel - Slat Station 95.15

SUBTASK 28-26-00-860-035

- (8) Set the defueling valve to the OPEN position.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

SUBTASK 28-26-00-860-036

- (9) Make sure the crossfeed valve is closed.

SUBTASK 28-26-00-650-004

- (10) Start the defueling operation.

NOTE: If it is not easy to get fuel to flow from the airplane, use the fuel truck to pump the airplane lines full of fuel (pressure-prime) then start the defueling pumps on the fuel truck.

- (a) Use the pump on the fuel truck to fill the airplane fuel lines with fuel (pressure prime).
(b) Start the defueling pumps on the fuel truck.

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SUBTASK 28-26-00-650-005

- (11) Continue to defuel the airplane until the fuel measuring sticks show the correct quantity of fuel in the No. 2 tank.
 - (a) You can also continue to defuel the airplane until the flowmeter on the fuel truck shows no fuel flow.

SUBTASK 28-26-00-650-006

- (12) Stop the defueling pump on the fuel truck.

SUBTASK 28-26-00-860-037

- (13) Close the defueling valve.

NOTE: If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.

SUBTASK 28-26-00-410-004

- (14) Close this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

SUBTASK 28-26-00-860-038

- (15) Close the shutoff handle on the nozzle of the fuel hose.

SUBTASK 28-26-00-080-006

- (16) Disconnect the defueling hose nozzle.

SUBTASK 28-26-00-420-003

- (17) Put the cap on the fueling receptacle (if installed).

SUBTASK 28-26-00-080-009

- (18) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-40-11-760-801).

SUBTASK 28-26-00-080-010

- (19) Disconnect the ground cables from the fueling source and the airplane (TASK 20-40-11-910-801).

SUBTASK 28-26-00-410-005

- (20) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-410-006

- (21) Install the access panels that you removed before this step (TASK 28-11-11-400-801).

SUBTASK 28-26-00-650-007

- (22) If you are scheduled to defuel the tanks completely, do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.

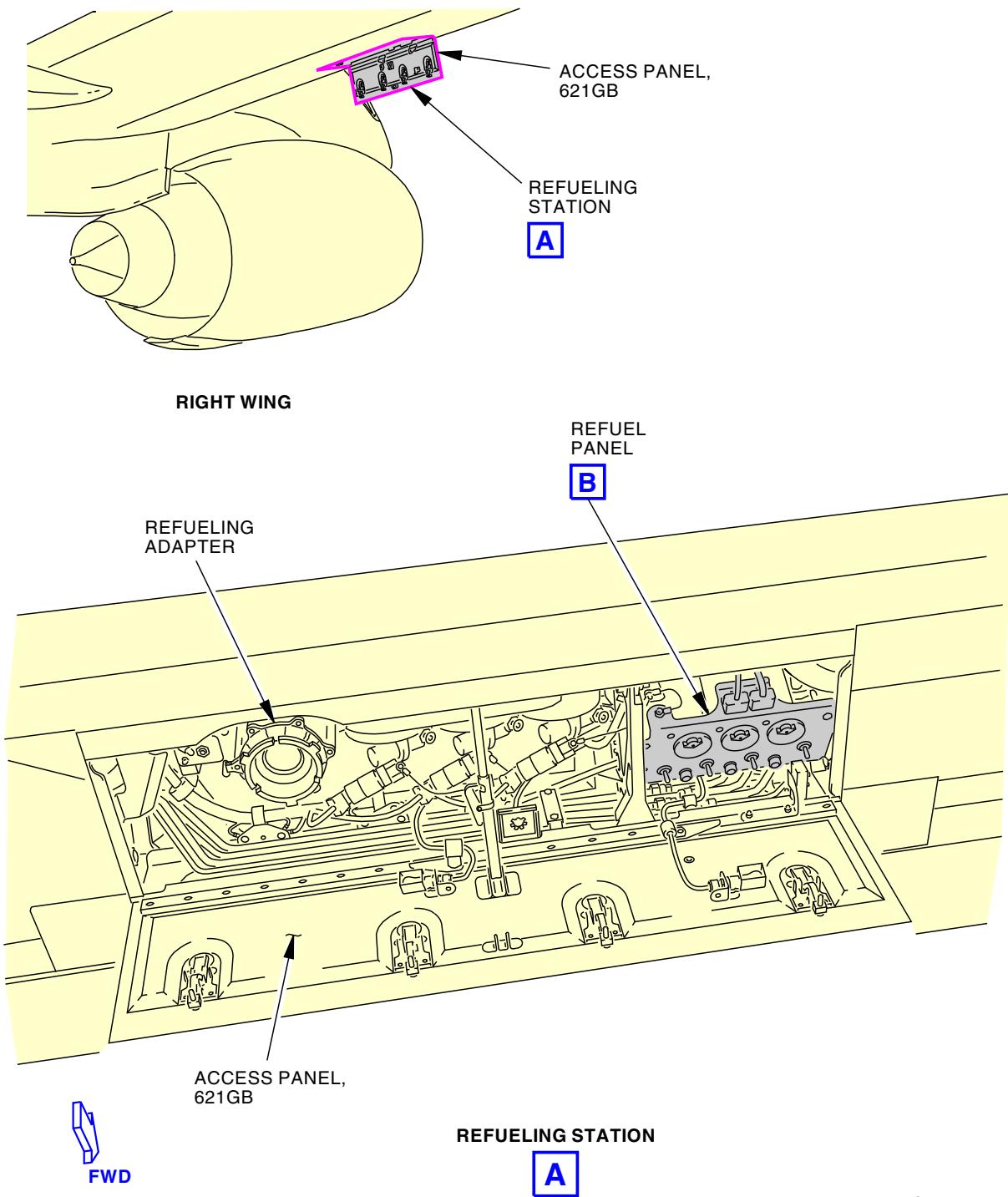
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Refueling Station Component Location
Figure 201/28-26-00-990-804 (Sheet 1 of 2)

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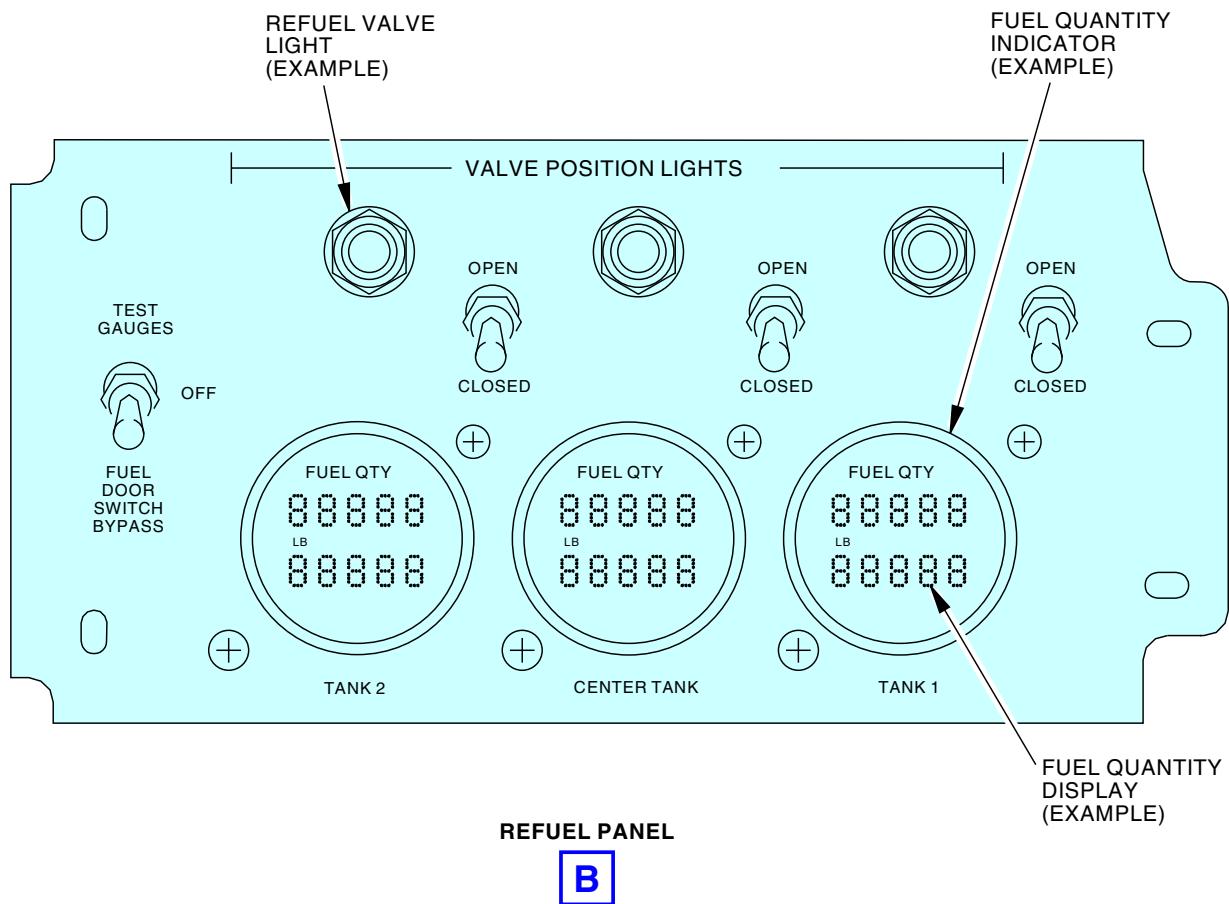
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Refueling Station Component Location
Figure 201/28-26-00-990-804 (Sheet 2 of 2)

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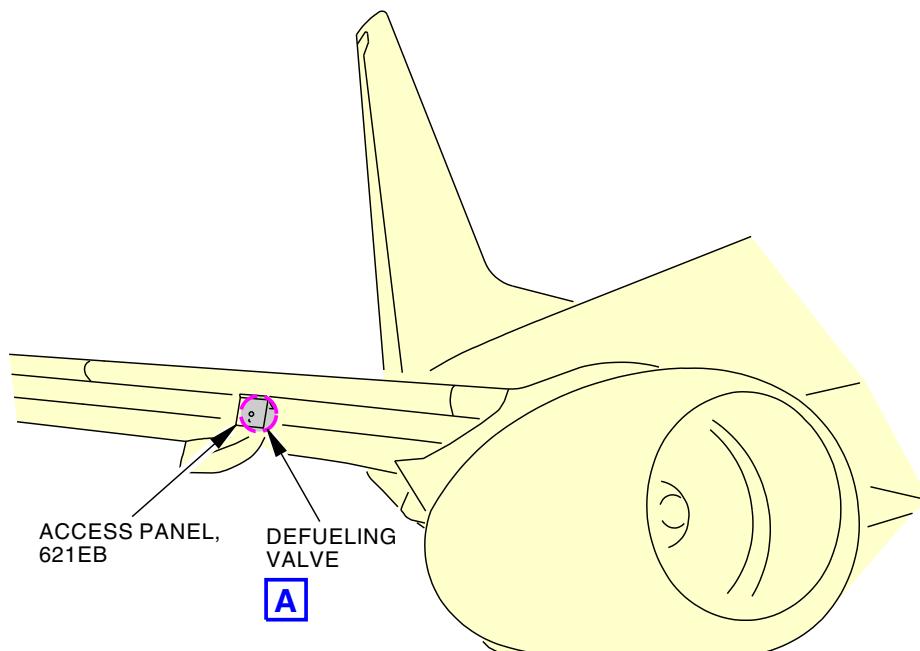
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

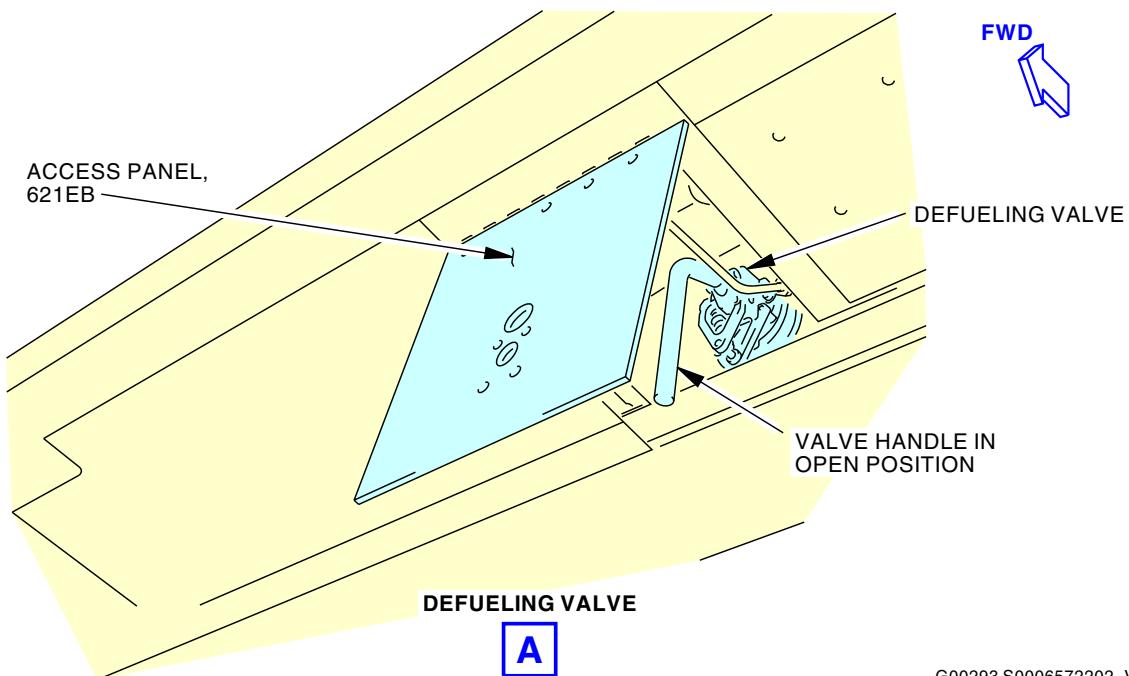
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RIGHT WING



G00293 S0006572202_V2

Defueling Valve Component Location
Figure 202/28-26-00-990-805

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TASK 28-26-00-650-802

4. Tank to Tank Fuel Transfer

A. General

- (1) If it is necessary to defuel only one of the tanks, you can move the fuel from that tank to a different tank. There are no limits on the permitted difference in the fuel quantities of the two main tanks. One main tank can be full while the other main tank is empty. For example, you can use this procedure when you must repair a fuel leak. The procedure is almost the same as the procedure to defuel the tank with the boost pumps.
- (2) Make sure that you monitor the fuel quantity in each tank when you move the fuel from one tank to a different tank.
- (3) If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248. If that does not decrease the force necessary to move the defueling valve, remove and replace the defueling valve.
- (4) An unexpected fuel transfer from the center tank to the No. 1 tank can occur during maintenance.
 - (a) To prevent fuel transfer from the center tank to the No. 1 tank through the fuel scavange system, do not put more than 23,000 lb (10,433 kg) of fuel in the center tank when the No. 1 tank is empty for maintenance.

NOTE: The fuel transfer will stop with less than 25,000 lb (11,340 kg) of fuel.

NOTE: It is recommended to use 23,000 lb (10,433 kg) for variations in airplane pitch and roll attitude while maintenance is done.

B. References

Reference	Title
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
33-18-00-710-802	Master Dim and Test - Operational Test (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D50248	Oil - Instrument, Aircraft, Low Volatility	MIL-PRF-6085 (Supersedes MIL-L-6085)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15
621GB	Refuel Access Panel - Slat Station 143.27



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F. Procedure

(Figure 201)

SUBTASK 28-26-00-860-066



WARNING

OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Make sure that you read and obey the precautions: Precautions and Limits for the Defuel Operation, TASK 28-26-00-600-801.

SUBTASK 28-26-00-860-054



CAUTION

DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN A SUFFICIENT QUANTITY OF FUEL IN THE APPLICABLE TANK. DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do not operate an engine-driven or electric motor-driven pump in the hydraulic system if the No. 1 tank or the No. 2 tank has less than 1675 lb (760 kg) of fuel (TASK 29-11-00-860-801).

SUBTASK 28-26-00-860-039

- (3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.
- (a) If you are not scheduled to defuel the No. 1 tank fully, you can supply power with the Auxiliary Power Unit (APU):
- 1) Make sure that you check the minimum fuel quantities and other applicable data before you start the APU.
 - 2) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

SUBTASK 28-26-00-860-040

- (4) On the P6 panel, make sure that all the circuit breakers for the fuel system are closed.

SUBTASK 28-26-00-710-003

- (5) Do the master dim and test system operational test: Master Dim and Test - Operational Test, TASK 33-18-00-710-802.
- (a) Make sure that the fuel pump low pressure lights operate.

SUBTASK 28-26-00-860-041

- (6) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 28-26-00-860-074

- (7) Make sure that ENGINE 1 and ENGINE 2 start levers are in the CUTOFF position.

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SUBTASK 28-26-00-860-042

- (8) If you are scheduled to transfer fuel out of the No. 2 tank, make sure that the crossfeed valve switch is in the CLOSE position.

SUBTASK 28-26-00-860-043

- (9) If you are scheduled to transfer fuel out of the No. 1 tank or the center tank, set the crossfeed valve switch to the OPEN position.

SUBTASK 28-26-00-610-001

- (10) Make sure that the technician at the Refuel Panel maintains direct communication with the technician in the Flight Deck at all times while transferring fuel between tanks.

NOTE: Two technicians are required for tank to tank transfer of the fuel.

SUBTASK 28-26-00-010-007

- (11) Open this access panel for the refuel station:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-710-001

- (12) Set each fueling valve switch to OPEN.

- (a) Make sure that the REFUEL LIGHT for the valve comes on, then set each switch to CLOSED.

SUBTASK 28-26-00-860-044

- (13) Find the fueling valve switch for the tank that will get the fuel that you are scheduled to transfer.

- (a) Set the fueling valve switch to OPEN.

- (b) Make sure that all the other fueling valve switches are in the CLOSE position.

SUBTASK 28-26-00-010-008

- (14) Open this access panel for the defueling valve:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

- (a) Set the defueling valve handle to OPEN:

- 1) If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248.
- 2) If the defueling valve handle continues to be hard to operate, replace the defueling valve.

SUBTASK 28-26-00-860-058



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)



WARNING

MONITOR THE INDICATORS ON THE P15 REFUEL PANEL FOR FLASHING FUEL QUANTITY INDICATORS. IF A FUEL QUANTITY INDICATION STARTS TO FLASH, THIS SHOWS THAT THE FUEL TANK IS FULL AND CAN OVERFLOW. CONTINUED FUELING CAN CAUSE FUEL TO SPILL. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

- (15) Make sure that you obey these fuel pump limitations during the pump operation:
- Make sure that you are in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

NOTE: The float switch in each fuel tank closes each refuel shutoff valve when each tank is filled to the maximum approved volume.

 - Monitor the refueling panel at all times, from the start to the finish of the refueling process.
 - If a flashing fuel quantity indication is observed during this process, stop refueling the aircraft immediately.

NOTE: A flashing indicator is defined as an indicator alternating between displaying the fuel quantity and blank at one second intervals.
 - Only set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on unless there is a reduced back-pressure condition.

NOTE: When you defuel or transfer fuel with minimum back-pressure to the pumps, the LOW PRESSURE light(s) can come on.

 - If the LOW PRESSURE light(s) come on, make sure that you monitor the tank quantity:
 - Set the pump switch to OFF if the tank quantity does not change.
 - If one LOW PRESSURE light comes on because of a reduced back-pressure condition, do these steps:
 - Put the applicable fuel boost pump switch to OFF and continue defueling.
 - If the remaining LOW PRESSURE light for the fuel boost pump switch for the tank comes on, monitor the tank quantity.
 - If the fuel quantity for the fuel tank does not change, then immediately set the fuel pump switch(es) to OFF.
 - For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
 - If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).
 - If two LOW PRESSURE lights for the fuel boost pump switches in the tank come on at the same time, do these steps:
 - For the No. 1 or No. 2 tanks, put the AFT fuel boost pump switch to OFF and continue to monitor the tank quantity.
 - For the center tank, put one of the fuel boost pump switches to OFF and continue to monitor the tank quantity.

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- c) If the fuel quantity in the tank does not change, immediately put the remaining fuel boost pump switch to OFF.
- d) For the No. 1 or No. 2 tank, do not operate the main boost pumps with fuel quantities less than 100 lb (45 kg).
- e) If the automatic shutoff system for the center tank boost pump is disabled, do not operate the center tank boost pumps with fuel quantities less than 2000 lb (907 kg).
- 4) If the center tank boost pump automatic shutoff system turns off the center tank boost pump(s) because of a reduced back-pressure condition, refer to Table 203 to do these steps:

NOTE: The table contains a list of configurations into which you can put the airplane. Configuration A shows the basic conditions to use when the automatic shutoff system does not cause problems.

Table 203/28-26-00-993-804

	Configuration						
	A	B	C	D	E	F	G
FUEL PUMPS AFT 1	OFF	ON	OFF	OFF	ON	OFF	OFF
FUEL PUMPS FWD 1	OFF	ON	OFF	OFF	ON	OFF	OFF
FUEL PUMPS AFT 2	OFF	OFF	ON	OFF	OFF	ON	OFF
FUEL PUMPS FWD 2	OFF	OFF	ON	OFF	OFF	ON	OFF
FUEL PUMPS L CTR	ON	ON	ON	ON	ON	ON	ON
FUEL PUMPS R CTR	ON	ON	ON	ON	ON	ON	ON
DEFUELING VALVE ^[1]	OPEN	OPEN	OPEN	½	½	½	OPEN
Circuit Breaker C01637 ^[2]	X	X	X	X	X	X	O
Circuit Breaker C01638 ^[2]	X	X	X	X	X	X	O
Circuit Breaker C01639 ^[2]	X	X	X	X	X	X	O
Circuit Breaker C01640 ^[2]	X	X	X	X	X	X	O

*[1] ½ = "half-open/half-closed"

*[2] X = "closed", O = "open"

- a) Turn on the fuel boost pumps for the tank that will receive the fuel.

NOTE: Turning on the main tank boost pumps will increase back-pressure to the center tank boost pumps.

 - <1> If you must transfer fuel from the center tank into the No. 1 tank, put the airplane in configuration B.
 - <2> If you must transfer fuel from the center tank into the No. 2 tank, put the airplane in configuration C.
 - <3> Continue from where you were last in the fuel transfer procedure.
- b) If the main tank boost pumps did not solve the problem, do these steps to put the airplane in configuration D:
 - <1> On the P5 Overhead Panel, set the switches for the applicable main tank boost pumps to the OFF position.

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- <2> Manually set the defueling valve to a half-open/half-closed position.
- <3> Continue from where you were last in the fuel transfer procedure.
- c) If adjusting the defueling valve did not solve the problem, do these steps:
 - <1> Keep the defueling valve in the half-open/half-closed position.
 - <2> Set the applicable fuel pump switches, on the P5 Overhead Panel, to the positions indicated in Table 203.
 - <a> If you must transfer fuel from the center tank into the No. 1 tank, put the airplane in configuration E.
 - If you must transfer fuel from the center tank into the No. 2 tank, put the airplane in configuration F.
 - <3> Continue from where you were last in the fuel transfer procedure.
- d) If the automatic shutoff system continues to prevent the fuel transfer, do these steps to put the airplane in configuration G:
 - <1> On the P5 Overhead Panel, set the switches for all main tank boost pumps to the OFF position.
 - <2> Set the defueling valve to the OPEN position:
 - <a> If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248.
 - If the defueling valve handle continues to be hard to operate, replace the defueling valve.
 - <3> Open the indicated circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

- <4> Continue from where you were last in the fuel transfer procedure.



OBEY THE SAFETY PRECAUTIONS WHILE PASSENGERS ARE ONBOARD THE AIRCRAFT. MAKE SURE THAT THE FUEL LEVEL DOES NOT BECOME LESS THAN 2000 LB (907 KG). IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Do these steps to transfer fuel with passengers on board:
 - 1) Do not let the fuel quantity in a main fuel tank become less than 2000 lb (907 kg).
 - 2) If the automatic shutoff system for the center tank boost pump is disabled, do not let the fuel quantity in the center fuel tank become less than 2000 lb (907 kg).

SUBTASK 28-26-00-860-045

- (16) To move fuel out of a tank, use this table to set the boost pump switch positions to remove the fuel from that tank:

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Table 204/28-26-00-993-803

FUEL BOOST PUMP SWITCH	SWITCH POSITION FOR DEFUELING		
	TANK NO. 1	TANK NO. 2	CENTER TANK
FUEL PUMPS AFT 1	ON	OFF	OFF
FUEL PUMPS FWD 1	ON	OFF	OFF
FUEL PUMPS AFT 2	OFF	ON	OFF
FUEL PUMPS FWD 2	OFF	ON	OFF
FUEL PUMPS L CTR	OFF	OFF	ON
FUEL PUMPS R CTR	OFF	OFF	ON

SUBTASK 28-26-00-650-008

- (17) Continue to move the fuel until the fuel quantity indicator shows the necessary quantity of remaining fuel in the tank.
 - (a) You can also monitor the applicable low pressure light to show when the applicable tank is empty.
 - (b) When the applicable low pressure lights come on, the applicable tank is empty.
 - (c) Set the applicable boost pump switches to OFF.

SUBTASK 28-26-00-860-059

- (18) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

SUBTASK 28-26-00-860-046

- (19) On the refuel panel P15, set the fueling valve switches to the CLOSE positions.

SUBTASK 28-26-00-410-007

- (20) Close this access panel for the refuel station:

<u>Number</u>	<u>Name/Location</u>
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-26-00-860-047

- (21) Close the defueling valve:

- (a) If the defueling valve handle is hard to operate, lubricate the mechanism with aircraft instrument oil, D50248.
- (b) If the defueling valve handle continues to be hard to operate, replace the defueling valve.

SUBTASK 28-26-00-410-008

- (22) Close this access panel for the defueling valve:

<u>Number</u>	<u>Name/Location</u>
621EB	Defuel Access Panel - Slat Station 95.15

SUBTASK 28-26-00-860-048

- (23) Set the crossfeed valve switch to the CLOSE position if you opened it before this step.

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SUBTASK 28-26-00-860-049

- (24) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 28-26-00-680-003

- (25) If you are scheduled to drain the sump fuel, do this task: Drain the Fuel from the Sumps after Defueling, TASK 12-11-00-650-804.

———— END OF TASK ————

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DEFUELING VALVE - REMOVAL/INSTALLATION

1. General

- A. The defueling valve has these three primary assemblies:
 - (1) The actuator handle assembly
 - (2) The adapter shaft
 - (3) The valve body
- B. This procedure has seven tasks:
 - (1) The removal actuator handle assembly
 - (2) The installation of the actuator handle assembly
 - (3) The removal of the adapter shaft
 - (4) The installation of the adapter shaft
 - (5) The alignment of the adapter shaft
 - (6) The removal of the valve body
 - (7) The installation of the valve body
- C. You must fully defuel and purge the No. 2 tank to remove the adapter shaft or the valve body.

TASK 28-26-11-010-801

2. Actuator Handle Assembly Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Actuator Handle Assembly.

B. Consumable Materials

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15

E. Prepare for the Removal

SUBTASK 28-26-11-010-001

- (1) Open this access panel to get access to the defueling valve actuator handle:

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15

NOTE: The access door is on the forward side of the front spar and on the outboard side of the No. 2 engine.

SUBTASK 28-26-11-860-001

- (2) Make sure the actuator handle is in the closed position.

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F. Procedure

SUBTASK 28-26-11-020-012

- (1) Remove the lockwire, G01505.

SUBTASK 28-26-11-020-001

- (2) Remove the mounting screws [1] and washers [2] that attach the defueling valve handle [6] to the index plate [4].

SUBTASK 28-26-11-020-002

- (3) Carefully remove the defueling valve handle [6] from the opening in the front spar.

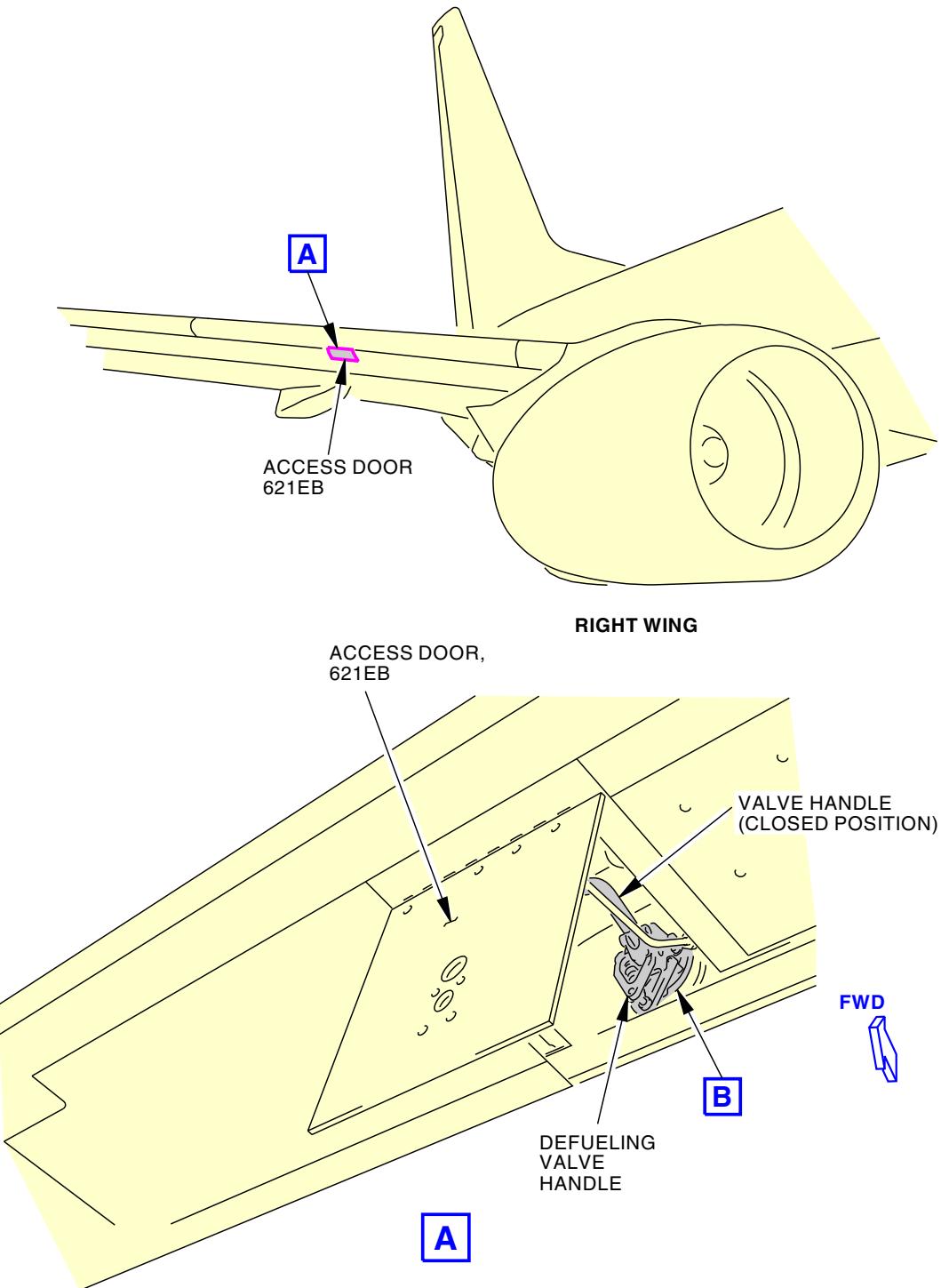
SUBTASK 28-26-11-420-001

- (4) Make sure you did not move the adapter shaft if you are not scheduled to remove the adapter shaft.

———— END OF TASK ————

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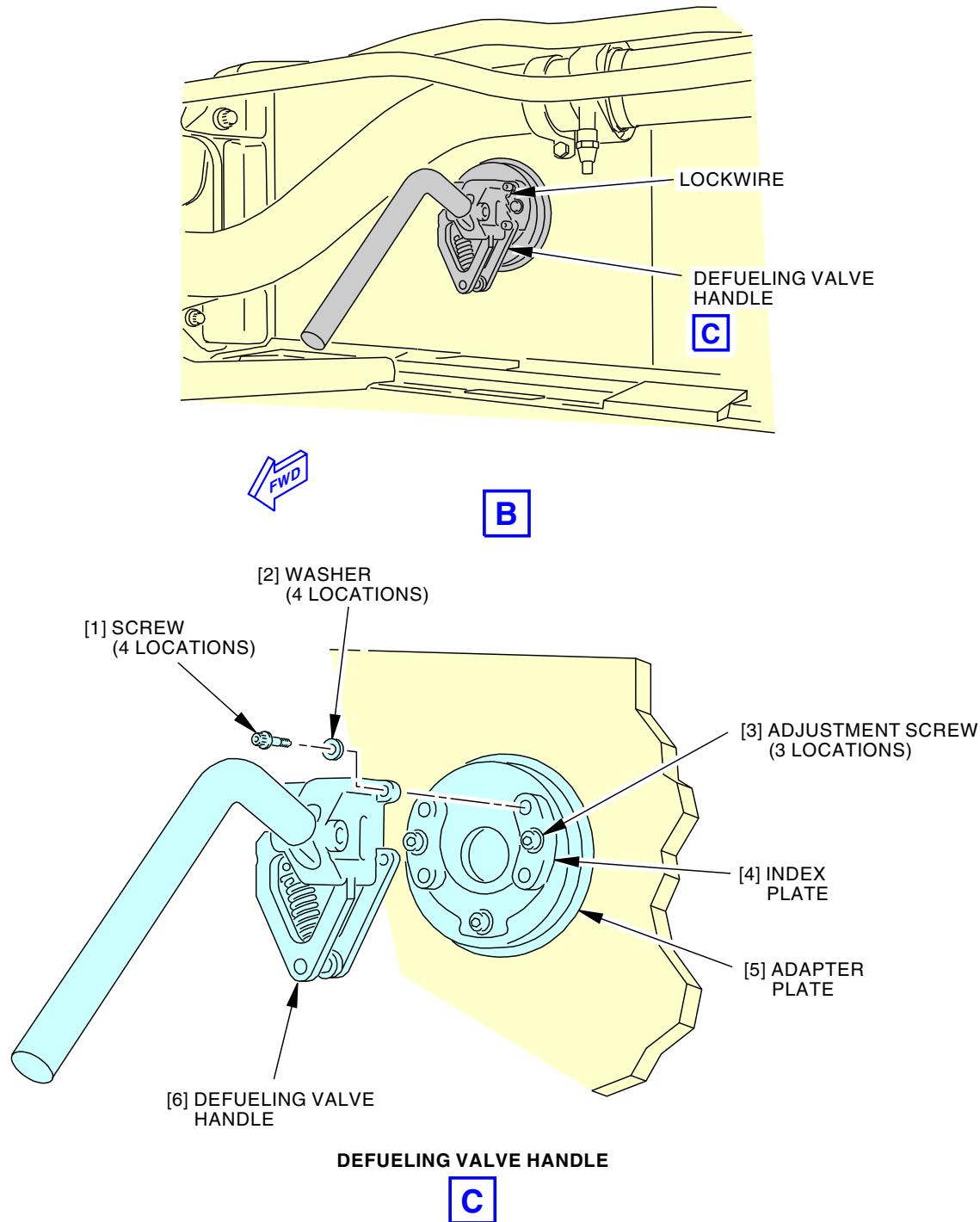


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Defueling Valve Handle Installation
Figure 401/28-26-11-990-804 (Sheet 1 of 2)

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Defueling Valve Handle Installation
Figure 401/28-26-11-990-804 (Sheet 2 of 2)

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TASK 28-26-11-400-801

3. Actuator Handle Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Actuator Handle.

B. References

Reference	Title
51-31-00-390-805	Fastener Seal Application (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
G01505	Lockwire - Safety And Lock	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Defueling valve handle	28-21-52-05A-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-21-52-09-030	LOM 447, 450-999

E. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15

G. Defueling Valve Actuator Handle Installation

SUBTASK 28-26-11-860-002

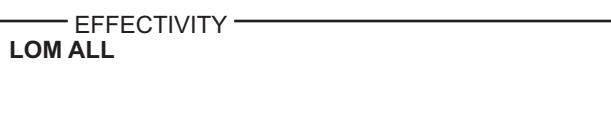
- (1) Move the handle on the actuator handle assembly to the closed position.

SUBTASK 28-26-11-420-002

- (2) Put the mating shaft of the defueling valve handle [6] on the adapter shaft.
- (a) Make sure the two teeth spaces on the adapter shaft align with the mating shaft of the actuator handle.
- NOTE: The mounting feet on the defueling valve actuator automatically align with the mounting points on the index plate.

SUBTASK 28-26-11-420-003

- (3) Do these steps to attach the defueling valve handle [6] to the index plate with the mounting screws.
- (a) Install the mounting screws [1] and washers [2].
- (b) Install lockwire, G01505, on the mounting screws [1].
- (c) Seal the mounting screws [1] and washers [2] with sealant, A00247 (TASK 51-31-00-390-805).



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H. Put Airplane Back to Its Usual Condition

SUBTASK 28-26-11-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
621EB	Defuel Access Panel - Slat Station 95.15

———— END OF TASK ————

TASK 28-26-11-010-802

4. Adapter Shaft Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the Adapter Shaft.

B. References

<u>Reference</u>	<u>Title</u>
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-22-21-710-801	Crossfeed Valve Operational Test (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2

D. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

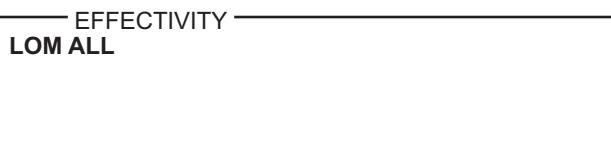
E. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15
632DB	Main Tank Access Door - Wing Station 313

F. Prepare for the Removal

SUBTASK 28-26-11-860-007

- (1) Do these steps to make sure that the crossfeed valve is closed:
 - (a) Do this task: Crossfeed Valve Operational Test, TASK 28-22-21-710-801.
 - (b) Make sure the crossfeed valve is set to the closed position and the crossfeed position indicator light is off.



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SUBTASK 28-26-11-860-003



WARNING

CAREFULLY DO ALL OF THE SAFETY PROCEDURES TO DEFUEL THE FUEL TANK AND TO GO INTO IT. AN EXPLOSION, INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Remove all fuel from the No. 2 tank and the center tank. To do this, do this task: Fuel Tank Defueling, TASK 28-26-00-650-801
or, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802

SUBTASK 28-26-11-860-004

- (3) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-26-11-010-002

- (4) Remove this access panel for the No. 2 tank to get access to the aft side of the front wing spar:

Number Name/Location

632DB Main Tank Access Door - Wing Station 313

(Main Tank Access Door Removal, TASK 28-11-11-000-801)

SUBTASK 28-26-11-010-003

- (5) Get access to the defueling valve through the access opening in the fuel tank.

SUBTASK 28-26-11-010-013

- (6) Open this access panel to get access to the defueling valve adapter:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

NOTE: The access door is on the forward side of the front spar and on the outboard side of the No. 2 engine.

G. Adapter Shaft Removal

SUBTASK 28-26-11-010-010

- (1) Do these steps on the outside of the fuel tank:

- (a) Remove the defueling valve handle (TASK 28-26-11-010-801).
- (b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate [5] (View A-A).
 - 1) Use a sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.

SUBTASK 28-26-11-010-014



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Go into the fuel tank to the defueling valve location and do these steps (TASK 28-11-00-910-802) (View A):
 - (a) Go to the valve adapter [11] location (View B).
 - (b) Remove the old sealant from the screws [22] and the valve adapter [11] front spar penetration (View A-A).
 - (c) Remove the screws [22] and washers [21] that attach the adapter plate [5] to the front spar.

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- (d) Disengage the adapter shaft [26] from the defueling valve [25] (View C).

SUBTASK 28-26-11-010-011

- (3) Go out of the fuel tank to the forward side of the front spar.

SUBTASK 28-26-11-010-012

- (4) Remove the adapter shaft [26] through the hole in the front spar.

- (a) Discard the O-ring [27].

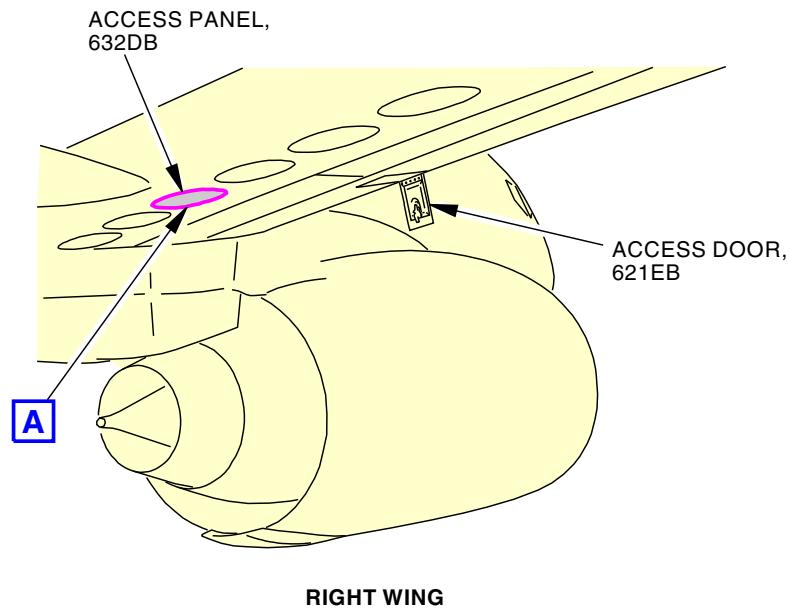
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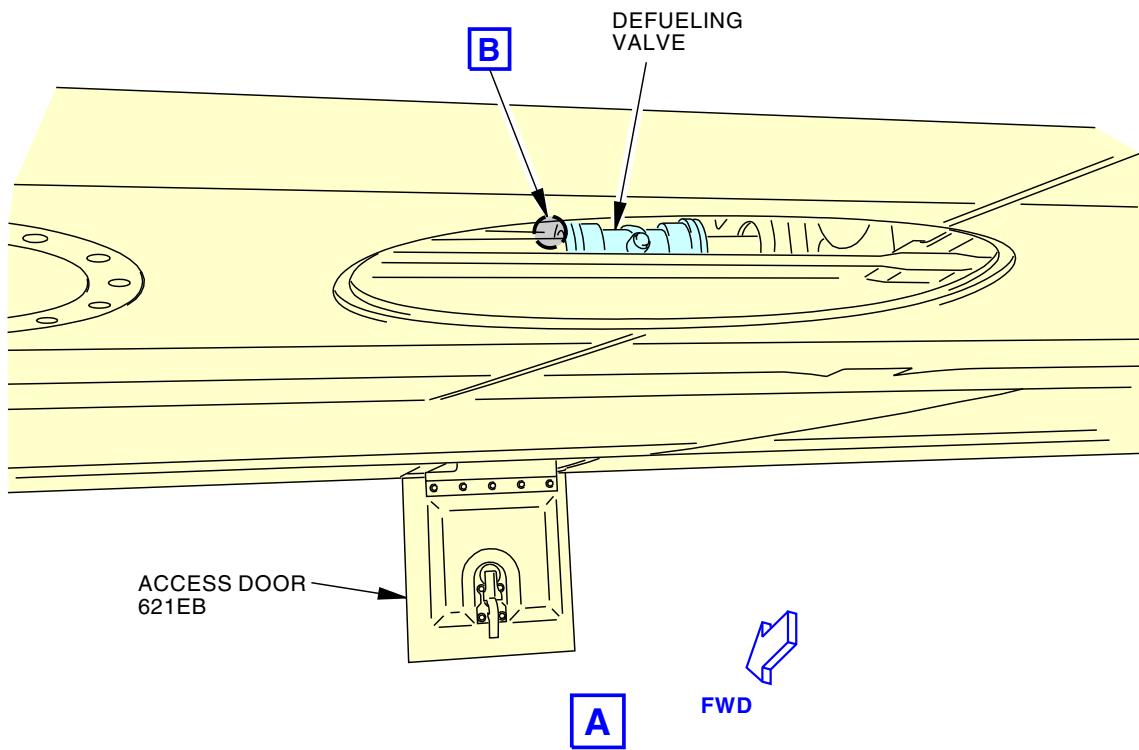
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RIGHT WING



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Defueling Valve Installation
Figure 402/28-26-11-990-802 (Sheet 1 of 4)

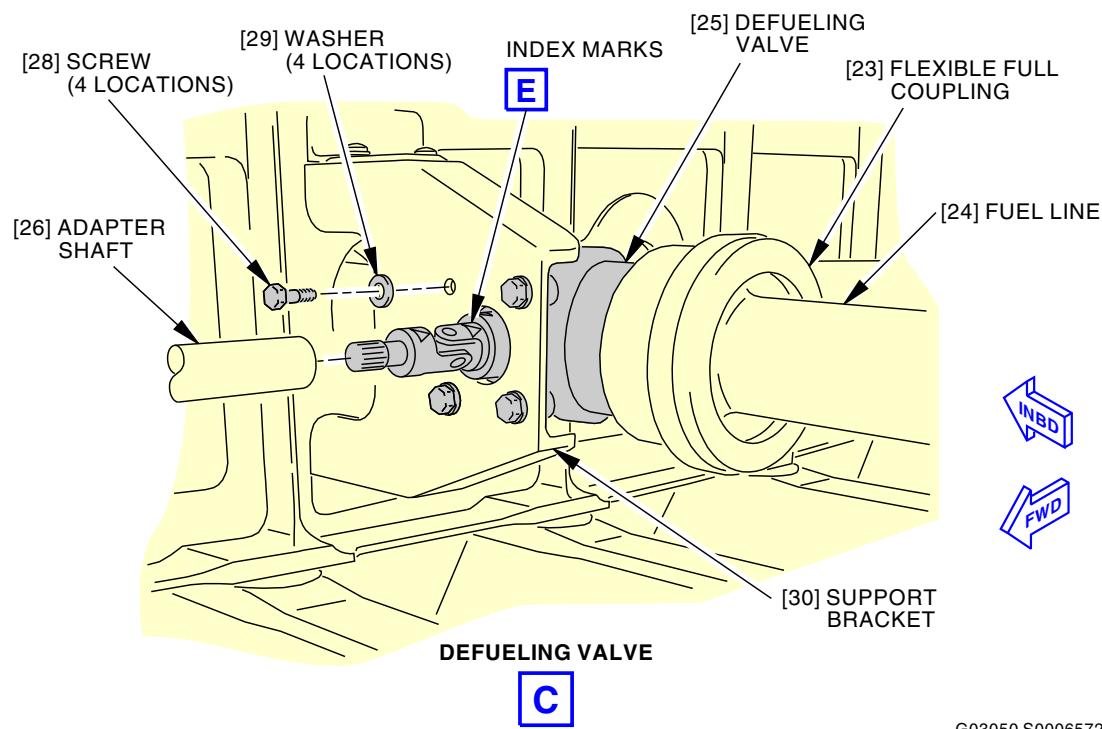
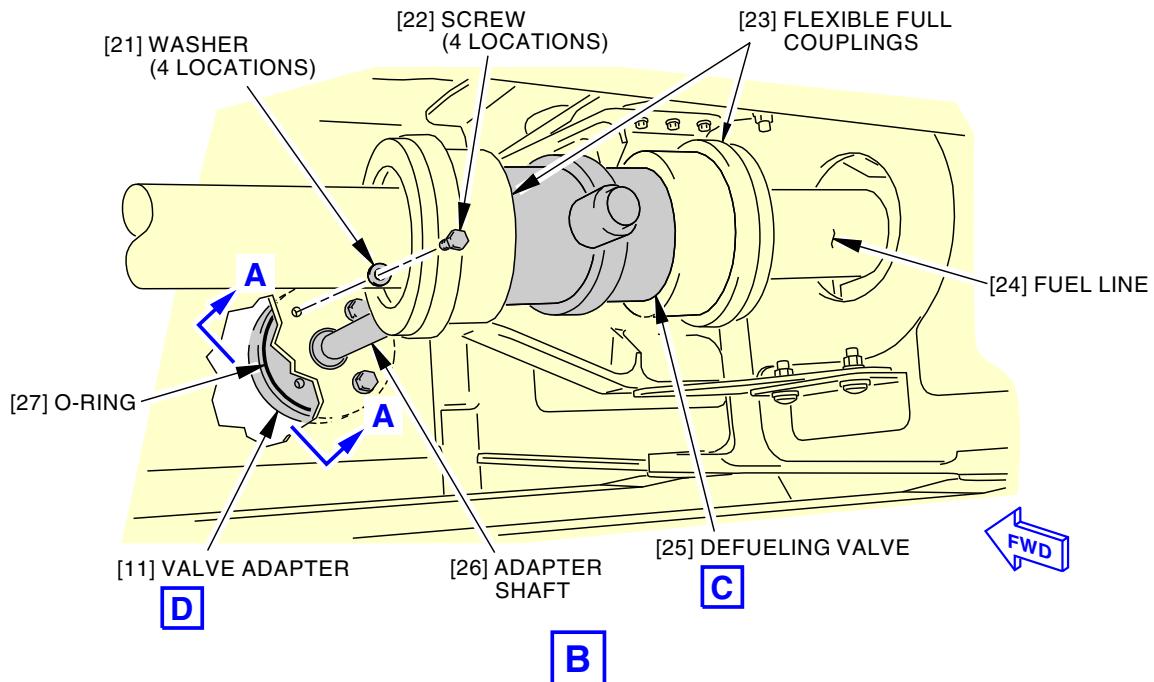
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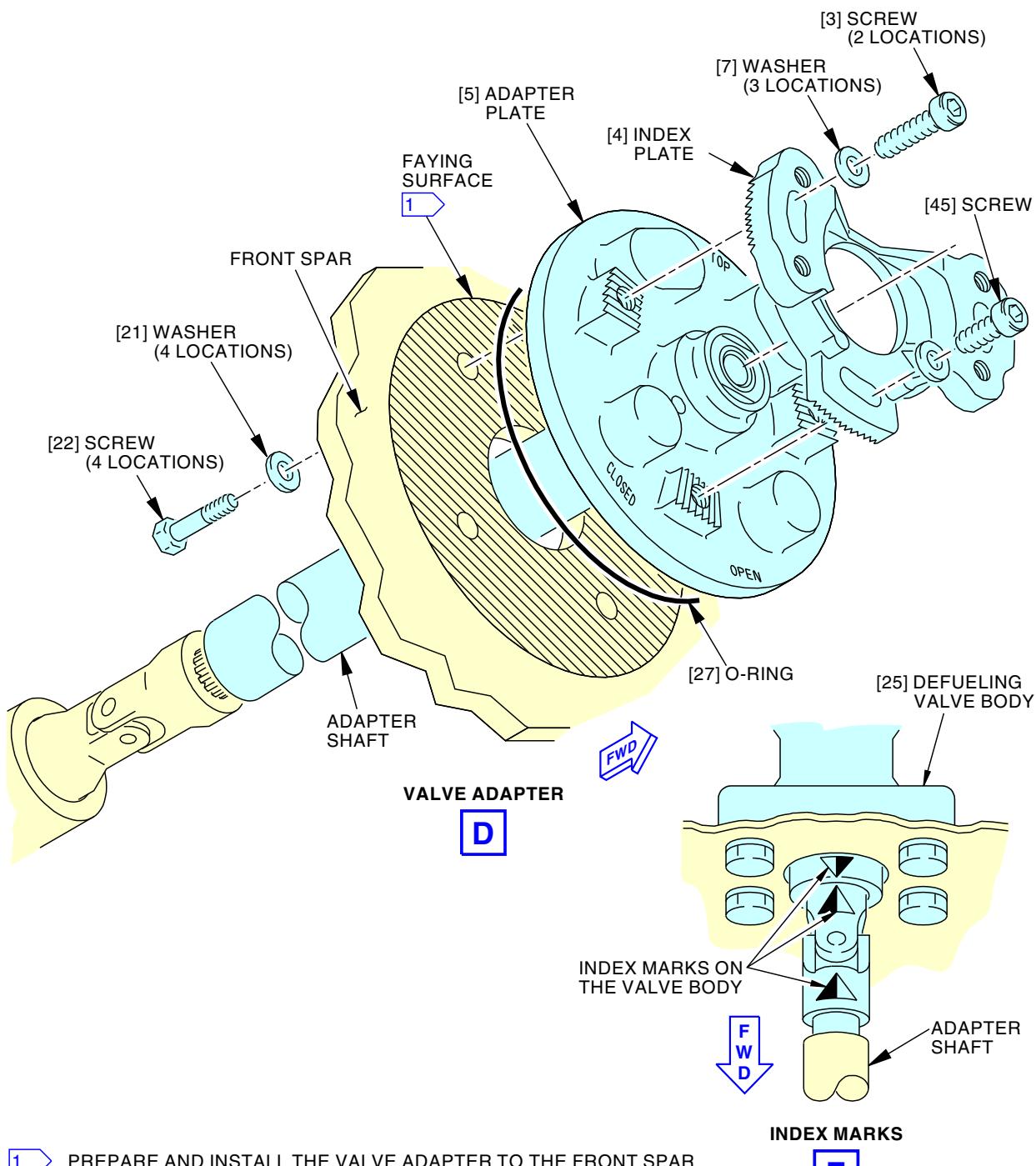
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Defueling Valve Installation
Figure 402/28-26-11-990-802 (Sheet 2 of 4)

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- 1** PREPARE AND INSTALL THE VALVE ADAPTER TO THE FRONT SPAR WITH A FILLET SEALED ELECTRICAL FAYING SURFACE BOND (SWPM 20-20-00).

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Defueling Valve Installation
Figure 402/28-26-11-990-802 (Sheet 3 of 4)

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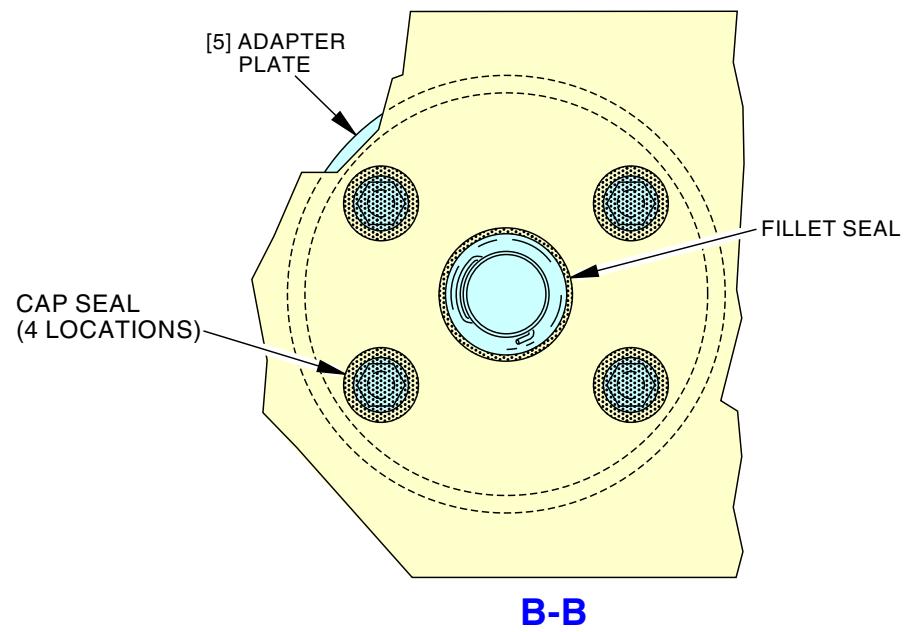
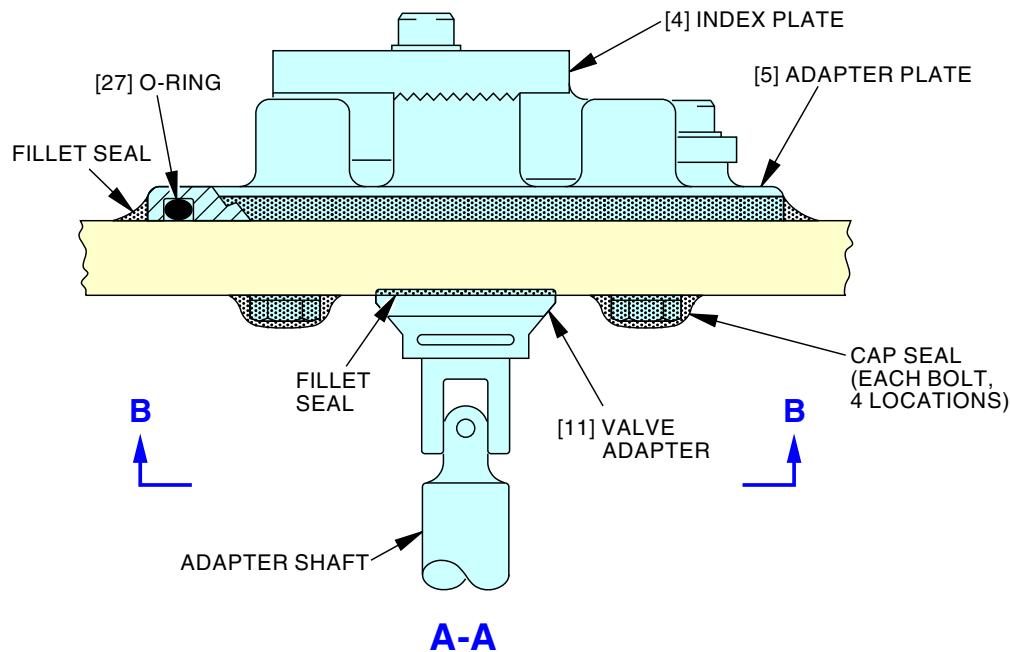
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Defueling Valve Installation
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TASK 28-26-11-410-801

5. Adapter Shaft Installation

(Figure 402)

A. General

- (1) This task gives instructions to install the Adapter Shaft.
- (2) The adapter shaft is used to connect the defueling valve handle to the defueling valve body. The adapter shaft consists of these components:
 - (a) Adapter plate (with index plate installed)
 - (b) Adapter shaft (with U-joint connection).
- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

B. References

Reference	Title
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
51-21-41-370-802	Bonderite M-CR 600 Aero, Bonderite M-CR Alcrm 1200 Aero or Bonderite M-CR 1200S Aero Application Process (P/B 701)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659





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Reference	Description
COM-2481	Sealant Removal Tool (Meets BSS7384 Requirements) Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 10811 Supplier: \$0855 Part #: 10812 Supplier: \$0855 Part #: 234350 Supplier: 5HCF1 Part #: 235072 Supplier: 5HCF1 Part #: 235073 Supplier: 5HCF1 Part #: 235074 Supplier: 5HCF1 Part #: 235075 Supplier: 5HCF1 Part #: 235076 Supplier: 5HCF1 Part #: 311/03 Supplier: F6892 Part #: 311/14 Supplier: F6892 Part #: 311/25 Supplier: F6892 Part #: 311/37 Supplier: F6892 Part #: AS1 Supplier: \$1351 Part #: AS2 Supplier: \$1351 Part #: AS3 Supplier: \$1351 Part #: DAD5013 Supplier: 7RKH2 Part #: DFD5019 Supplier: 7RKH2 Part #: JNT411B60 Supplier: 3DN12 Part #: JNT411B90 Supplier: 3DN12 Part #: PT6529-S Supplier: 81205 Part #: SCD5019 Supplier: 7RKH2 Part #: ST982LF-9 Supplier: 81205 Part #: TS1275-4 Supplier: 22975
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 (for SkyScraper) Supplier: F6892 Part #: SHR0272-T (for PnJ scraper) Supplier: 7RKH2 Part #: ST982LH-F-3 (for ST982LF) Supplier: 81205 Opt Part #: SHW0215 (for PnJ scraper) Supplier: 7RKH2
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50315	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	BAC5719 Class A, C or D, MIL-DTL-81706 Type I Class 1A or 3
C50356	Coating - Chemical Conversion - Bonderite M-CR 600RTU Aero (Formerly Alodine 600RTU)	MIL-DTL-81706 Type I Class 1A or 3
D00504	Grease - Petrolatum	VV-P-236

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Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	Defueling valve	28-26-01-01A-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		28-26-01-02-025	LOM 422-434, 437-447, 450-999
	Adapter shaft	28-22-11-01-040	LOM 411, 412, 415, 416, 420
		28-22-11-03-040	LOM 422-434, 437-446
		28-22-11-04-055	LOM 447
		28-22-11-05-060	LOM 402, 404, 406, 407
		28-22-11-06-080	LOM 450-460
		28-22-11-08-075	LOM 461-999
		28-26-01-01A-005	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		28-26-01-02-005	LOM 422-434, 437-447, 450-999
27	O-ring	28-22-11-01-058	LOM 411, 412, 415, 416, 420
		28-22-11-03-058	LOM 422-434, 437-446
		28-22-11-04-100	LOM 447
		28-22-11-05-078	LOM 402, 404, 406, 407
		28-22-11-06-120	LOM 450-460
		28-22-11-08-120	LOM 461-999
		28-26-01-01A-023	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		28-26-01-02-023	LOM 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

G. Access Panels

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15
632DB	Main Tank Access Door - Wing Station 313





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H. Adapter Shaft Installation

SUBTASK 28-26-11-100-001

- (1) Remove the old sealant and clean the front spar, adapter plate [5], and fasteners (if re-used).



CAUTION
USE APPROVED SEALANT REMOVAL TOOLS TO REMOVE THE SEALANT. IF YOU USE A TOOL THAT IS NOT APPROVED, YOU CAN CAUSE DAMAGE TO THE COMPONENT SURFACES AND FINISHES.

- (a) To remove the sealant from the front spar use a sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.



WARNING
DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):
 - 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034

SUBTASK 28-26-11-100-002

► 28-AWL-31: CDCCL

- (2) Apply a fillet sealed fay surface bond of sealant, A00247 between the adapter plate [5] and the front spar outside of the fuel tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

SUBTASK 28-26-11-420-014

- (3) Prepare the adapter shaft and the valve adapter plate [5] for installation:
 - (a) Apply a thin layer of petrolatum grease, D00504, on the new O-ring [27].
 - (b) Install the O-ring [27] in the O-ring groove of the adapter plate [5].
 - (c) Put the valve adapter shaft [26] attached to the adapter plate [5] through the hole in the front spar.

SUBTASK 28-26-11-420-015



WARNING
DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Go into the fuel tank to the defueling valve location (TASK 28-11-00-910-802) (View A).

SUBTASK 28-26-11-420-016

- (5) Do these steps to install the adapter plate [5]:

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- (a) Make sure that the index marks on the defueling valve [25] and the adapter shaft [26] are aligned (View E).
NOTE: A small misalignment of the index marks is satisfactory.
- (b) Engage the adapter shaft [26] with the defueling valve [25] (View C).
- (c) Make sure that the shoulder of the adapter plate [5] does not bind in the opening of the front spar.
- (d) Install the screws [22] and washers [21] to attach the adapter plate [5] and adapter shaft [26] to the front spar.

SUBTASK 28-26-11-220-001

► 28-AWL-31: CDCCL

- (6) Measure the bonding resistance between the adapter plate [5] and the front spar outside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-31: CDCCL

- (b) Make sure that the bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

SUBTASK 28-26-11-390-001

- (7) On the inside of the fuel tank, do these steps (View B-B):

► 28-AWL-31: CDCCL

- (a) Apply a cap seal of sealant, A00767 on the four screws [22] inside the tank (TASK 51-31-00-390-804).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

► 28-AWL-31: CDCCL

- (b) Apply a fillet seal of sealant, A00767 around the edge of the hole and on the stationary part of the valve adapter plate [5] inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

- 1) Make sure that the sealant does not touch the adapter shaft [26] or other parts of the valve adapter plate [5] that turn.

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SUBTASK 28-26-11-390-002

► 28-AWL-31: CDCCL

- (8) Apply fillet seal of sealant, A00247 around the periphery of the valve adapter plate [5] and the spar outside the tank (TASK 51-31-00-390-804) (View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-31.

SUBTASK 28-26-11-800-001

- (9) Apply protective finishes to the bare metal areas of the front spar (TASK 28-11-00-600-801).

NOTE: Re-apply the protective coating to the front spar at all bare metal areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

- (a) These are the protective finishes:

- 1) Bonderite M-CR 600 Aero coating, C50315 or Bonderite M-CR 600RTU Aero coating, C50356.
- 2) BMS 10-20 coating, C00307.

SUBTASK 28-26-11-800-002

- (10) Apply chemical conversion coating, to all bare metal areas of the adapter plate [5] (TASK 51-21-41-370-802).

NOTE: Re-apply the protective coating to the adapter plate [5] where the electrical bonding probe removed the finish.

SUBTASK 28-26-11-410-002

- (11) Do this task: Adapter Shaft Alignment, TASK 28-26-11-820-801.

I. Put Airplane Back to Its Usual Condition

SUBTASK 28-26-11-410-003

- (1) Close this access panel:

Number Name/Location

632DB Main Tank Access Door - Wing Station 313

Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-26-11-410-005

- (2) Close this access panel:

Number Name/Location

621EB Defuel Access Panel - Slat Station 95.15

———— END OF TASK ————

TASK 28-26-11-820-801

6. Adapter Shaft Alignment

(Figure 403)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.



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Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: 5718A42 Supplier: 3A054 Opt Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment - Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

B. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Adapter Shaft Alignment

SUBTASK 28-26-11-010-004

- (1) If it is not removed, do this task: Actuator Handle Assembly Removal, TASK 28-26-11-010-801.

SUBTASK 28-26-11-480-001

- (2) To install the alignment tool [44] (valve alignment equipment, SPL-1771) in the adapter plate [5], do these steps:
- Remove the top two index screws from the index plate [4].
 - Loosen the bottom index screw [45] but do not remove it.
 - Install the alignment tool [44].
 - Put the alignment tool [44] in its position with the two guide pins in the holes left by the two index screws that you removed (the scale [42] should be on the top of the alignment tool [44]).
 - Make sure that the spline on the alignment tool [44] engages with the spline on the shaft.

SUBTASK 28-26-11-820-002

- (3) To align the adapter shaft (Procedure 1, optional to Procedure 2), do these steps:

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

- Put the tool handle in the extreme counterclockwise position.
- Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.
- Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.
- If you cannot find the position in the rotation where the torque increases significantly, use Procedure 2 below.
- Put the shaft in the extreme counterclockwise position again.
- Slowly and smoothly turn the handle of the alignment tool [44] clockwise until a distinct increase in torque is found and immediately stop turning the handle.
- Read the scale [42] on the alignment tool [44].

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

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- (h) Turn the handle 13 degrees more in the clockwise direction (the scale [42] is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-26-11-820-003

- (4) To align the adapter shaft (Procedure 2, optional to Procedure 1), do these steps:

NOTE: A torque wrench (30 in-lbs), COM-1587, is necessary to do this procedure.

- (a) Put the tool handle in the extreme counterclockwise position.
- (b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.
- (c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.
- (d) Turn the tool back to the extreme counterclockwise position.
- (e) Turn the shaft clockwise again at approximately the same rate that you used before.
- (f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.
- (g) Read the scale [42] on the alignment tool [44] at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

- (h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-26-11-820-004

- (5) Tighten the lockscrew [43] on the alignment tool [44] to keep the adapter shaft in its position.

SUBTASK 28-26-11-820-005

- (6) Turn the index plate [4] until the actuator mounting holes in the index plate [4] are aligned with the two upper holes for the actuator mounting screws.

SUBTASK 28-26-11-820-006

- (7) Insert the two alignment screws [41] into the holes for the actuator mounting screws to hold the index plate [4] in alignment with the mounting plate (this is the final adjustment of the position of the index plate [4]).

SUBTASK 28-26-11-420-008

- (8) Tighten the bottom index screw [45] to 45 ± 1 in-lb (5.1 ± 0.1 N·m).

SUBTASK 28-26-11-020-007

- (9) Carefully remove the alignment screws [41].

SUBTASK 28-26-11-080-001

- (10) Carefully remove the alignment tool [44] from the index plate [4].

SUBTASK 28-26-11-420-009

- (11) Install the top two index screws in the index plate [4].

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SUBTASK 28-26-11-420-017

- (12) Tighten the top two index screws to 22 ± 1 in-lb (2.5 ± 0.1 N·m).

SUBTASK 28-26-11-420-010

- (13) Install lockwire on the index screws.

SUBTASK 28-26-11-410-004

- (14) Do this task: Actuator Handle Installation, TASK 28-26-11-400-801.

———— END OF TASK ————

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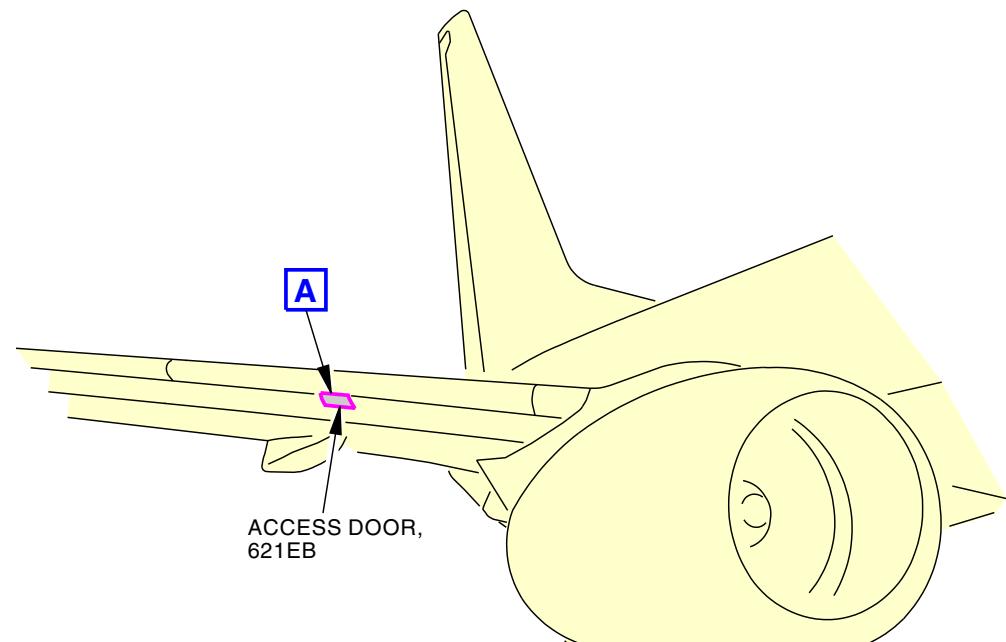
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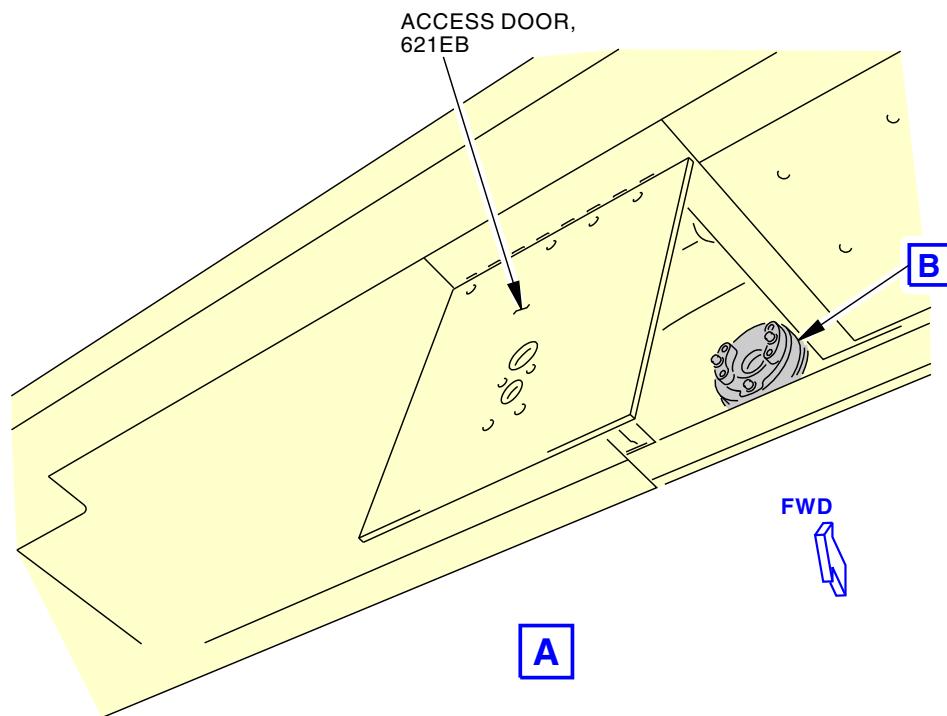
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RIGHT WING



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Defueling Valve Alignment
Figure 403/28-26-11-990-805 (Sheet 1 of 2)

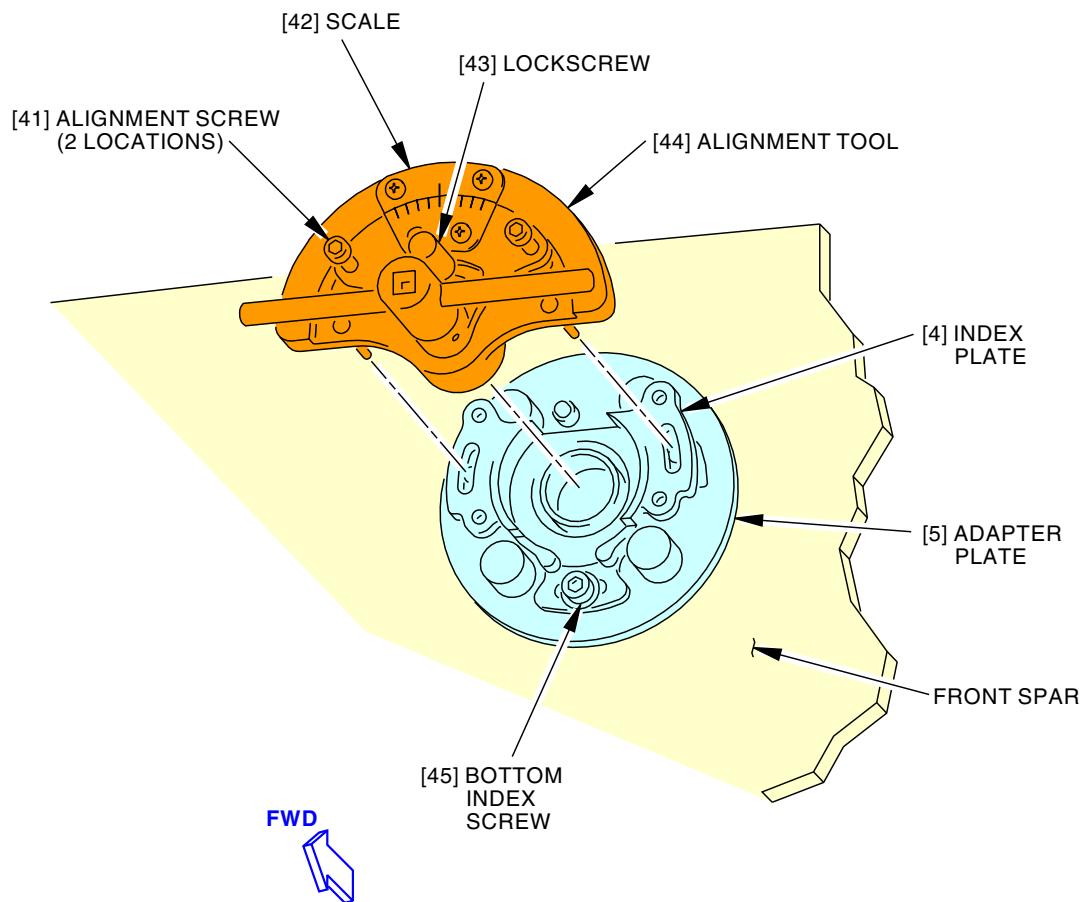
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Defueling Valve Alignment
Figure 403/28-26-11-990-805 (Sheet 2 of 2)

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TASK 28-26-11-020-801

7. Valve Body Removal

(Figure 402)

A. General

- (1) This task gives instructions to remove the Valve Body.

B. References

Reference	Title
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
632DB	Main Tank Access Door - Wing Station 313

E. Prepare for the Removal

SUBTASK 28-26-11-860-005



DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

- (1) Do this task: Fuel Tank Defueling, TASK 28-26-00-650-801.

SUBTASK 28-26-11-860-006

- (2) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-26-11-010-005

- (3) Remove this access panel for the No. 2 tank to get access to the aft side of the wing front spar:

Number Name/Location

632DB Main Tank Access Door - Wing Station 313

Main Tank Access Door Removal, TASK 28-11-11-000-801

F. Valve Body Removal

SUBTASK 28-26-11-010-006

- (1) Go into the No. 2 tank and find the defueling valve [25].

SUBTASK 28-26-11-020-008

- (2) Disconnect the flexible fuel coupling [23] from each side of the defueling valve [25] (TASK 28-22-15-000-801).

SUBTASK 28-26-11-020-009

- (3) Hold the defueling valve [25] and remove the screws [28] that attach the defueling valve [25] to the support bracket [30].

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SUBTASK 28-26-11-020-010

- (4) Disengage the defueling valve [25] from the adapter shaft [26].

SUBTASK 28-26-11-020-011

- (5) Remove the defueling valve [25].

SUBTASK 28-26-11-480-002

- (6) Put covers on the holes in the fuel line to keep unwanted materials out.

———— END OF TASK ————

TASK 28-26-11-420-801

8. Valve Body Installation

(Figure 402)

A. General

- (1) This task gives instructions to install the Valve Body.
(2) The valve body is referred to as the defueling valve [25] in this task.

B. References

Reference	Title
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	Defueling valve	28-26-01-01A-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		28-26-01-02-025	LOM 422-434, 437-447, 450-999
26	Adapter shaft	28-22-11-01-040	LOM 411, 412, 415, 416, 420
		28-22-11-03-040	LOM 422-434, 437-446
		28-22-11-04-055	LOM 447
		28-22-11-05-060	LOM 402, 404, 406, 407

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
26 (cont.)		28-22-11-06-080	LOM 450-460
		28-22-11-08-075	LOM 461-999
		28-26-01-01A-005	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		28-26-01-02-005	LOM 422-434, 437-447, 450-999

E. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

F. Access Panels

Number	Name/Location
632DB	Main Tank Access Door - Wing Station 313

G. Valve Body Installation

SUBTASK 28-26-11-080-002

- (1) Remove the covers from the fuel line.

SUBTASK 28-26-11-820-007

- (2) Align the index marks on the defueling valve [25] and the adapter shaft [26].

SUBTASK 28-26-11-420-011

- (3) Engage the defueling valve [25] in the adapter shaft [26].

- (a) Make sure that the two teeth spaces on the spline of the adapter shaft align with the teeth spaces in the rotor on the defueling valve [25].

- (b) Make sure that the spline on the adapter shaft [26] is correctly engaged with the spline on the rotor of the defueling valve [25].

SUBTASK 28-26-11-210-001

- (4) Make sure that the surfaces that touch on the support bracket [30] and the defueling valve [25] are clean.

SUBTASK 28-26-11-820-008

- (5) Align the defueling valve [25] with the support bracket [30].

SUBTASK 28-26-11-420-012

- (6) Install the washers [29] and screws [28] through the support bracket [30] to attach to the defueling valve [25].

SUBTASK 28-26-11-760-001

- (7) Measure the electrical bonding resistance between the defueling valve [25] and the support bracket [30] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

- (a) Make sure that the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-26-11-420-013

- (8) Connect the flexible full couplings [23] that attach the valve body to the fuel line (TASK 28-22-15-400-801).



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H. Valve Body Installation Test

SUBTASK 28-26-11-010-007

- (1) Install this access panel: for the No. 2 tank

Number Name/Location

632DB Main Tank Access Door - Wing Station 313
(TASK 28-11-11-400-801).

SUBTASK 28-26-11-710-001

- (2) To do an operational test of the defueling valve, do these steps:
- (a) Add a minimum of 300 pounds (140 kilograms) to the No. 1 tank.
 - (b) Transfer a minimum of 100 pounds (40 kilograms) from the No. 1 tank to the No. 2 tank (TASK 28-26-00-650-802).
 - (c) With the defuel valve in the closed position, do the steps to transfer fuel from the No. 1 tank to the No. 2 tank (TASK 28-26-00-650-802).
 - (d) Monitor the fuel quantity indicators for the No. 1 and the No. 2 tank for five minutes.
 - (e) Make sure that there is no fuel transfer as shown by the fuel quantity indicating system.
 - (f) Make sure that all boost pumps are off and the crossfeed valve and defuel valve are closed.

———— END OF TASK ————

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FUEL QUANTITY INDICATING SYSTEM (FQIS) - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has three tasks. The first task is an operational test of the fuel quantity indicating system (FQIS). The second task is a comparison check of the FQIS with the fuel measuring sticks. The third task is a system test of the FQIS.
- C. The operational test makes sure the FQIS operates correctly.
- D. The comparison check makes sure the fuel quantity shown agrees with the correct quantity of fuel in the fuel tanks.
- E. The system test makes sure the total capacitance for the tank units and the compensators are in the permitted limits for the FQIS precision.

TASK 28-41-00-710-801

2. Operational Test - Fuel Quantity Indicating System

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure contains:
 - (a) A check of the load select indicators on the fueling control panel, P15.
 - (b) A fuel quantity Built-In-Test Equipment (BITE) procedure to be done from the control display unit in the flight compartment.

| LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- (2) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-37.

- (3) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-38.

LOM ALL

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-00-00-040-807	MMEL 28-6 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Main Tank) Inoperative (P/B 901)
28-00-00-040-808	MMEL 28-7 (DDPG) Preparation - Flight Deck Fuel Quantity Indicators (Center Tank) Inoperative (P/B 901)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
FIM 28-41 TASK 801	FQIS BITE Procedure

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C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare for Checks

SUBTASK 28-41-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

F. Check of the Load Select Indicators

(Figure 501)

SUBTASK 28-41-00-010-001

- (1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-41-00-210-001

- (2) Make sure that the display on each load select indicator shows the quantity of fuel in each fuel tank.

SUBTASK 28-41-00-710-001

- (3) Select and hold the FUELING INDICATION TEST SWITCH on the refuel control panel in the TEST GAGES position.
 - (a) Make sure that all of the refuel quantity indicators operate correctly.

NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

- (b) Release the FUELING INDICATION TEST SWITCH.

SUBTASK 28-41-00-210-002

- (4) Make sure that the display on each load select indicator shows the quantity of fuel in each fuel tank.

SUBTASK 28-41-00-410-001

- (5) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

G. Fuel Quantity BITE Test Procedure

(Figure 502)

SUBTASK 28-41-00-740-001

- (1) Do the BITE procedure for the Fuel Quantity Indication System (FQIS).

- (a) If you are not at the Control Display Unit (CDU) Initial Reference Index (INIT/REF INDEX), or one of the FQIS BITE menus, then do these steps:

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- 1) Push the INIT REF function key.
- 2) If the POS INIT display shows, then push the line select key next to the INDEX prompt.

NOTE: This makes the CDU Initial Reference Index (INIT/REF INDEX) show.

- (b) On the CDU, push the line select key next to the MAINT prompt on the CDU Initial Reference Index.

NOTE: This brings you to the MAINT BITE INDEX.

- (c) Push the line select key next to the FQIS prompt.

- (d) Do these steps to look for maintenance messages in CURRENT STATUS:

- 1) Push the line select key next to the CURRENT STATUS prompt.
- 2) If there are faults shown, do the task for the faults shown (FIM 28-41 TASK 801), or deactivate the FQIS under Master Minimum Equipment List (MMEL) 28-6 (TASK 28-00-00-040-807) or MMEL 28-7 (for faults associated with only one fuel tank) (TASK 28-00-00-040-808).
 - a) If there is more than one page of faults in CURRENT STATUS, then use the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.

NOTE: The number of pages of faults in CURRENT STATUS are shown in the upper right corner of the display. If a fault shows the message FAULT NO LONGER PRESENT, then the fault was corrected while the CURRENT STATUS display was on.

28-AWL-37: ALI

28-AWL-38: CDCCL

| LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- b) For the periodic BITE check or if the FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in CURRENT STATUS.
- 28-41()02 TANK UNIT LO-Z OPEN/GND
 - 28-41()05 HI-Z OP/SHORT TO SHIELD
 - 28-41()06 COMPENSATOR LO-Z OP/GND
 - 28-41()07 COMPENSATOR SHORTED

NOTE: () = 1 for Tank 1, 2 for Tank 2, 3 for Center Tank

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

| LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- c) For the periodic BITE check or if the center tank FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in CURRENT STATUS.

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LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003 (Continued)

- 28-41302 TANK UNIT LO-Z OPEN/GND
- 28-41305 HI-Z OP/SHORT TO SHIELD
- 28-41306 COMPENSATOR LO-Z OP/GND
- 28-41307 COMPENSATOR SHORTED

LOM ALL

- 3) If NO PRESENT FAULTS shows on the CURRENT STATUS display, then continue.
No current faults are found in the system.
 - 4) Push the line select key next to the INDEX prompt.
NOTE: This will bring you back to the FQIS BITE TEST main menu.
- (e) Do these steps to look for maintenance messages in INFLIGHT FAULTS/FAULT HISTORY.
- 1) Push the line select key next to the INFLIGHT FAULTS/FAULT HISTORY prompt.
 - a) If there is more than one page of faults in INFLIGHT FAULTS/FAULT HISTORY, push the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.
NOTE: The number of pages of faults in INFLIGHT FAULTS/FAULT HISTORY are shown in the upper right corner of the display.
 - NOTE: Recording faults and maintenance actions from INFLIGHT FAULTS/FAULT HISTORY maintenance messages can be used to help correct intermittent faults.
- 28-AWL-37: ALI
 28-AWL-38: CDCCL

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- b) For the periodic BITE check or if the FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in INFLIGHT FAULTS/FAULT HISTORY.
 - 28-41()02 TANK UNIT LO-Z OPEN/GND
 - 28-41()05 HI-Z OP/SHORT TO SHIELD
 - 28-41()06 COMPENSATOR LO-Z OP/GND
 - 28-41()07 COMPENSATOR SHORTED

NOTE: () = 1 for Tank 1, 2 for Tank 2, 3 for Center Tank

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

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LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- c) For the periodic BITE check or if the center tank FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in INFLIGHT FAULTS/FAULT HISTORY.
 - 28-41302 TANK UNIT LO-Z OPEN/GND
 - 28-41305 HI-Z OP/SHORT TO SHIELD
 - 28-41306 COMPENSATOR LO-Z OP/GND
 - 28-41307 COMPENSATOR SHORTED

LOM ALL

- 2) If there are no faults shown on the INFLIGHT FAULTS/FAULT HISTORY display, then continue. No faults are found in the fault history.

- 3) Push the line select key next to the INDEX prompt.

NOTE: This will bring you back to the FQIS BITE TEST main menu.

- (f) Do these steps to do the FQIS ground test:

- 1) Push the line select key next to the GROUND TEST prompt.

- a) Push the line select key next to the YES prompt to verify that you want to do the ground test.

- 2) When the ground test is complete, the display will show GROUND TEST COMPLETE PASS or FAIL.

- 3) If the display shows GROUND TEST COMPLETE PASS, then there are no faults found in the FQIS.

NOTE: If faults show in INFLIGHT FAULTS/FAULT HISTORY, then keep a record of the faults for later fault isolation of intermittent faults. The corrective action given for each fault found in INFLIGHT FAULTS/FAULT HISTORY can also be used to correct intermittent faults that occur frequently.

- 4) If the display shows GROUND TEST COMPLETE FAIL, do the task for the faults shown (FIM 28-41 TASK 801).

- a) If there is more than one page of faults in GROUND TEST FAULTS, then use the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.

NOTE: The number of pages of faults in GROUND TEST FAULTS are shown in the upper right corner of the display.

► 28-AWL-37: ALI

► 28-AWL-38: CDCCL

LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- b) For the periodic BITE check or if the FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in GROUND TEST.

- 28-41()02 TANK UNIT LO-Z OPEN/GND

- 28-41()05 HI-Z OP/SHORT TO SHIELD

- 28-41()06 COMPENSATOR LO-Z OP/GND

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LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003 (Continued)

- 28-41()07 COMPENSATOR SHORTED

NOTE: () = 1 for Tank 1, 2 for Tank 2, 3 for Center Tank

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

| LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- c) For the periodic BITE check or if the center tank FQIS has blanked, make a written record in the airplane maintenance log if the maintenance messages that follow are in GROUND TEST.
 - 28-41302 TANK UNIT LO-Z OPEN/GND
 - 28-41305 HI-Z OP/SHORT TO SHIELD
 - 28-41306 COMPENSATOR LO-Z OP/GND
 - 28-41307 COMPENSATOR SHORTED

28-AWL-37: ALI

28-AWL-38: CDCCL

| LOM 465-999; LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- (g) If a maintenance message that follows was found in CURRENT STATUS or INFLIGHT FAULTS/FAULT HISTORY or GROUND TEST, do these steps before further flight.
 - 28-41()02 TANK UNIT LO-Z OPEN/GND
 - 28-41()05 HI-Z OP/SHORT TO SHIELD
 - 28-41()06 COMPENSATOR LO-Z OP/GND
 - 28-41()07 COMPENSATOR SHORTED

NOTE: () = 1 for Tank 1, 2 for Tank 2, 3 for Center Tank

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

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► **28-AWL-37: ALI**

► **28-AWL-38: CDCCL**

- 1) Do the task for the faults shown (FIM 28-41 TASK 801), or deactivate the FQIS under MMEL 28-6 (TASK 28-00-00-040-807) or MMEL 28-7 (for faults associated with only one fuel tank (TASK 28-00-00-040-808).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-37 and 28-AWL-38.

NOTE: When the tank is deactivated with a wire harness assembly shorted to ground, the maintenance message that follows will be displayed in BITE: 28-41(05 HI-Z OP/SHORT TO SHIELD.

LOM 402, 404, 411, 416, 420 POST SB 737-28-1355 AND PRE SB 737-47-1003

- (h) If a maintenance message for center tank FQIS that follows was found in CURRENT STATUS or INFLIGHT FAULTS/FAULT HISTORY or GROUND TEST, do these steps before further flight:

- 28-41302 TANK UNIT LO-Z OPEN/GND
- 28-41305 HI-Z OP/SHORT TO SHIELD
- 28-41306 COMPENSATOR LO-Z OP/GND
- 28-41307 COMPENSATOR SHORTED

- 1) Do the task for the faults shown (FIM 28-41 TASK 801), or deactivate the FQIS under MMEL 28-6 or MMEL 28-7 (for faults associated with only one fuel tank).

NOTE: When the tank is deactivated with a wire harness assembly shorted to ground, the maintenance message that follows will be displayed in BITE: 28-41305 HI-Z OP/SHORT TO SHIELD.

LOM ALL

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-41-00-860-002

- (1) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

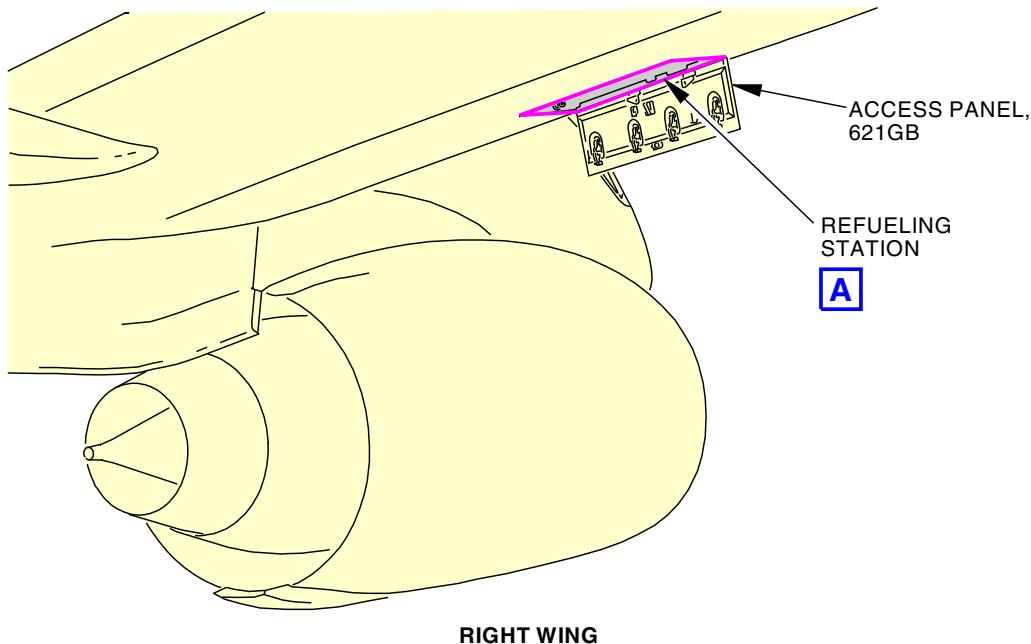
———— END OF TASK ————

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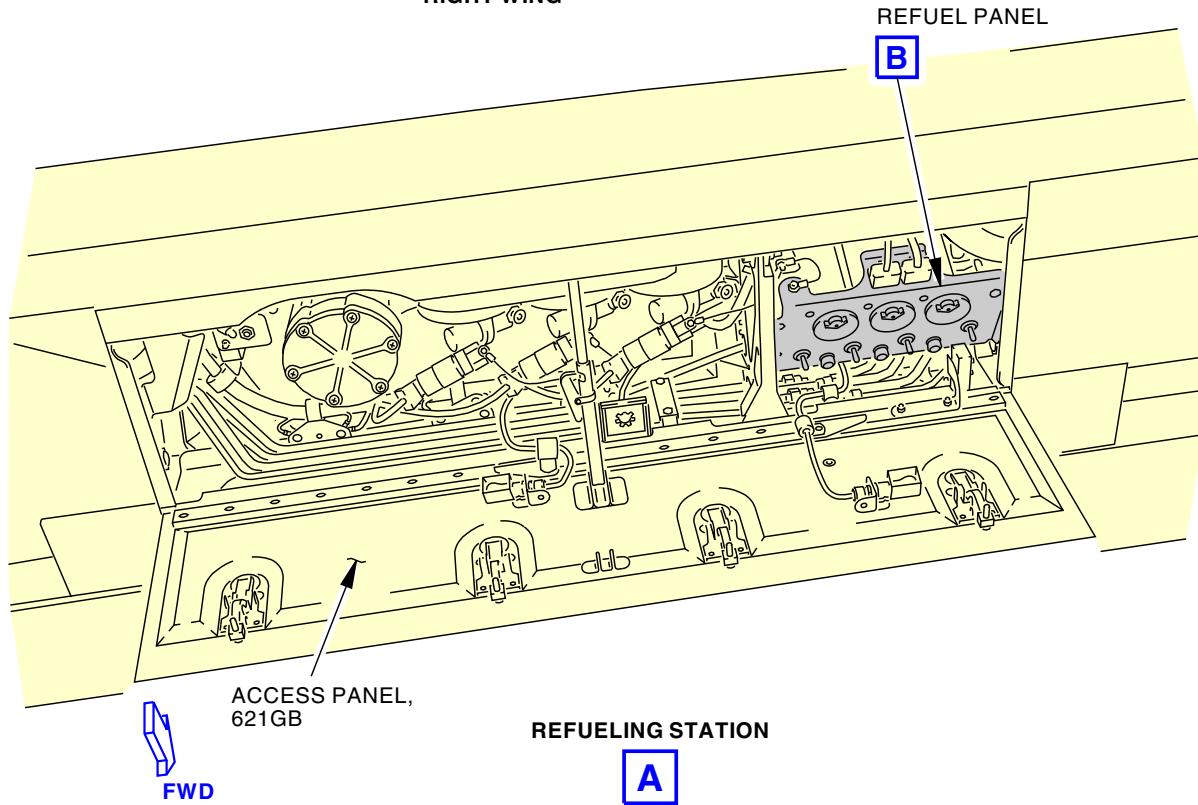
28-41-00



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RIGHT WING



G19495 S0006572235_V3

Refuel Panel
Figure 501/28-41-00-990-804 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

28-41-00

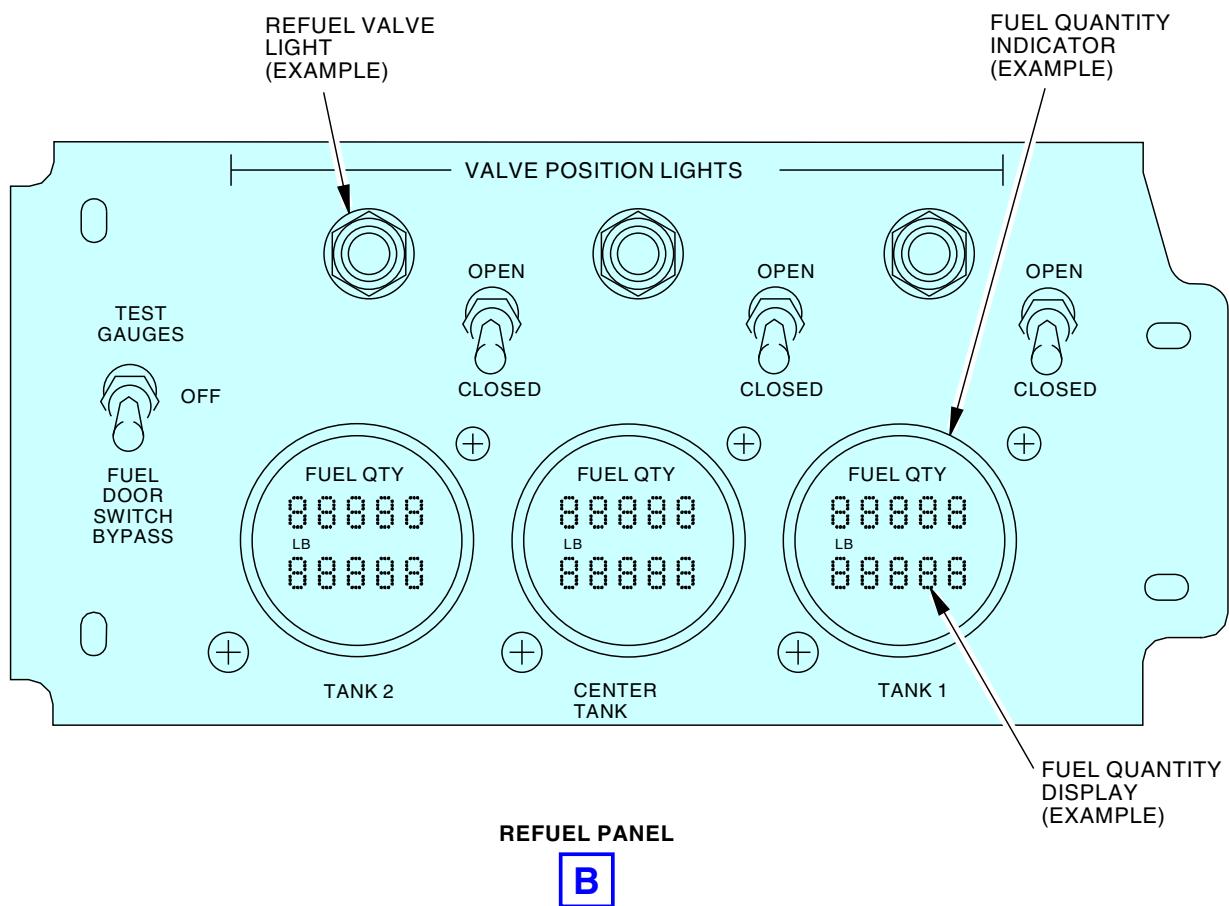
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G19595 S0006572236_V3

Refuel Panel
Figure 501/28-41-00-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

28-41-00

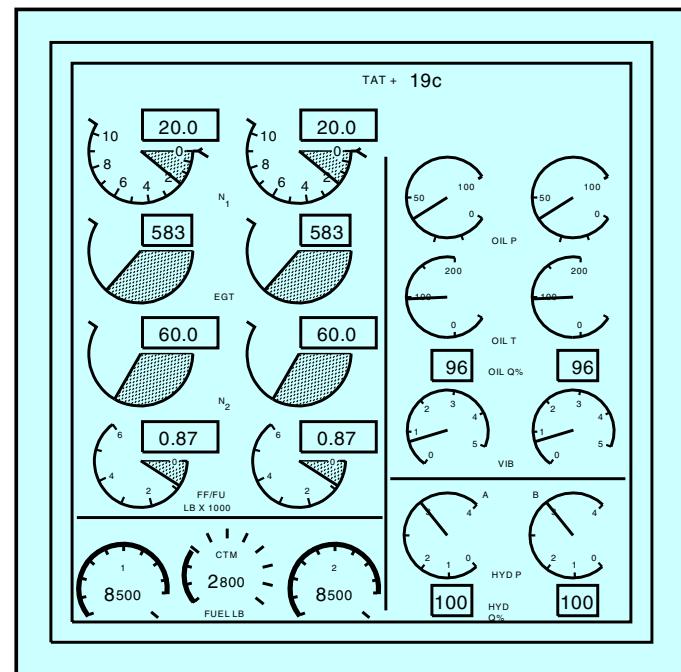
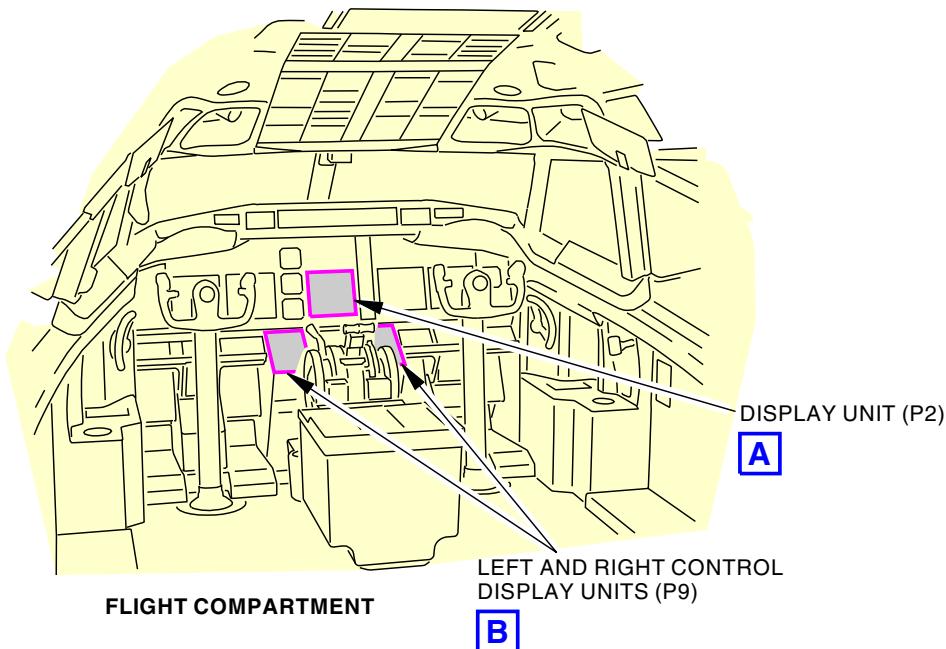
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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DISPLAY UNIT (P2)

A

G19802 S0006572237_V2

Fuel Quantity Indicating System Test
Figure 502/28-41-00-990-807 (Sheet 1 of 2)

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LOM ALL

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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FQIS BITE TEST MAIN MENU		1/2
1L	< CURRENT STATUS	1R
2L	< INFLIGHT FAULTS/ FAULT HISTORY	2R
3L	< GROUND TEST	3R
4L	< IDENT/CONFIG	4R
5L	< INPUT MONITORING	5R
6L	< INDEX	6R

NEXT **PREV**

CONTROL DISPLAY UNIT (P9)

B

G19966 S0006572238_V2

Fuel Quantity Indicating System Test
Figure 502/28-41-00-990-807 (Sheet 2 of 2)

EFFECTIVITY
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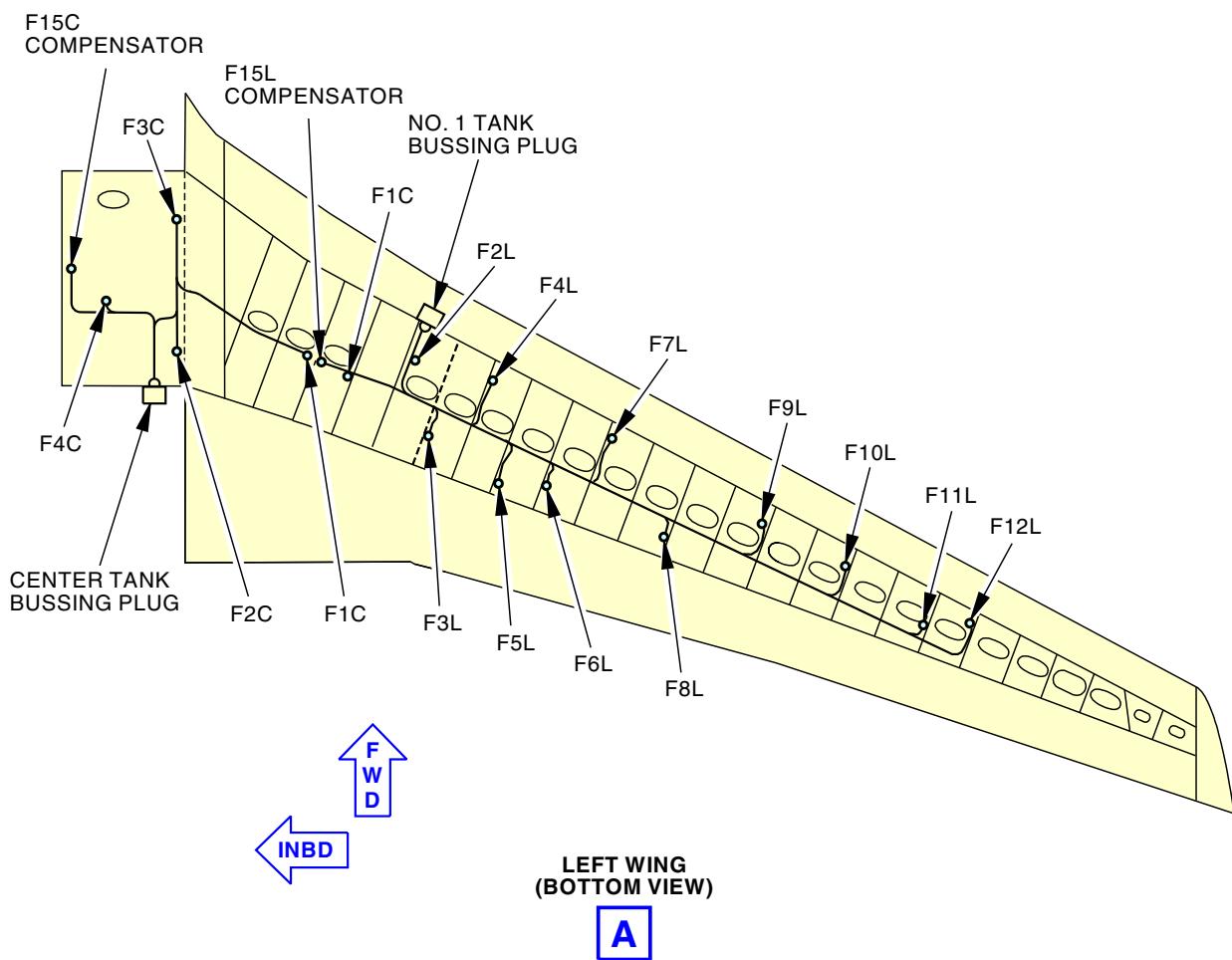
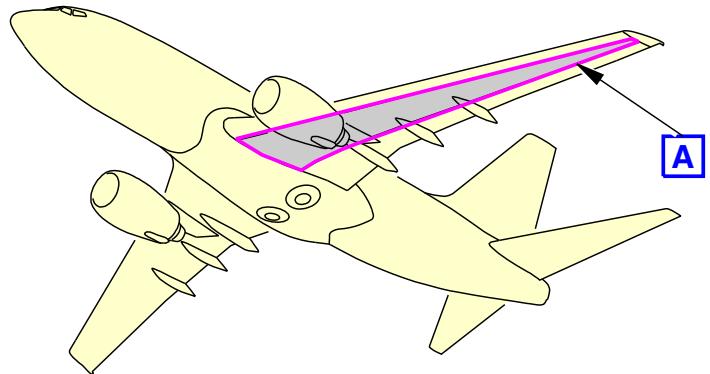
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Fuel Quantity Indicating System
Figure 503/28-41-00-990-808 (Sheet 1 of 2)

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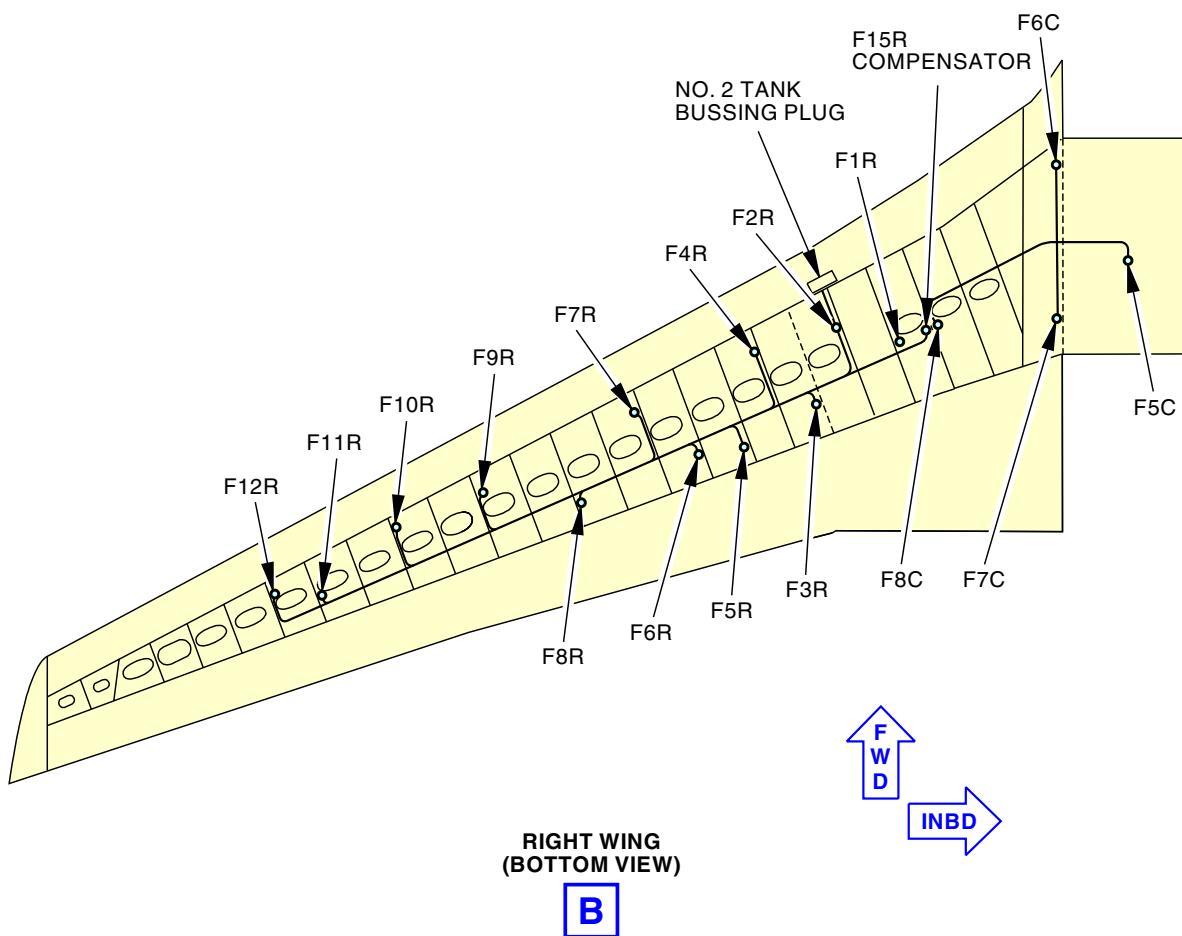
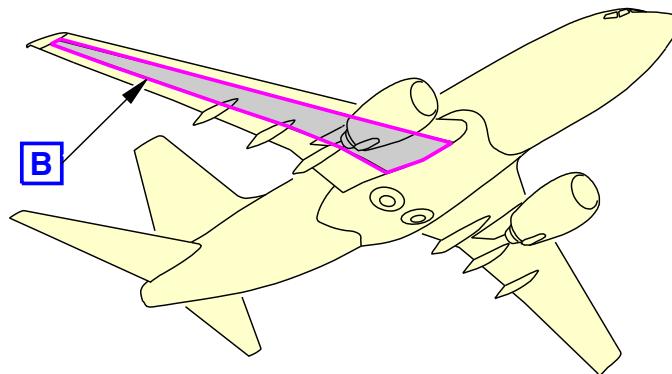
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Fuel Quantity Indicating System
Figure 503/28-41-00-990-808 (Sheet 2 of 2)

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TASK 28-41-00-720-801

3. Comparison Check - Fuel Quantity Indicating System (FQIS) with the Fuel Measuring Sticks

A. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

D. Comparison Check of the Fuel Quantity Indicating System (FQIS) with the Fuel Measuring Sticks

SUBTASK 28-41-00-860-003

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-41-00-010-002

- (2) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

SUBTASK 28-41-00-650-004

- (3) Make sure there is a minimum of 3000 lb (1361 kg) of fuel in the center tank if applicable.
(a) To refuel the fuel tank (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-41-00-650-006

- (4) Make sure there is a minimum of 1000 lb (454 kg) of fuel in each main tank if applicable.

NOTE: Both main tanks must be equally filled to prevent the airplane from tipping.

- (a) To refuel the fuel tank (if it is necessary), do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

SUBTASK 28-41-00-970-001

- (5) Use the fuel measuring sticks to calculate the fuel quantity for each fuel tank.

SUBTASK 28-41-00-220-001

- (6) Make sure the difference between the calculated fuel quantity (with the fuel measuring sticks) for each tank and the fuel quantity shown on the load select indicators on the P15 panel and the center instrument panel, P2 in the flight compartment is in the subsequent range:
(a) Main tank +/- 350 lbs
(b) Main tank +/- 160 kgs
(c) Center tank +/- 1160 lbs

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- (d) Center tank +/- 520 kgs

SUBTASK 28-41-00-410-002

- (7) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-41-00-860-004

- (8) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

———— END OF TASK ————

TASK 28-41-00-730-801

4. System Test - Fuel Quantity Indicating System

A. General

- (1) The fuel quantity processor unit, M121, will do a capacitance test of the tank units and compensators.

NOTE: This test is a dry capacitance test (no fuel in the tank).

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
12-11-00-650-804	Drain the Fuel from the Sumps after Defueling (P/B 301)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
28-41-21-710-801	Tank and Compensator Units - Resistance and Capacitance Check (P/B 501)
FIM 28-41 TASK 801	FQIS BITE Procedure

C. Dry Capacitance Test in the Main Equipment Center (No Fuel in the Tank)

SUBTASK 28-41-00-740-002

- (1) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.
(a) If the BITE test shows faults, then do the corrective action for the fault shown.
(b) If the BITE test does not show faults, then continue.

SUBTASK 28-41-00-650-001

- (2) Defuel the applicable fuel tank (TASK 28-26-00-650-801) or transfer fuel out of the applicable tank (TASK 28-26-00-650-802).

SUBTASK 28-41-00-650-002

- (3) Drain the fuel from the applicable fuel tank (TASK 12-11-00-650-804).

SUBTASK 28-41-00-730-001

- (4) On the Control Display Unit (CDU), push the line select key next to the MAINT prompt on the CDU Initial Reference Index.

NOTE: This brings you to the MAINT BITE INDEX.

- (a) Push the line select key next to the FQIS prompt.
(b) Push the line select key next to the INPUT MONITORING prompt.
(c) Push the NEXT key to get to the second INPUT MONITORING page.

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- (d) Make sure the quantities shown under TANK UNIT CAP are in this range for the applicable tank:
 - 1) No. 1 Tank and No. 2 Tank: 399.40 pf maximum/390.30 pf minimum
 - 2) Center Tank: 574.50 pf maximum/563.00 pf minimum
- (e) Make sure the quantities shown under COMPENSATOR CAP are in this range for the applicable tank:
 - 1) 59.2 pf maximum/57.6 pf minimum

NOTE: These values apply to the No. 1, No. 2, and the center tank.

SUBTASK 28-41-00-730-002

- (5) If the capacitances are not in the correct range for empty tank capacitances, do this task:
FIM 28-41 TASK 801.
 - (a) If the BITE test shows faults, then do the corrective action for the fault shown.
 - (b) If the BITE test does not show faults, then do the tank unit and compensator test from the wing spar (TASK 28-41-21-710-801) to isolate the problem.

SUBTASK 28-41-00-650-003

- (6) If no more tests are necessary, refuel the applicable tank (TASK 12-11-00-650-802).

————— END OF TASK ————

TASK 28-41-00-730-802

5. Wet Capacitance System Check - Fuel Quantity Indicating System

A. General

- (1) The fuel quantity processor unit, M121, will do a capacitance test of the tank units and compensators.
- (2) This capacitance check can be used if it is easier to add fuel to a tank than to drain it to empty. In some isolated cases, it is possible that problems can appear with a full fuel tank that do not appear with an empty fuel tank. The recommended procedure to find problems with the FQIS equipment is to do the Tank and Compensator Units Test (TASK 28-41-21-710-801) before you do the steps in the task below. Wet capacitance values change with fuel properties and fuel temperature. The capacitance values supplied in this procedure are approximate and only to be used to identify further fault isolation.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
28-41-21-710-801	Tank and Compensator Units - Resistance and Capacitance Check (P/B 501)
FIM 28-41 TASK 801	FQIS BITE Procedure

**C. Wet Capacitance Check in the Main Equipment Center (Tanks Filled to Full Capacity)
(Figure 503)**

SUBTASK 28-41-00-740-003

- (1) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.
 - (a) If the BITE test shows faults, then do the corrective action for the fault shown.
 - (b) If the BITE test does not show faults, then continue.



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SUBTASK 28-41-00-650-005

- (2) Add fuel to the applicable fuel tank until the float switch closes the applicable fueling shutoff valve (fill the tank to its full capacity) (TASK 12-11-00-650-802).

SUBTASK 28-41-00-730-003

- (3) On the Control Display Unit (CDU), push the line select key next to the MAINT prompt on the CDU Initial Reference Index.

NOTE: This brings you to the MAINT BITE INDEX.

- (a) Push the line select key next to the FQIS prompt.
- (b) Push the line select key next to the INPUT MONITORING prompt.
- (c) Push the NEXT key to get to the second INPUT MONITORING page.
- (d) Make sure the quantities shown under TANK UNIT CAP are approximately the same as the capacitance value shown below for the applicable tank:

NOTE: Wet capacitance values change with fuel properties and fuel temperature. The capacitance values supplied below are the approximate capacitances when the tank units and compensator are fully covered with fuel. These values must only be used with caution and to identify further fault isolation.

- 1) No. 1 Tank: 830 pf
- 2) No. 2 Tank: 830 pf
- 3) Center Tank: 1190 pf
- (e) Make sure the quantities shown under COMPENSATOR CAP are approximately equal to 121 pf for the applicable tank.

NOTE: These values apply to the No. 1, No. 2, and the center tank.

SUBTASK 28-41-00-730-004

- (4) If the capacitances are not in the correct range for wet tank capacitances, do this task:
FIM 28-41 TASK 801.

- (a) If the BITE test shows faults, then do the corrective action for the fault shown.
- (b) If the BITE test does not show faults, then do the tank unit and compensator test from the wing spar (TASK 28-41-21-710-801) to isolate the problem.

———— END OF TASK ————

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TANK AND COMPENSATOR UNITS - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) A task to remove the tank unit or the compensator unit;
 - (2) A task to install the tank unit or the compensator unit.
- B. The procedure is the same for the tank units or the compensator units.
- C. The access to the tank units or compensator units is different for each unit.

TASK 28-41-21-000-801

2. Tank Unit or the Compensator Unit Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Tank Unit or the Compensator Unit.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-41-21-110-801	Tank Unit or Compensator Unit Cleaning (P/B 701)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Prepare for the Removal

SUBTASK 28-41-21-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-41-21-860-002



OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

- (2) For the applicable tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802

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E. Tank Unit or the Compensator Unit Removal

SUBTASK 28-41-21-010-002

- (1) Get access to the tank unit [2], tank unit [3], tank unit [4], or tank unit [5] or the compensator [1] through the access panel opening and the rib access openings (TASK 28-11-11-000-801) or (TASK 28-11-31-000-801).

SUBTASK 28-41-21-020-001

- (2) Disconnect the wires from the electrical terminals on the unit.

SUBTASK 28-41-21-020-002

- (3) Loosen the wire clamp on the unit.

NOTE: This step is applicable to the tank unit or compensator unit with camloc clamps (Figure 401: View H - CAMLOC CLAMP).

SUBTASK 28-41-21-020-003

- (4) Open the two camloc clamps that hold the tank unit in its position.

NOTE: This step is applicable to the tank unit or compensator unit with camloc clamps (Figure 401: View H - CAMLOC CLAMP).

SUBTASK 28-41-21-020-009

- (5) Remove the screw on the two molded plastic clamps.

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).

SUBTASK 28-41-21-020-010

- (6) Open the two molded plastic clamps that hold the tank unit in its position.

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).

SUBTASK 28-41-21-020-004



CAUTION

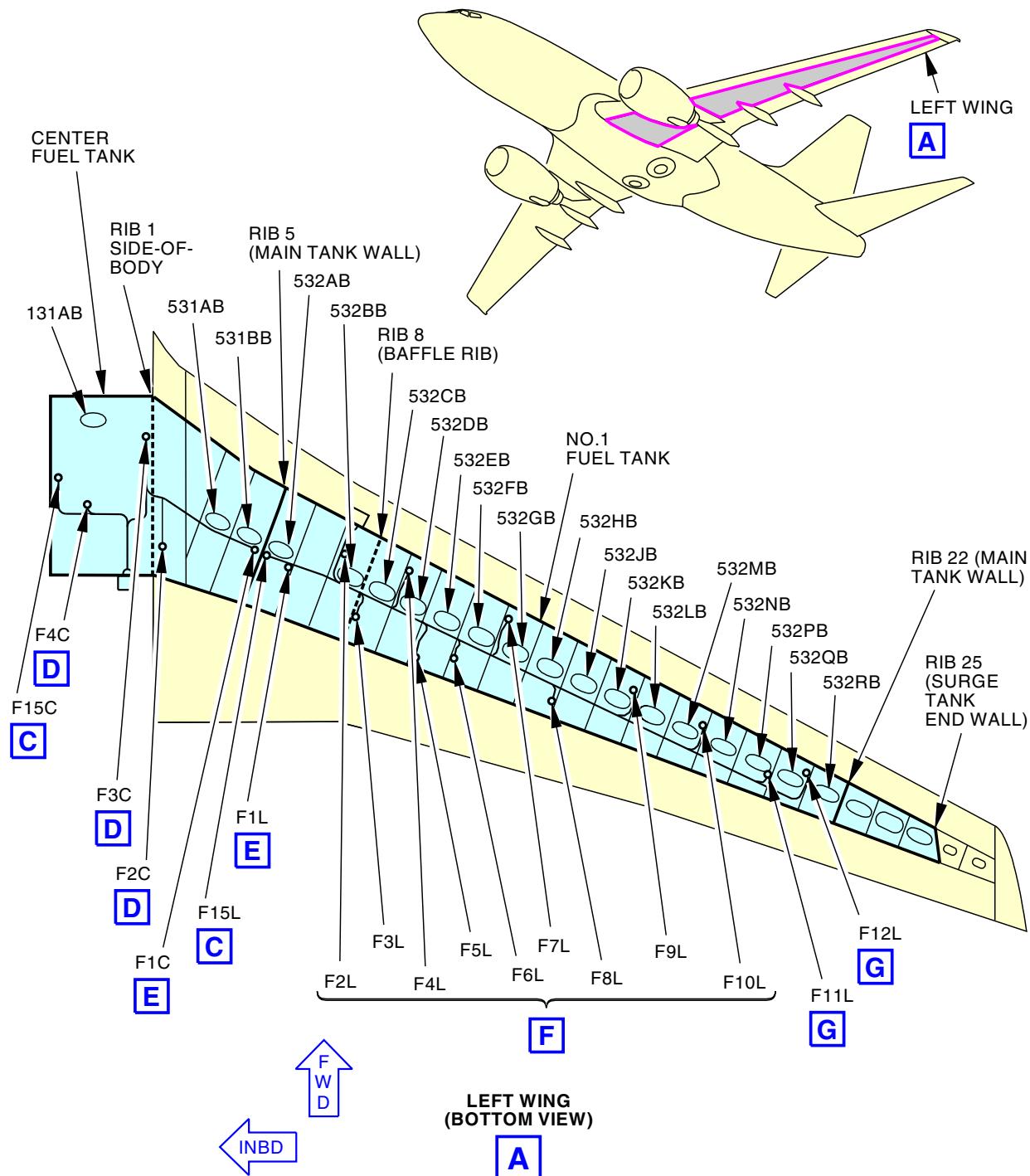
MOVE THE TANK UNITS AND THE COMPENSATOR UNITS CAREFULLY. YOU CAN CAUSE DAMAGE TO THE PROPERTIES OF THE TANK UNITS AND THE COMPENSATOR UNIT.

- (7) Remove the compensator [1], tank unit [2], tank unit [3], tank unit [4], or tank unit [5].
 - (a) If it is necessary, clean the compensator [1], tank unit [2], tank unit [3], tank unit [4], or tank unit [5], do this task: Tank Unit or Compensator Unit Cleaning, TASK 28-41-21-110-801.

———— END OF TASK ————

— EFFECTIVITY —
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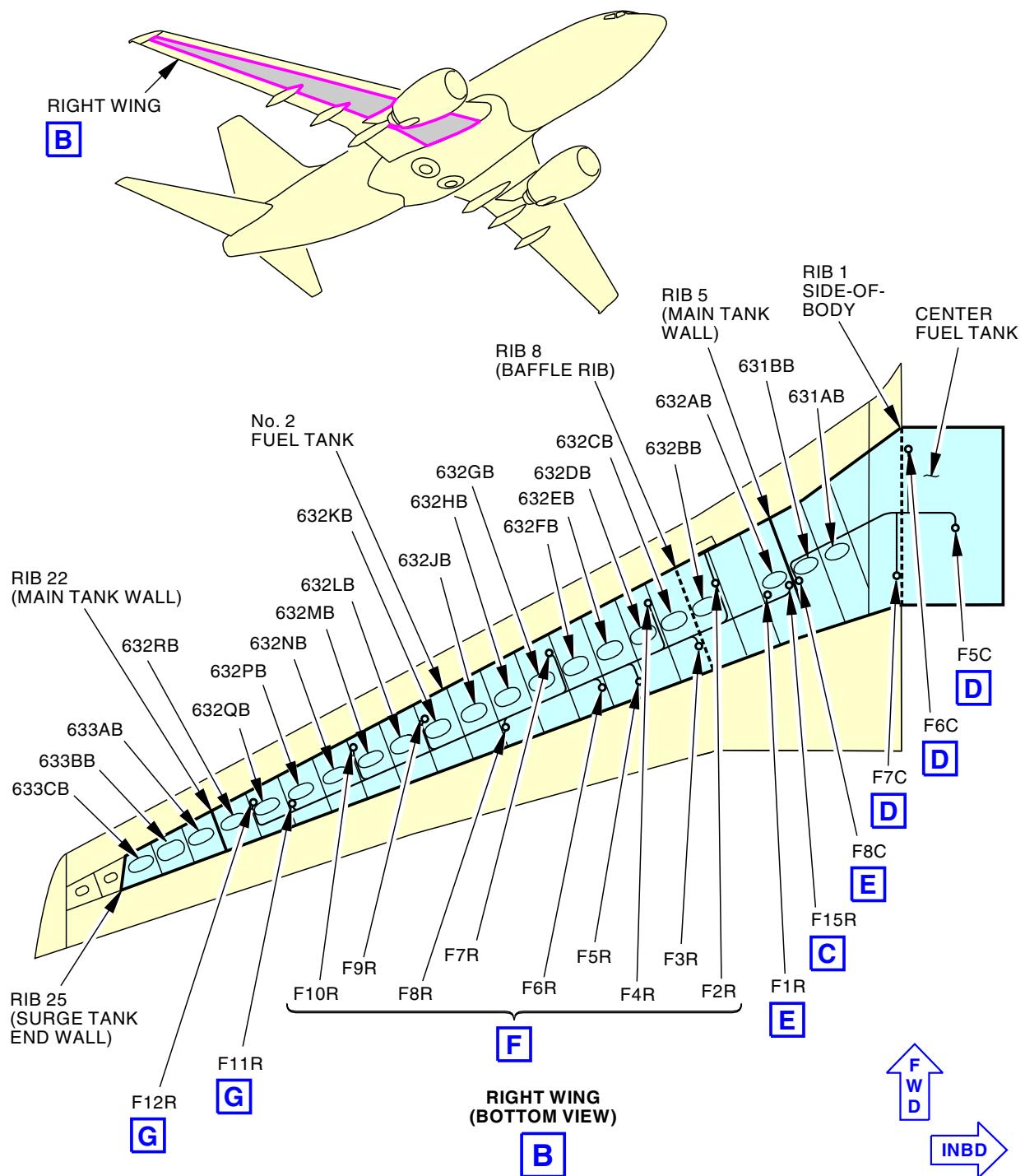
Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 1 of 6)

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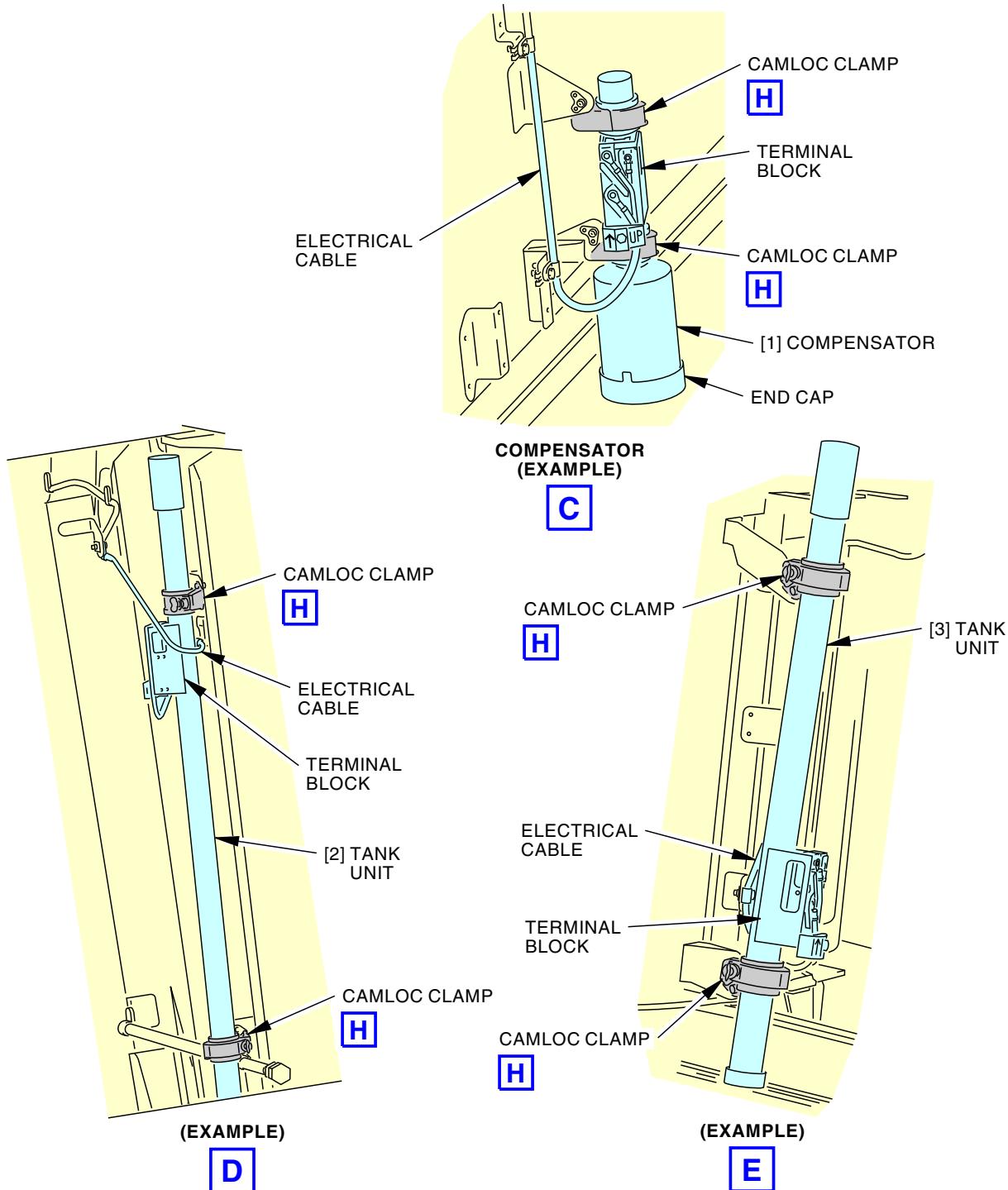


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Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 2 of 6)

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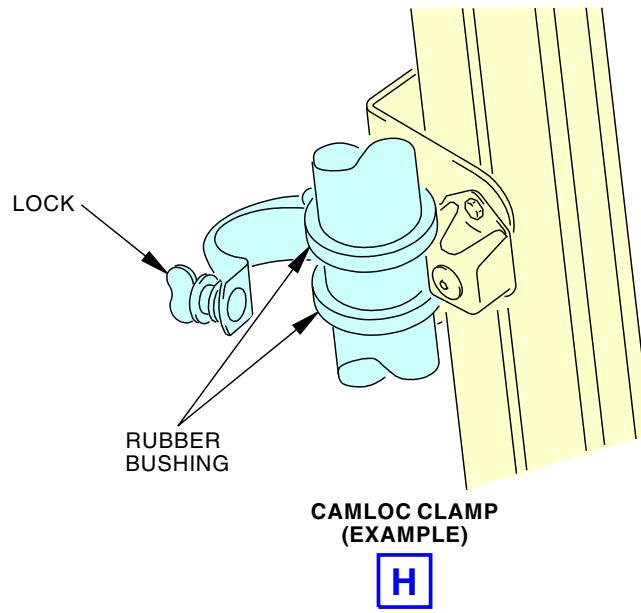
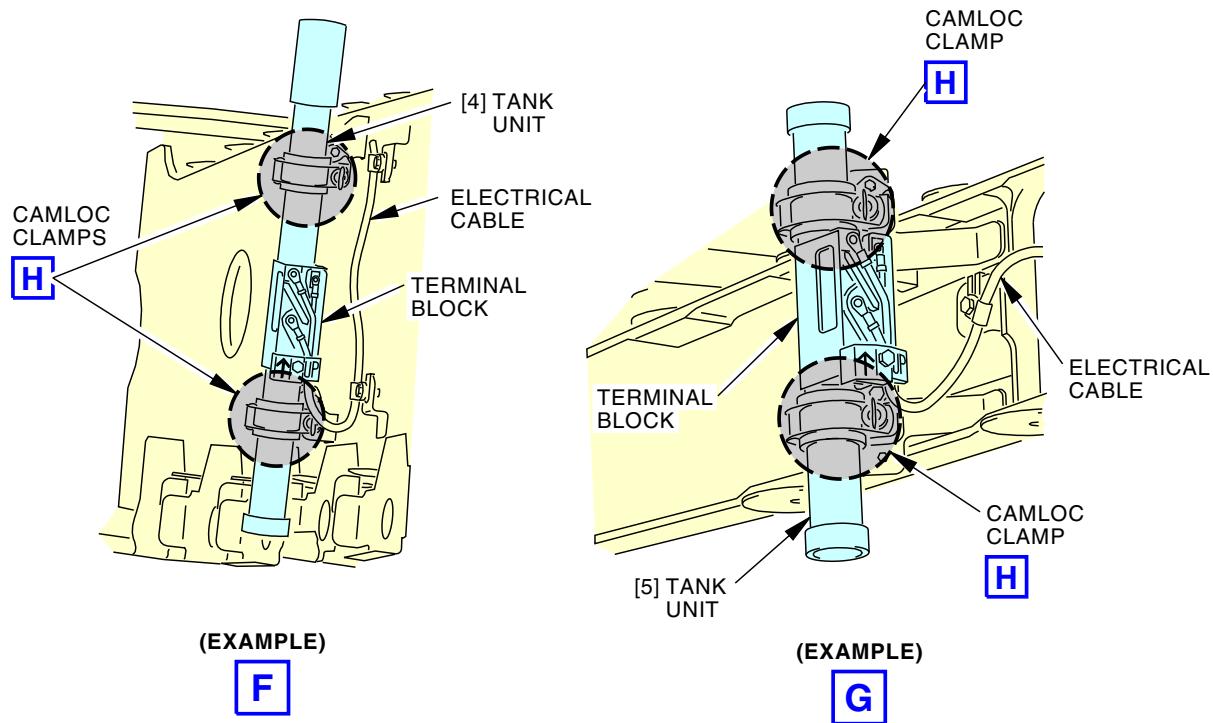


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Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 3 of 6)

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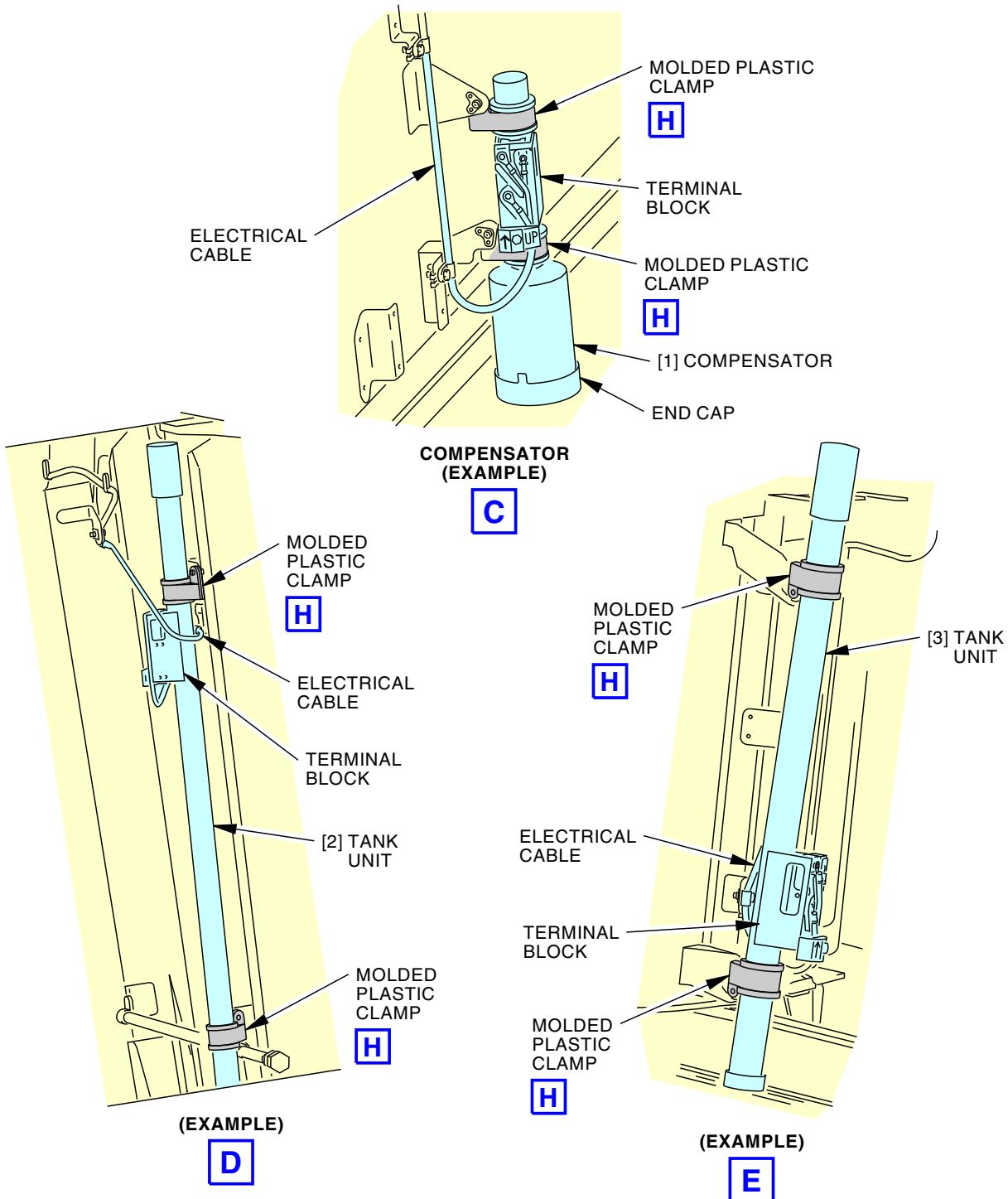
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Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 4 of 6)

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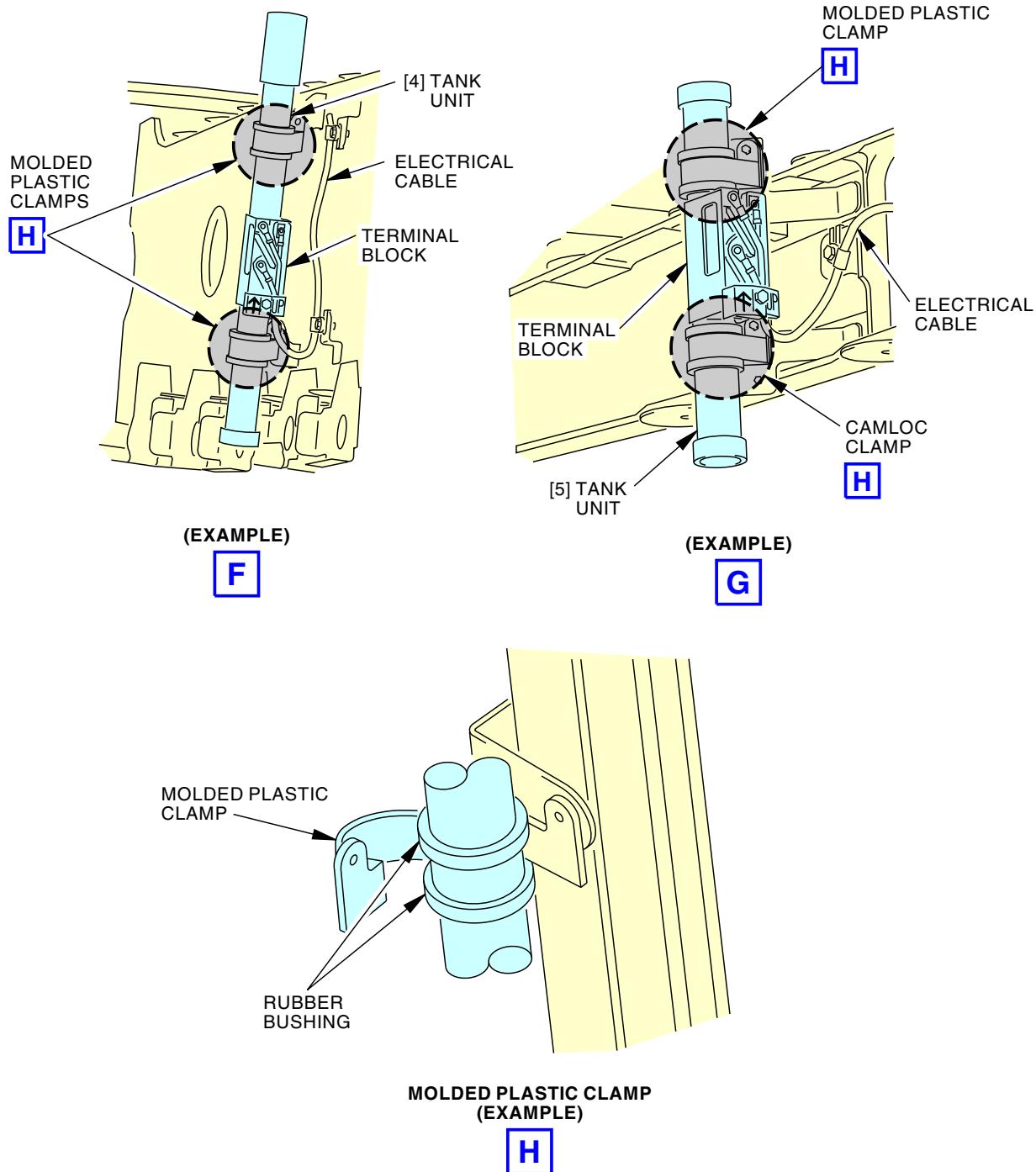


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Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 5 of 6)

EFFECTIVITY
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1873774 S0000340931_V3

**Tank and Compensator Unit Installation
Figure 401/28-41-21-990-804 (Sheet 6 of 6)**

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TASK 28-41-21-400-801

3. Tank Unit or Compensator Unit Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
- (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-09 and 28-AWL-30.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
28-41-00-730-801	System Test - Fuel Quantity Indicating System (P/B 501)
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-12	WIRE HARNESS SUPPORTS
SWPM 20-10-19	WIRE SEPARATION

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Compensator	28-41-21-01-025	LOM 425-434, 437-447, 450-999
		28-41-21-02-020	LOM 425-434, 437-447, 450-999
		28-41-21-03-020	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-020	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-05-015	LOM 425-434, 437-447, 450-999
		28-41-21-05A-010	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
2	Tank unit	28-41-21-01-015	LOM 425-434, 437-447, 450-999
		28-41-21-02-010	LOM 425-434, 437-447, 450-999



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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
2 (cont.)		28-41-21-03-010	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-010	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-05-020	LOM 425-434, 437-447, 450-999
		28-41-21-05-025	LOM 425-434, 437-447, 450-999
		28-41-21-05A-015	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-05A-020	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
3	Tank unit	28-41-21-01-020	LOM 425-434, 437-447, 450-999
		28-41-21-01-030	LOM 425-434, 437-447, 450-999
		28-41-21-02-015	LOM 425-434, 437-447, 450-999
		28-41-21-02-025	LOM 425-434, 437-447, 450-999
		28-41-21-03-015	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-015	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-025	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
4	Tank unit	28-41-21-01-035	LOM 425-434, 437-447, 450-999
		28-41-21-01-040	LOM 425-434, 437-447, 450-999
		28-41-21-01-045	LOM 425-434, 437-447, 450-999
		28-41-21-01-050	LOM 425-434, 437-447, 450-999

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
4 (cont.)		28-41-21-01-055	LOM 425-434, 437-447, 450-999
		28-41-21-01-060	LOM 425-434, 437-447, 450-999
		28-41-21-01-065	LOM 425-434, 437-447, 450-999
		28-41-21-01-070	LOM 425-434, 437-447, 450-999
		28-41-21-01-075	LOM 425-434, 437-447, 450-999
		28-41-21-02-030	LOM 425-434, 437-447, 450-999
		28-41-21-02-035	LOM 425-434, 437-447, 450-999
		28-41-21-02-040	LOM 425-434, 437-447, 450-999
		28-41-21-02-045	LOM 425-434, 437-447, 450-999
		28-41-21-02-050	LOM 425-434, 437-447, 450-999
		28-41-21-02-055	LOM 425-434, 437-447, 450-999
		28-41-21-02-060	LOM 425-434, 437-447, 450-999
		28-41-21-02-065	LOM 425-434, 437-447, 450-999
		28-41-21-02-070	LOM 425-434, 437-447, 450-999
		28-41-21-03-030	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-035	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-040	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
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		28-41-21-03-050	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
4 (cont.)		28-41-21-03-055	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-060	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-065	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-03-070	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-030	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-035	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-040	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-045	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-050	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-055	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-060	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-065	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
		28-41-21-04-070	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424
5	Tank unit	28-41-21-01-080	LOM 425-434, 437-447, 450-999
		28-41-21-02-075	LOM 425-434, 437-447, 450-999
		28-41-21-03-075	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
5 (cont.)		28-41-21-04-075	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-424

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Procedure

SUBTASK 28-41-21-420-001

- (1) Put the tank unit [2], tank unit [3], tank unit [4], or tank unit [5] or the compensator [1] in its position.

► 28-AWL-30: CDCCL

- (a) For the tank unit [2], tank unit [3], tank unit [4], and tank unit [5], make sure that end caps (upper and lower) are installed on the applicable tank unit [2], tank unit [3], tank unit [4], and tank unit [5].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

► 28-AWL-30: CDCCL

- (b) For the compensator [1], make sure a lower end cap is installed on the compensator [1].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

SUBTASK 28-41-21-420-002

- (2) Close the camloc clamps around the tank unit or compensator unit to install it in the correct position.

NOTE: This step is applicable to the tank unit or compensator unit with camloc clamps (Figure 401: View H - CAMLOC CLAMP).

SUBTASK 28-41-21-420-006

- (3) Close the molded plastic clamps around the tank unit or compensator unit to install it in the correct position.

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).



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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 POST SB 737-28-1356

SUBTASK 28-41-21-420-009

► 28-AWL-30: CDCCL

- (4) For the center tanks, make sure that there are molded plastic clamps and close the molded plastic clamps around the tank unit [2], tank unit [3], or compensator [1] to install it in the correct position.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).

LOM 465-999

SUBTASK 28-41-21-420-012

► 28-AWL-30: CDCCL

- (5) For the main tanks, make sure that there are molded plastic clamps and close the molded plastic clamps around the main tank unit [3], tank unit [4], tank unit [5], or compensator [1] to install it in the correct position.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).

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SUBTASK 28-41-21-220-001

- (6) For the tank unit [2], tank unit [3], tank unit [4], and tank unit [5], do these steps:

► 28-AWL-30: CDCCL

- (a) Make sure that there is a 0.04 in. (1.0 mm) or more gap between the end cap of the applicable tank unit [2], tank unit [3], tank unit [4], and tank unit [5] and the upper and lower fuel tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

► 28-AWL-30: CDCCL

- (b) Make sure that there is a 0.10 in. (2.5 mm) or more gap between the side of the tank unit [2], tank unit [3], tank unit [4], and tank unit [5] and the fuel tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

SUBTASK 28-41-21-220-002

- (7) For the compensator [1], do these steps:

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► 28-AWL-30: CDCCL

- (a) Make sure that there is a 0.10 in. (2.5 mm) or more gap between the side of the compensator [1] and the fuel tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

► 28-AWL-30: CDCCL

- (b) Make sure that there is a 0.10 in. (2.5 mm) or more gap between the lower end cap of the compensator [1] and the fuel tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-30.

SUBTASK 28-41-21-420-003

- (8) Connect the wires to the electrical terminals on the unit (SWPM 20-10-11, SWPM 20-10-12), SWPM 20-10-19).

- (a) Adjust the wire slack to maintain a clearance of 0.5 in. (12.7 mm) between the wire and components or structure.

► 28-AWL-09: CDCCL

- (b) If 0.5 in. (12.7 mm) clearance is not possible, then you must maintain a minimum clearance of 0.13 in. (3.3 mm).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

SUBTASK 28-41-21-420-004

- (9) Tighten the screws to these torque ranges:

- (a) HI-Z 13.5 ± 1.5 in-lb (1.5 ± 0.2 N·m)
(b) HI-Z SHIELD 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m)
(c) LO-Z 29 ± 6 in-lb (3 ± 1 N·m)

SUBTASK 28-41-21-210-001

- (10) Make sure that the screw holds each terminal tightly and the terminal will not turn.

SUBTASK 28-41-21-210-002

- (11) Make sure there is a drip loop in the wire as shown on the illustration.

NOTE: Water drops can collect on the wire and fall on the electrical terminals. The drip loop will prevent this.

SUBTASK 28-41-21-420-005

- (12) Tighten the wire clamp nut to 8 ± 1 in-lb (1 ± 0 N·m).

NOTE: This step is applicable to the tank unit or compensator unit with camloc clamps (Figure 401: View H - CAMLOC CLAMP).

SUBTASK 28-41-21-420-007

- (13) Install the screws on the molded plastic clamps.

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- (a) Tighten the screw to 34.5 ± 3.5 in-lb (3.9 ± 0.4 N·m).

NOTE: This step is applicable to the tank unit or compensator unit with molded plastic clamps (Figure 401: View H - MOLDED PLASTIC CLAMP).

SUBTASK 28-41-21-410-002

- (14) Install the access panel for the fuel tank (TASK 28-11-11-400-801 or TASK 28-11-31-400-801).

SUBTASK 28-41-21-860-003

- (15) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-41-21-820-001

- (16) Do this task: System Test - Fuel Quantity Indicating System, TASK 28-41-00-730-801.

SUBTASK 28-41-21-650-002

- (17) If it is necessary, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

———— END OF TASK ————

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TANK AND COMPENSATOR UNITS - ADJUSTMENT/TEST

1. General

- A. This procedure measures the capacitance of each tank unit and the compensator. It also measures the insulation resistance of the related wiring.
- B. This procedure has these tasks:
 - (1) Tank and Compensator Units - Resistance and Capacitance Check
 - (2) Tank and Compensator Units - Wet Capacitance Check.
 - (3) Tank and Compensator Units - Fuel Quantity Indicating System Health Check.

TASK 28-41-21-710-801

2. Tank and Compensator Units - Resistance and Capacitance Check

(Figure 501, Figure 502)

A. References

Reference	Title
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
28-41-41-400-801	Bussing Plug Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1770	Tester - Fuel Gauge System, Includes V.T.O. Capability Part #: 22160649 Supplier: 51190 Part #: 361-012-001 Supplier: 26055 Part #: PSD60-2R Supplier: 51190 Opt Part #: PSD40-1 Supplier: 89305
COM-1780	Cables - Adapter, Fuel Quantity Indicating System (FQIS) Tester Part #: PSD737-1 Supplier: 41364
COM-15149	Adapter - Cable, FQIS Part #: 112-00007 Supplier: 21844 Part #: PSD40-524B Supplier: 41364
COM-15150	Adapter - Cable FQIS Part #: 101-00562 Supplier: 21844
COM-19223	Tester - Fuel Gauge System, Intrinsically Safe with Frequency Selector Part #: PSD60-2R Supplier: 51190
COM-23749	Test Set - AC Fuel Quantity System, PSD90-3AC (Intrinsically Safe) Part #: 22160649 Supplier: 51190





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C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Test of the Tank and Compensator Units Resistance and Capacitance

SUBTASK 28-41-21-730-001

- (1) Use these test units or one of its approved equivalents to do this test:
 - (a) The tester, COM-1770, with applicable tester cables.
 - (b) The tester, COM-19223, with applicable tester cables.
 - (c) The tester, COM-23749, with applicable tester cables.

SUBTASK 28-41-21-800-001

- (2) This test adapter kit or one of its approved equivalents can be used to do the test:
 - (a) The tester cables, COM-1780.

SUBTASK 28-41-21-800-003

- (3) The table below supplies more data about the approved Fuel Quantity Indication System (FQIS) test units and adapter equipment:

Table 501/28-41-21-993-808

Test Unit	Adapter Equipment
PSD60-2R, PSD60-2, PSD60-1, PSD40, or 22160649 (PSD90-3AC)	cables, COM-1780
Gull 361-012-001	cables, COM-1780 with FQIS cable adapter, COM-15149
Barfield 101-00540 MOD8000	FQIS adapter cable, COM-15150 or cables, COM-1780

SUBTASK 28-41-21-650-001

- (4) Defuel the airplane or defuel the applicable fuel tank only, and drain the sump fuel (TASK 28-26-00-650-801).

SUBTASK 28-41-21-860-004



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) To test the tank units in the No. 1 or No. 2 tank, extend the leading edge flaps (TASK 27-81-00-860-803).

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WARNING

YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO
INSTALL THE LE FLAP SAFETY LOCKS. THE LE FLAPS CAN MOVE
QUICKLY IF YOU DO NOT INSTALL THE SAFETY LOCKS CORRECTLY.
THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO
EQUIPMENT.

- (a) Install safety locks on the leading edge flaps (TASK 27-81-00-480-801).

SUBTASK 28-41-21-860-005

- (6) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-21-020-005

- (7) To test the equipment in the No. 1 tank or No. 2 tank, at the wing front spar, remove the applicable bussing plug from the bulkhead receptacle (TASK 28-41-41-000-801).

SUBTASK 28-41-21-020-006

- (8) To test the equipment in the center tank, remove the center tank bussing plug from the bulkhead receptacle (TASK 28-41-41-000-801).

SUBTASK 28-41-21-480-001

- (9) Connect the adapter plug on the test harness to the tank and compensator unit receptacle (Figure 501).

SUBTASK 28-41-21-480-002

- (10) Do one of these steps to connect the test harness to the system tester (Figure 501):

- (a) For the system tester, COM-19223, do these steps:

- 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.

NOTE: The bonding bracket or stud used by the FQIS harness near the FQIS feed-through connector is a good location if you can get a good ground through any sealant, paint or primer that might be present.

- 2) Connect the banana jack connector, P5, on the test harness to the connector, J7, on the tester identified as CHASSIS.

- 3) Connect the connector, P3, labeled HI-Z on the test harness to the connector, J5, on the tester identified as TANK UNITS HI-Z.

- 4) To test the applicable tank units, do these steps:

- a) Connect the connector, P2, identified as LO-Z on the test harness to the connector, P4, identified as TANK UNITS LO-Z on the tester.

- b) On the test harness's selector box, select the applicable tank unit to measure.

- c) To measure the total capacitance of the tank units, select TOTAL on the test harness.

- 5) Connect the connector, P1, on the test harness to the FQIS feed-through connector on the rear or front spar.

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- 6) To test the applicable compensator units, do these steps:

NOTE: The following step to move cables is not necessary to test the COMP when using cables, COM-1780. It is only necessary to select COMP on the cables, COM-1780.

- a) Connect the connector, P2, identified as LO-Z on the tester cables to the connector, P6, identified as COMP on the tester.
- b) On the tester cables, select COMP.

NOTE: Use capacitance measurement MODE A.

NOTE: No adjustment of the frequency is necessary.

- (b) For the system tester, COM-23749, do these steps:

- 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.

NOTE: The bonding bracket or stud used by the FQIS harness near the feed-through connector is a good location. A good ground is possible through the sealant, paint, or primer.

- 2) Connect the banana jack connector, P5, on the test harness to the connector on the tester labeled CHASSIS.
- 3) Connect the connector, P3, labeled HI-Z on the test harness to the MEASURE TANKS TU HI-Z plug on the tester.
- 4) Connect the connector, P1, on the test harness to the feed-through connector on the rear or front spar.

- 5) To test the applicable tank units, do these steps:

- a) Connect the connector, P2, labeled LO-Z on the test harness the MEASURE TANKS TU LO-Z plug on the tester.

- b) On the test harness's selector box, select the applicable tank unit to measure.

- c) To measure the total capacitance of the tank units, select TOTAL on the test harness.

SUBTASK 28-41-21-710-001

- (11) Measure the insulation resistance of each tank unit and compensator unit.

NOTE: Resistance must not be less than the quantity shown in the table below.

- (a) For the system tester, COM-19223, do these steps:

- 1) Measure the insulation resistance of the tank units and compensator units by rotating the tester MEGGER SELECT switch knob.

NOTE: During testing for each unit, the value may fluctuate and be slow to climb. Allow up to 30 seconds for the value to settle, if required.

NOTE: Tester reading as -0r- is Out of Range.

NOTE: The frequency setting does not affect the IR test.

- 2) Make sure that the values are within table limits.

- (b) For the system tester, COM-23749, do these steps:

- 1) On the test harness, select the applicable tank unit or compensator to measure.

- 2) Turn the POWER/TYPE SELECT switch knob to AC CAP.

- 3) Turn the FUNCTION SELECT switch knob to MEGGER.

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- 4) Set the MEG MODE/SIMULATE SELECT switch knob to 3-WIRE.
- 5) Set the MEGGER SELECT switch knob to measure and record each of the circuits as indicated in the table below.
 - a) Set the MEGGER SELECT to these positions:
 - <1> LO-Z/HI-Z
 - <2> HI-Z/GND
 - <3> HI-Z/SHLD
 - <4> LO-Z/GND.

Table 502/28-41-21-993-828

COMPONENT	PIN NUMBER ^{*[1]}	INSULATION RESISTANCE (MEGOHMS)			
NO. 1 (L) OR NO. 2 (R) FUEL TANK		A to B	B to GRD	B to SHLD	A to GRD
F15 (L,R)	3 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F1 (L,R)	6 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F2 (L,R)	7 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F3 (L,R)	8 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F4 (L,R)	9 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F5 (L,R)	10 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F6 (L,R)	11 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F7 (L,R)	12 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F8 (L,R)	13 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F9 (L,R)	14 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F10 (L,R)	15 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F11 (L,R)	16 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F12 (L,R)	17 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
CENTER TANK					
F15C	3 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F1C	6 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6

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Table 502/28-41-21-993-828 (Continued)

COMPONENT	PIN NUMBER *[1]	INSULATION RESISTANCE (MEGOHMS)			
NO. 1 (L) OR NO. 2 (R) FUEL TANK		A to B	B to GRD	B to SHLD	A to GRD
F2C	7 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F3C	8 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F4C	9 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F5C	10 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F6C	11 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F7C	12 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6
F8C	13 AND 1	1000 (minimum)	10 (minimum)	10 (minimum)	4.9-6

*[1] Pin numbers correspond to numbers on the test harness and pin numbers on the airplane connector receptacle. A to B, B to GRD, B to SHLD, and A to GND correspond to the system tester switch positions in the table below.

Table 503/28-41-21-993-830

GULL TESTER	SIMMONDS (PSD TESTER)
A TO B = COAX TO TANK OR COMP	A TO B = LO-Z TO HI-Z
A TO GRD = COAX TO SHIELD	B TO GRD = HI-Z TO GND
B TO SHLD = TANK OR COMP TO SHIELD	B TO SHLD = HI-Z TO SHLD
	A TO GRD = LO-Z TO GND

SUBTASK 28-41-21-710-002

- (12) Measure the capacitance of each tank unit and compensator unit.

NOTE: The capacitance must be as shown in the table below.

Table 504/28-41-21-993-805

COMPONENT	PIN NUMBER *[1]	EMPTY CAPACITANCE (PICOFARADS)
NO. 1 (L) OR NO. 2 (R) FUEL TANK		
F15 (L,R)	3 AND 1	57.60 - 58.70
F1 (L,R)	6 AND 1	62.91 - 64.69
F2 (L,R)	7 AND 1	40.84 - 42.34
F3 (L,R)	8 AND 1	40.21 - 41.71
F4 (L,R)	9 AND 1	27.66 - 29.16
F5 (L,R)	10 AND 1	31.13 - 32.63
F6 (L,R)	11 AND 1	36.88 - 38.38
F7 (L,R)	12 AND 1	29.48 - 30.98

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Table 504/28-41-21-993-805 (Continued)

COMPONENT	PIN NUMBER ^{*[1]}	EMPTY CAPACITANCE (PICOFARADS)
F8 (L,R)	13 AND 1	36.48 - 37.98
F9 (L,R)	14 AND 1	32.55 - 34.05
F10 (L,R)	15 AND 1	27.11 - 28.61
F11 (L,R)	16 AND 1	10.82 - 12.32
F12 (L,R)	17 AND 1	10.82 - 12.32
CENTER TANK		
F15C	3 AND 1	57.60 - 58.70
F1C	6 AND 1	34.80 - 36.30
F2C	7 AND 1	74.91 - 76.93
F3C	8 AND 1	97.09 - 99.55
F4C	9 AND 1	74.17 - 76.17
F5C	10 AND 1	74.17 - 76.17
F6C	11 AND 1	97.09 - 99.55
F7C	12 AND 1	74.91 - 76.93
F8C	13 AND 1	34.80 - 36.30

*[1] Pin numbers correspond to numbers on the test harness and pin numbers on the airplane connector receptacle.

SUBTASK 28-41-21-080-001

- (13) Remove the bolts from the adapter plug.

SUBTASK 28-41-21-080-002

- (14) Remove the adapter plug.

SUBTASK 28-41-21-480-003

- (15) Carefully connect the bussing plug to the receptacle (TASK 28-41-41-400-801).

- (a) If there is a damage to the connector receptacle, it is necessary to replace the tank wire harness.

NOTE: The connector pins and sockets are easily damaged. The connector receptacle is part of the tank wire harness.

SUBTASK 28-41-21-710-003

- (16) Do the procedure again for the other fuel tanks.

SUBTASK 28-41-21-860-006

- (17) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

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SUBTASK 28-41-21-080-003



WARNING

YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO REMOVE THE LE FLAP SAFETY LOCK. THE LE FLAPS CAN MOVE QUICKLY IF YOU DO NOT DO THE STEPS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (18) Remove the leading edge flap locks if you installed them before (TASK 27-81-00-080-801).

SUBTASK 28-41-21-860-007



WARNING

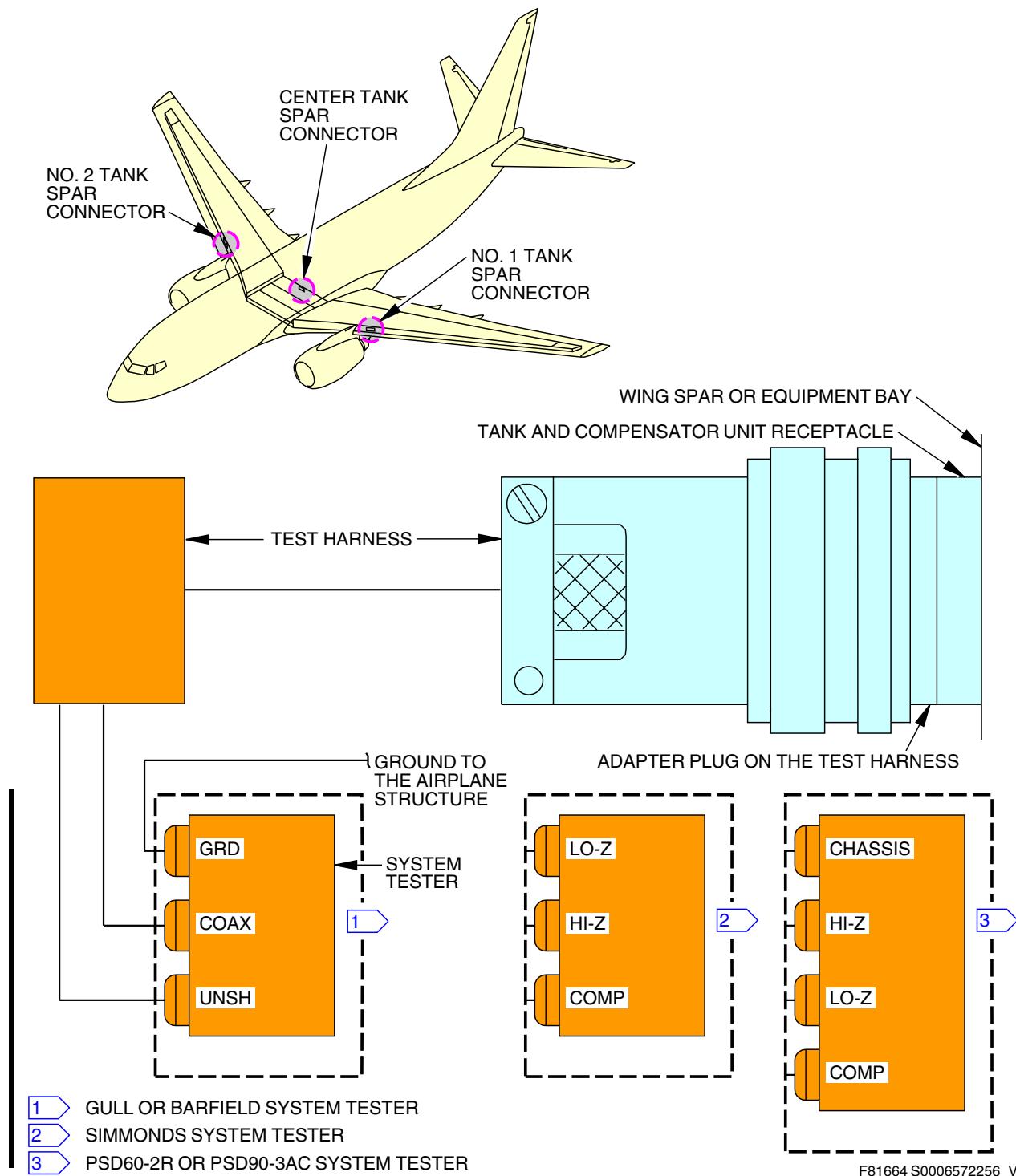
MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (19) Retract the leading edge flaps if they are extended (TASK 27-81-00-860-804).

— END OF TASK —

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Tank Unit and Compensator Unit Test Connections
Figure 501/28-41-21-990-805

EFFECTIVITY
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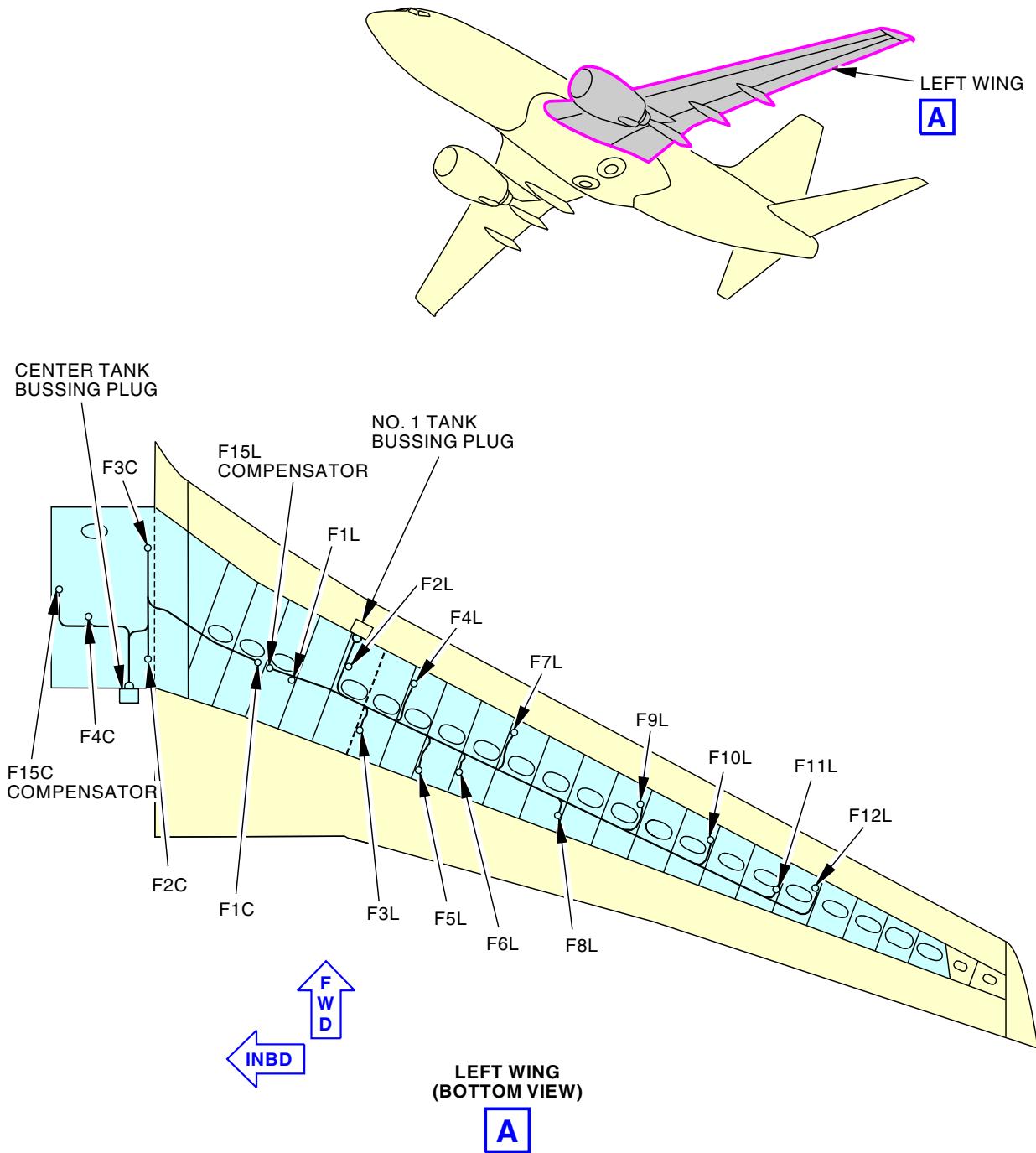
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F81681 S0006572257_V2

Tank Unit and Compensator Unit Test
Figure 502/28-41-21-990-806 (Sheet 1 of 2)

EFFECTIVITY
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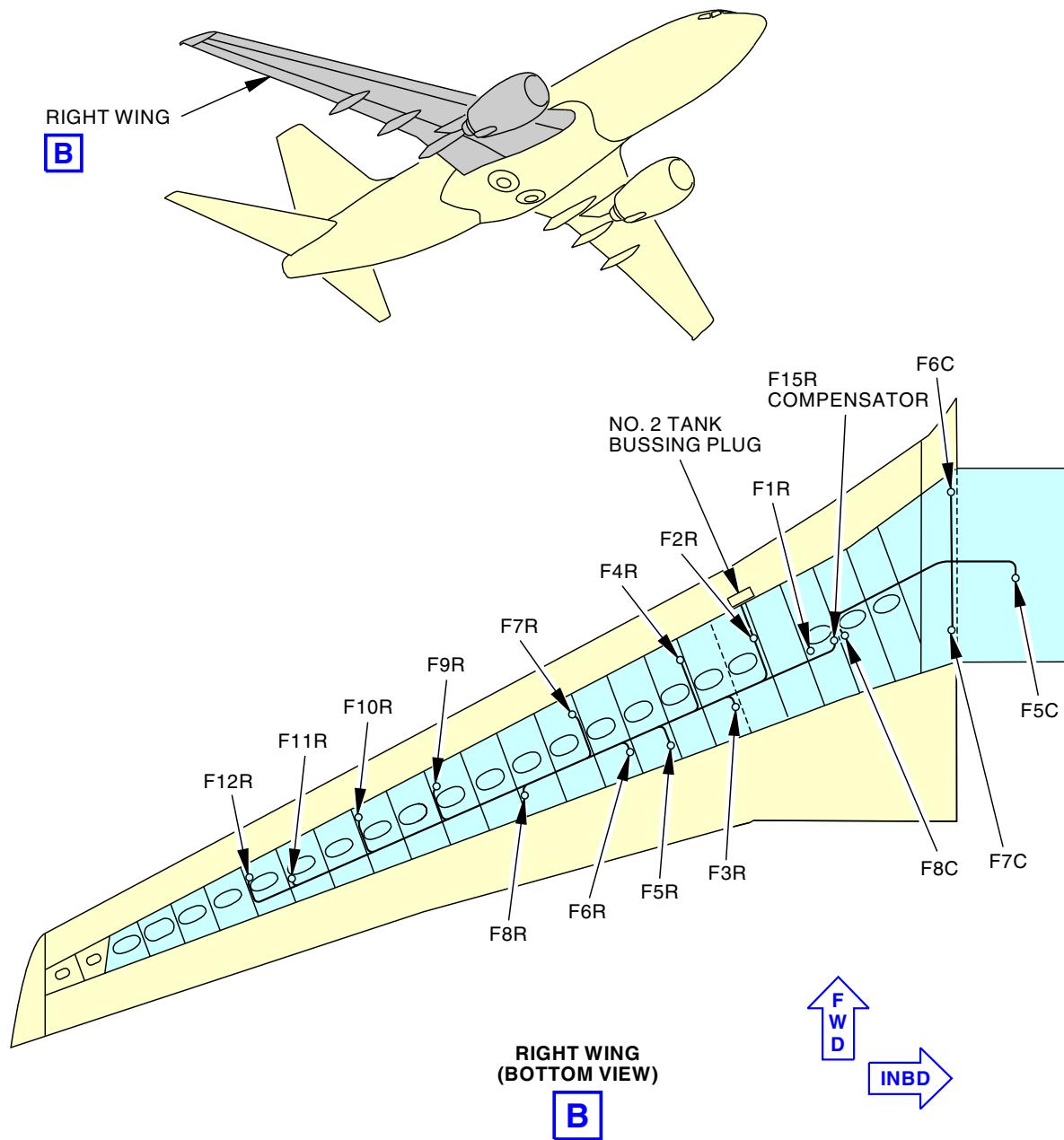
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F81677 S0006572258_V2

Tank Unit and Compensator Unit Test
Figure 502/28-41-21-990-806 (Sheet 2 of 2)

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TASK 28-41-21-710-802

3. Tank and Compensator Units Wet Capacitance Check

(Figure 501, Figure 502)

A. General

- (1) This capacitance check can be used if it is easier to add fuel to a tank than to drain it to empty. In some isolated cases, it is possible that problems can appear with a full fuel tank that do not appear with an empty fuel tank. The recommended procedure to find problems with the FQIS equipment is to do this task: Tank and Compensator Units - Resistance and Capacitance Check, TASK 28-41-21-710-801, before you do the steps in the task below.
- (2) Wet capacitance values change with fuel properties and fuel temperature. The capacitance values supplied in this procedure are approximate and only to be used to identify further fault isolation.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
28-41-41-400-801	Bussing Plug Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1770	Tester - Fuel Gauge System, Includes V.T.O. Capability Part #: 22160649 Supplier: 51190 Part #: 361-012-001 Supplier: 26055 Part #: PSD60-2R Supplier: 51190 Opt Part #: PSD40-1 Supplier: 89305
COM-1780	Cables - Adapter, Fuel Quantity Indicating System (FQIS) Tester Part #: PSD737-1 Supplier: 41364
COM-19223	Tester - Fuel Gauge System, Intrinsically Safe with Frequency Selector Part #: PSD60-2R Supplier: 51190
COM-23749	Test Set - AC Fuel Quantity System, PSD90-3AC (Intrinsically Safe) Part #: 22160649 Supplier: 51190

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

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Zone	Area
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Tank and Compensator Units - Wet Capacitance Check

SUBTASK 28-41-21-730-002

- (1) Use one of these approved test units to do this test:
 - (a) The tester, COM-1770, with applicable test cables.
 - (b) The tester, COM-19223, with applicable test cables.
 - (c) The tester, COM-23749, with applicable tester cables.

SUBTASK 28-41-21-800-007

- (2) This test adapter kit or one of its approved equivalents can be used to do the test:
 - (a) The tester cables, COM-1780.

SUBTASK 28-41-21-650-003

- (3) Add fuel to the applicable fuel tank until the float switch closes the applicable fueling shutoff valve (fill the tank to its full capacity) (TASK 12-11-00-650-802).

SUBTASK 28-41-21-860-008



WARNING

KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (4) To test the tank units in the No. 1 or the No. 2 tank, extend the leading edge flaps (TASK 27-81-00-860-803).



WARNING

YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO INSTALL THE LE FLAP SAFETY LOCKS. THE LE FLAPS CAN MOVE QUICKLY IF YOU DO NOT INSTALL THE SAFETY LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Install safety locks on the leading edge flaps (TASK 27-81-00-480-801).

SUBTASK 28-41-21-860-009

- (5) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-21-020-007

- (6) To test the equipment in the No. 1 tank or the No. 2 tank, at the wing front spar, remove the applicable bussing plug from the bulkhead receptacle (TASK 28-41-41-000-801).

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SUBTASK 28-41-21-020-008

- (7) To test the equipment in the center tank, remove the center tank bussing plug from the bulkhead receptacle (TASK 28-41-41-000-801).

SUBTASK 28-41-21-480-004

- (8) Connect the adapter plug on the test harness to the tank and compensator unit receptacle (Figure 501).

SUBTASK 28-41-21-480-005

- (9) Do one of these steps to connect the test harness to the system tester (Figure 501):

- (a) For the system tester, COM-19223, do these steps:

- 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.

NOTE: The bonding bracket or stud used by the Fuel Quantity Indication System (FQIS) harness near the FQIS feed-through connector is a good location if you can get a good ground through any sealant, paint or primer that might be present.

- 2) Connect the banana jack connector, P5, on the test harness to the connector, J7, on the tester identified as CHASSIS.

- 3) Connect the connector, P3, labeled HI-Z on the test harness to the connector, J5, on the tester identified as TANK UNITS HI-Z.

- 4) To test the applicable tank units, do these steps:

- a) Connect the connector, P2, identified as LO-Z on the test harness to the connector, P4, identified as TANK UNITS LO-Z on the tester.

- b) On the test harness's selector box, select the applicable tank unit to measure.

- c) To measure the total capacitance of the tank units, select TOTAL on the test harness.

- 5) Connect the connector, P1, on the test harness to the FQIS feed-through connector on the rear or front spar.

- 6) To test the applicable compensator units, do these steps:

NOTE: The following step to move cables is not necessary to test the COMP when using cables, COM-1780. It is only necessary to select COMP on the cables, COM-1780.

- a) Connect the connector, P2, identified as LO-Z on the tester cables to the connector, P6, identified as COMP on the tester.

- b) On the tester cables, select COMP.

NOTE: Use capacitance measurement MODE A.

NOTE: No adjustment of the frequency is necessary.

- (b) For the system tester, COM-23749, do these steps:

- 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.

NOTE: The bonding bracket or stud used by the FQIS harness near the feed-through connector is a good location. A good ground is possible through the sealant, paint, or primer.

- 2) Connect the banana jack connector, P5, on the test harness to the connector on the tester labeled CHASSIS.

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- 3) Connect the connector, P3, labeled HI-Z on the test harness to the MEASURE TANKS TU HI-Z plug on the tester.
- 4) Connect the connector, P1, on the test harness to the feed-through connector on the rear or front spar.
- 5) To test the applicable tank units, do these steps:
 - a) Connect the connector, P2, labeled LO-Z on the test harness the MEASURE TANKS TU LO-Z plug on the tester.
 - b) On the test harness's selector box, select the applicable tank unit to measure.
 - c) To measure the total capacitance of the tank units, select TOTAL on the test harness.

SUBTASK 28-41-21-710-004

- (10) Measure the capacitance of each tank unit and compensator unit.

NOTE: Wet capacitance values change with fuel properties and fuel temperature. The capacitance values supplied in the table below are the approximate tank unit and compensator capacitances when these units are fully covered with fuel. These values must only be used with caution and to identify further fault isolation.

Table 505/28-41-21-993-807

COMPONENT	PIN NUMBER *[1]	WET CAPACITANCE (PICOFARADS)
NO. 1 (L) OR NO. 2 (R) FUEL TANK		
F15 (L,R)	3 AND 1	121.5
F1 (L,R)	6 AND 1	135.1
F2 (L,R)	7 AND 1	87.9
F3 (L,R)	8 AND 1	86.5
F4 (L,R)	9 AND 1	60.0
F5 (L,R)	10 AND 1	67.1
F6 (L,R)	11 AND 1	79.5
F7 (L,R)	12 AND 1	63.6
F8 (L,R)	13 AND 1	78.3
F9 (L,R)	14 AND 1	70.2
F10 (L,R)	15 AND 1	58.6
F11 (L,R)	16 AND 1	20.9 *[2]
F12 (L,R)	17 AND 1	15.7 *[2]
CENTER TANK		
F15C	3 AND 1	121.5
F1C	6 AND 1	74.9
F2C	7 AND 1	161.4
F3C	8 AND 1	209.0
F4C	9 AND 1	159.3
F5C	10 AND 1	159.3

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Table 505/28-41-21-993-807 (Continued)

COMPONENT	PIN NUMBER ^{*[1]}	WET CAPACITANCE (PICOFARADS)
F6C	11 AND 1	209.0
F7C	12 AND 1	161.4
F8C	13 AND 1	74.9

*[1] Pin numbers correspond to numbers on the test harness and pin numbers on the airplane connector receptacle.

*[2] Tank unit is not completely covered in fuel at volumetric shutoff (VSO). This is an approximate wet capacitance value for the fuel level at VSO and can be different.

SUBTASK 28-41-21-080-004

- (11) Remove the bolts from the adapter plug.

SUBTASK 28-41-21-080-005

- (12) Remove the adapter plug.

SUBTASK 28-41-21-480-006

- (13) Carefully connect the bussing plug to the receptacle (TASK 28-41-41-400-801).

- (a) If there is a damage to the connector receptacle, it is necessary to replace the tank wire harness.

NOTE: The connector pins and sockets are easily damaged. The connector receptacle is part of the tank wire harness.

SUBTASK 28-41-21-710-005

- (14) Do the procedure again for the other fuel tanks.

SUBTASK 28-41-21-860-010

- (15) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-21-080-006



WARNING

YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO REMOVE THE LE FLAP SAFETY LOCK. THE LE FLAPS CAN MOVE QUICKLY IF YOU DO NOT DO THE STEPS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (16) Remove the leading edge flap locks if you installed them before (TASK 27-81-00-080-801).

SUBTASK 28-41-21-860-011



WARNING

KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (17) Retract the leading edge flaps if they are extended (TASK 27-81-00-860-804).

— END OF TASK —

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TASK 28-41-21-710-803

4. Tank and Compensator Units - Fuel Quantity Indicating System Health Check

(Figure 501, Figure 502)

A. General

- (1) This task contains the following procedures to inspect the tank fuel probes, compensator units and Fuel Quantity Indication System (FQIS) wiring harness and connectors for contamination and degradation which affects the capacitance measurement ability of the system.
- (2) Water, Foreign Object Debris (FOD), and Microbiological Growth (MBG) in a fuel tank can lead to significant interruptions to the FQIS and corrosion of an aircraft structure. Hydrocarbon fuels are subject to bacterial and fungal growth during storage, transportation and use. The organisms that feed on these hydrocarbons not only grow in small quantities of water present the fuel systems, but also grow in the hydrocarbon fuel itself. Microbes can live for months, and any subsequent presence of free water may lead to rapid population increase. These micro organisms will feed on the boundary layers that exist between the water and the fuel. Since water is heavier than fuel, it will eventually migrate to the lower inboard areas of the fuel tanks. If not addressed, secretions of the microbes will start to eat away the corrosion protection layers of FQIS components, wiring harnesses, structure and lead to material corrosion damage.
- (3) MBG or fungus contamination, will appear as a dirty slime which can stain the fuel tank primer and/or the tank sealant. This FQIS Health Check will detect water, FOD and MBG that typically occurs over time, but also after extended maintenance and storage.
- (4) In order to mitigate future MBG reoccurrences and subsequent FQIS intermittent operation, sump the drains, use an approved fuel biocide protection additive, test the fuel regularly in accordance with maintenance manual recommendations and perform proactive FQIS health checks. While Boeing cannot guarantee prevention of MBG occurring due to the many outstanding variables, we do believe these recommendations will help mitigate any future MBG issues.
- (5) This check is performed using intrinsically safe equipment to facilitate testing with any level of fuel in the tank. This enhances the ability to uncover issues that occur only in-flight and also eliminates the need to drain, sump and purge the tanks prior to testing.

NOTE: A tank entry is necessary if the test fails and in-tank equipment or wire harness require replacement.

- (6) If planning to do the wet capacitance measurement, then a minimum of 10% of fuel quantity must be in each tank to ensure the compensator is immersed in fuel. Refer to the Systems Description Section (SDS) section 28-10-00 for the fuel tank storage capacity.

NOTE: The fuel quantities in Table 506 are calculated using fuel Specific Gravity (SG) of 6.7 lbs/gal.

Table 506/28-41-21-993-824 Fuel quantities for a Specific Gravity (SG) of 6.7 lbs/gal

Tank	10% of Fuel Weight (lb/Kgs)	Total volume at VSO (gal/L)
Main tank 1 & 2 (Per tank)	863 lb (391 kg)	1288.06 gal (4875.84 l)
Center tank	2820.3 lb (1279.3 kg)	4298.96 gal (16,273.33 l)

B. References

Reference	Title
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)

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Reference	Title
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
28-41-21-000-801	Tank Unit or the Compensator Unit Removal (P/B 401)
28-41-21-400-801	Tank Unit or Compensator Unit Installation (P/B 401)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
28-41-41-400-801	Bussing Plug Installation (P/B 401)
28-41-42-020-801	FQIS Spar Penetration Connector Removal (P/B 401)
28-41-42-420-801	FQIS Spar Penetration Connector Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1780	Cables - Adapter, Fuel Quantity Indicating System (FQIS) Tester Part #: PSD737-1 Supplier: 41364
COM-19223	Tester - Fuel Gauge System, Intrinsically Safe with Frequency Selector Part #: PSD60-2R Supplier: 51190
COM-23749	Test Set - AC Fuel Quantity System, PSD90-3AC (Intrinsically Safe) Part #: 22160649 Supplier: 51190

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Prepare for the Test

SUBTASK 28-41-21-730-003



MAKE SURE THAT YOU USE AN INTRINSICALLY SAFE METER IN AN UNCONTROLLED TANK. AN ALTERNATIVE TOOL MUST BE INTRINSICALLY SAFE. IF YOU DO NOT OBEY, A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Use the system tester, COM-19223 or tester, COM-23749 with the cables, COM-1780.

NOTE: The cables, COM-1780 are referred to as the test harness in this procedure.



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SUBTASK 28-41-21-650-004

- (2) This test may be performed at any fuel level. If performing the health check to troubleshoot an issue, the user may increase the ability to uncover issues by duplicating the conditions leading to the event by filling or transferring fuel to the tank at the level reported when the problem occurred.

SUBTASK 28-41-21-860-012



KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (3) To test the tank or compensator units for the main tanks, extend the leading edge flaps (TASK 27-81-00-860-803).



YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO INSTALL THE LE FLAP SAFETY LOCKS. THE LE FLAPS CAN MOVE QUICKLY IF YOU DO NOT INSTALL THE SAFETY LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Install safety locks on the leading edge flaps (TASK 27-81-00-480-801).

SUBTASK 28-41-21-860-013

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

F. Tank and Compensator Units - Fuel Quantity Indicating System Health Check

SUBTASK 28-41-21-010-003

- (1) Disconnect the applicable bussing plug from the applicable fuel tank feed-through connector (TASK 28-41-41-000-801).

SUBTASK 28-41-21-480-007

- (2) Connect the adapter plug on the test harness to the feed-through connector (Figure 501).

SUBTASK 28-41-21-480-008

- (3) Do one of these steps to connect the test harness to the system tester (Figure 501).

- (a) For the system tester, COM-19223, do these steps:

- 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.

NOTE: The bonding bracket or stud used by the FQIS harness near the feed-through connector is a good location. A good ground is possible through the sealant, paint or primer.

- 2) Connect the banana jack connector, P5, on the test harness to the connector, J7, on the tester identified as CHASSIS.
- 3) Connect the connector, P3, labeled HI-Z on the test harness to the connector, J5, on the tester identified as TANK UNIT HI-Z.

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- 4) Connect the connector, P1, on the test harness to the feed-through connector on the rear or front spar.
- 5) To test the applicable tank units, do these steps:
 - a) Connect the connector, P2, identified as LO-Z on the test harness to the connector, P4, identified as TANK UNIT LO-Z on the tester.
 - b) On the test harness's selector box, select the applicable tank unit to measure.
 - c) To measure the total capacitance of the tank units, Select TOTAL on the test harness.
- (b) For the system tester, COM-23749, do these steps:
 - 1) Connect the alligator style clamp labeled AIRFRAME GROUND on the test harness to the aircraft ground/structure.
NOTE: The bonding bracket or stud used by the FQIS harness near the feed-through connector is a good location. A good ground is possible through the sealant, paint or primer.
 - 2) Connect the banana jack connector, P5, on the test harness to the connector on the tester labeled CHASSIS.
 - 3) Connect the connector, P3, labeled HI-Z on the test harness to the MEASURE TANKS TU HI-Z plug on the tester.
 - 4) Connect the connector, P1, on the test harness to the feed-through connector on the rear or front spar.
 - 5) To test the applicable tank units, do these steps:
 - a) Connect the connector, P2, labeled LO-Z on the test harness the MEASURE TANKS TU LO-Z plug on the tester.
 - b) On the test harness's selector box, select the applicable tank unit to measure.
 - c) To measure the total capacitance of the tank units, Select TOTAL on the test harness.

SUBTASK 28-41-21-480-009

- (4) Do one of these steps to setup the system tester to perform Fuel Quantity Indicating System Health Check:
 - (a) For the system tester, COM-19223, do these steps:
NOTE: Adjustment of the frequency will be necessary to conduct this health check.
 - 1) Set the POWER switch to ON and wait for 3 minutes.
NOTE: Three minutes is necessary for the system tester to stabilize.
 - 2) Set the CAPACITANCE MEASUREMENT MODE switch to MODE A.
 - 3) Use the Frequency Select Switch to set the frequency to 5000Hz, push the knob down to enter.
 - 4) Place the Function Select Switch to MEASUREMENT EXT.
 - 5) Set the Megger Mode Switch to 3-WIRE.
 - 6) Place the Megger Select to TU.
NOTE: You may ignore the CAP SIMULATOR settings.
 - (b) For the system tester, COM-23749, do these steps:
 - 1) Set the POWER/TYPE SELECT switch knob to the PROBE CHECK position.

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- 2) Set the FUNCTION SELECT switch knob to the MEAS EXT - TU position.

NOTE: You may ignore the MEG MODE/SIMULATE SELECT switch knob, and the MEGGER SELECT switch knob when you are using the PROBE CHECK function.

SUBTASK 28-41-21-710-006

- (5) Do one of these steps to measure the capacitance of each tank unit and compensator unit at 5000Hz and 500Hz, and record the data (Table 507, Table 510).

NOTE: Each compensator or tank unit has a PROBE SELECT switch position. See Table 507 & Table 510 for the correct compensator or tank unit position on the switch. The switch positions will not be the same for all the fuel tanks. Some of the PROBE SELECT positions are not used.

- (a) For the system tester, COM-19223, do these steps:

- 1) Push the frequency Select knob to change the frequency.

NOTE: You may need to push PWR INT or cycle power OFF/ON to enable the frequency change display.

- (b) For the system tester, COM-23749, do these steps:

- 1) Measure the difference in capacitance of each tank unit using the PROBE CHECK function.

- a) On the test harness, select the applicable tank unit or compensator to measure.

- b) Record the measured percent error on the applicable table.

NOTE: The percent error is displayed in the upper left corner of the display.

NOTE: It is not necessary to measure or record the capacitance values at 500Hz or at 5000Hz. The PROBE CHECK function measures the capacitance at multiple frequencies and calculates the percent error automatically.

SUBTASK 28-41-21-710-007

- (6) Do one of these steps to measure the insulation resistance of the tank units and compensator units:

- (a) For the system tester, COM-19223, do these steps:

- 1) Measure the insulation resistance of the tank units and compensator units by rotating the tester Megger select switch knob to measure and record each of the circuits as indicated in Table 508, Table 509 and Table 511.

NOTE: During testing for each unit, the value may fluctuate and be slow to climb. Allow up to 30 seconds for the value to settle, if required.

NOTE: Tester reading as -0r- is Out of Range.

NOTE: The frequency setting does not affect the IR test.

- (b) For the system tester, COM-23749, do these steps:

- 1) On the test harness, select the applicable tank unit or compensator to measure.

- 2) Turn the POWER/TYPE SELECT switch knob to AC CAP.

- 3) Turn the FUNCTION SELECT switch knob to MEGGER

- 4) Set the MEG MODE/SIMULATE SELECT switch knob to 3-WIRE.

- 5) Set the MEGGER SELECT switch knob to measure and record each of the circuits as indicated in Table 508, Table 509 and Table 511.

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- a) Set the MEGGER SELECT to these positions for Table 508:
 - <1> LO-Z/HI-Z
 - <2> HI-Z/GND
 - <3> HI-Z/SHLD
 - <4> LO-Z/GND.
- b) Set the MEGGER SELECT to these positions for Table 509:
 - <1> LO-Z/HI-Z
 - <2> HI-Z/GND
 - <3> HI-Z/SHLD
 - <4> LO-Z/GND.
- c) Set the MEGGER SELECT to these positions for Table 510:
 - <1> LO-Z/HI-Z
 - <2> HI-Z/GND
 - <3> HI-Z/SHLD
 - <4> LO-Z/GND.

SUBTASK 28-41-21-750-001

- (7) Do one of these steps to check the measured capacitance values for the tank units and compensator:
 - (a) For the system tester, COM-19223, do these steps:
 - 1) Make sure that the measured capacitance values for the tank units and compensator:
 - a) Do not vary by more than 10% of the 500Hz reading when the frequency is lowered to 500Hz.
 - b) Are within the limits given in Table 507 and Table 510 at 5000Hz.
 - (b) For the system tester, COM-23749, do this step:
 - 1) Make sure that the percent (%) difference measured in PROBE CHECK is less than 10%.

NOTE: The difference in percent is shown in the top left corner of the display using probe check mode.

NOTE: Probe check mode varies the frequency from 5000Hz to 500Hz for each measurement, and will display the difference in pF.
- (8) If the capacitance value for a tank unit is out of tolerance for steps a) or b) above, further fault isolate by doing the following:
 - (a) De-fuel the fuel tank for entry (TASK 28-26-00-650-801).
 - (b) Do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.
 - (c) Disconnect the respective tank unit or compensator and retest.
 - 1) If the test values are within limits; the respective tank unit or compensator is defective or contaminated.
 - a) Remove and replace component and retest (TASK 28-41-21-000-801, TASK 28-41-21-400-801).

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- 2) If the test still varies by more than 10% with the components disconnected, continue to fault isolate the defective harness segment by shaking the harness while monitoring the tester fluctuations.
 - a) Verify faulty wiring harness bundle by disconnecting suspect segments and retesting.
 - b) If isolated to the connector, clean or replace and retest.
- 3) If the capacitance values of the wire bundle segment continues to be out of tolerance, remove and replace or repair the in-tank FQIS wire bundle per Standard Wiring Practices Manual (SWPM). Retest after the corrective action and ensure the test values are within limits.

SUBTASK 28-41-21-750-003

- (9) Make sure that the measured insulation resistance for each circuit is greater than the minimum insulation resistance as indicated in Table 508, Table 509 and Table 511.

SUBTASK 28-41-21-750-004

- (10) If the insulation resistance value was out of tolerance, further fault isolate by doing the following:
 - (a) De-fuel the fuel tank for entry (TASK 28-26-00-650-801).
 - (b) Disconnect the respective tank unit or compensator and retest.
 - 1) If the insulation resistance values are in range; the respective tank unit or compensator is defective or contaminated.
 - a) Remove and replace component and retest (TASK 28-41-21-000-801, TASK 28-41-21-400-801).
 - 2) If the insulation resistance test still fails with the components disconnected, continue to fault isolate the defective harness segment by shaking the harness at the spar connector and at each tank unit terminal box while monitoring the tester fluctuations.
 - a) If isolated to the connector, clean or replace and retest.
 - 3) If the insulation resistance values of the wire bundle segment continues to be out of tolerance, remove and replace or repair the in-tank FQIS wire bundle per SWPM. Retest after the corrective action and ensure the test values are within limits.

Table 507/28-41-21-993-822 Health Range Capacitance - Main Tank

COMPONENT NO. 1 (L) OR NO. 2 (R) MAIN TANK	PIN NUMBER ^[1]	CAPACITANCE (PICOFARADS)		MEASURED CAPACITANCE AT 5000Hz (PICOFARADS)		MEASURED CAPACITANCE AT 500Hz (PICOFARADS)	
		EMPTY	MAX WET	L TANK	R TANK	L TANK	R TANK
F15 (L,R)	3 AND 1	57.60 - 58.70	121.5				
F1 (L,R)	6 AND 1	62.91 - 64.69	135.1				
F2 (L,R)	7 AND 1	40.84 - 42.34	87.9				
F3 (L,R)	8 AND 1	40.21 - 41.71	86.5				
F4 (L,R)	9 AND 1	27.66 - 29.16	60.0				
F5 (L,R)	10 AND 1	31.13 - 32.63	67.1				
F6 (L,R)	11 AND 1	36.88 - 38.38	79.5				

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Table 507/28-41-21-993-822 Health Range Capacitance - Main Tank (Continued)

COMPONENT NO. 1 (L) OR NO. 2 (R) MAIN TANK	PIN NUMBER ^[1]	CAPACITANCE (PICOFARADS)		MEASURED CAPACITANCE AT 5000Hz (PICOFARADS)		MEASURED CAPACITANCE AT 500Hz (PICOFARADS)	
		EMPTY	MAX WET	L TANK	R TANK	L TANK	R TANK
F7 (L,R)	12 AND 1	29.48 - 30.98	63.6				
F8 (L,R)	13 AND 1	36.48 - 37.98	78.3				
F9 (L,R)	14 AND 1	32.55 - 34.05	70.2				
F10 (L,R)	15 AND 1	27.11 - 28.61	58.6				
F11 (L,R)	16 AND 1	10.82 - 12.32	20.9 ^[2]				
F12 (L,R)	17 AND 1	10.82 - 12.32	15.7 ^[2]				

*[1] Pin numbers correspond to numbers on the test harness and pin numbers on the airplane feed-through connector.

*[2] Tank unit is not completely covered in fuel at volumetric shutoff (VSO). This is an approximate wet capacitance value for the fuel level at VSO and can be different.

Table 508/28-41-21-993-825 Health Range Insulation Resistance - Left Tank

COMP	PIN NUMBER	LO-Z to HI-Z ^[1] (1000 Min) (Megaohms)	HI-Z to GND ^[1] (10 Min) (Megaohms)	LO-Z to GND ^[1] (4.9 to 6 Min) (Megaohms)	HI-Z to SHLD ^[1] (10 Min) (Megaohms)
F15 (L)	3 AND 1				
F1 (L)	6 AND 1				
F2 (L)	7 AND 1				
F3 (L)	8 AND 1				
F4 (L)	9 AND 1				
F5 (L)	10 AND 1				
F6 (L)	11 AND 1				
F7 (L)	12 AND 1				
F8 (L)	13 AND 1				
F9 (L)	14 AND 1				
F10 (L)	15 AND 1				
F11 (L)	16 AND 1				
F12 (L)	17 AND 1				

*[1] Units in Megaohms.

Table 509/28-41-21-993-827 Health Range Insulation Resistance - Right Tank

COMP	PIN NUMBER	LO-Z to HI-Z ^[1] (1000 Min) (Megaohms)	HI-Z to GND ^[1] (10 Min) (Megaohms)	LO-Z to GND ^[1] (4.9 to 6 Min) (Megaohms)	HI-Z to SHLD ^[1] (10 Min) (Megaohms)
F15 (R)	3 AND 1				
F1 (R)	6 AND 1				

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Table 509/28-41-21-993-827 Health Range Insulation Resistance - Right Tank (Continued)

COMP	PIN NUMBER	LO-Z to HI-Z ^[1] (1000 Min) (Megaohms)	HI-Z to GND ^[1] (10 Min) (Megaohms)	LO-Z to GND ^[1] (4.9 to 6 Min) (Megaohms)	HI-Z to SHLD ^[1] (10 Min) (Megaohms)
F2 (R)	7 AND 1				
F3 (R)	8 AND 1				
F4 (R)	9 AND 1				
F5 (R)	10 AND 1				
F6 (R)	11 AND 1				
F7 (R)	12 AND 1				
F8 (R)	13 AND 1				
F9 (R)	14 AND 1				
F10 (R)	15 AND 1				
F11 (R)	16 AND 1				
F12 (R)	17 AND 1				

*[1] Units in Megaohms.

Table 510/28-41-21-993-823 Health Range Capacitance - Center Tank

COMPONENT	PIN NUMBER ^[1]	CAPACITANCE (PICOFARADS)		MEASURED CAPACITANCE AT 5000Hz (PICOFARADS)	MEASURED CAPACITANCE AT 500Hz (PICOFARADS)
		EMPTY	MAX WET		
F15 (C)	3 AND 1	57.60 - 58.70	121.5		
F1 (C)	6 AND 1	34.80 - 36.30	74.9		
F2 (C)	7 AND 1	74.91 - 76.93	161.4		
F3 (C)	8 AND 1	97.09 - 99.55	209.0		
F4 (C)	9 AND 1	74.17 - 76.17	159.3		
F5 (C)	10 AND 1	74.17 - 76.17	159.3		
F6 (C)	11 AND 1	97.09 - 99.55	209.0		
F7 (C)	12 AND 1	74.91 - 76.93	161.4		
F8 (C)	13 AND 1	34.80 - 36.30	74.9		

*[1] Pin numbers correspond to numbers on the test harness and pin numbers on the airplane feed-through connector.

Table 511/28-41-21-993-826 Health Range Insulation Resistance - Center tank

COMP	PIN NUMBER	LO-Z to HI-Z ^[1] (1000 Min) (Megaohms)	HI-Z to GND ^[1] (10 Min) (Megaohms)	LO-Z to GND ^[1] (4.9 to 6 Min) (Megaohms)	HI-Z to SHLD ^[1] (10 Min) (Megaohms)
F15 (C)	3 AND 1				
F1 (C)	6 AND 1				
F2 (C)	7 AND 1				

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Table 511/28-41-21-993-826 Health Range Insulation Resistance - Center tank (Continued)

COMP	PIN NUMBER	LO-Z to HI-Z ^[1] (1000 Min) (Megaohms)	HI-Z to GND ^[1] (10 Min) (Megaohms)	LO-Z to GND ^[1] (4.9 to 6 Min) (Megaohms)	HI-Z to SHLD ^[1] (10 Min) (Megaohms)
F3 (C)	8 AND 1				
F4 (C)	9 AND 1				
F5 (C)	10 AND 1				
F6 (C)	11 AND 1				
F7 (C)	12 AND 1				
F8 (C)	13 AND 1				

*[1] Units in Megaohms.

SUBTASK 28-41-21-080-007

- (11) Disconnect the adapter plug from the feed-through connector.

SUBTASK 28-41-21-080-008

- (12) Disconnect the AIRFRAME GROUND alligator clamp.

SUBTASK 28-41-21-420-013

- (13) Carefully connect the bussing plug to the feed-through connector (TASK 28-41-41-400-801).

- (a) If the feed-through connector is damaged, replace the feed-through connector (TASK 28-41-42-020-801, TASK 28-41-42-420-801).

NOTE: The connector pins and sockets are easily damaged.

SUBTASK 28-41-21-700-001

- (14) If necessary, do the procedure again for the other fuel tanks.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-41-21-980-001

- (1) For the system tester, COM-19223, set the POWER switch of the tester to the OFF position.

SUBTASK 28-41-21-980-002

- (2) For the system tester, COM-23749, set the POWER/TYPE SELECT switch on the tester to POWER OFF.

SUBTASK 28-41-21-860-014

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-21-280-001

- (4) Perform the FQIS BITE Test procedure at the Control Display Unit (CDU) in the flight deck and make sure the test passes. (TASK 28-41-00-710-801).

SUBTASK 28-41-21-840-001

- (5) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

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SUBTASK 28-41-21-080-009



WARNING

YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO INSTALL THE LE FLAP SAFETY LOCKS. THE LE FLAPS CAN MOVE QUICKLY IF YOU DO NOT INSTALL THE SAFETY LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Remove the leading edge flap locks (TASK 27-81-00-080-801).

SUBTASK 28-41-21-860-015



WARNING

KEEP ALL PERSONNEL AND EQUIPMENT CLEAR OF THE LEADING EDGE FLAPS. THE LEADING EDGE FLAPS CAN MOVE QUICKLY. THE MOVEMENT OF THE LEADING EDGE FLAPS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (7) Retract the leading edge flaps (TASK 27-81-00-860-804).

———— END OF TASK ————

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TANK AND COMPENSATOR UNITS - CLEANING/PAINTING

1. General

- A. This procedure contains this task:
- (1) Tank unit or compensator unit cleaning.

TASK 28-41-21-110-801

2. Tank Unit or Compensator Unit Cleaning

A. References

Reference	Title
28-41-21-000-801	Tank Unit or the Compensator Unit Removal (P/B 401)
28-41-21-400-801	Tank Unit or Compensator Unit Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle
STD-193	Container

C. Consumable Materials

Reference	Description	Specification
B50138	Cleaner - Brulin Formula 815GD	
G02418	Water - De-ionized	

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Tank Unit or Compensator Unit Cleaning

SUBTASK 28-41-21-010-004

- (1) Remove the applicable tank unit or the compensator unit (TASK 28-41-21-000-801).

SUBTASK 28-41-21-110-003



MAKE SURE YOU USE APPROVED SAFETY EQUIPMENT FOR YOUR FACE,
HANDS, AND ARMS WHEN YOU DO WORK NEAR HEATED WATER. THIS
WILL HELP PREVENT INJURY TO PERSONS.

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(WARNING PRECEDES)



WARNING

USE RUBBER GLOVES AND EYE PROTECTION WHEN YOU HANDLE LIQUID DETERGENT. LIQUID DETERGENT AND ANTI-FREEZE SOLVENT HAVE LOW FLASHPOINTS. KEEP AWAY FROM HEAT AND AN OPEN FLAME. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT COULD OCCUR.

- (2) Fill the container, STD-193, with heated de-ionized water, G02418, (140°F (60°C) - 160°F (71°C)) and Brulin Formula 815GD Cleaner, B50138, or equivalent.

NOTE: Use the container, STD-193 with sufficient depth to clean the tank unit or the compensator unit.

- (a) The concentration of Brulin Formula 815GD Cleaner, B50138, to water must be 8 to 10% by volume.

SUBTASK 28-41-21-110-004

- (3) Fill a different container, STD-193, with unheated de-ionized water, G02418, (48°F (9°C) - 88°F (31°C)) to allow for rinsing the tank unit or the compensator unit.

NOTE: Use the container, STD-193 with sufficient depth to clean the tank unit or the compensator unit.

SUBTASK 28-41-21-110-005



WARNING

MAKE SURE YOU USE APPROVED SAFETY EQUIPMENT FOR YOUR FACE, HANDS, AND ARMS WHEN YOU DO WORK NEAR HEATED WATER. THIS WILL HELP PREVENT INJURY TO PERSONS.

- (4) Fill another container, STD-193, with heated de-ionized water, G02418, (140°F (60°C) - 180°F (82°C)) for rinsing the tank unit or the compensator unit.

NOTE: Use the container, STD-193 with sufficient depth to clean the tank unit or the compensator unit.

SUBTASK 28-41-21-410-003



WARNING

USE RUBBER GLOVES AND EYE PROTECTION WHEN YOU HANDLE LIQUID DETERGENT. LIQUID DETERGENT AND ANTI-FREEZE SOLVENT HAVE LOW FLASHPOINTS. KEEP AWAY FROM HEAT AND AN OPEN FLAME. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT COULD OCCUR.

- (5) Put the tank unit or the compensator unit into the Brulin Formula 815GD Cleaner, B50138, for 2 - 5 minutes.

- (a) Shake tank unit or the compensator unit in the tank.
(b) Remove all contamination with the soft bristle brush, STD-123.
(c) Do not make scratches in the tank unit or the compensator unit.

SUBTASK 28-41-21-010-005

- (6) Remove the tank unit or the compensator unit from the Brulin Formula 815GD Cleaner, B50138, and let drain for a minimum of 4 seconds, maximum of 60 seconds.

SUBTASK 28-41-21-410-004

- (7) Put the tank unit or the compensator unit into the container, STD-193, of unheated water for a minimum of 30 seconds.

- (a) Shake the tank unit or the compensator unit to promote rinsing.

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- 1) Regularly change the de-ionized water, G02418, in the Clean-Water Tank.

SUBTASK 28-41-21-010-006

- (8) Remove the tank unit or the compensator unit from unheated flush bath and let water drain for a minimum of 5 seconds into the bath.

SUBTASK 28-41-21-410-005

- (9) Put the tank unit or the compensator unit into the container, STD-193, of heated water for a minimum of 30 seconds.
 - (a) Shake the tank unit or the compensator unit to promote rinsing.

SUBTASK 28-41-21-010-007

- (10) Remove the tank unit or the compensator unit from the heated flush bath and let water drain for a minimum of 5 seconds into the bath.

SUBTASK 28-41-21-410-006



WARNING

DO NOT SUPPLY AIR AT A PRESSURE OF 50 PSIG (354 KPA) OR MORE AND/OR 450 F (232 C) OR MORE TO THE PNEUMATIC SYSTEM. IF YOU SUPPLY TOO MUCH PRESSURE OR TEMPERATURE, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

- (11) Blow dry the tank unit or the compensator unit with compressed air (50 psig (344.7 kPa)) and air dry 2 ± 0.5 hours at 48°F (9°C) - 88°F (31°C) or bake at 130°F (54°C) - 150°F (66°C) for 1 hour.

SUBTASK 28-41-21-410-007

- (12) Install the tank unit or the compensator unit (TASK 28-41-21-400-801).

———— END OF TASK ————

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TANK AND COMPENSATOR UNIT BUSSING PLUG - REMOVAL/INSTALLATION

1. General

- A. There are three tank and compensator unit bussing plugs, one for each fuel tank. The removal and installation procedures for each plug are the same, only the location is different. Two bussing plugs are installed on the front spar and one on the rear spar in the wheel well area (Figure 401).

TASK 28-41-41-000-801

2. Bussing Plug Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Bussing Plug.

B. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-61-11	MIL-C-26500 Front Release Connectors

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
511	Left Wing - Leading Edge To Front Spar
611	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

E. Prepare for the Removal

SUBTASK 28-41-41-860-001

- (1) To get access to the bussing plug for the No. 1 tank on the left front spar, open this access panel:

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-41-41-010-001

- (2) To get access to the bussing plug for the No. 2 tank on the right front spar, open this access panel:

Number	Name/Location
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-41-41-480-001

- (3) Do this step to get access to the bussing plug for the center tank:

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WARNING

MAKE SURE THAT THE GROUND LOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Make sure the ground lock assemblies are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-41-41-860-002

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

F. Bussing Plug Removal

SUBTASK 28-41-41-020-001

- (1) Loosen the nut [4] to disconnect the ground wire [3].

SUBTASK 28-41-41-020-002

- (2) Remove the lockwire that attaches the bussing plug [2] to the jammnut (TASK 20-10-44-000-801).

SUBTASK 28-41-41-020-004

- (3) Carefully remove the bussing plug [2] from the penetration connector [1] (SWPM 20-61-11).

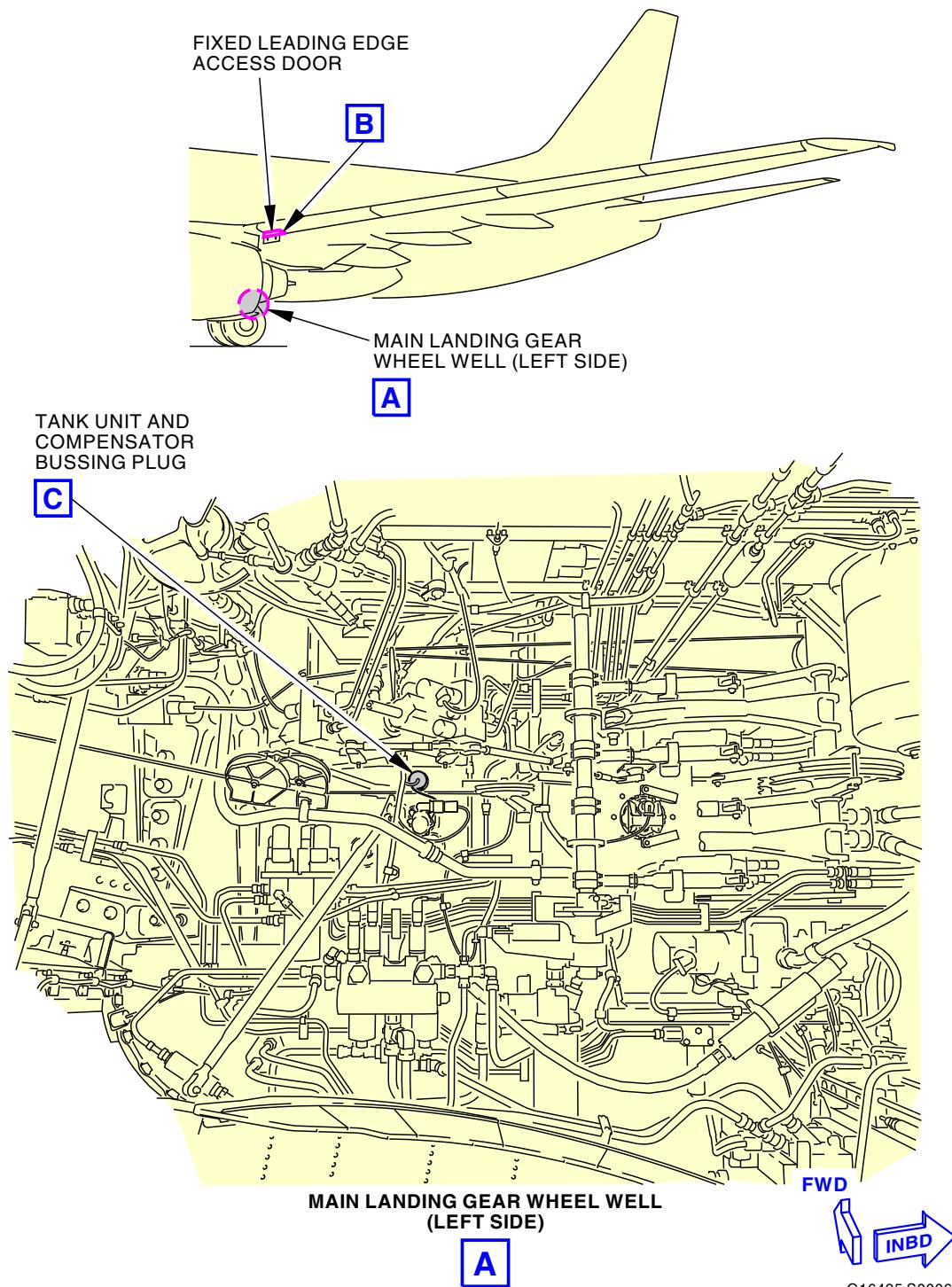
———— END OF TASK ————

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G16495 S0006572292_V2

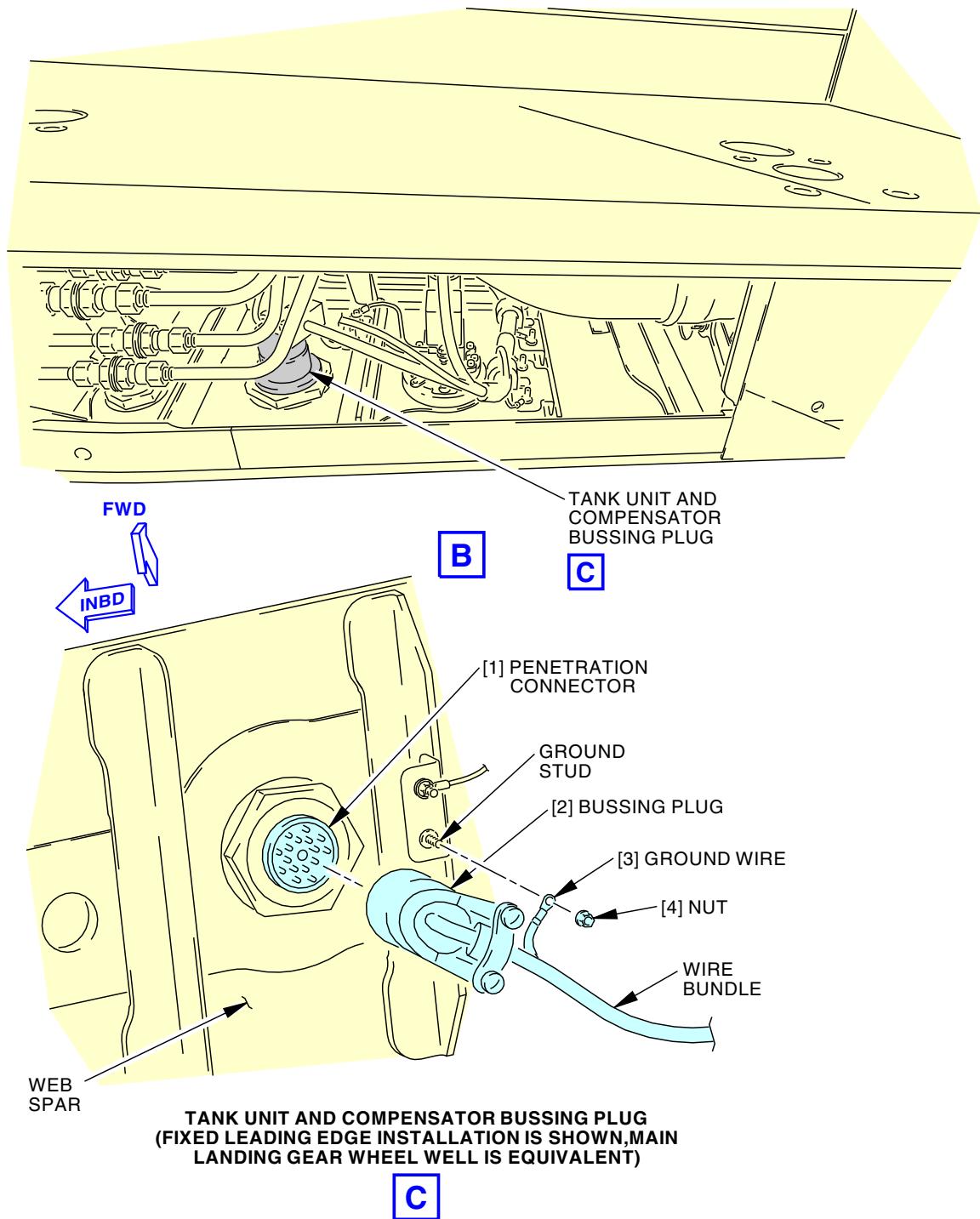
Tank Unit and Compensator Bussing Plug Installation
Figure 401/28-41-41-990-802 (Sheet 1 of 2)

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



G16496 S0006572293_V3

Tank Unit and Compensator Bussing Plug Installation
Figure 401/28-41-41-990-802 (Sheet 2 of 2)

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TASK 28-41-41-400-801

3. Bussing Plug Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
SWPM 20-10-15	ASSEMBLY OF SHIELD GROUND WIRES
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation
SWPM 20-60-06	Standard Wiring Practices Manual
SWPM 20-61-11	MIL-C-26500 Front Release Connectors

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50142	Sealant - Fuel Tank	BMS5-45 Class B-1/2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C

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(Continued)

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
511	Left Wing - Leading Edge To Front Spar
611	Right Wing - Leading Edge to Front Spar

F. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

G. Bussing Plug Installation

SUBTASK 28-41-41-110-001

- (1) Clean the machined surface on the rear of the bussing plug and seal that touches the surface around the receptacle with solvent, B00083.

SUBTASK 28-41-41-160-001

- (2) Rub the surfaces dry with a clean, cotton wiper, G00034.

SUBTASK 28-41-41-420-001

- (3) Install the bussing plug [2] into the penetration connector [1] (SWPM 20-20-00, SWPM 20-60-06, SWPM 20-61-11).
 - (a) Make sure that the FQIS wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

SUBTASK 28-41-41-020-005

- (4) Install lockwire to attach the bussing plug [2] to the jamnut (TASK 20-10-44-400-801).

LOM 402, 404, 406 PRE SB 737-28A1207

SUBTASK 28-41-41-420-002

- (5) Attach the ground wire [3] to its ground stud and tighten the nut [4].

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207

SUBTASK 28-41-41-420-005

- (6) For the main tanks and center tank do these steps to install the ground wire [3] to the structure:

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB 737-28A1207
(Continued)



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - 1) Rub dry with a clean, dry cotton wiper, G00034.
 - 2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
- (b) Apply a thin continuous layer of sealant to both surfaces of the ground wire [3] and the two washers.
 - 1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296, for the faying surface seal that is outside the tank.
 - 2) Make sure that the sealant layer is approximately 0.005 in. (0.127 mm) thick.
- (c) Install the nut [4], washer, and ground wire [3] to the structure.
- (d) Tighten the nut [4] to 31.5 ± 3.5 in-lb (4 ± 1 N·m).

LOM ALL

SUBTASK 28-41-41-760-001

► 28-AWL-04: CDCCL

- (7) Measure the electrical bonding resistance from terminal lug on the ground wire [3] (shield pigtail) to the ground stud bracket for the applicable tank side FQIS connector (D11312, D11314, or D11316) (SWPM 20-20-00 and SWPM 20-20-10).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-04: CDCCL

- (b) Make sure that the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

SUBTASK 28-41-41-390-001

- (8) Apply sealant, A50142, over the nut [4] and the bonding jumper terminal (SWPM 20-20-10).

NOTE: It is satisfactory to encapsulate the ground stud head.

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SUBTASK 28-41-41-860-005

- (9) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-41-860-003

- (10) If it was opened, close the applicable access panel:

Number **Name/Location**

521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-41-41-710-001

- (11) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.

———— END OF TASK ————

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FQIS SPAR PENETRATION CONNECTOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the spar penetration connector
 - (2) An installation of the spar penetration connector.

TASK 28-41-42-020-801

2. FQIS Spar Penetration Connector Removal

(Figure 401, Figure 402)

A. General

- (1) This task give instructions to remove the FQIS spar penetration connector.

B. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-22-15-000-801	Fuel Line, Fitting and Coupling Removal (P/B 401)
28-41-41-000-801	Bussing Plug Removal (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
434	Engine 1 - Aft Strut Fairing
444	Engine 2 - Aft Strut Fairing
511	Left Wing - Leading Edge To Front Spar
521	Left Wing - Leading Edge to Front Spar
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
611	Right Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Access Panels

Number	Name/Location
131AB	Center Tank Access
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
532BB	Main Tank Access Door - Wing Station 265
532CB	Main Tank Access Door - Wing Station 290
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

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(Continued)

Number Name/Location

632BB Main Tank Access Door - Wing Station 265

E. Prepare for the Removal

SUBTASK 28-41-42-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-42-860-002

- (2) To get access to the spar connector for the No. 1 tank on the left front spar, open this access panel:

Number Name/Location

521BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station
36.02

SUBTASK 28-41-42-010-001

- (3) To get access to the spar connector for the No. 2 tank on the right front spar, open this access panel:

Number Name/Location

621BB Outboard Lower Fixed Leading Edge Access Panel - Slat Station
36.02

SUBTASK 28-41-42-480-001

- (4) Do this step to get access to the spar penetration connector [1] for the center tank:



MAKE SURE THAT THE GROUND LOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Make sure that the ground lock assemblies are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 28-41-42-020-010

- (5) Remove the bussing plug [2] (TASK 28-41-41-000-801).

SUBTASK 28-41-42-020-009

- (6) Remove the lockwire that attaches the jamnut [5] to the bolt [9] (TASK 20-10-44-000-801).

SUBTASK 28-41-42-020-004

- (7) Loosen the jamnut [5] that holds the spar penetration connector [1] in its position.

(a) Remove the jamnut [5].

(b) For the center tank connector, remove the spacer [6].

(c) Remove any sealant that remains on the spar penetration connector [1].



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SUBTASK 28-41-42-010-004

- (8) For the No. 1 tank, remove these access panels:

(TASK 28-11-11-000-801)

Number Name/Location

532BB Main Tank Access Door - Wing Station 265

532CB Main Tank Access Door - Wing Station 290

- (a) To get to access panel, 532BB, do this step (TASK 06-43-00-800-801):

- 1) Remove this access panel:

Number Name/Location

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

SUBTASK 28-41-42-010-005

- (9) For the No. 2 tank, remove these access panels:

(TASK 28-11-11-000-801)

Number Name/Location

532CB Main Tank Access Door - Wing Station 290

632BB Main Tank Access Door - Wing Station 265

- (a) To get to access panel, 632BB, do this step (TASK 06-43-00-800-801):

- 1) Remove this access panel:

Number Name/Location

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

SUBTASK 28-41-42-010-006

- (10) For the center tank, remove this access panel:

(TASK 28-11-31-000-801)

Number Name/Location

131AB Center Tank Access

F. FQIS Spar Penetration Connector Removal

SUBTASK 28-41-42-650-001



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) For the applicable tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-41-42-010-002

- (2) Go into the applicable fuel tank to find the FQIS wire bundle connection on the spar (Figure 402) (TASK 28-11-00-910-802).

SUBTASK 28-41-42-010-003

- (3) To get access to the spar penetration connector in the No. 2 tank, remove the section of refuel tubing 344A2201-13 between ribs 7 and 9 (TASK 28-22-15-000-801).
(a) Discard the O-rings [10] and O-ring [11].

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SUBTASK 28-41-42-160-001

- (4) If there is some sealant around the edge of the wire bundle connection with the receptacle on the spar, remove the sealant.

SUBTASK 28-41-42-020-005

- (5) Remove the electrical disconnect on the wire harness [8] from the spar penetration connector [1].

SUBTASK 28-41-42-140-001

- (6) Remove the sealant from the spar penetration connector [1] and surface of the spar around the spar penetration connector (Figure 402) (TASK 28-11-00-300-803).

SUBTASK 28-41-42-020-006

- (7) Remove the spar penetration connector [1] from the spar penetration.

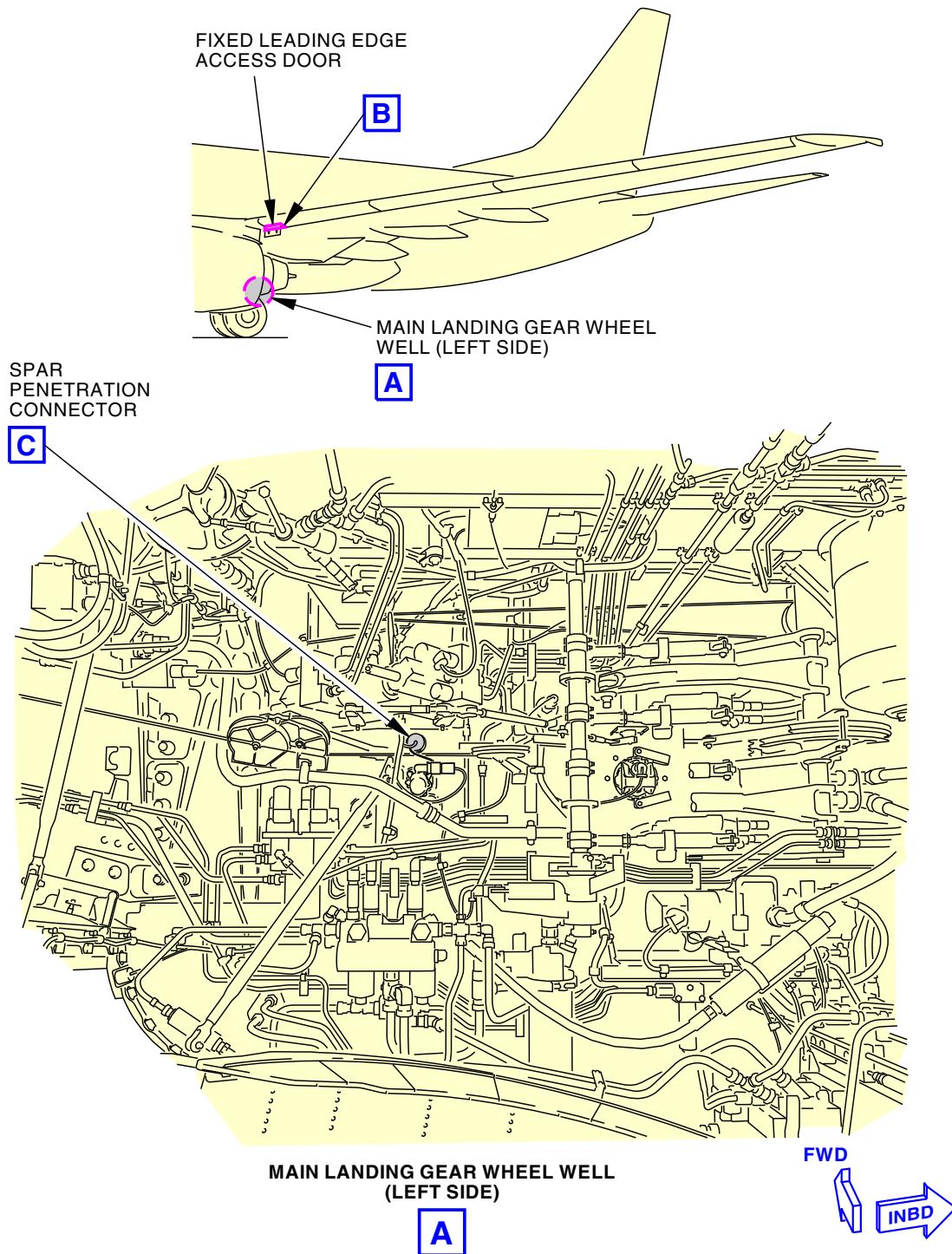
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M15727 S0006572299_V3

FQIS Penetration Connector Installation (Exterior)
Figure 401/28-41-42-990-803 (Sheet 1 of 3)

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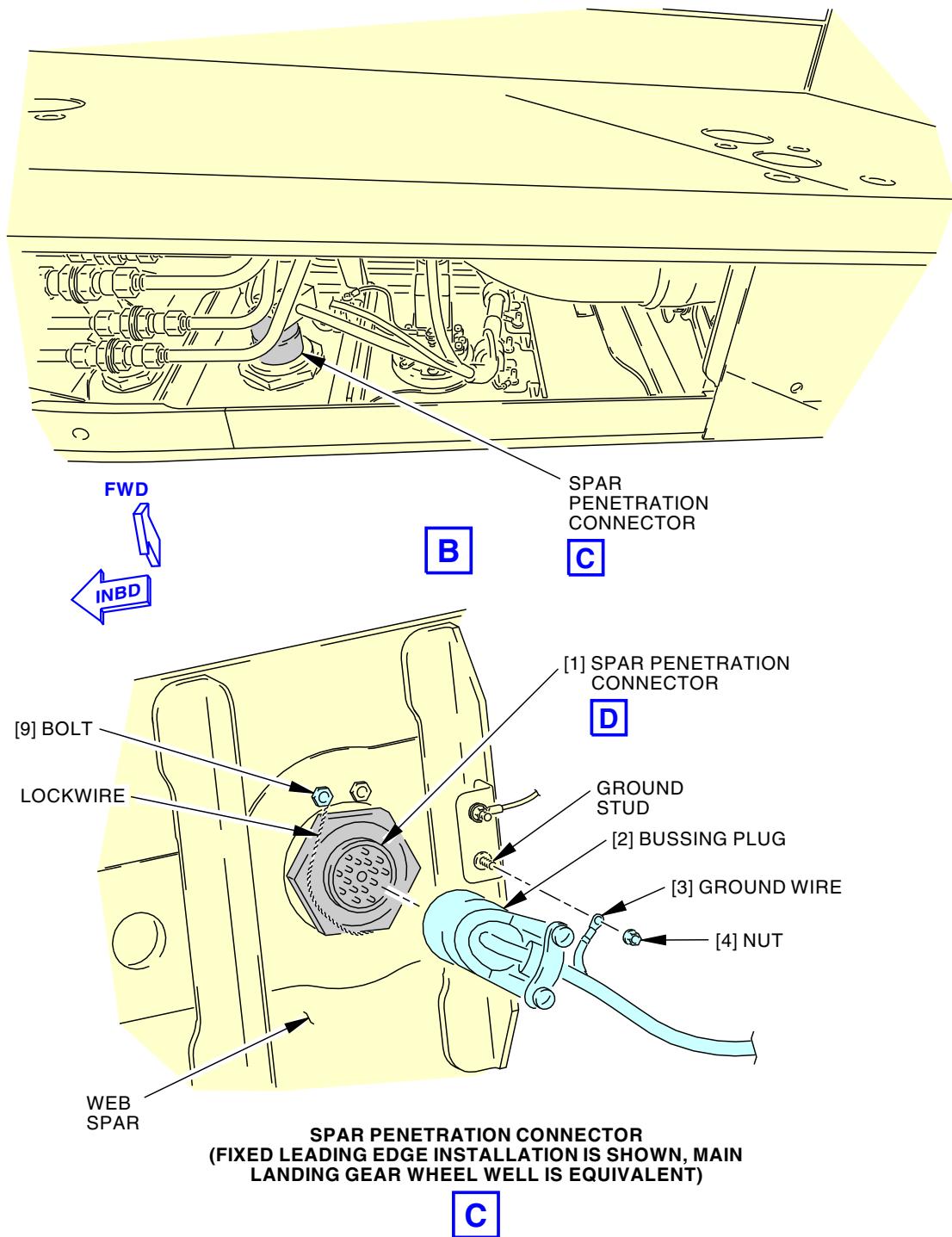
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M15729 S0006572300_V4

FQIS Penetration Connector Installation (Exterior)
Figure 401/28-41-42-990-803 (Sheet 2 of 3)

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LOM ALL

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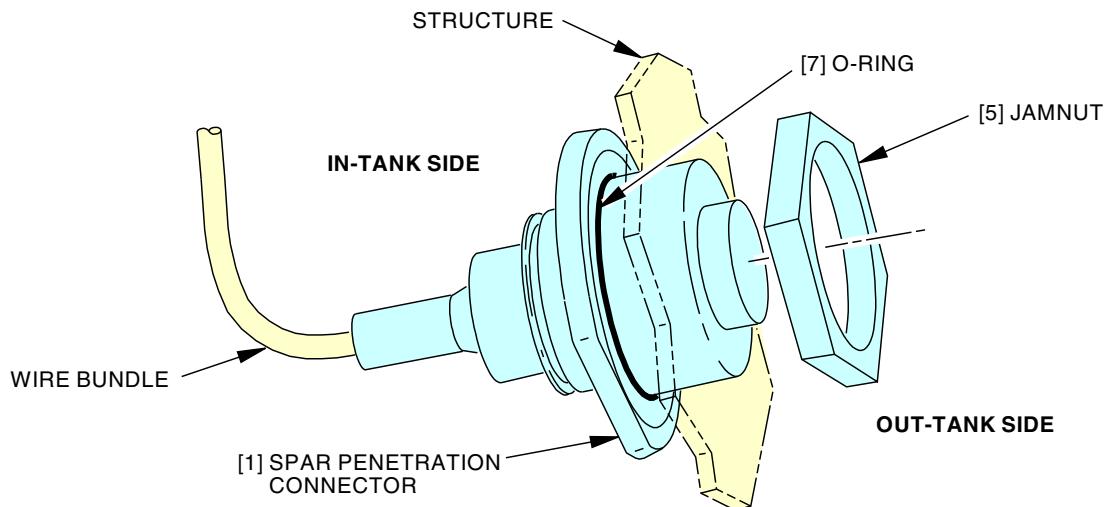
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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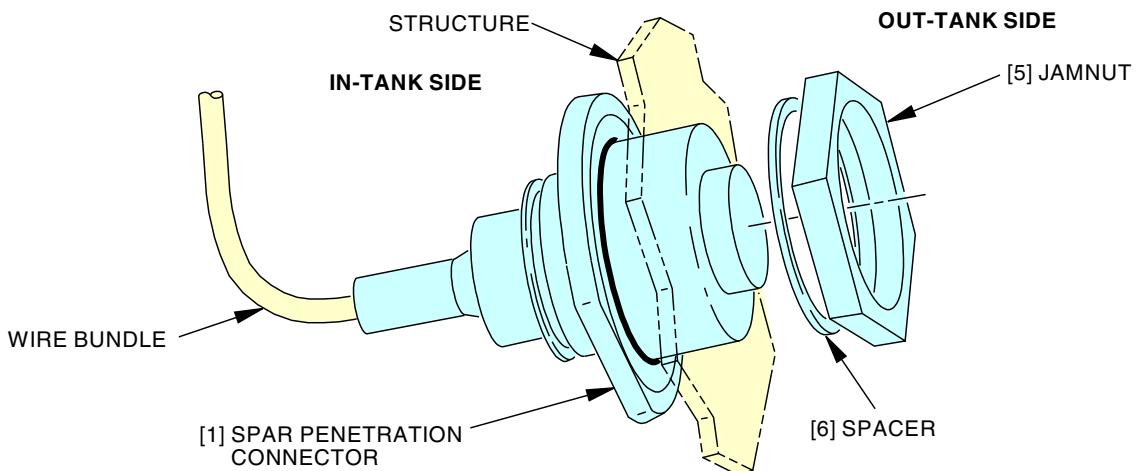


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SPAR PENETRATION CONNECTOR
FOR THE NO. 1 OR NO. 2 TANK
(FIXED LEADING EDGE)

D



SPAR PENETRATION CONNECTOR FOR THE CENTER TANK
(LANDING GEAR WHEEL WELL)

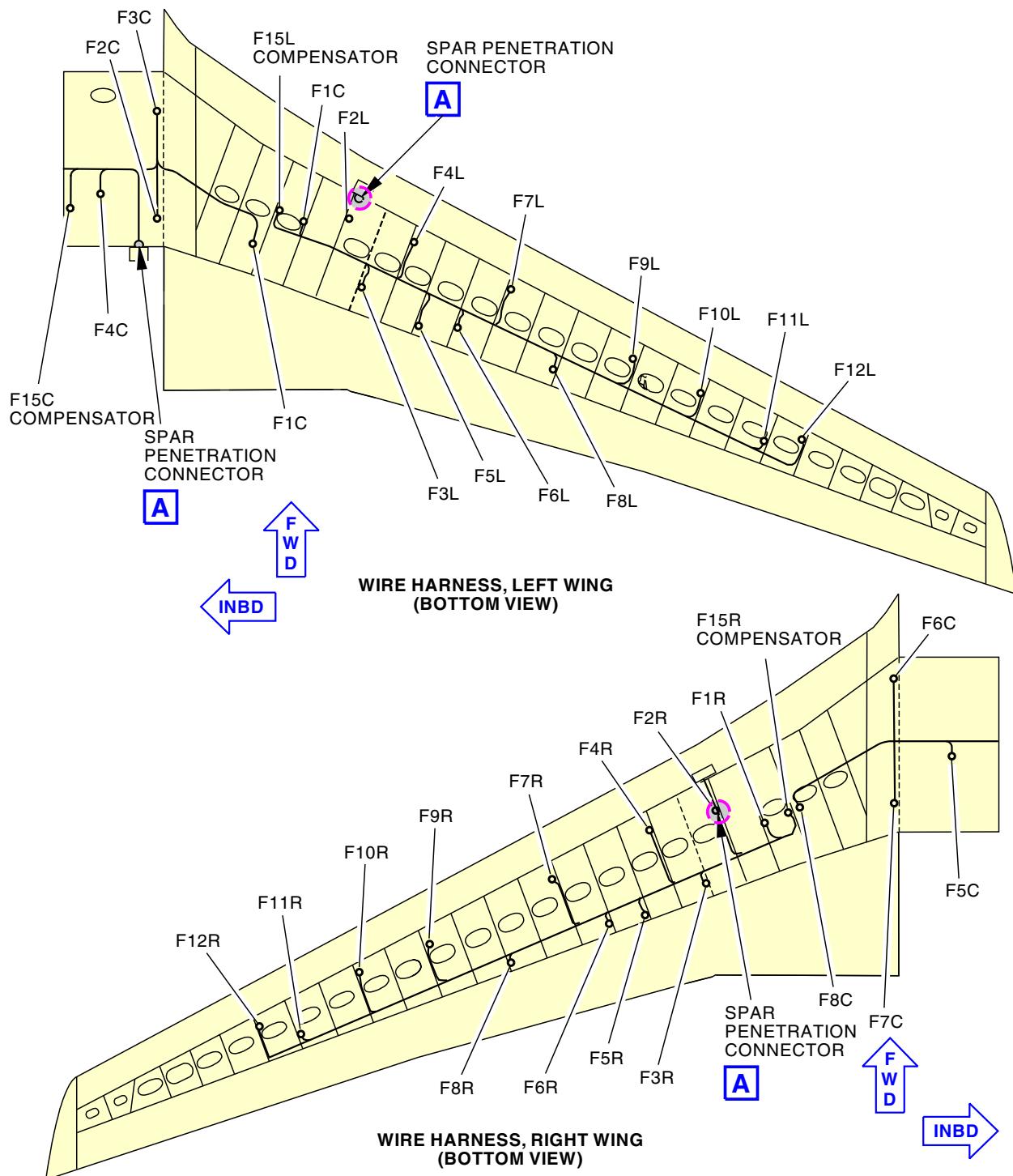
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M15747 S0006572301_V5

FQIS Penetration Connector Installation (Exterior)
Figure 401/28-41-42-990-803 (Sheet 3 of 3)

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LOM ALL

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M15735 S0006572302_V3

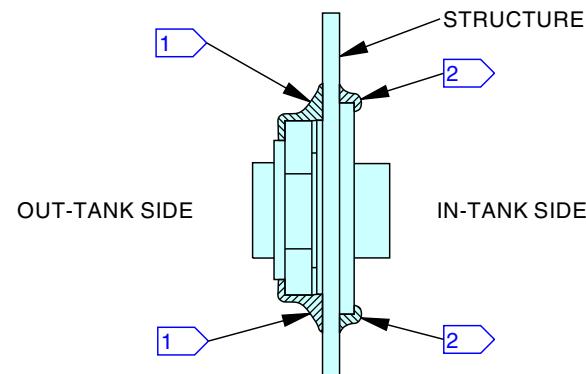
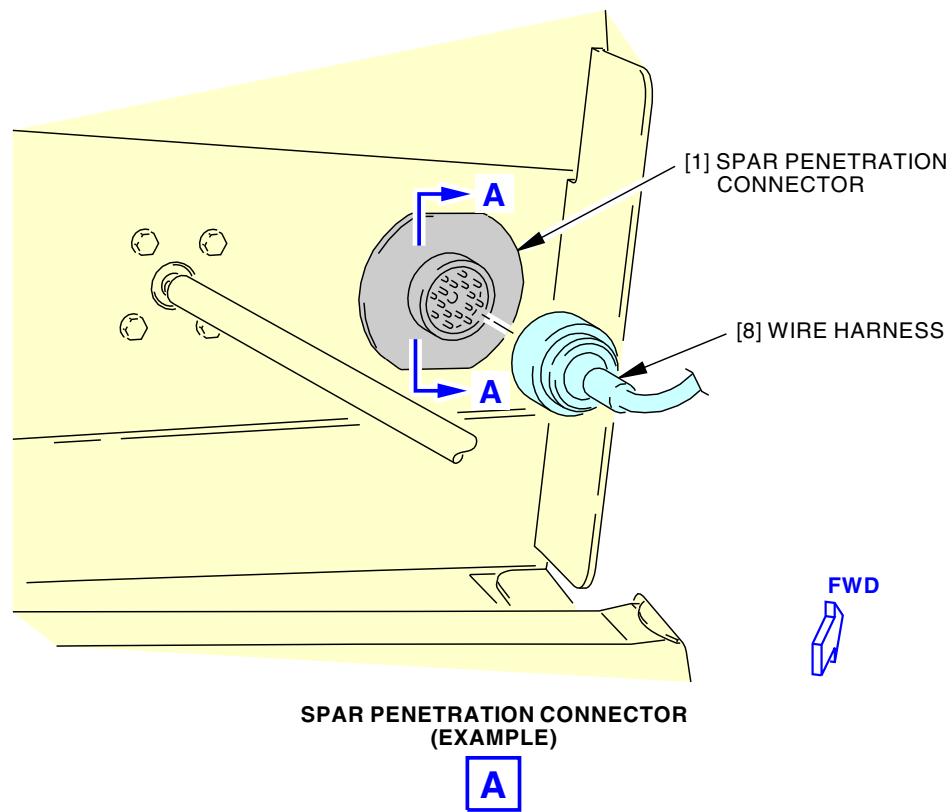
FQIS Penetration Connector Installation (Interior)
Figure 402/28-41-42-990-804 (Sheet 1 of 2)

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FQIS SPAR PENETRATION CONNECTOR SEALING

A-A

- [1] FILLET SEAL WITH BMS 5-95
[2] FILLET SEAL WITH BMS 5-45

M15748 S0006572303_V5

FQIS Penetration Connector Installation (Interior)
Figure 402/28-41-42-990-804 (Sheet 2 of 2)

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TASK 28-41-42-420-801

3. FQIS Spar Penetration Connector Installation

(Figure 401, Figure 402)

A. General

- (1) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:
 - (a) sealant, A50153, and sealant, A50110, are also acceptable sealants.
- (2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-400-801	Fuel Tank Closure Leak Check (P/B 601)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-400-801	Fuel Line, Fitting and Coupling Installation (P/B 401)
28-41-00-730-801	System Test - Fuel Quantity Indicating System (P/B 501)
28-41-41-400-801	Bussing Plug Installation (P/B 401)
51-31-00-390-804	Fillet Seal Application (P/B 201)
57-41-02-400-801	Leading Edge Access Panel Installation (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-60-06	Standard Wiring Practices Manual
SWPM 20-61-11	MIL-C-26500 Front Release Connectors

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.





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Reference	Description
COM-1550	<p>Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550).</p> <p>Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659</p>

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Spar penetration connector	28-11-51-02A-020	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464
7	O-ring	28-11-51-02B-025	LOM 465-999
		28-11-51-02A-015	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464
10	O-ring	28-11-51-02B-020	LOM 465-999
		28-20-51-02-080	LOM 402, 404, 406
		28-20-51-06-090	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
11	O-ring	28-20-51-02-100	LOM 402, 404, 406

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AMM Item	Description	AIPC Reference	AIPC Effectivity
11 (cont.)		28-20-51-06-115	LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

F. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
511	Left Wing - Leading Edge To Front Spar
611	Right Wing - Leading Edge to Front Spar

G. Access Panels

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

H. FQIS Spar Penetration Connector Installation

SUBTASK 28-41-42-650-002



OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) For the applicable tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-41-42-420-001

- (2) Make sure that there is a new O-ring [7] installed in the O-ring groove of the spar penetration connector [1].

SUBTASK 28-41-42-010-003

- (3) Go into the applicable fuel tank to find the penetration for the spar penetration connector [1] (Figure 402) (TASK 28-11-00-910-802).

SUBTASK 28-41-42-420-002

- (4) Put the spar penetration connector [1] into its position in the spar penetration (Figure 402).

28-AWL-09: CDCCL

- (a) Install a fillet sealed fay surface bond between the spar penetration connector [1] and the spar inside the fuel tank (TASK 28-11-00-300-803, SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

- 1) Use sealant, A00767.

SUBTASK 28-41-42-420-004

- (5) Go out of the tank and find the spar penetration on the exterior of the tank (Figure 401).

SUBTASK 28-41-42-420-005

- (6) For the center tank connector, put the spacer [6] in its position on the spar penetration connector [1].

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SUBTASK 28-41-42-420-006

- (7) Install the jamnut [5] on the spar penetration connector [1].
 - (a) Tighten the jamnut [5] to 325 in-lb (36.7 N·m) - 350 in-lb (39.5 N·m).
 - (b) Install the lockwire to attach the jamnut [5] to the bolt [9] (TASK 20-10-44-400-801).

SUBTASK 28-41-42-765-001

► 28-AWL-09: CDCCL

- (8) Measure the electrical bonding resistance between the spar penetration connector [1] and the structure (spar) inside the fuel tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-09: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

SUBTASK 28-41-42-390-002

► 28-AWL-09: CDCCL

- (9) Apply a fillet seal around the spar penetration connector [1] inside the fuel tank (TASK 51-31-00-390-804).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

- (a) Use sealant, A00767.

SUBTASK 28-41-42-420-003

- (10) Connect the electrical connector of the wire harness [8] to the new spar penetration connector [1].
 - (a) Tighten the electrical disconnect to 95 in-lb (10.7 N·m) - 105 in-lb (11.9 N·m).
 - 1) Apply an additional turn up to 1/4 turn until the connector can no longer turn.
 - a) Use the plug pliers strap.
 - (b) Install the lockwire from the plug to the receptacle (TASK 20-10-44-400-801).

SUBTASK 28-41-42-420-007

► 28-AWL-09: CDCCL

- (11) Apply a fillet seal around the spar penetration connector [1] outside the fuel tank (TASK 51-31-00-390-804).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

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- (a) Use sealant, A00247.

SUBTASK 28-41-42-420-008

- (12) Install the bussing plug [2] onto the spar penetration connector [1] (TASK 28-41-41-400-801, SWPM 20-20-00, SWPM 20-60-06, SWPM 20-61-11).

SUBTASK 28-41-42-020-007

- (13) Install the lockwire to attach the bussing plug [2] to the jamnut [5] (TASK 20-10-44-400-801).

LOM 402, 404, 406 PRE SB 737-28A1207

SUBTASK 28-41-42-420-009

- (14) Attach the FQIS shield ground wire [3] to its ground point and tighten the nut [4].

**LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999; LOM 402, 404, 406 POST SB
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SUBTASK 28-41-42-420-010

- (15) For the center tank, attach the FQIS shield ground wire [3] to its ground point and tighten the nut [4].

SUBTASK 28-41-42-420-020

- (16) For the main tank, do these steps to install the FQIS shield ground wire [3] to the structure:



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Final clean the contact surfaces with cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
1) Rub dry with a clean, dry cotton wiper, G00034.
2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
- (b) Apply a thin continuous layer of sealant to both surfaces of the FQIS shield ground wire [3] and two washers.
1) Use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296, for the faying surface seal that is outside the tank.
2) Make sure that the sealant layer is approximately 0.005 in. (0.127 mm) thick.
- (c) Install the nut [4], washer, and FQIS shield ground wire [3] to the structure.
- (d) Tighten the nut [4] to 31.5 ± 3.5 in-lb (3.6 ± 0.4 N·m).

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SUBTASK 28-41-42-010-008

- (17) For the spar penetration connector [1] in the No. 2 tank, install the section of refuel tubing (344A2201-13) between ribs 7 and 9 that you removed to get access to the spar penetration connector [1].
(a) Lubricate and install the new O-rings [10] in the inboard end of the tubing 344A2201-13.
(b) Lubricate and install a new O-ring [11] in the outboard end of the tubing 344A2201-13.

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- (c) Install the tubing (344A2201-13) again (TASK 28-22-15-400-801).

SUBTASK 28-41-42-410-002

- (18) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-41-42-860-003

- (19) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-42-410-001

- (20) To install the applicable lower leading edge access panels, do this step (TASK 57-41-02-400-801):

- (a) Close these access panels:

Number	Name/Location
521BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02
621BB	Outboard Lower Fixed Leading Edge Access Panel - Slat Station 36.02

SUBTASK 28-41-42-400-001

- (21) Install the access panels that you removed (TASK 28-11-11-400-801).

SUBTASK 28-41-42-820-001

- (22) Do this task: System Test - Fuel Quantity Indicating System, TASK 28-41-00-730-801.

SUBTASK 28-41-42-650-003

- (23) Refuel the applicable fuel tank (TASK 12-11-00-650-802).

SUBTASK 28-41-42-790-001

- (24) Monitor the spar penetration where you installed the new spar penetration connector [1] for leakage for a minimum of one hour (TASK 28-11-00-400-801).

———— END OF TASK ————

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FQIS SPAR PENETRATION CONNECTOR - ADJUSTMENT/TEST

1. General

- A. This procedure has one task, a test of the FQIS shield ground terminal.

TASK 28-41-42-700-801

2. FQIS Shield Ground Terminal - Test

(Figure 28-41-42-990-803)

A. General

- (1) This task is only applicable for the FQIS spar penetration connector for the main tanks and the spar valves.
- (2) This task has these procedures:
 - (a) Rework the Bonding Jumper Bond
 - (b) Rework the Fay Surface Bond - Actuator to Index Plate
 - (c) Rework the Fay Surface Bond - Index Plate to Adapter Plate
 - (d) Rework the Fay Surface Bond - Adapter Plate to Front Spar.
- (3) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.
- (4) The motor operated valve uses two electrical bonding paths:
 - (a) One bonding path is from the upper housing of the actuator through the bonding jumper to the stiffener.
 - (b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the front spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter plate to the bare metal surface of the front spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by an electrical faying surface. You cannot repair or rework the faying surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

- (5) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical resistance between the components is within the permitted resistance values.
- (6) Because the build-up of the spar valve includes several fay surface bonds, you may not know which fay surface bond is the cause of the problem. This task will help you isolate the location of the fay surface bond that needs to be reworked. The procedure does a check of the fay surface bond downstream of the bond that is in question.
- (7) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

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B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-11-000-804	Actuator of the Spar Valve Removal (P/B 401)
28-22-11-000-805	Valve Adapter of the Spar Valve Removal (P/B 401)
28-22-11-300-801	Rework the Electrical Faying Surface Bonds for the Spar Valve (P/B 401)
28-22-11-400-804	Actuator of the Spar Valve Installation (P/B 401)
28-22-11-400-805	Valve Adapter of the Spar Valve Installation (P/B 401)
28-22-11-820-801	Spar Valve Alignment (P/B 401)
28-22-11-990-806	Figure: Spar Valve Actuator Installation (P/B 401)
28-22-11-990-808	Figure: Spar Valve Adapter Installation (P/B 401)
28-41-42-420-801	FQIS Spar Penetration Connector Installation (P/B 401)
28-41-42-990-803	Figure: FQIS Penetration Connector Installation (Exterior) (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
SWPM 20-20-10	Replacement of Ground Studs and Bonding Jumper Installation

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. Location Zones

Zone	Area
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

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F. Rework the Bonding Jumper Bond

(Figure 28-22-11-990-806)

SUBTASK 28-41-42-010-012

- (1) Disconnect the electrical connector from the actuator.

SUBTASK 28-41-42-010-013

- (2) Remove the sealant from the bonding jumper and fasteners at the actuator attachment location.

SUBTASK 28-41-42-010-014

- (3) Remove the screw, two washers, and bonding jumper from the actuator.

SUBTASK 28-41-42-765-009

► 28-AWL-21: CDCCL

- (4) Measure the electrical bonding resistance between the loose end of the bonding jumper and the stiffener (SWPM 20-20-10).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (b) Make sure the bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (c) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do this procedure: Rework the Bonding Jumper Bond (TASK 28-22-11-300-801).

- (d) If the electrical bonding resistance is less than 0.0015 ohm (1.5 milliohms), then do the steps in this procedure: Rework the Fay Surface Bond - Actuator to Index Plate.

G. Rework the Fay Surface Bond - Actuator to Index Plate

(Figure 28-22-11-990-806)

(Figure 28-22-11-990-808)

SUBTASK 28-41-42-765-012

► 28-AWL-21: CDCCL

- (1) Measure the electrical bonding resistance between the upper housing of the actuator and the front spar (SWPM 20-20-00, SWPM 20-20-10).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

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► 28-AWL-21: CDCCL

- (a) Do this measurement with the bonding jumper and the electrical connector disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (b) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- (c) Make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- (d) If the electrical bonding resistance is less than 0.0040 ohm (4.0 milliohms), then do these steps to install the bonding jumper to the actuator:

- 1) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
 - a) Rub dry with a clean, dry cotton wiper, G00034.
 - b) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

► 28-AWL-21: CDCCL

- 2) Install the screw and two washers to attach the bonding jumper to the actuator with a fillet sealed fay surface bond between the actuator and the bonding jumper terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- 3) Tighten the screw to 35 in-lb (4 N·m).

► 28-AWL-21: CDCCL

- 4) Measure the electrical bonding resistance between the upper housing of the actuator and the attached terminal of the bonding jumper (SWPM 20-20-10) (View D).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- a) Do not touch the screw when you make the bonding measurement.
- b) Use an intrinsically safe approved bonding meter, COM-1550.

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► 28-AWL-21: CDCCL

- c) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- d) If the electrical bonding resistance is more than 0.0010 ohm (1.0 milliohm), then do the applicable procedure in this task: Rework the Electrical Faying Surface Bonds for the Spar Valve, TASK 28-22-11-300-801.

► 28-AWL-21: CDCCL

- 5) Measure the electrical bonding resistance between the FQIS outermost shield ground terminal on the stiffener and the front spar (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- a) Do this measurement with the electrical connector disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- b) Do not touch the FQIS shield ground terminal stud when you make the bonding measurement.

- c) Use an intrinsically safe approved bonding meter, COM-1550.

► 28-AWL-21: CDCCL

- d) Make sure the electrical bonding resistance is 0.0070 ohm (7.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

► 28-AWL-21: CDCCL

- 6) Apply a cap seal over the screw and the terminal lug of the bonding jumper attached to the actuator.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-21.

- a) Use sealant, A50337 (BMS 5-45 Class B) to apply the cap seal.

- (e) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then continue with the subsequent steps.

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SUBTASK 28-41-42-010-015

- (2) Do this task: Actuator of the Spar Valve Removal, TASK 28-22-11-000-804.

SUBTASK 28-41-42-765-014

- (3) Do these steps to do a check of the index plate to structure bonding path:

- (a) Remove the sealant and clean one of the contact surfaces on the index plate.
- (b) Measure the electrical bonding resistance between one of the actuator feet contact surfaces on the index plate (bare metal surface) and the front spar (SWPM 20-20-00) (Figure 28-22-11-990-808, View G).
- (c) Use an intrinsically safe approved bonding meter, COM-1550.
- (d) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.
- (e) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the steps in this procedure: Rework the Fay Surface Bond - Index Plate to Adapter Plate.
- (f) If the electrical bonding resistance is less than 0.0020 ohm (2.0 milliohms), then continue with the subsequent steps.

SUBTASK 28-41-42-040-003

- (4) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804.

NOTE: This task will rework the fay surface bond and re-install the actuator.

- (5) If during the installation of the actuator, the electrical bonding resistance value between the upper housing of the actuator and the spar web is more than 0.0040 ohm (4.0 milliohms), then replace the actuator (TASK 28-22-11-000-804, TASK 28-22-11-400-804).

H. Rework the Fay Surface Bond - Index Plate to Adapter Plate

(Figure 28-22-11-990-808)

SUBTASK 28-41-42-010-016

- (1) Do this procedure: Remove the Index Plate (TASK 28-22-11-000-805).

SUBTASK 28-41-42-765-018

- (2) Do these steps to do a check of the adapter plate to front spar bonding path:

- (a) Remove the sealant and clean one of the serrated contact surfaces on the valve adapter.
- (b) Measure the electrical bonding resistance between the serrated contact surface on the valve adapter and the front spar (SWPM 20-20-00) (View F).
- (c) Use an intrinsically safe approved bonding meter, COM-1550.
- (d) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.
- (e) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the steps in this procedure: Rework the Fay Surface Bond - Adapter Plate to Front Spar.
- (f) If the electrical bonding resistance is less than 0.0015 ohm (1.5 milliohms), then continue with the subsequent steps.

SUBTASK 28-41-42-420-013

- (3) Do these steps to install the index plate:

NOTE: These steps will re-align the spar valve, rework the faying surface, and re-install the index plate.

- (a) Do this task: Spar Valve Alignment, TASK 28-22-11-820-801.
- (b) Do this procedure: Install the Index Plate (TASK 28-22-11-400-805).

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SUBTASK 28-41-42-420-015

- (4) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804
- (5) If during the installation of the actuator, the electrical bonding resistance value between the upper housing of the actuator and the spar web is more than 0.004 ohm (4.0 milliohms), then replace the actuator (TASK 28-22-11-000-804, TASK 28-22-11-400-804).

I. Rework the Fay Surface Bond - Adapter Plate to Front Spar

(Figure 28-22-11-990-808)

SUBTASK 28-41-42-020-008

- (1) Do this task: Valve Adapter of the Spar Valve Removal, TASK 28-22-11-000-805.

NOTE: A fuel tank entry is necessary to rework the fay surface of the valve adapter.

SUBTASK 28-41-42-420-014

- (2) Do this task: Valve Adapter of the Spar Valve Installation, TASK 28-22-11-400-805.

NOTE: These steps will rework the fay surface, and re-install the valve adapter.

SUBTASK 28-41-42-420-016

- (3) Do this task: Actuator of the Spar Valve Installation, TASK 28-22-11-400-804

- (4) If during the installation of the actuator, the electrical bonding resistance value between the upper housing of the actuator and the spar web is more than 0.0040 ohm (4.0 milliohms), then replace the actuator (TASK 28-22-11-000-804, TASK 28-22-11-400-804).

SUBTASK 28-41-42-420-018

- (5) Continue with this task: FQIS Spar Penetration Connector Installation, TASK 28-41-42-420-801.

———— END OF TASK ————



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FUEL TANK BULKHEAD (SPAR) RECEPTACLE WIRE HARNESS - REMOVAL/INSTALLATION

1. General

- A. This procedure has one task:
- (1) A task to replace the wire harness that goes to the receptacle on the wing spar.

TASK 28-41-44-400-801

2. FQIS Wire Harness Replacement

(Figure 401 or Figure 402 or Figure 403)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-41-00-730-801	System Test - Fuel Quantity Indicating System (P/B 501)
51-31-00-390-805	Fastener Seal Application (P/B 201)
SWPM 20-10-11 AND 20-10-12	Standard Wiring Practices Manual
SWPM 20-10-19	WIRE SEPERATION

C. Consumable Materials

Reference	Description	Specification
A50467	Sealant - Fuel Tank	BMS5-45, Class A, Grade 1

D. FQIS Wire Harness Replacement

SUBTASK 28-41-44-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1



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SUBTASK 28-41-44-650-001



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) For the applicable tank, do this task: Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

SUBTASK 28-41-44-010-001

- (3) Go into the applicable fuel tank with the replacement wire harness (TASK 28-11-00-910-802).

SUBTASK 28-41-44-160-001

- (4) Remove the sealant around the edge of the wire bundle connection with the receptacle on the spar if there is some sealant.

SUBTASK 28-41-44-020-001

- (5) Remove the electrical disconnect on the wire harness [2] from the spar penetration connector [1].

SUBTASK 28-41-44-420-001

- (6) Connect the electrical disconnect of the new wire harness [2] to the spar penetration connector [1].

- (a) Tighten the electrical disconnect to 95 in-lb (10.7 N·m) - 105 in-lb (11.9 N·m).
1) Apply an additional turn up to 1/4 turn until the connector can no longer turn.
a) Use the plug pliers strap.

- (b) Install the lockwire from the plug to the receptacle (TASK 20-10-44-400-801).

SUBTASK 28-41-44-420-002

- (7) Replace the wire harness (SWPM 20-10-11 AND 20-10-12) (SWPM 20-10-19).

- (a) Install the new wire harness while you remove the wire harness that is installed.

NOTE: To get between rib 6 and rib 7 of each main tank, go into the tank at WSTA 216. Remove only one of the two access panels on rib 6. (Do not remove both panels unless the engine is removed).

28-AWL-09: CDCCL

- (b) Make sure that the new wire harness has the same routing, clamping and sleeving as the wire bundle that you removed or is newly approved.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

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► 28-AWL-09: CDCCL

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- (c) For the main tanks, make sure that the new wire harness has the same routing, clamping, spacers under the p-clamps, ring posts, stringer clips, and sleeving as the wire bundle that you removed or is newly approved.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 POST SB 737-28-1356

- (d) For the center tanks, make sure that the new wire harness has the same routing, clamping, stringer clips, ring post, grommets, nylon nut clips, and nylon support rods as the wire bundle that you removed or is newly approved.

NOTE: Grommets and nylon nut clips are installed on the wire harness support brackets.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

- (e) For the center tanks, make sure that the wire harness clamps that are installed using nylon nut clips meet the following requirements:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

- 1) Conductive fasteners, BACS12HN3-(), are installed in bare metal holes in the brackets.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

NOTE: '()' refers to the length of the fastener.

- a) Clean the bracket holes before installation.

► 28-AWL-09: CDCCL

- 2) The conductive fasteners are wet installed.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

- a) Wet install the fasteners with sealant, A50467 (TASK 51-31-00-390-805).

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► 28-AWL-09: CDCCL

- (f) Make sure that the wire harness, clamps, and sleeving are not damaged.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

LOM 465-999

- (g) For the main tanks, make sure that the wire harness support bracket, spacers under the p-clamps, ring posts, and stringer clips are not damaged.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 POST SB 737-28-1356

- (h) For the center tanks, make sure that the wire harness support bracket, stringer clips, ring posts, grommets, nylon nut clips, and nylon support rods are not damaged.

NOTE: Grommets and nylon nut clips are installed on the wire harness support brackets.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

► 28-AWL-09: CDCCL

- (i) For the center tanks, make sure that sealant at the wire harness support bracket at the access hole at the spanwise beam number 1 is installed and is not damaged (such as peeling and cracking).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

LOM ALL

► 28-AWL-09: CDCCL

- (j) Make sure that the wires are not chafed.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

- (k) Adjust wire slack to make sure the wires are not in contact with the structure.

- 1) Try to maintain 0.5 in. (12.7 mm) wire slack clearance between the wires and structure.

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28-AWL-09: CDCCL

- 2) Make sure that the wire harness clearance between the wires and structure, accounting for slack in all directions), is a minimum of 0.13 in. (3.3 mm).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-09.

28-AWL-09: CDCCL

LOM 465-999

- 3) For the main tanks, make sure that each ring post has an independent wire tie.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

28-AWL-09: CDCCL

- 4) For the main tanks, make sure that for each stringer clip at a transition or breakout location, a wire tie is installed at both the horizontal and vertical section of the stringer clip.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

LOM ALL

SUBTASK 28-41-44-420-003

- (8) Connect the wires to the electrical terminals on each compensator or tank unit.
 - (a) Let the drip loop stay in the wire after you install the wire bundle.

SUBTASK 28-41-44-420-004

- (9) Tighten the screws to these torque ranges:
 - (a) HI-Z (COAX) 13.5 ± 1.5 in-lb (1.5 ± 0.2 N·m)
 - (b) HI-Z (SHIELD) 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m)
 - (c) LO-Z (TANK UNIT/COMPENSATOR) 29 ± 6 in-lb (3 ± 1 N·m)

SUBTASK 28-41-44-410-001

- (10) Install the access panels that you removed (TASK 28-11-11-400-801).

SUBTASK 28-41-44-860-002

- (11) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1



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SUBTASK 28-41-44-820-001

- (12) Do this task: System Test - Fuel Quantity Indicating System, TASK 28-41-00-730-801.

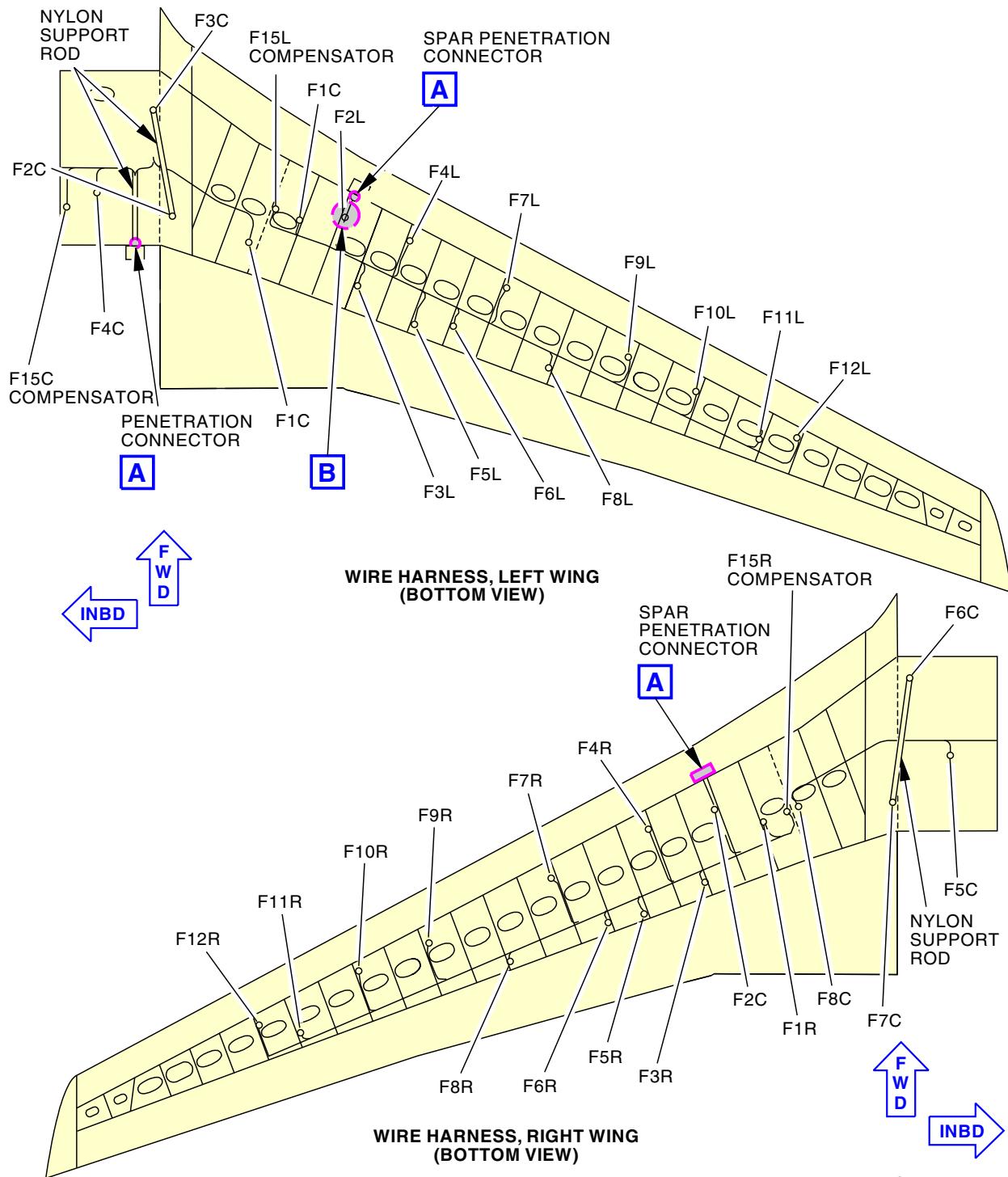
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

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FQIS Wire Harness Installation
Figure 401/28-41-44-990-802 (Sheet 1 of 3)

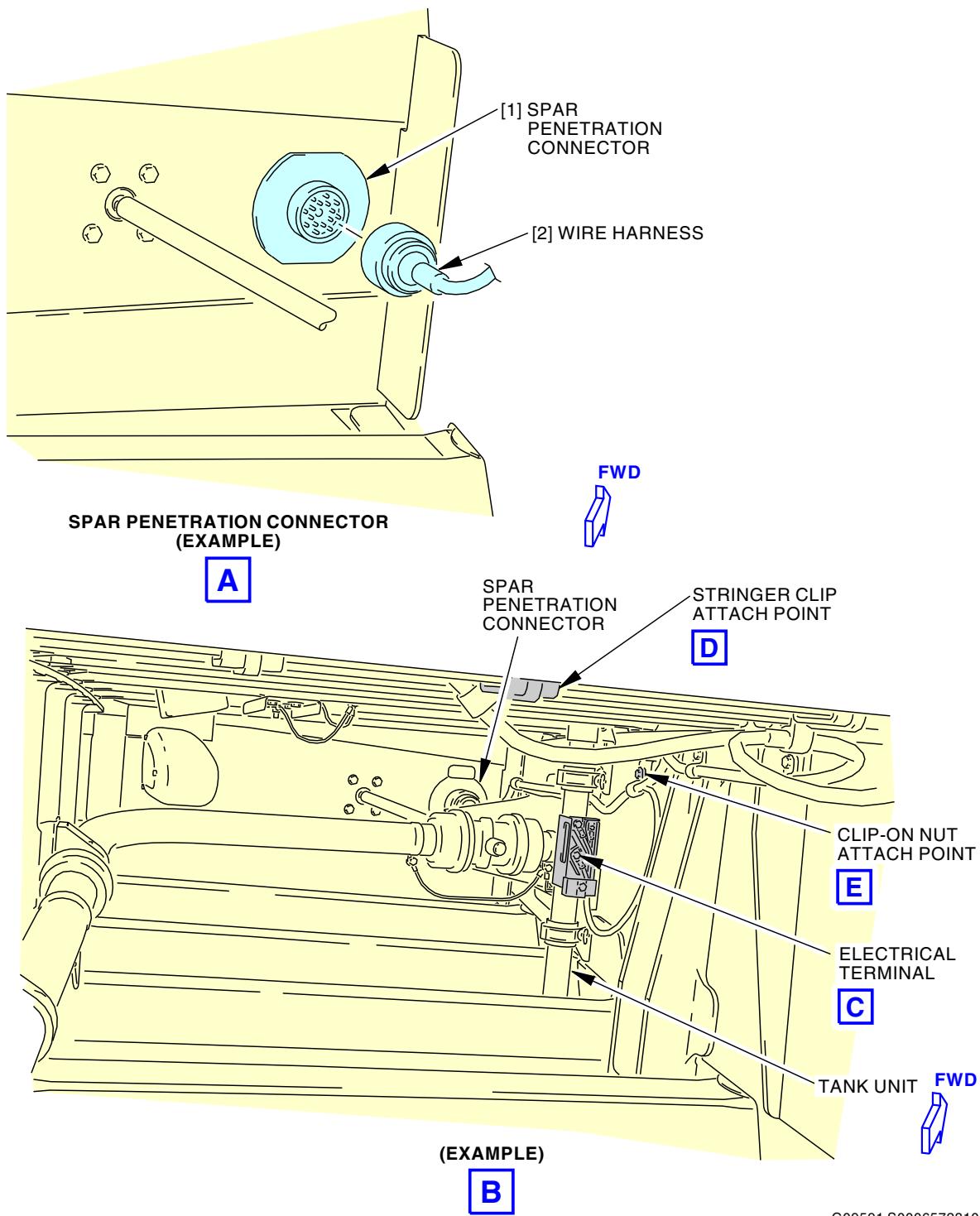
EFFECTIVITY	LOM ALL
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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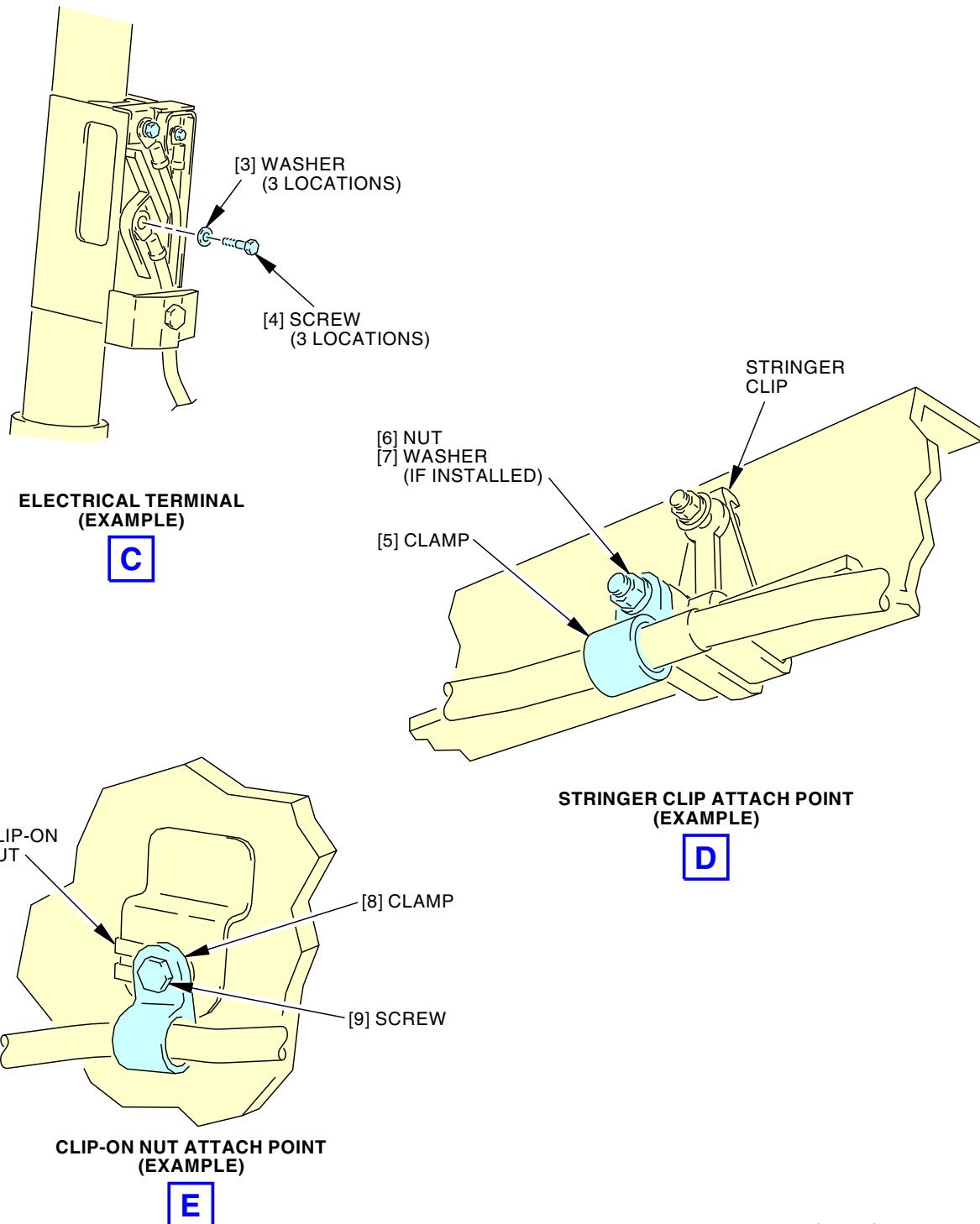
FQIS Wire Harness Installation
Figure 401/28-41-44-990-802 (Sheet 2 of 3)

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LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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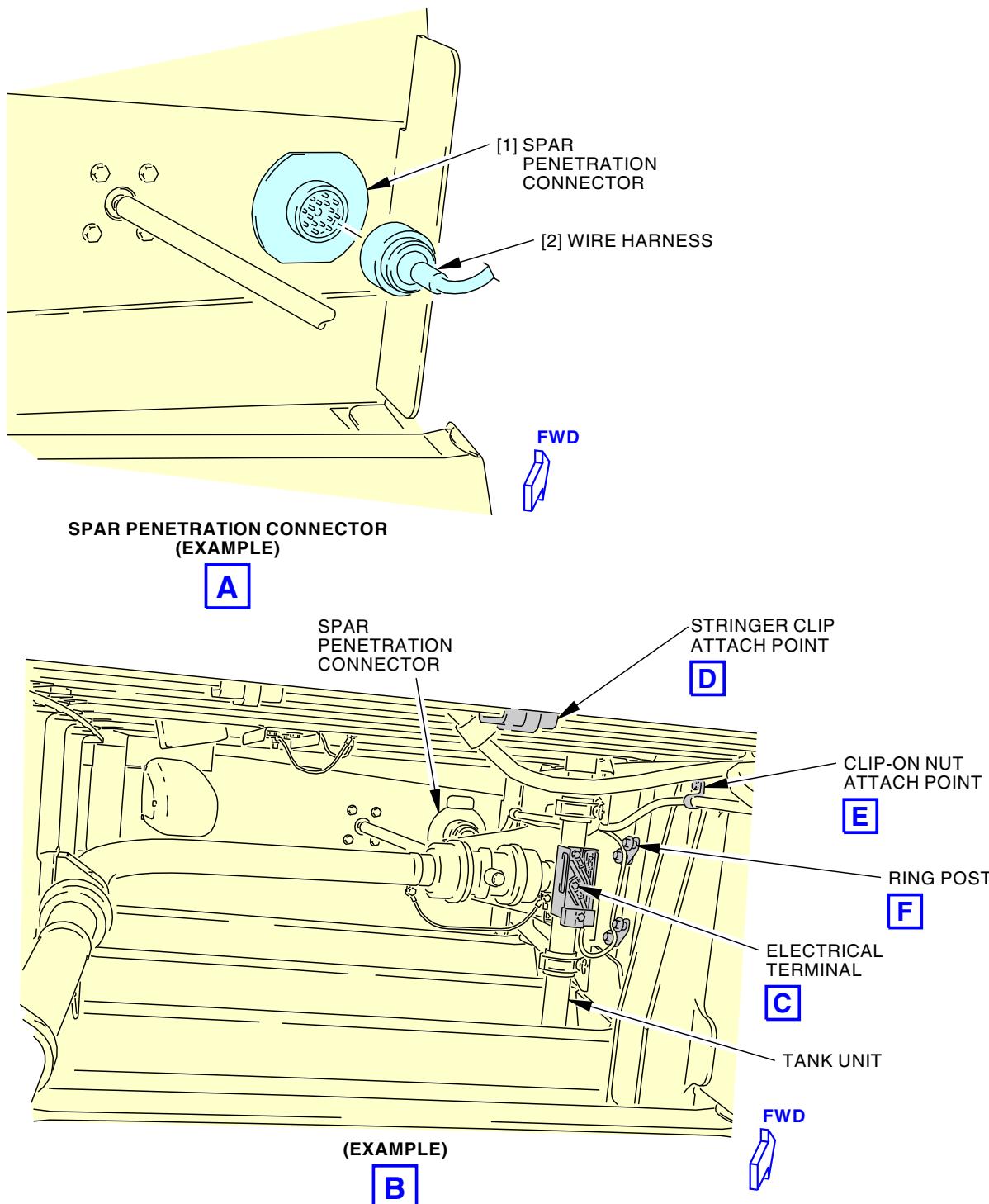
FQIS Wire Harness Installation
Figure 401/28-41-44-990-802 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

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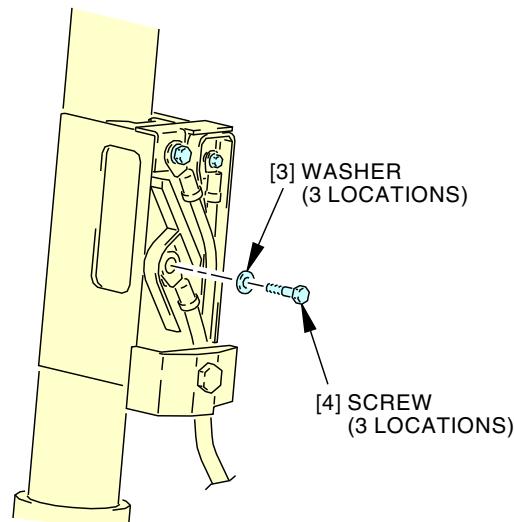
FQIS Wire Harness Installation (Main Tank)
Figure 402/28-41-44-990-803 (Sheet 1 of 3)

EFFECTIVITY
LOM 465-999

28-41-44

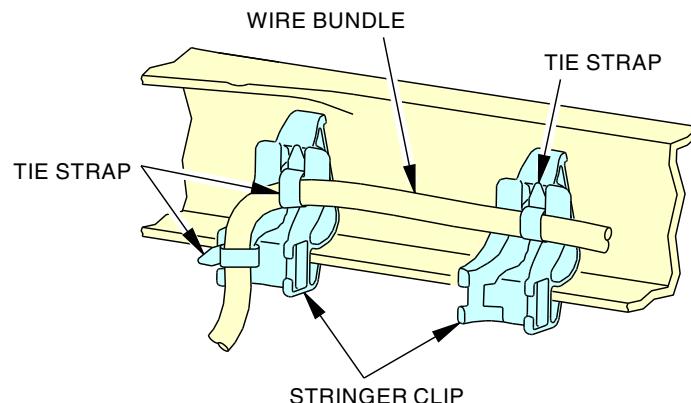


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ELECTRICAL TERMINAL
(EXAMPLE)

C



STRINGER CLIP ATTACH POINT
(EXAMPLE)

D

2829733 S0000656174_V1

FQIS Wire Harness Installation (Main Tank)
Figure 402/28-41-44-990-803 (Sheet 2 of 3)

EFFECTIVITY
LOM 465-999

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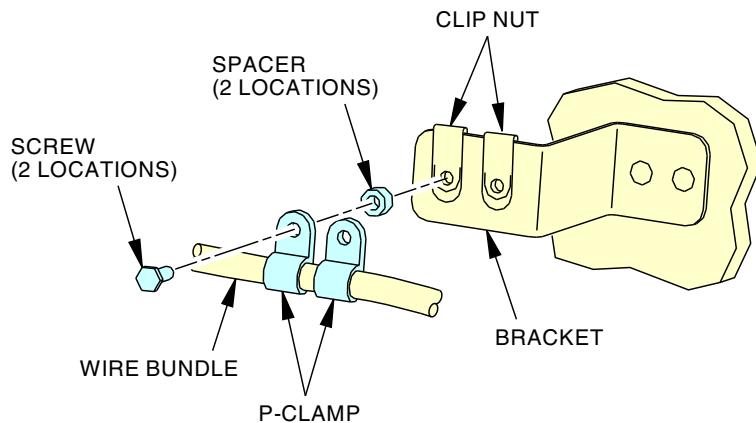
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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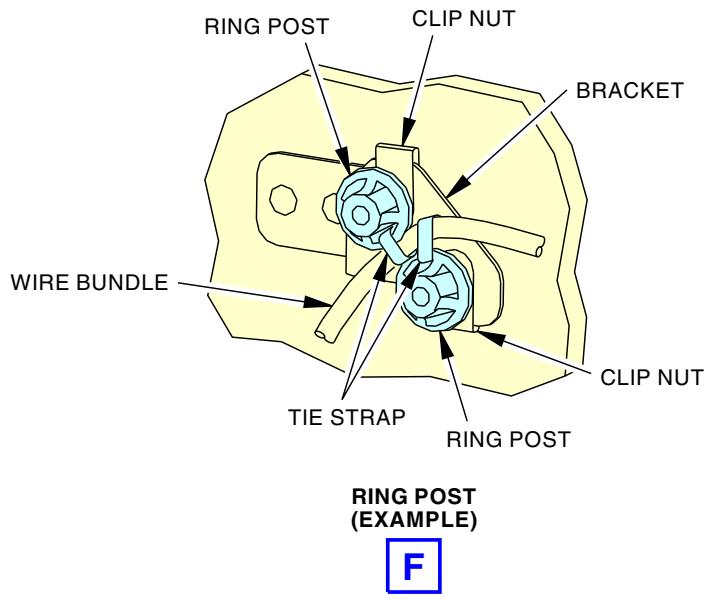


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CLIP-ON NUT ATTACH POINT
(EXAMPLE)

E



RING POST
(EXAMPLE)

F

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FQIS Wire Harness Installation (Main Tank)
Figure 402/28-41-44-990-803 (Sheet 3 of 3)

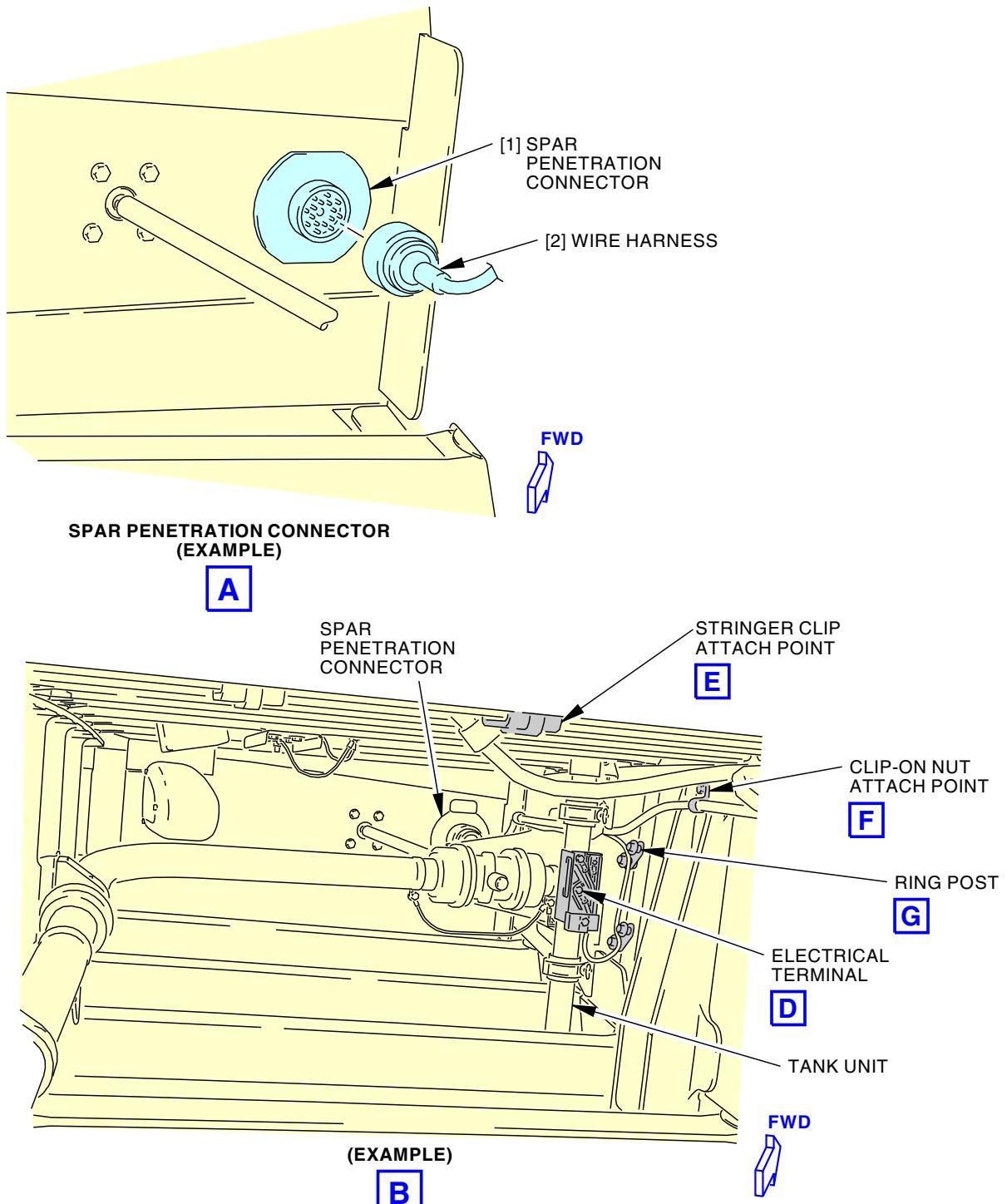
EFFECTIVITY
LOM 465-999

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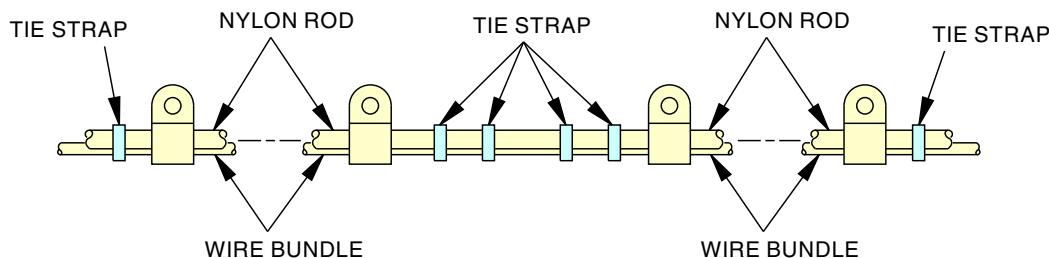
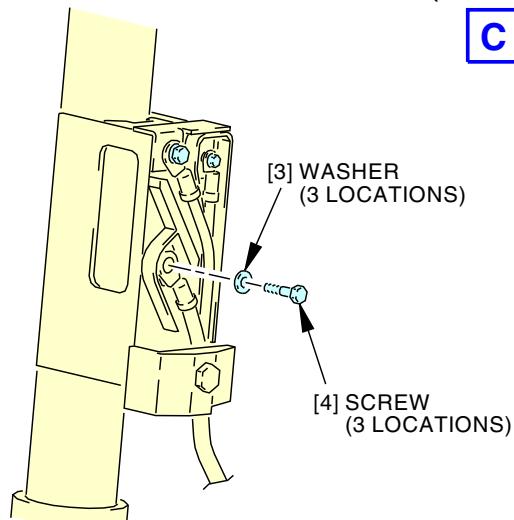
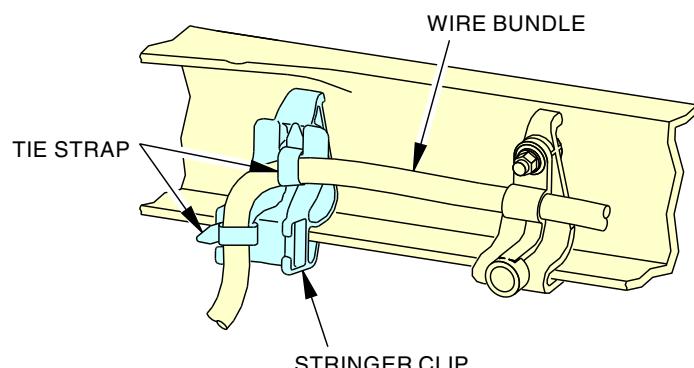
FQIS Wire Harness Installation (Center Tank)
Figure 403/28-41-44-990-804 (Sheet 1 of 3)

EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
 POST SB 737-28-1356

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ECCN 9E991 BOEING PROPRIETARY - See title page for details


**NYLON ROD
(EXAMPLE)**
C

**ELECTRICAL TERMINAL
(EXAMPLE)**
D

**STRINGER CLIP ATTACH POINT
(EXAMPLE)**
E

2829739 S0000656176_V1

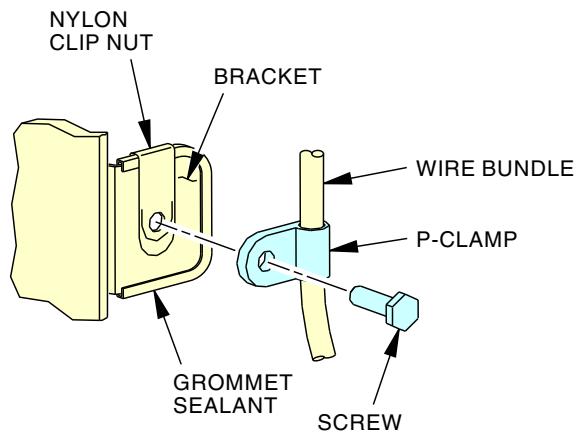
**FQIS Wire Harness Installation (Center Tank)
Figure 403/28-41-44-990-804 (Sheet 2 of 3)**

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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
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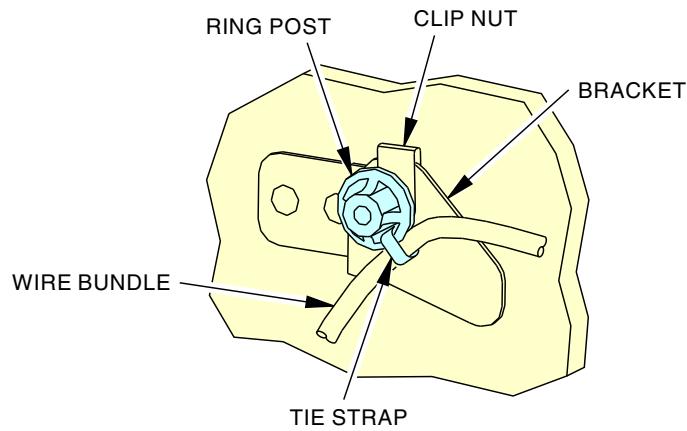
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**CLIP-ON NUT ATTACH POINT
 (EXAMPLE)**

F



**RING POST
 (EXAMPLE)**

G

2829740 S0000656543_V1

**FQIS Wire Harness Installation (Center Tank)
 Figure 403/28-41-44-990-804 (Sheet 3 of 3)**

EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
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FUEL TANK BULKHEAD (SPAR) RECEPTACLE WIRE HARNESS - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) FQIS Wiring and Component Visual Inspection
 - (2) FQIS, No. 1 Tank - Inspection
 - (3) FQIS, No. 2 Tank - Inspection
 - (4) FQIS, Center Tank - Inspection

TASK 28-41-44-210-801

2. FQIS Wiring and Component Visual Inspection

A. General

- (1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

D. Procedure

SUBTASK 28-41-44-210-001

- (1) Examine the wiring for these problems:
 - (a) Insulation that is abraded, cracked or over-stressed.
 - (b) Conductors or shields that are broken or exposed.
 - (c) Clearance from the structure that is not sufficient.

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► 28-AWL-35: ALI

- 1) For the center tanks, make sure that the clearance between wires and structures, accounting for slack in all directions, is a minimum of 0.13 in. (3.3 mm).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

- (d) Clamps that are loose or missing.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 POST SB 737-28-1356

► 28-AWL-35: ALI

- 1) For the center tanks, make sure that the applicable center tank unit or compensator unit support clamps are not damaged and are not loose.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

- (e) Wiring that is routed incorrectly.

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► 28-AWL-35: ALI

- 1) For the center tanks, make sure that the wires are not chafed.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

SUBTASK 28-41-44-210-002

- (2) Examine the compensators and tank units for these problems:

- (a) Make sure the wiring is correctly attached to the terminals.
- (b) Wiring to the terminals that is damaged or is incorrectly routed.
- (c) An end cap that is missing.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420 POST SB 737-28-1356

► 28-AWL-35: ALI

- 1) In the center tanks, make sure that end caps (upper and lower) are installed on the applicable tank unit.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

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28-AWL-35: ALI

- 2) In the center tanks, make sure that a lower end cap is installed on the compensator unit.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

- (d) Clearance from the structure that is not sufficient.

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28-AWL-35: ALI

- 1) For the center tanks, make sure that there is a 0.04 in. (1.0 mm) or more gap between the end cap of the applicable tank unit and the upper and lower fuel tank structure.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

28-AWL-35: ALI

- 2) For the center tanks, make sure that there is a 0.10 in. (2.5 mm) or more gap between the side of the applicable tank unit and the fuel tank structure.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

28-AWL-35: ALI

- 3) For the center tanks, make sure that there is a 0.10 in. (2.5 mm) or more gap between the side of the compensator unit and the fuel tank structure.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

28-AWL-35: ALI

- 4) For the center tanks, make sure that there is a 0.10 in. (2.5 mm) or more gap between the lower end cap of the compensator unit and the fuel tank structure.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

- (e) Mounting brackets and hardware that are loose or damaged.

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► **28-AWL-35: ALI**

- 1) For the center tanks, make sure that the wire harness support bracket, stringer clips, ring post, grommets, nylon nut clips, and nylon support rods are not damaged.

NOTE: Grommets and nylon nut clips are installed on the wire harness support brackets.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

► **28-AWL-35: ALI**

- 2) For the center tanks, make sure that sealant at the wire harness support bracket at the access hole at the spanwise beam number 1 is installed and is not damaged (such as peeling and cracking).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Airworthiness Limitation Instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-35.

LOM ALL

- (f) Terminals that are bent.
- (g) Do an inspection of the electrical connectors and seals for damage, wear, or fuel leakage.

— END OF TASK —

► **SFAR 88**

TASK 28-41-44-280-801

3. FQIS, No. 1 Tank - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
434	Engine 1 - Aft Strut Fairing
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50

C. Access Panels

Number	Name/Location
434CL	Aft Strut Fairing, Left Access To Fuel Door, Strut 1
532AB	Main Tank Access Door - Wing Station 216
532AZ	Main Tank Inner Access at Rib 6
532BB	Main Tank Access Door - Wing Station 265

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(Continued)

<u>Number</u>	<u>Name/Location</u>
532BZ	Main Tank Inner Access at Rib 6
532CB	Main Tank Access Door - Wing Station 290
532DB	Main Tank Access Door - Wing Station 313
532EB	Main Tank Access Door - Wing Station 337
532FB	Main Tank Access Door - Wing Station 367
532GB	Main Tank Access Door - Wing Station 390
532HB	Main Tank Access Door - Wing Station 417
532JB	Main Tank Access Door - Wing Station 443
532KB	Main Tank Access Door - Wing Station 470
532LB	Main Tank Access Door - Wing Station 496
532MB	Main Tank Access Door - Wing Station 523
532NB	Main Tank Access Door - Wing Station 549
532PB	Main Tank Access Door - Wing Station 576
532QB	Main Tank Access Door - Wing Station 602

D. Procedure

SUBTASK 28-41-44-750-001

- (1) For the area in the No. 1 fuel tank between rib No. 5 (inboard tank end) and rib No. 7, do these steps:

- (a) Remove this access panel:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

532AB Main Tank Access Door - Wing Station 216

- (c) For the area in the No. 1 fuel tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

Number Name/Location

532AZ Main Tank Inner Access at Rib 6

532BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

- (d) For all FQIS wiring and components between Rib No. 5 and Rib No. 7, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801.

- (e) If it is removed and access is not necessary for subsequent tasks, install the applicable access panel(s) on rib No. 6:

Number Name/Location

532AZ Main Tank Inner Access at Rib 6

532BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-801.

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- (f) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-41-44-280-001

- (2) For the area in the No. 1 fuel tank between rib No. 7 and rib No. 8, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

- (b) Remove this access panel:

Number **Name/Location**

532BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (c) Go into the opening for:

Number **Name/Location**

532BB Main Tank Access Door - Wing Station 265

- (d) For all FQIS wiring and components between Rib No. 7 and Rib No. 8, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801.

- (e) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

- (f) Install this access panel:

Number **Name/Location**

434CL Aft Strut Fairing, Left Access To Fuel Door, Strut 1

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

SUBTASK 28-41-44-280-002

- (3) For the area in the No. 1 fuel tank between rib No. 8 and rib No. 9, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532CB Main Tank Access Door - Wing Station 290

- (c) For all FQIS wiring and components between Rib No. 8 and Rib No. 9, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

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- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-003

- (4) For the area in the No. 1 fuel tank between rib No. 9 and rib No. 10, do these steps:

- (a) Remove this access panel:

Number Name/Location

532DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

532DB Main Tank Access Door - Wing Station 313

- (c) For all FQIS wiring and components between Rib No. 9 and Rib No. 10, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-004

- (5) For the area in the No. 1 fuel tank between rib No. 10 and rib No. 11, do these steps:

- (a) Remove this access panel:

Number Name/Location

532EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

532EB Main Tank Access Door - Wing Station 337

- (c) For all FQIS wiring and components between Rib No. 10 and Rib No. 11, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-750-002

- (6) For the area in the No. 1 fuel tank between rib No. 11 and rib No. 12, do these steps:

- (a) Remove this access panel:

Number Name/Location

532FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

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- (b) Go into the opening for:

Number **Name/Location**

532FB Main Tank Access Door - Wing Station 367

- (c) For all FQIS wiring and components between Rib No. 11 and Rib No. 12, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-750-003

- (7) For the area in the No. 1 fuel tank between rib No. 12 and rib No. 13, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532GB Main Tank Access Door - Wing Station 390

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532GB Main Tank Access Door - Wing Station 390

- (c) For all FQIS wiring and components between Rib No. 12 and Rib No. 13, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532GB Main Tank Access Door - Wing Station 390

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-005

- (8) For the area in the No. 1 fuel tank between rib No. 13 and rib No. 14, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532HB Main Tank Access Door - Wing Station 417

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532HB Main Tank Access Door - Wing Station 417

- (c) For all FQIS wiring and components between Rib No. 13 and Rib No. 14, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532HB Main Tank Access Door - Wing Station 417

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-006

- (9) For the area in the No. 1 fuel tank between rib No. 14 and rib No. 15, do these steps:

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- (a) Remove this access panel:

Number **Name/Location**

532JB Main Tank Access Door - Wing Station 443

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532JB Main Tank Access Door - Wing Station 443

- (c) For all FQIS wiring and components between Rib No. 14 and Rib No. 15, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532JB Main Tank Access Door - Wing Station 443

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-007

- (10) For the area in the No. 1 fuel tank between rib No. 15 and rib No. 16, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532KB Main Tank Access Door - Wing Station 470

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532KB Main Tank Access Door - Wing Station 470

- (c) For all FQIS wiring and components between Rib No. 15 and Rib No. 16, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532KB Main Tank Access Door - Wing Station 470

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-008

- (11) For the area in the No. 1 fuel tank between rib No. 16 and rib No. 17, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532LB Main Tank Access Door - Wing Station 496

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532LB Main Tank Access Door - Wing Station 496

- (c) For all FQIS wiring and components between Rib No. 16 and Rib No. 17, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

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- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532LB Main Tank Access Door - Wing Station 496

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-009

- (12) For the area in the No. 1 fuel tank between rib No. 17 and rib No. 18, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532MB Main Tank Access Door - Wing Station 523

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532MB Main Tank Access Door - Wing Station 523

- (c) For all FQIS wiring and components between Rib No. 17 and Rib No. 18, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532MB Main Tank Access Door - Wing Station 523

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-010

- (13) For the area in the No. 1 fuel tank between rib No. 18 and rib No. 19, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532NB Main Tank Access Door - Wing Station 549

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

532NB Main Tank Access Door - Wing Station 549

- (c) For all FQIS wiring and components between Rib No. 18 and Rib No. 19, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

532NB Main Tank Access Door - Wing Station 549

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-011

- (14) For the area in the No. 1 fuel tank between rib No. 19 and rib No. 20, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

532PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

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- (b) Go into the opening for:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

- (c) For all FQIS wiring and components between Rib No. 19 and Rib No. 20, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-012

- (15) For the area in the No. 1 fuel tank between rib No. 20 and rib No. 21, do these steps:

- (a) Remove this access panel:

Number Name/Location

532QB Main Tank Access Door - Wing Station 602

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

532QB Main Tank Access Door - Wing Station 602

- (c) For all FQIS wiring and components between Rib No. 20 and Rib No. 21, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

532QB Main Tank Access Door - Wing Station 602

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

— END OF TASK —



TASK 28-41-44-280-802

4. FQIS, No. 2 Tank - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-43-00-800-801	Engine and Nacelle Strut Access Doors and Panels (P/B 201)
06-44-00-800-801	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
444	Engine 2 - Aft Strut Fairing
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50



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C. Access Panels

<u>Number</u>	<u>Name/Location</u>
444CR	Aft Strut Fairing, Right Access To Fuel Door, Strut 2
632AB	Main Tank Access Door - Wing Station 216
632AZ	Main Tank Inner Access at Rib 6
632BB	Main Tank Access Door - Wing Station 265
632BZ	Main Tank Inner Access at Rib 6
632CB	Main Tank Access Door - Wing Station 290
632DB	Main Tank Access Door - Wing Station 313
632EB	Main Tank Access Door - Wing Station 337
632FB	Main Tank Access Door - Wing Station 367
632GB	Main Tank Access Door - Wing Station 390
632HB	Main Tank Access Door - Wing Station 417
632JB	Main Tank Access Door - Wing Station 443
632KB	Main Tank Access Door - Wing Station 470
632LB	Main Tank Access Door - Wing Station 496
632MB	Main Tank Access Door - Wing Station 523
632NB	Main Tank Access Door - Wing Station 549
632PB	Main Tank Access Door - Wing Station 576
632QB	Main Tank Access Door - Wing Station 602

D. Procedure

SUBTASK 28-41-44-750-004

- (1) For the area in the No. 2 fuel tank between rib No. 5 (inboard tank end) and rib No. 7, do these steps:

- (a) Remove this access panel:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (b) Go into the opening for:

Number Name/Location

632AB Main Tank Access Door - Wing Station 216

- (c) For the area in the No. 2 fuel tank between rib No. 6 and rib No. 7, remove only one of these access panels on rib No. 6 (unless the engine is removed):

Number Name/Location

632AZ Main Tank Inner Access at Rib 6

632BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings,
TASK 06-44-00-800-801.

- (d) For all FQIS wiring and components between Rib No. 5 and Rib No. 7, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801.





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- (e) If it is removed and access is not necessary for subsequent tasks, install the applicable access panel(s) on rib No. 6:

Number **Name/Location**

632AZ Main Tank Inner Access at Rib 6

632BZ Main Tank Inner Access at Rib 6

To do this, do this task: Finding an Access Door or Panel on the Wings,
TASK 06-44-00-800-801.

- (f) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632AB Main Tank Access Door - Wing Station 216

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 28-41-44-280-014

- (2) For the area in the No. 2 fuel tank between rib No. 7 and rib No. 8, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

- (b) Remove this access panel:

Number **Name/Location**

632BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

- (c) Go into the opening for:

Number **Name/Location**

632BB Main Tank Access Door - Wing Station 265

- (d) For all FQIS wiring and components between Rib No. 7 and Rib No. 8, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801.

- (e) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632BB Main Tank Access Door - Wing Station 265

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

- (f) Install this access panel:

Number **Name/Location**

444CR Aft Strut Fairing, Right Access To Fuel Door, Strut 2

(Engine and Nacelle Strut Access Doors and Panels, TASK 06-43-00-800-801).

SUBTASK 28-41-44-280-015

- (3) For the area in the No. 2 fuel tank between rib No. 8 and rib No. 9, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

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- (b) Go into the opening for:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

- (c) For all FQIS wiring and components between Rib No. 8 and Rib No. 9, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632CB Main Tank Access Door - Wing Station 290

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-016

- (4) For the area in the No. 2 fuel tank between rib No. 9 and rib No. 10, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632DB Main Tank Access Door - Wing Station 313

- (c) For all FQIS wiring and components between Rib No. 9 and Rib No. 10, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632DB Main Tank Access Door - Wing Station 313

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-017

- (5) For the area in the No. 2 fuel tank between rib No. 10 and rib No. 11, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632EB Main Tank Access Door - Wing Station 337

- (c) For all FQIS wiring and components between Rib No. 10 and Rib No. 11, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632EB Main Tank Access Door - Wing Station 337

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-750-005

- (6) For the area in the No. 2 fuel tank between rib No. 11 and rib No. 12, do these steps:

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- (a) Remove this access panel:

Number **Name/Location**

632FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632FB Main Tank Access Door - Wing Station 367

- (c) For all FQIS wiring and components between Rib No. 11 and Rib No. 12, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632FB Main Tank Access Door - Wing Station 367

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-018

- (7) For the area in the No. 2 fuel tank between rib No. 12 and rib No. 13, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632GB Main Tank Access Door - Wing Station 390

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632GB Main Tank Access Door - Wing Station 390

- (c) For all FQIS wiring and components between Rib No. 12 and Rib No. 13, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632GB Main Tank Access Door - Wing Station 390

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-019

- (8) For the area in the No. 2 fuel tank between rib No. 13 and rib No. 14, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632HB Main Tank Access Door - Wing Station 417

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632HB Main Tank Access Door - Wing Station 417

- (c) For all FQIS wiring and components between Rib No. 13 and Rib No. 14, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

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- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632HB Main Tank Access Door - Wing Station 417

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-020

- (9) For the area in the No. 2 fuel tank between rib No. 14 and rib No. 15, do these steps:

- (a) Remove this access panel:

Number Name/Location

632JB Main Tank Access Door - Wing Station 443

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

632JB Main Tank Access Door - Wing Station 443

- (c) For all FQIS wiring and components between Rib No. 14 and Rib No. 15, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632JB Main Tank Access Door - Wing Station 443

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-021

- (10) For the area in the No. 2 fuel tank between rib No. 15 and rib No. 16, do these steps:

- (a) Remove this access panel:

Number Name/Location

632KB Main Tank Access Door - Wing Station 470

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

632KB Main Tank Access Door - Wing Station 470

- (c) For all FQIS wiring and components between Rib No. 15 and Rib No. 16, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632KB Main Tank Access Door - Wing Station 470

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-022

- (11) For the area in the No. 2 fuel tank between rib No. 16 and rib No. 17, do these steps:

- (a) Remove this access panel:

Number Name/Location

632LB Main Tank Access Door - Wing Station 496

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

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- (b) Go into the opening for:

Number **Name/Location**

632LB Main Tank Access Door - Wing Station 496

- (c) For all FQIS wiring and components between Rib No. 16 and Rib No. 17, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632LB Main Tank Access Door - Wing Station 496

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-023

- (12) For the area in the No. 2 fuel tank between rib No. 17 and rib No. 18, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632MB Main Tank Access Door - Wing Station 523

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632MB Main Tank Access Door - Wing Station 523

- (c) For all FQIS wiring and components between Rib No. 17 and Rib No. 18, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632MB Main Tank Access Door - Wing Station 523

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-024

- (13) For the area in the No. 2 fuel tank between rib No. 18 and rib No. 19, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

632NB Main Tank Access Door - Wing Station 549

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number **Name/Location**

632NB Main Tank Access Door - Wing Station 549

- (c) For all FQIS wiring and components between Rib No. 18 and Rib No. 19, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

632NB Main Tank Access Door - Wing Station 549

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-025

- (14) For the area in the No. 2 fuel tank between rib No. 19 and rib No. 20, do these steps:

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- (a) Remove this access panel:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

- (c) For all FQIS wiring and components between Rib No. 19 and Rib No. 20, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632PB Main Tank Access Door - Wing Station 576

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

SUBTASK 28-41-44-280-026

- (15) For the area in the No. 2 fuel tank between rib No. 20 and rib No. 21, do these steps:

- (a) Remove this access panel:

Number Name/Location

632QB Main Tank Access Door - Wing Station 602

To do this, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801

- (b) Go into the opening for:

Number Name/Location

632QB Main Tank Access Door - Wing Station 602

- (c) For all FQIS wiring and components between Rib No. 20 and Rib No. 21, do this task:
FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

632QB Main Tank Access Door - Wing Station 602

To do this, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801

— END OF TASK —



TASK 28-41-44-280-803

5. FQIS, Center Tank - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)



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B. Location Zones

Zone	Area
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Access Panels

Number	Name/Location
131AB	Center Tank Access
531AB	Center Tank Access Door - Wing Station 168
531BB	Center Tank Access Door - Wing Station 192
631AB	Center Tank Access Door - Wing Station 168
631BB	Center Tank Access Door - Wing Station 192

D. Procedure

SUBTASK 28-41-44-750-006

- (1) For the area in the center tank on the left side between rib No. 4 and rib No. 5 (tank end), do these steps:

- (a) Remove this access panel:

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192

- (c) For all FQIS wiring and components between Rib No. 4 and Rib No. 5, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-41-44-280-028

- (2) For the area in the center tank on the left side between rib No. 1 (side of body rib) and rib No. 4, do these steps:

- (a) Remove this access panel:

Number	Name/Location
531AB	Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number	Name/Location
531AB	Center Tank Access Door - Wing Station 168

- (c) For all FQIS wiring and components between Rib No. 1 and Rib No. 4, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

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- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

531AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-41-44-280-029

- (3) For the area in the center tank on the right side between rib No. 4 and rib No. 5 (tank end), do these steps:

- (a) Remove this access panel:

Number **Name/Location**

631BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number **Name/Location**

631BB Center Tank Access Door - Wing Station 192

- (c) For all FQIS wiring and components between Rib No. 4 and Rib No. 5, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

631BB Center Tank Access Door - Wing Station 192

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-41-44-280-030

- (4) For the area in the center tank on the right side between rib No. 1 (side of body rib) and rib No. 4, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

631AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number **Name/Location**

631AB Center Tank Access Door - Wing Station 168

- (c) For all FQIS wiring and components between Rib No. 1 and Rib No. 4, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number **Name/Location**

631AB Center Tank Access Door - Wing Station 168

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

SUBTASK 28-41-44-280-031

- (5) For the area of the center tank in the center wing section, do these steps:

- (a) Remove this access panel:

Number **Name/Location**

131AB Center Tank Access

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To do this, do this task: Center Tank Access Door Removal, TASK 28-11-31-000-801

- (b) Go into the opening for:

Number Name/Location

131AB Center Tank Access

- (c) For all FQIS wiring and components in the wing center section, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-44-210-801

- (d) If access is not necessary for subsequent tasks, install this access panel:

Number Name/Location

131AB Center Tank Access

To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-31-400-801

———— END OF TASK ————

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REFUEL QUANTITY INDICATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A task to remove the refuel quantity indicator
 - (2) A task to install the refuel quantity indicator.
- B. 737 SB 28-1200 (inspection for wire chafing behind the P15 refuel panel) reduces the service loop for the refuel quantity indicators. To remove the refuel quantity indicators, it is necessary to lower the refuel panel (P15), disconnect the electrical connector from the refuel quantity indicator and then remove the refuel quantity indicator from the refuel panel.
- C. The refuel quantity indicator is also called the refuel quantity indicator. In this procedure it is also referred to as the "indicator".

TASK 28-41-61-000-801

2. Refuel Quantity Indicator Removal

(Figure 401)

A. General

- (1) This task gives you instructions to remove the Refuel Quantity Indicator.

B. References

Reference	Title
28-21-00-000-801	Refuel Panel (P15) Removal (P/B 401)

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare for the Removal

SUBTASK 28-41-61-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-61-010-001

- (2) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-41-61-010-005

- (3) Remove the refuel panel [4] (TASK 28-21-00-000-801).



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F. Refuel Quantity Indicator Removal

SUBTASK 28-41-61-020-007

- (1) Do these steps to remove the refuel quantity indicator [3]:
 - (a) Disconnect the applicable electrical connector [1] from the rear of the refuel quantity indicator [3].
 - (b) Put a tag or mark on the electrical connector [1] and the refuel quantity indicator [3].
 - (c) Loosen the clamp screw [2] of the applicable refuel quantity indicator [3].
 - (d) Remove the refuel quantity indicator [3] through the forward side of the refuel panel [4].

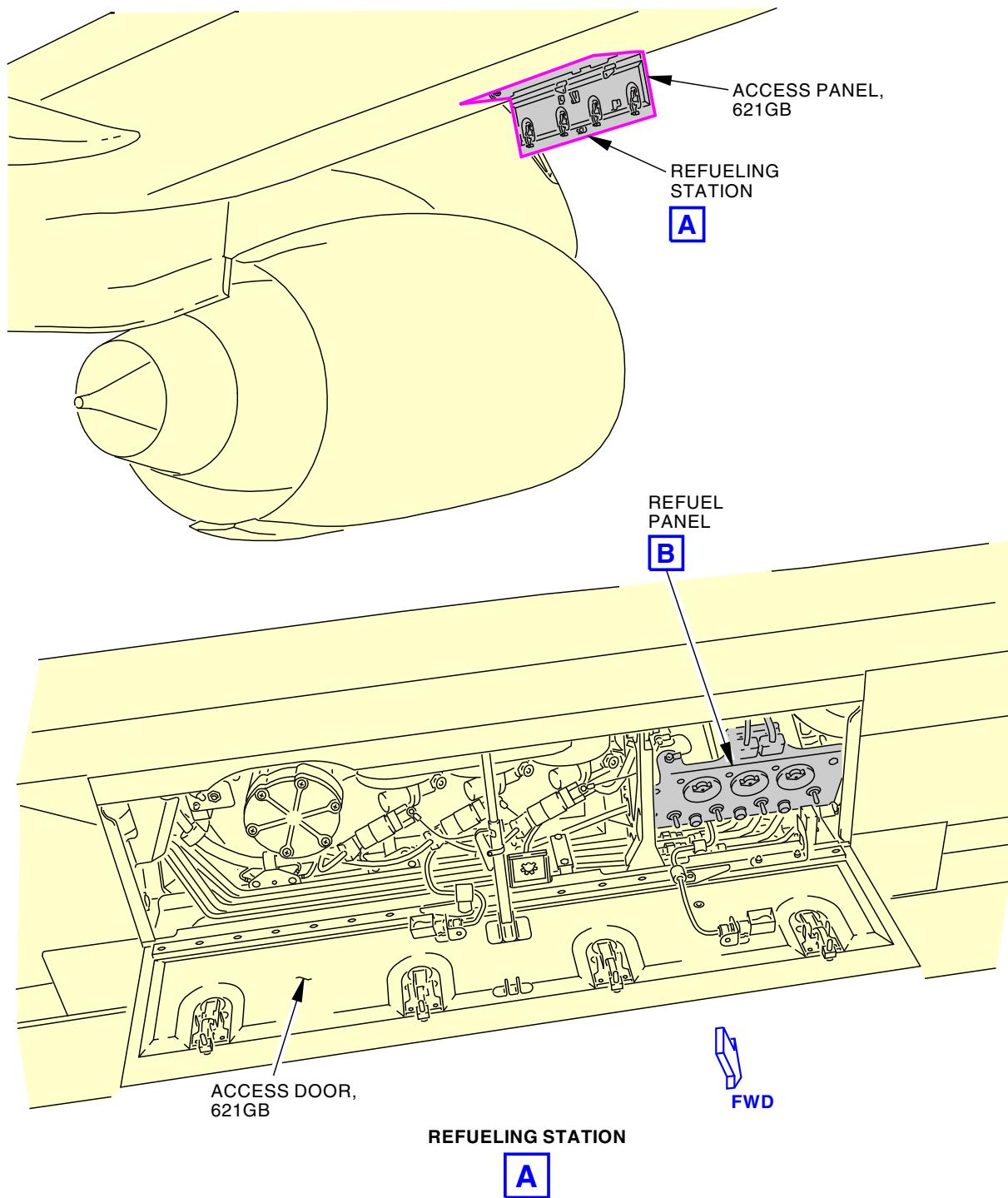
———— END OF TASK ————

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BOEING

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**Refuel Quantity Indicators Installation
Figure 401/28-41-61-990-802 (Sheet 1 of 2)**

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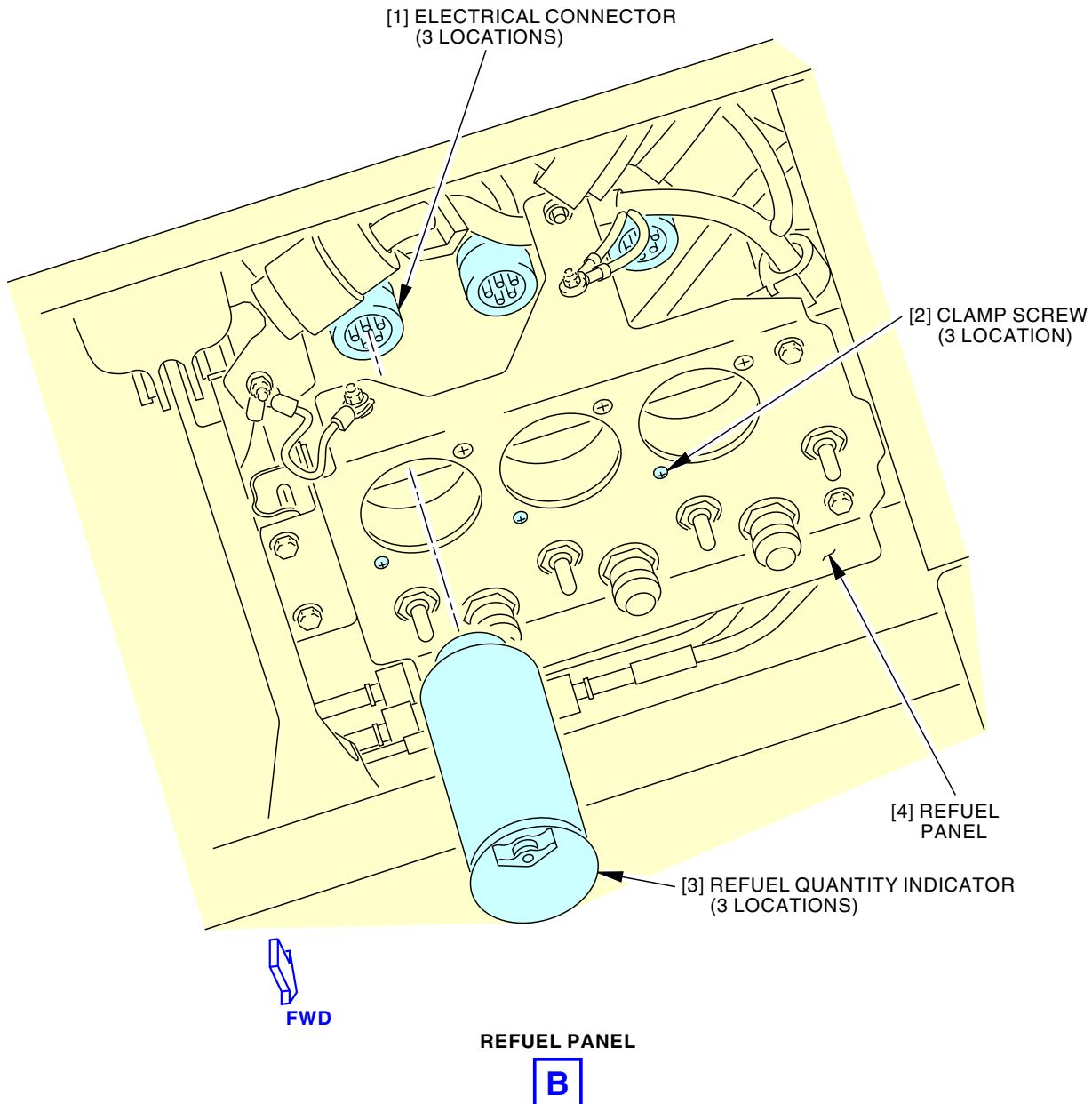
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Refuel Quantity Indicators Installation
Figure 401/28-41-61-990-802 (Sheet 2 of 2)

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TASK 28-41-61-400-801

3. Refuel Quantity Indicator Installation

(Figure 401)

A. References

Reference	Title
28-21-00-211-801	Refuel Panel Wire Bundle Inspection (P/B 601)
28-21-00-400-801	Refuel Panel (P15) Installation (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Refuel quantity indicator	28-21-51-02-005	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 423, 424, 426-431, 437-439, 441, 445, 450-452, 457-465
		28-21-51-03-005	LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

C. Location Zones

Zone	Area
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare for the Installation

SUBTASK 28-41-61-860-003

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-61-010-002

- (2) Open this access panel, if it is not open:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

- (a) Remove the pins that attach the linkage assemblies to the access door.

SUBTASK 28-41-61-210-003

- (3) Do a visual inspection of the refuel panel (P15) W0024 wire bundle (TASK 28-21-00-211-801).

NOTE: A visual inspection is recommended each time a refuel quantity indicator is removed.

F. Refuel Quantity Indicator Installation

SUBTASK 28-41-61-420-001

- (1) Do these steps to install the refuel quantity indicator [3]:

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- (a) Install the refuel quantity indicator [3] in the refuel panel [4].
- (b) Tighten the clamp screw [2] on the refuel quantity indicator [3].
- (c) Connect the electrical connector [1] to the refuel quantity indicator [3].
- (d) Remove the temporary tags or marks on the electrical connector [1] and refuel quantity indicator [3].

SUBTASK 28-41-61-410-004

- (2) Install the refuel panel [4] (TASK 28-21-00-400-801).

G. Operational Test

SUBTASK 28-41-61-860-002

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-61-710-002

- (2) Push each fueling valve position light.
 - (a) Make sure that each fueling valve position light comes on.
NOTE: The lights are PRESS-TO-TEST.

SUBTASK 28-41-61-710-001

- (3) Set the FUELING INDICATION TEST SWITCH on the refuel control panel to the TEST position.
 - (a) Make sure all of the refuel quantity indicators [3] operate correctly.
NOTE: The test blanks the fueling indicators display for two seconds, then all LED segments go on for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the test mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

SUBTASK 28-41-61-710-003

- (4) Make sure that the fueling shutoff valves operate correctly.
 - (a) Set the switch for the fueling shutoff valve for the No. 1 tank to the OPEN position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the No. 1 tank comes on.
 - (b) Set the switch for the fueling shutoff valve for the No. 1 tank to the CLOSE position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the No. 1 tank goes off.
 - (c) Set the switch for the fueling shutoff valve for the No. 2 tank to the OPEN position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the No. 2 tank comes on.
 - (d) Set the switch for the fueling shutoff valve for the No. 2 tank to the CLOSE position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the No. 2 tank goes off.

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- (e) Set the switch for the fueling shutoff valve for the center tank to the OPEN position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the center tank comes on.
- (f) Set the switch for the fueling shutoff valve for the center tank to the CLOSE position.
 - 1) Make sure that the indication light for the fueling shutoff valve for the center tank goes off.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-41-61-410-006

- (1) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

———— END OF TASK ————

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FQIS PROCESSOR - REMOVAL/INSTALLATION

1. General

- A. The fuel quantity processor unit collects signals from all FQIS system components, calculates the fuel quantity in each fuel tank and transmits this information to the P2 Display Unit in the flight compartment and to the fuel quantity indicators on the P15 refueling panel on the right wing. The processor is installed in the radar bay immediately forward of the nose landing gear wheel well.
- B. The fuel quantity processor unit (FQPU) is referred to as "the processor" in this procedure.
- C. This procedure contains two tasks. The first task removes the processor. The second task installs the processor.

TASK 28-41-81-000-801

2. Fuel Quantity Processor Unit Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the fuel quantity processor unit.
- (2) The fuel quantity processor unit is referred to as the "processor" in this task.

B. References

Reference	Title
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

D. Access Panels

Number	Name/Location
112A	Forward Access Door

E. Prepare for the Removal

SUBTASK 28-41-81-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-81-010-001

- (2) Open this access panel:

Number Name/Location

112A Forward Access Door



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F. Fuel Quantity Processor Unit Removal

SUBTASK 28-41-81-910-001



BE CAREFUL WHEN YOU REMOVE OR INSTALL THE FQIS PROCESSOR.
DAMAGE TO THE FQIS CONNECTOR PINS CAN EASILY OCCUR.



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR
DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE.
ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 28-41-81-020-001

- (2) Disconnect the electrical connectors from the processor [1].

SUBTASK 28-41-81-020-002

- (3) While you hold up the processor [1], loosen and remove the bolts [2] and washers [3] that hold the processor [1] in its position.

SUBTASK 28-41-81-020-003

- (4) Remove the processor [1].

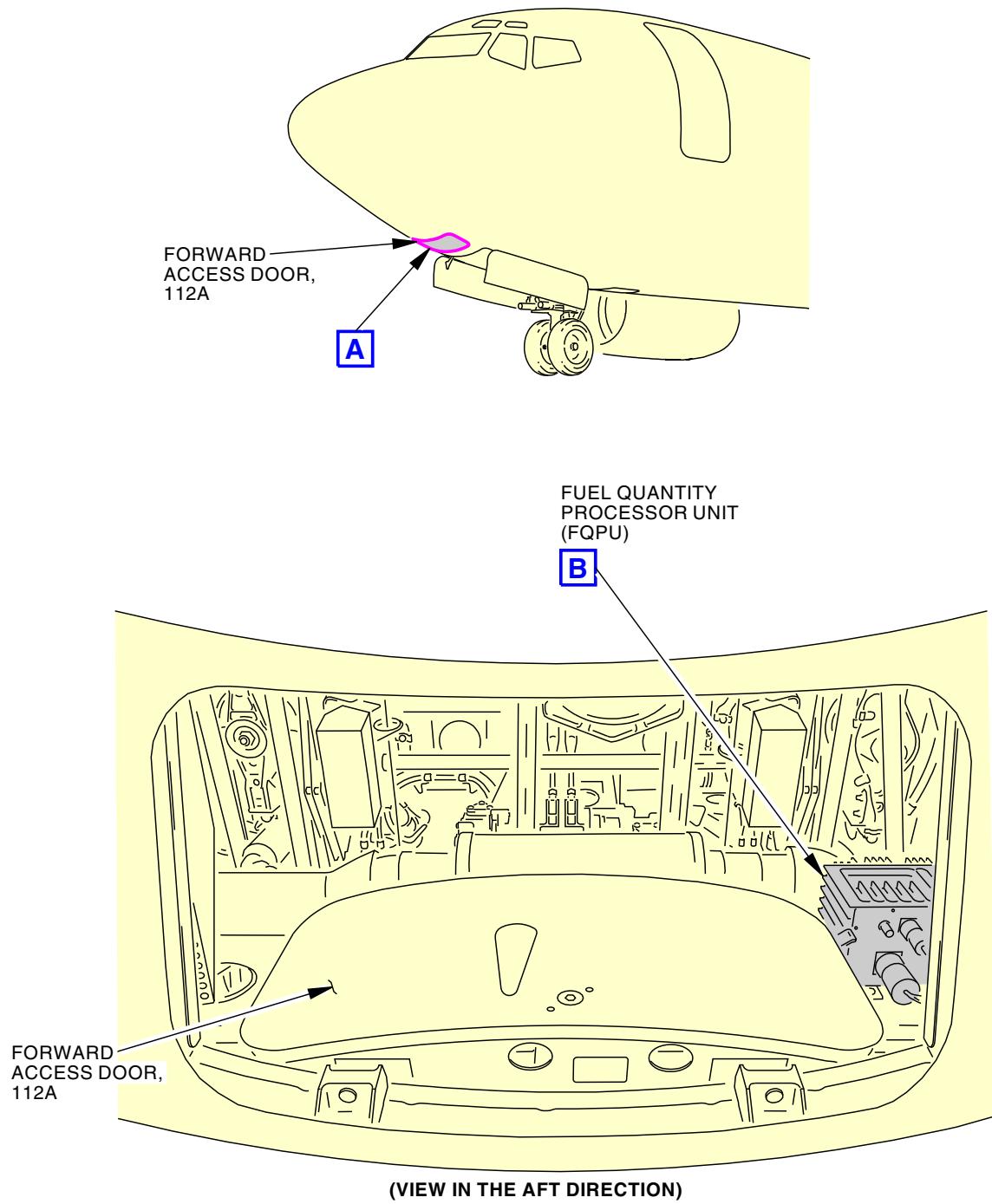
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Fuel Quantity Processor Unit (FQPU) Installation
Figure 401/28-41-81-990-802 (Sheet 1 of 4)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-456

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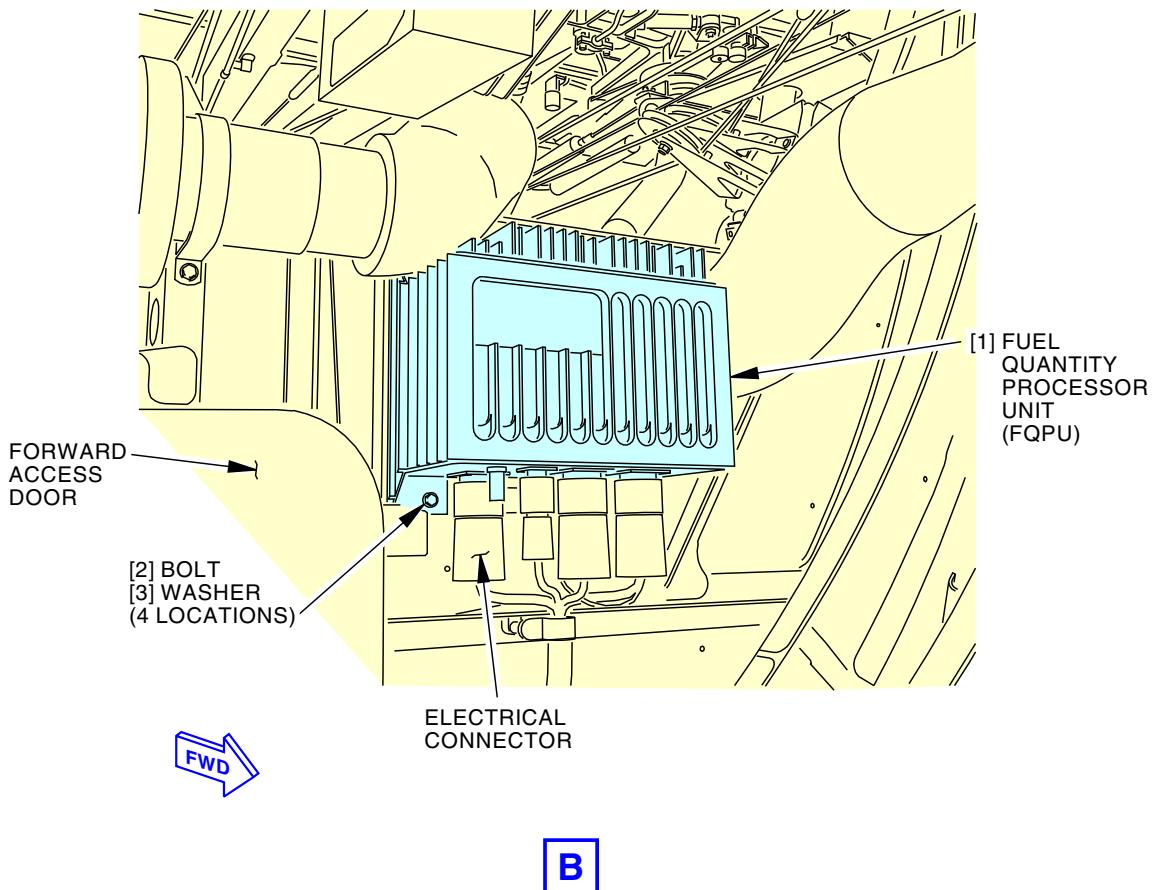
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Fuel Quantity Processor Unit (FQPU) Installation
Figure 401/28-41-81-990-802 (Sheet 2 of 4)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-456

28-41-81

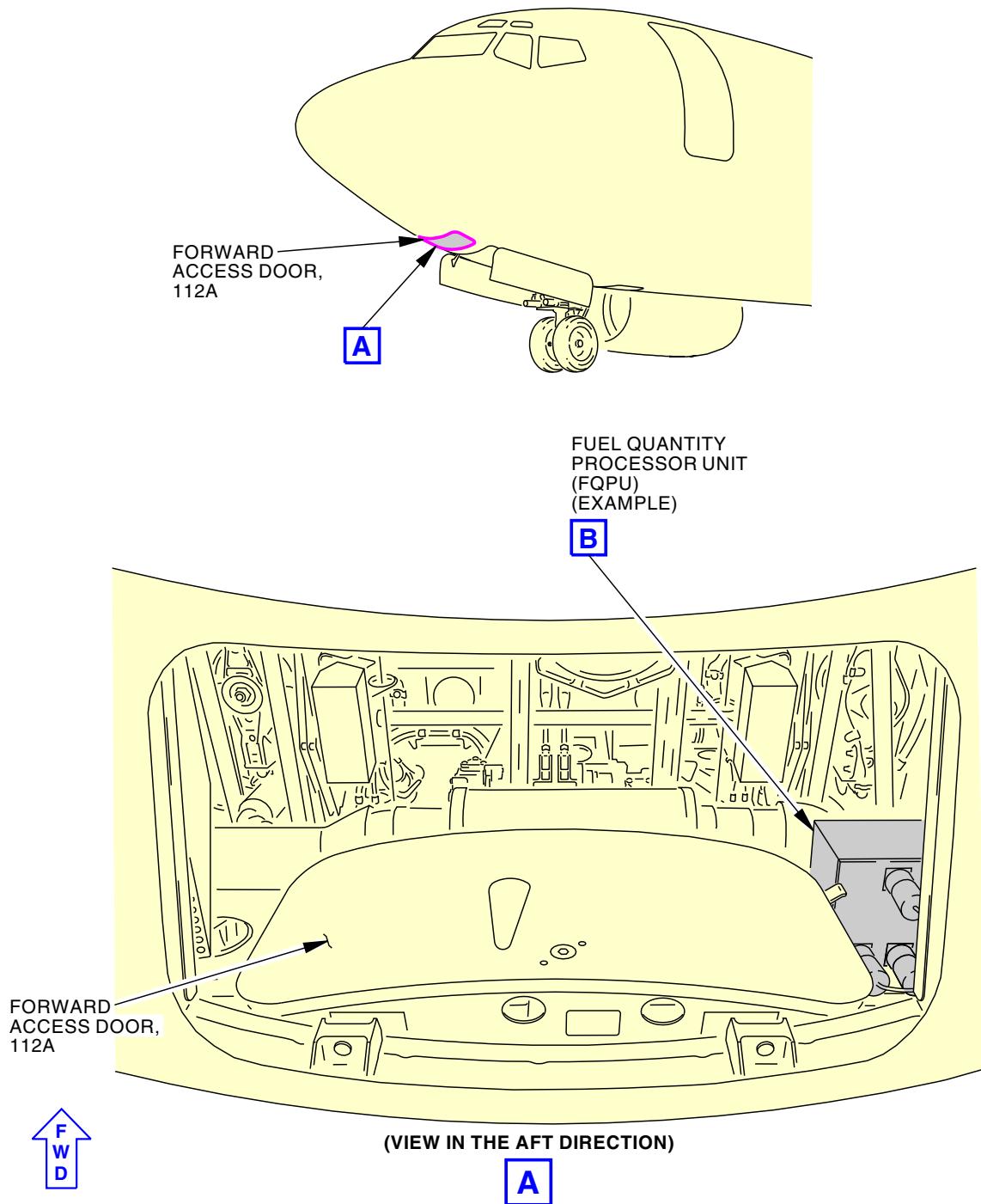
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Fuel Quantity Processor Unit (FQPU) Installation
Figure 401/28-41-81-990-802 (Sheet 3 of 4)

EFFECTIVITY
LOM 457-999

28-41-81

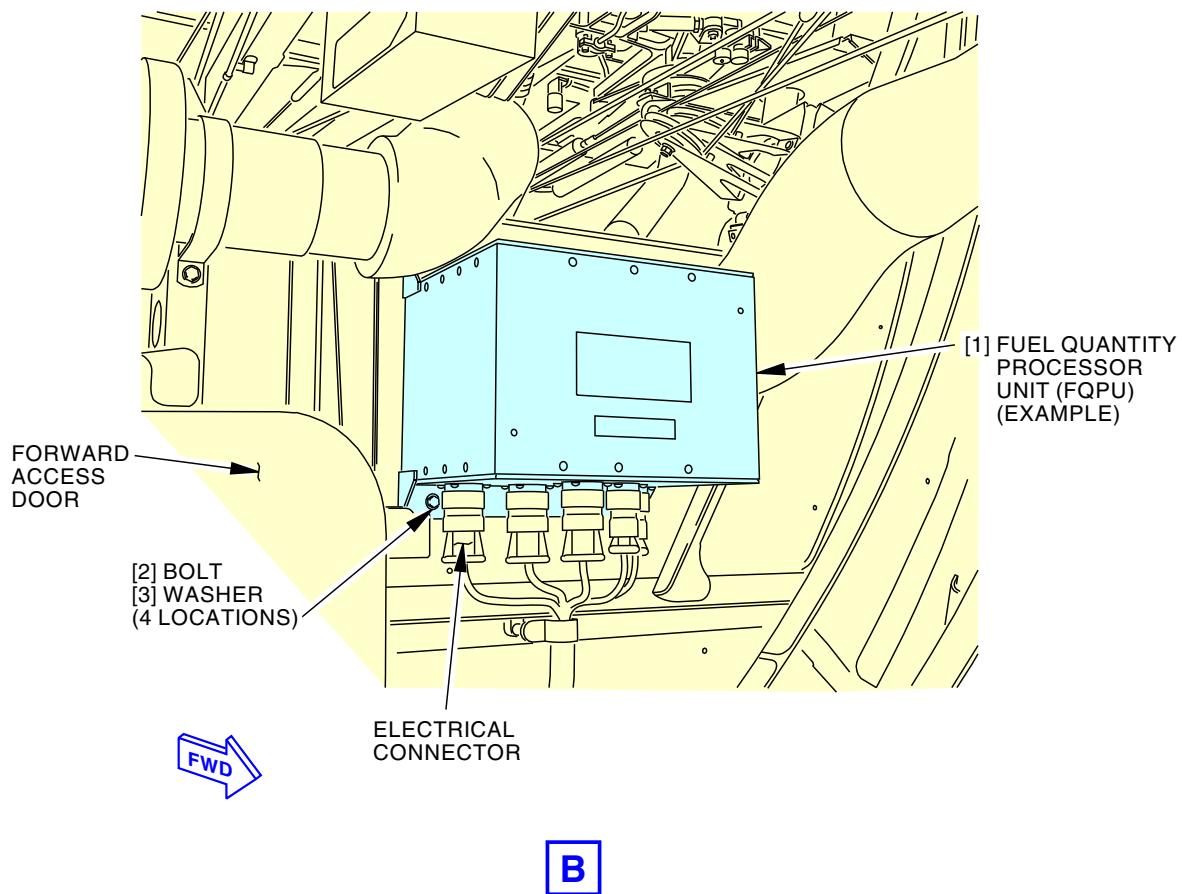
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Fuel Quantity Processor Unit (FQPU) Installation
Figure 401/28-41-81-990-802 (Sheet 4 of 4)

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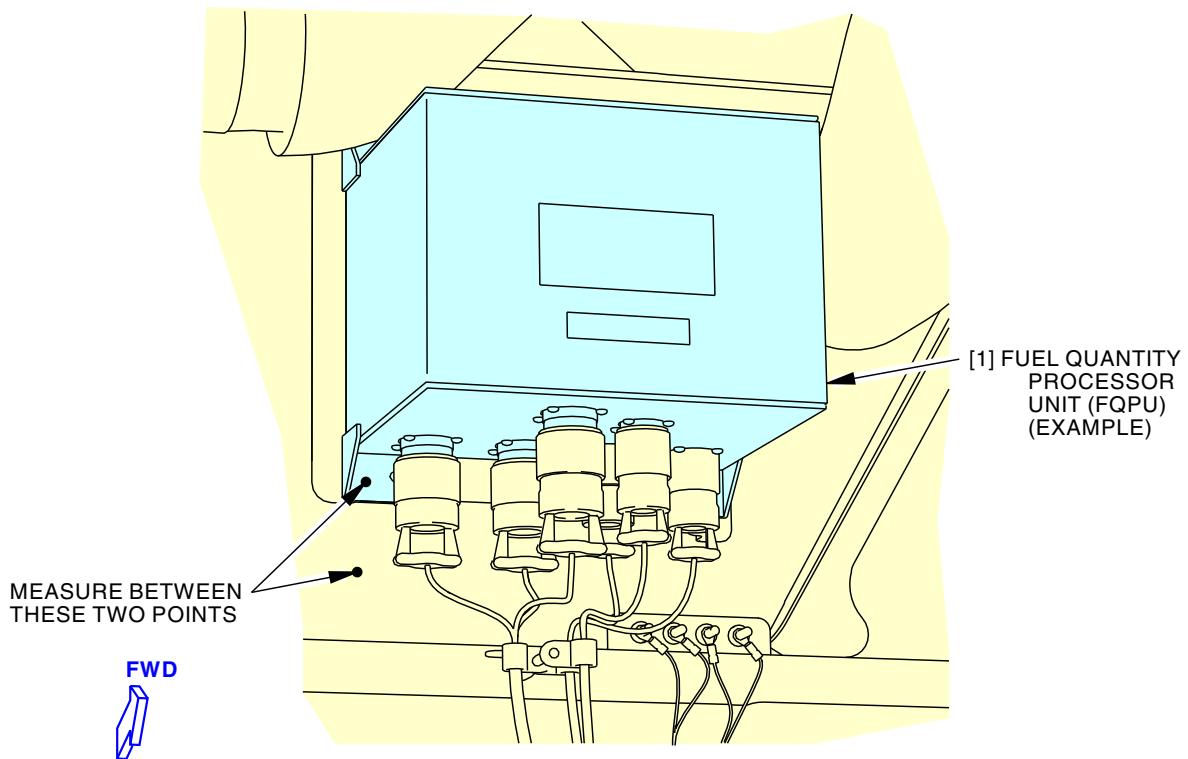
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Bonding Resistance Measurement
Figure 402/28-41-81-990-804

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TASK 28-41-81-400-801

3. Fuel Quantity Processor Unit Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the fuel quantity processor unit.
- (2) The fuel quantity processor unit is referred to as the "processor" for this task.

B. References

Reference	Title
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-41-00-710-801	Operational Test - Fuel Quantity Indicating System (P/B 501)
51-21-72-370-804	BMS10-11 Primer - Application (P/B 701)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659

D. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00291	Tape - Aluminum Foil, 3M 425	AMS-T-23397 / L-T-80
G50398	Pad - Abrasive, Scotch-Brite Type S, Abrasive Pad	
G50492	Pad - 3M Scotch Brite 7448 Ultra Fine Pad	MIL-A-9962A Type III Grade AAA

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Reference	Description	Specification
G51293	Cotton Wiper - Knit, Process Cleaning Absorbent Wiper	BMS15-5 Class B

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Processor	28-41-81-01-010	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-456
		28-41-81-01-025	LOM 457-999

F. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

G. Access Panels

Number	Name/Location
112A	Forward Access Door

H. Fuel Quantity Processor Unit Installation

SUBTASK 28-41-81-110-001

- (1) Do these steps to prepare the processor [1] for an unsealed electrical faying surface bond (SWPM 20-20-00).



DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Use a new cotton wiper, G00034 (alternate: knit cotton wiper, G51293) soaked with solvent, B00062 or solvent, B00184.
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

SUBTASK 28-41-81-110-002

- (2) Do these steps to prepare the aircraft structure or the aluminum bracket for an unsealed electrical faying surface bond (SWPM 20-20-00).
- (a) Use Cleaning Procedure 1 to manually clean the aircraft structure or aluminum bracket fay surface at each mount hole.
 - 1) Use a very fine Scotch-Brite Type S pad, G50398, or a Scotch-Brite 7448 pad, G50492.
 - 2) Move the pad in a circular motion while you press with your thumb.
 - (b) Final clean the fay surfaces of the aircraft structure or aluminum bracket.





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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- 1) Use a new cotton wiper, G00034 (alternate: knit cotton wiper, G51293) soaked with solvent, B00062 or solvent, B00184.
- 2) Rub dry with a clean, dry cotton wiper, G00034.
- 3) Continue to clean and dry the surface until the cotton wiper, G00034 stays clean.

LOM ALL; AIRPLANES WITH 30128-06 FQPU

SUBTASK 28-41-81-160-001

- (3) Apply chemical conversion coating, C00064 to the abraded surfaces:
 - (a) Apply 3M 425 Aluminum Foil Tape, G00291, around all fay surfaces.
 - (b) Manually apply coating, C00064 to the contact surfaces with a clean, dry cotton wiper, G00034.
NOTE: Keep the surfaces wet, until a perceptible color develops. Color change takes about 2 to 3 minutes.
 - (c) Air dry at room temperature.
NOTE: The maximum drying air temperature is 130°F (54°C).

SUBTASK 28-41-81-370-001

- (4) Manually apply primer, C00259 to the abraded surfaces on the processor [1] and the bracket (BMS10-11 Primer - Application, TASK 51-21-72-370-804).

LOM ALL

SUBTASK 28-41-81-210-001

- (5) Make sure that the connector sockets on the electrical connectors are not damaged.

SUBTASK 28-41-81-910-003

- (6) Make sure that the pins on the processor [1] that go into the sockets on the electrical connectors are not damaged.

SUBTASK 28-41-81-910-002



CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE FQIS PROCESSOR. DAMAGE TO THE FQIS CONNECTOR PINS CAN EASILY OCCUR.



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (7) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-456

SUBTASK 28-41-81-410-001

- (8) While you hold up the processor [1], install the four bolts and washers that hold the processor in its position.
 - (a) Tighten the bolts to a torque of 35 ± 5 in-lb (4 ± 1 N·m).

LOM 457-999

SUBTASK 28-41-81-400-001

- (9) While you hold up the processor [1], install the four bolts and washers that hold the processor in its position.
 - (a) Torque the bolt heads to 35 ± 5 in-lb (4 ± 1 N·m).

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-456

SUBTASK 28-41-81-220-001

- (10) Measure the bonding resistance between the processor [1] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (a) Make sure that the bonding resistance is 0.001 ohm (1 milliohm) or less.

LOM 457-999

SUBTASK 28-41-81-400-002

- (11) Measure the bonding resistance between the processor [1] and the airplane structure, not the FQPU mounting bracket, with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).
 - (a) Make sure that the bonding resistance is 0.0015 ohm (1.5 milliohm) or less.

LOM ALL

SUBTASK 28-41-81-420-001

- (12) Connect the electrical connectors to the processor [1].

I. Fuel Quantity Processor Unit Installation Test

SUBTASK 28-41-81-860-002

- (1) Close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

SUBTASK 28-41-81-860-003

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-41-81-740-001

- (3) Do this task: Operational Test - Fuel Quantity Indicating System, TASK 28-41-00-710-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-41-81-410-002

- (1) Close this access panel:

Number Name/Location

112A Forward Access Door

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SUBTASK 28-41-81-860-004

- (2) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power,
TASK 24-22-00-860-812

———— END OF TASK ————

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FUEL BOOST PUMP PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. There are six pressure switches, one for each of these pumps:
 - (1) Left aft fuel boost pump
 - (2) Left forward fuel boost pump
 - (3) Left center fuel boost pump
 - (4) Right aft fuel boost pump
 - (5) Right forward fuel boost pump
 - (6) Right center fuel boost pump
- B. This procedure contains two tasks. The first task removes the pressure switch. The second task installs the pressure switch.

TASK 28-42-11-000-801

2. Fuel Boost Pump Pressure Switch Removal

(Figure 401 or Figure 402)

A. General

- (1) This task gives instructions to remove the fuel boost pump pressure switch.

B. References

Reference	Title
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
511	Left Wing - Leading Edge To Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
611	Right Wing - Leading Edge to Front Spar
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
511AT	Inboard Leading Edge, Strakelet Upper Panel
611AT	Inboard Leading Edge, Strakelet Upper Access Panel





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E. Prepare for the Removal (Left Aft Fuel Boost Pump)

SUBTASK 28-42-11-420-018



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-034

- (3) To get access to the P92 panel, open this access panel:

<u>Number</u>	<u>Name/Location</u>
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117A	Electronic Equipment Access Door
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SUBTASK 28-42-11-860-080



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
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D	1	C00826	FUEL BOOST PUMP TANK 1 AFT
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LOM 402, 404, 406			
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D	2	C00826	FUEL BOOST PUMP TANK 1 AFT
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LOM ALL

SUBTASK 28-42-11-010-001

- (5) Get access to the pressure switch [1] immediately inboard of the left main landing gear.

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F. Pressure Switch of the Left Aft Fuel Boost Pump Removal

SUBTASK 28-42-11-020-001

- (1) Remove the electrical connector [3] from the pressure switch [1].

SUBTASK 28-42-11-210-001



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to make sure that the fuel tanks contain less than the maximum quantity of fuel:

- (a) Make sure that the fuel quantity in the center tank is not more than 11,400 lb (5171 kg).

NOTE: The fuel quantity is shown on the central display unit (P2).

NOTE: The No. 1 Main Tank is not defueled for the removal of the pressure switch for the left aft boost pump so that the adapter fitting behind the pressure switch is tested.

SUBTASK 28-42-11-020-026

- (3) Remove the safety cable [4] and discard.

LOM 402, 406, 407, 437, 438, 458-460; LOM 404, 411, 412, 415, 416, 420, 422-434, 439-447, 450-457, 461-465 POST SB 737-28-1371

SUBTASK 28-42-11-020-033

- (4) Remove the sealing boot [5].

LOM ALL

SUBTASK 28-42-11-020-002

- (5) Remove the pressure switch [1] from the boss on the rear spar.

NOTE: Fuel may leak from the adapter as the pressure switch is removed. After the pressure switch is removed, there should not be more than 20 drops per minute leaking from the adapter. If fuel leaks faster than 20 drops per minute, then replace the adapter fitting.

- (a) Discard the O-ring [2].

G. Prepare for the Removal (Left Forward Fuel Boost Pump)

SUBTASK 28-42-11-420-019



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-004

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

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SUBTASK 28-42-11-010-035

- (3) To get access to the P91 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-860-081



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM ALL

SUBTASK 28-42-11-010-036

- (5) To get access to the pressure switch for the left forward boost pump, open this access panel:

Number Name/Location

511AT Inboard Leading Edge, Strakelet Upper Panel

H. Pressure Switch of the Left Forward Fuel Boost Pump Removal

SUBTASK 28-42-11-420-001

- (1) Remove the electrical connector [3] from the pressure switch [1].

SUBTASK 28-42-11-210-031



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to make sure that the fuel tanks contain less than the maximum quantity of fuel:

- (a) Make sure that the fuel quantity in the center tank is not more than 11,400 lb (5171 kg).

NOTE: The fuel quantity is shown on the central display unit (P2).

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- (b) Completely defuel the No. 1 tank or transfer the fuel out of it (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

SUBTASK 28-42-11-020-027

- (3) Remove the safety cable [4] and discard.

SUBTASK 28-42-11-020-003

- (4) Remove the pressure switch [1] from the boss on the front spar.
(a) Discard the O-ring [2].

I. Prepare for the Removal (Left Center Fuel Boost Pump)

SUBTASK 28-42-11-420-020



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-037

- (3) To get access to the P91 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-860-082



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999 (Continued)

(Continued)

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT
LOM 402, 404, 406			
D	6	C00845	FUEL BOOST PUMP CTR TANK LEFT

LOM ALL

J. Pressure Switch of the Left Center Fuel Boost Pump Removal

SUBTASK 28-42-11-020-004

- (1) Remove the electrical connector [3] from the pressure switch [1].

SUBTASK 28-42-11-210-027



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Make sure that the fuel quantity in the center tank is less than 11,400 lb (5171 kg).

NOTE: The fuel quantity is shown on the central display unit (P2).

SUBTASK 28-42-11-020-028

- (3) Remove the safety cable [4] and discard.

SUBTASK 28-42-11-020-005

- (4) Remove the pressure switch [1] from the boss on the rear spar.
 - (a) Discard the O-ring [2].

K. Prepare for the Removal (Right Aft Fuel Boost Pump)

SUBTASK 28-42-11-420-021



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-008

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-038

- (3) To get access to the P91 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

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SUBTASK 28-42-11-860-083



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406			
D	4	C00828	FUEL BOOST PUMP TANK 2 AFT

LOM ALL

SUBTASK 28-42-11-010-002

- (5) Get access to the pressure switch [1] immediately inboard of the right main landing gear.

L. Pressure Switch of the Right Aft Fuel Boost Pump Removal

SUBTASK 28-42-11-020-006

- (1) Remove the electrical connector [3] from the pressure switch [1].

SUBTASK 28-42-11-210-032



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to make sure that the fuel tanks contain less than the maximum quantity of fuel:

- (a) Make sure that the fuel quantity in the center tank is not more than 11,400 lb (5171 kg).

NOTE: The fuel quantity is shown on the central display unit (P2).

NOTE: The No. 2 Main Tank is not defueled for the removal of the pressure switch for the right aft boost pump so that the adapter fitting behind the pressure switch is tested.

SUBTASK 28-42-11-020-029

- (3) Remove the safety cable [4] and discard.

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**LOM 402, 406, 407, 437, 438, 458-460; LOM 404, 411, 412, 415, 416, 420, 422-434, 439-447, 450-457,
461-465 POST SB 737-28-1371**

SUBTASK 28-42-11-020-035

- (4) Remove the sealing boot [5].

LOM ALL

SUBTASK 28-42-11-020-007

- (5) Remove the pressure switch [1] from the boss on the rear spar.

NOTE: Fuel may leak from the adapter as the pressure switch is removed. After the pressure switch is removed, there should not be more than 20 drops per minute leaking from the adapter. If fuel leaks faster than 20 drops per minute, then replace the adapter fitting.

- (a) Discard the O-ring [2].

M. Prepare for the Removal (Right Forward Fuel Boost Pump)

SUBTASK 28-42-11-420-022



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-010

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-040

- (3) To get access to the P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-860-084



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-42-11



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM ALL

SUBTASK 28-42-11-010-039

- (5) To get access to the pressure switch for the right forward boost pump, open this access panel:

Number Name/Location

611AT Inboard Leading Edge, Strakelet Upper Access Panel

N. Pressure Switch of the Right Forward Fuel Boost Pump Removal

SUBTASK 28-42-11-020-008

- (1) Remove the electrical connector [3] from the pressure switch [1].

SUBTASK 28-42-11-210-033



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps to make sure that the fuel tanks contain less than the maximum quantity of fuel:
- Make sure that the fuel quantity in the center tank is not more than 11,400 lb (5171 kg).
NOTE: The fuel quantity is shown on the central display unit (P2).
 - Completely defuel the No. 2 tank or transfer the fuel out of it (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

SUBTASK 28-42-11-020-030

- (3) Remove the safety cable [4] and discard.

SUBTASK 28-42-11-020-009

- (4) Remove the pressure switch [1] from the boss on the front spar.
(a) Discard the O-ring [2].

EFFECTIVITY
LOM ALL

28-42-11



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AIRCRAFT MAINTENANCE MANUAL

O. Prepare for the Removal (Right Center Fuel Boost Pump)

SUBTASK 28-42-11-420-023



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-012

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-041

- (3) To get access to the P92 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-860-085



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (4) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

P. Pressure Switch of the Right Center Fuel Boost Pump Removal

SUBTASK 28-42-11-020-010

- (1) Remove the electrical connector [3] from the pressure switch [1].

EFFECTIVITY
LOM ALL

28-42-11



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SUBTASK 28-42-11-210-030



WARNING

MAKE SURE THAT THE QUANTITY OF FUEL IS LESS THAN THE SPECIFIED MAXIMUM. IF THE QUANTITY OF FUEL IS MORE THAN THE SPECIFIED MAXIMUM, FUEL CAN DRAIN FROM THE FUEL TANK. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Make sure that the fuel quantity in the center tank is not more than 11,400 lb (5171 kg).

NOTE: The fuel quantity is shown on the central display unit (P2).

SUBTASK 28-42-11-020-031

- (3) Remove the safety cable [4] and discard.

SUBTASK 28-42-11-020-011

- (4) Remove the pressure switch [1] from the boss on the rear spar.

- (a) Discard the O-ring [2].

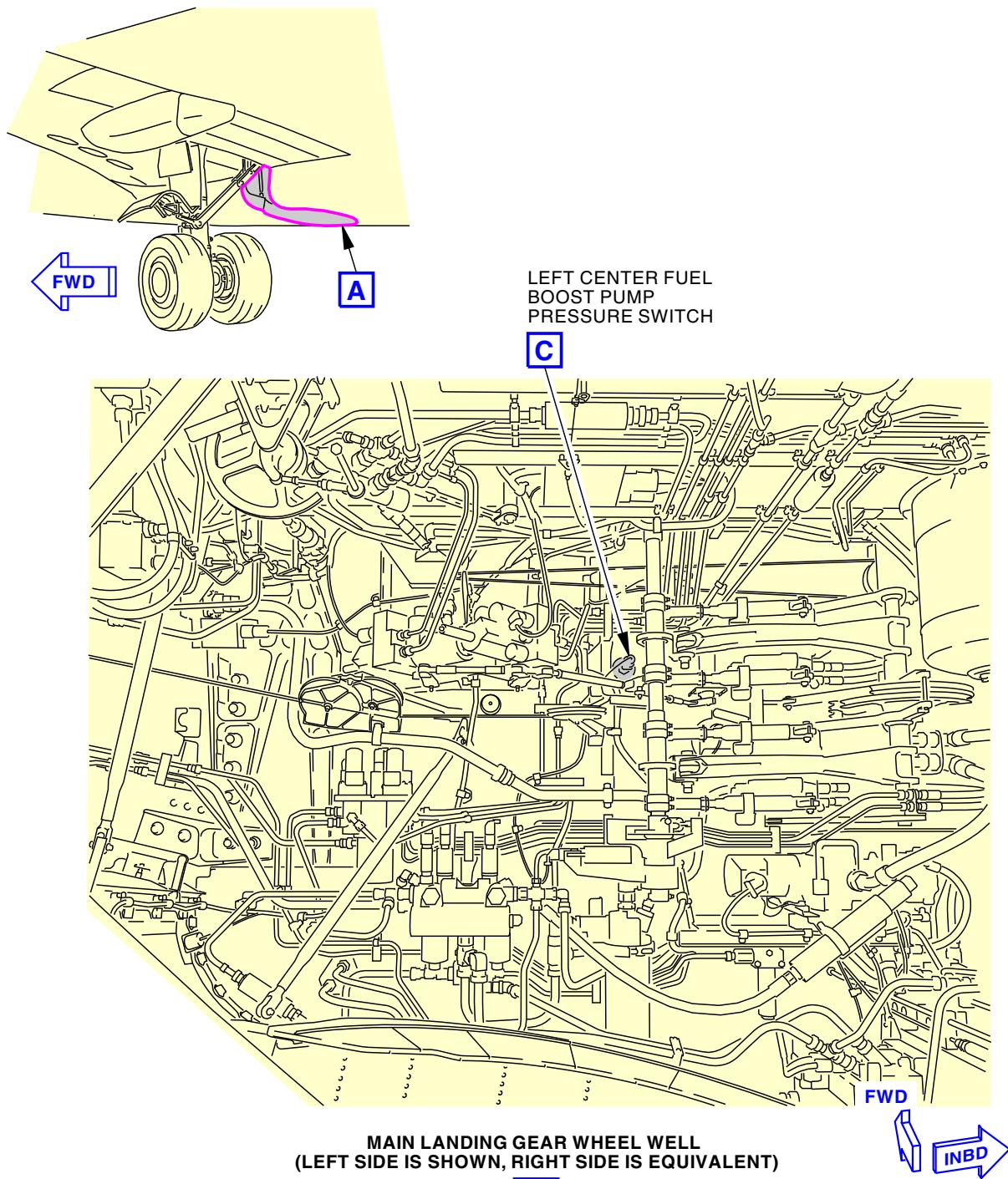
———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-42-11



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AIRCRAFT MAINTENANCE MANUAL



F98684 S0006572336_V3

Fwd and Center Fuel Boost Pump Pressure Switch Installation
Figure 401/28-42-11-990-802 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-42-11

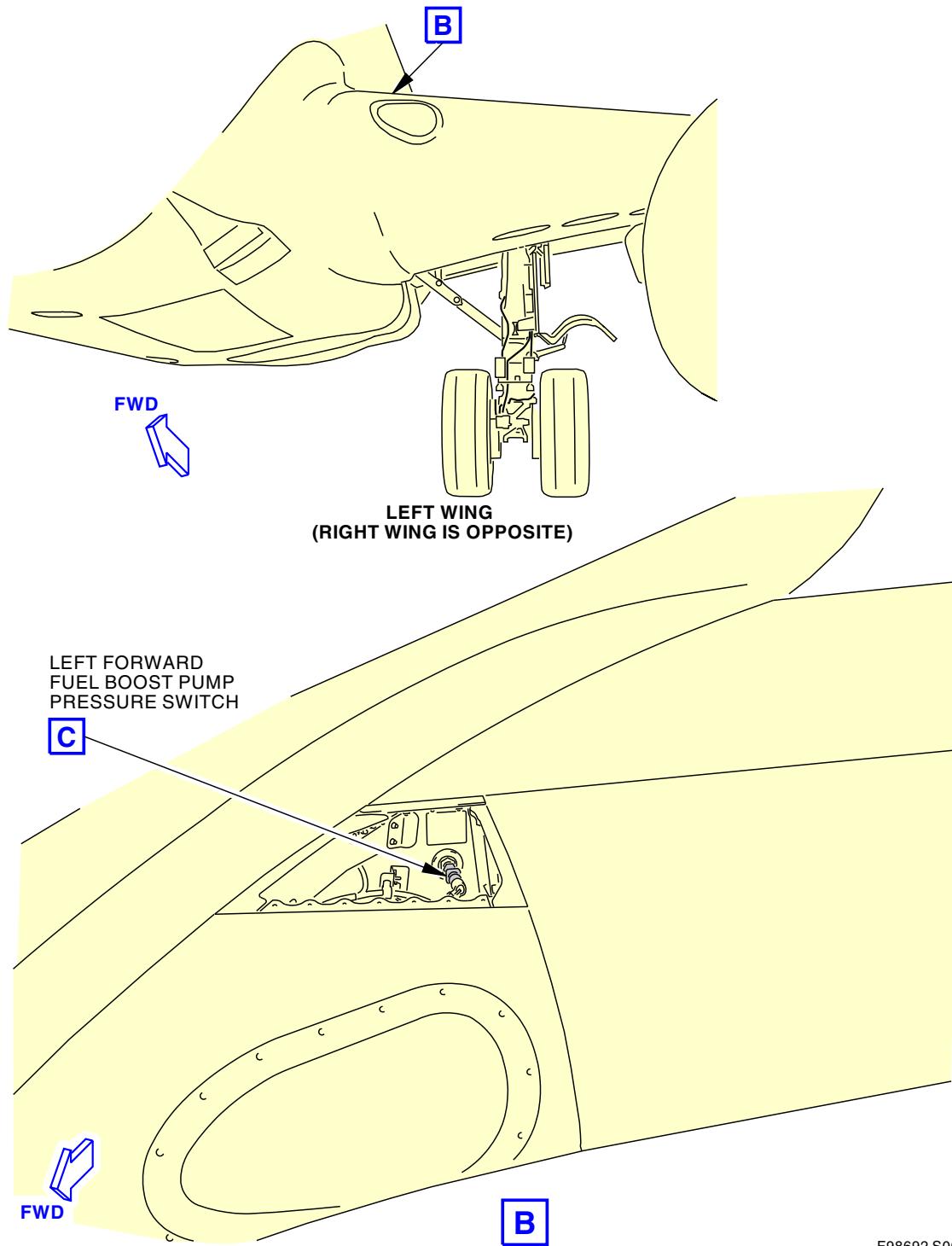
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F98692 S0006572337_V4

Fwd and Center Fuel Boost Pump Pressure Switch Installation
Figure 401/28-42-11-990-802 (Sheet 2 of 3)

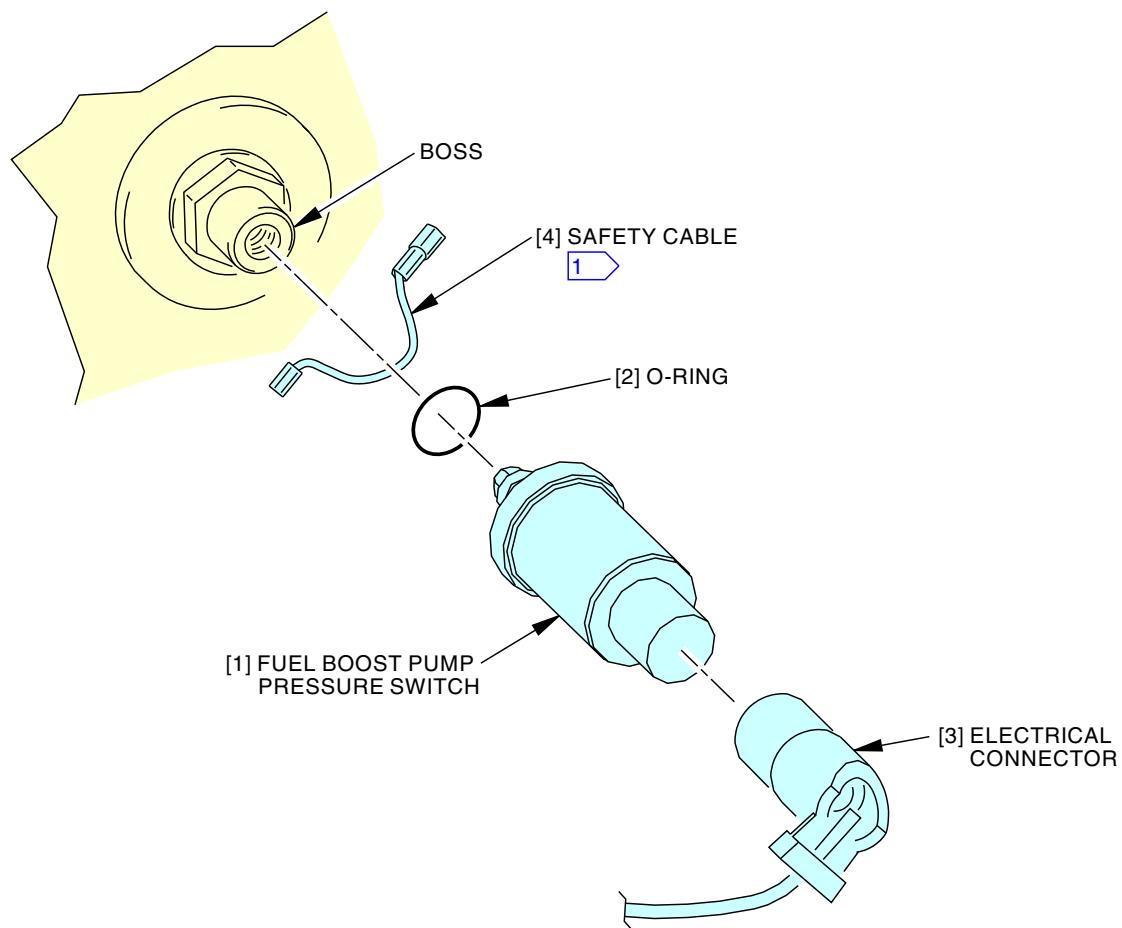
EFFECTIVITY
LOM ALL

28-42-11

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

BOEING
737-600/700/800/900
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(EXAMPLE)

C

1 SAFETY CABLE PREFERRED,
LOCKWIRE ALTERNATE.

F98690 S0006572338_V3

Fwd and Center Fuel Boost Pump Pressure Switch Installation
Figure 401/28-42-11-990-802 (Sheet 3 of 3)

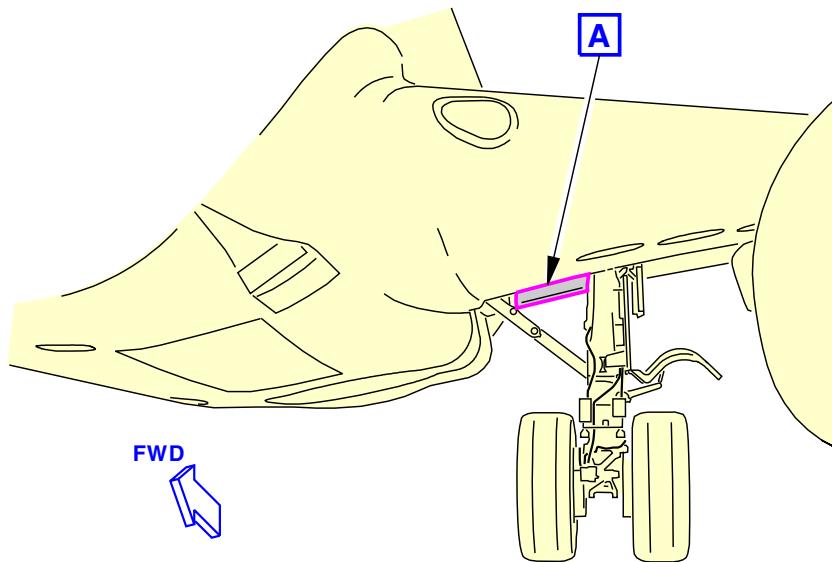
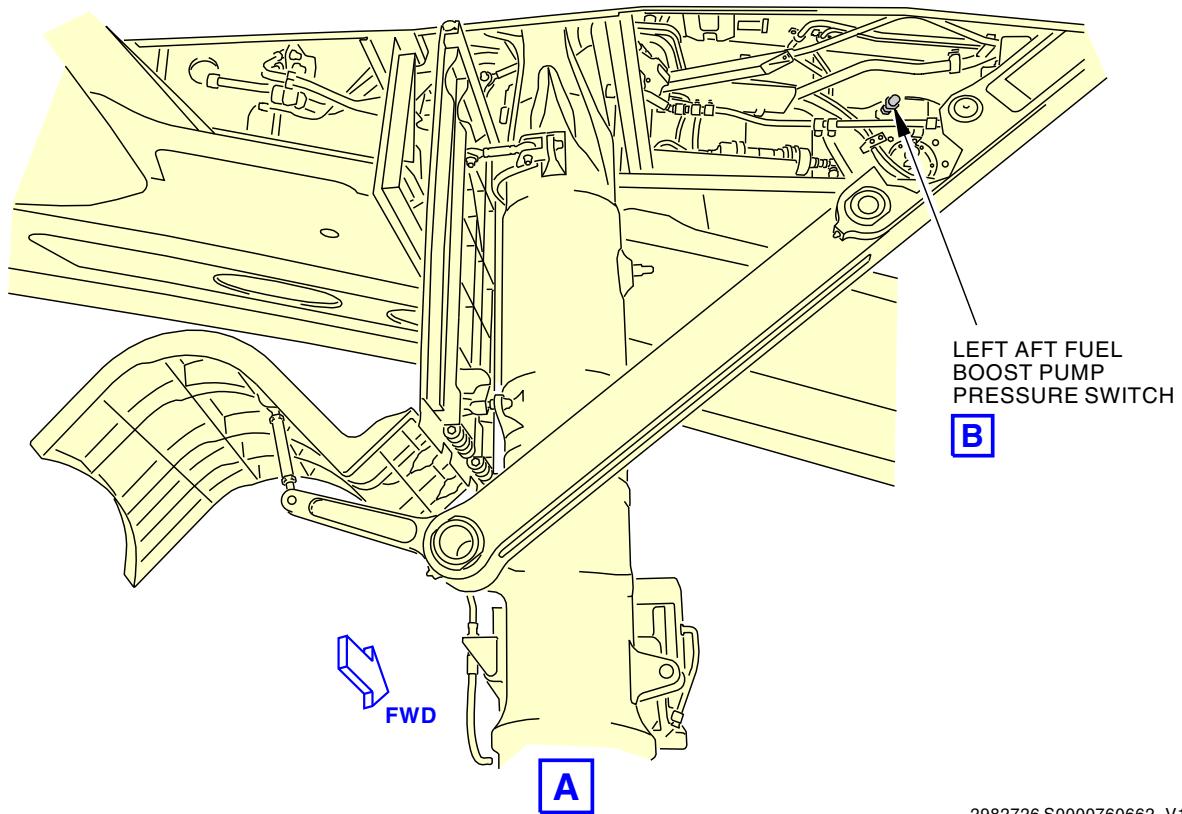
EFFECTIVITY
LOM ALL

28-42-11

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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LEFT WING
(RIGHT WING IS OPPOSITE)LEFT AFT FUEL
BOOST PUMP
PRESSURE SWITCH

B

A

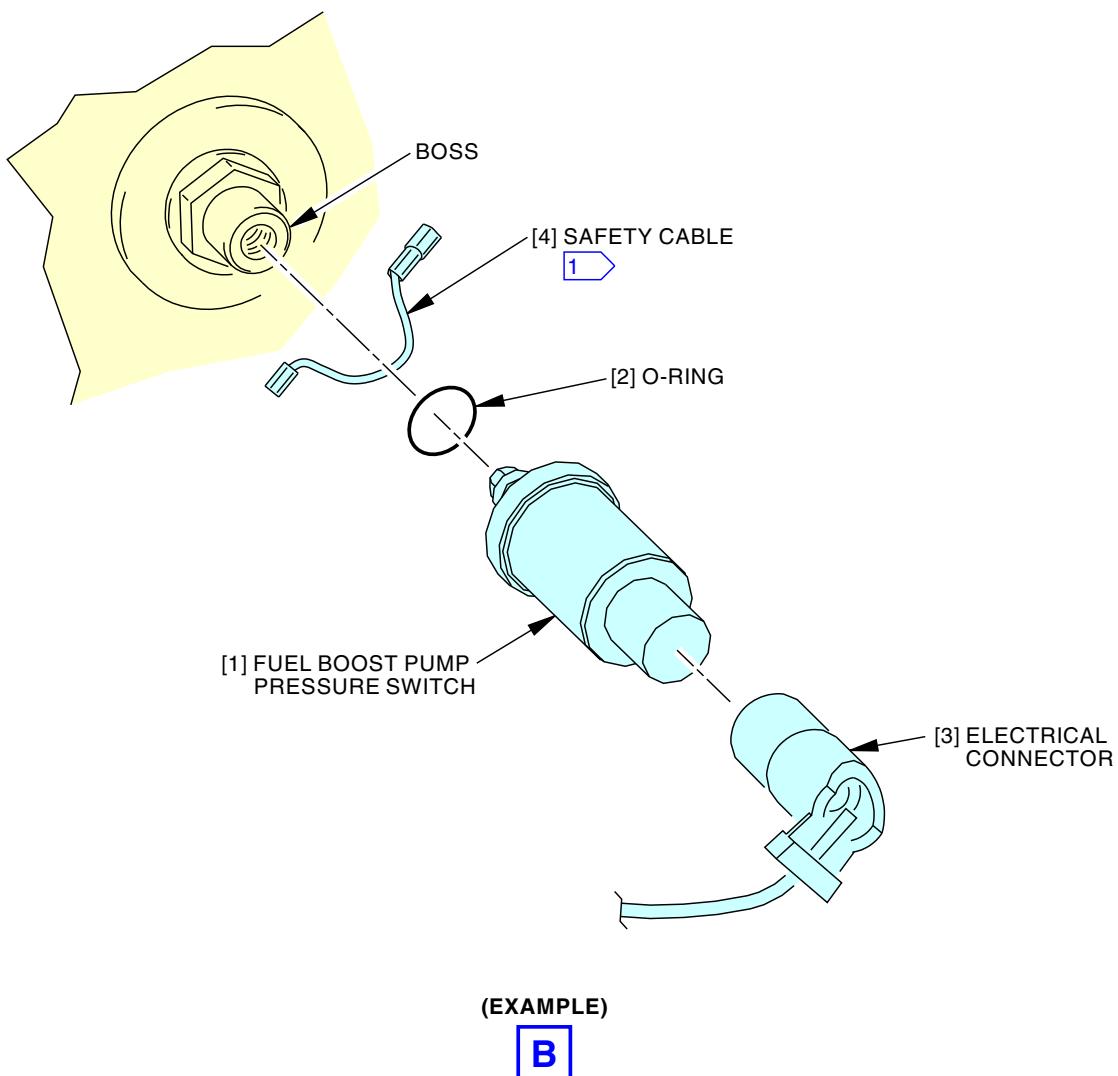
2982726 S0000760662_V1

Aft Fuel Boost Pump Pressure Switch Installation
Figure 402/28-42-11-990-805 (Sheet 1 of 3)EFFECTIVITY
LOM ALL**28-42-11**

D633A101-LOM



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1 SAFETY CABLE PREFERRED,
LOCKWIRE ALTERNATE.

2983075 S0000760663_V1

Aft Fuel Boost Pump Pressure Switch Installation
Figure 402/28-42-11-990-805 (Sheet 2 of 3)

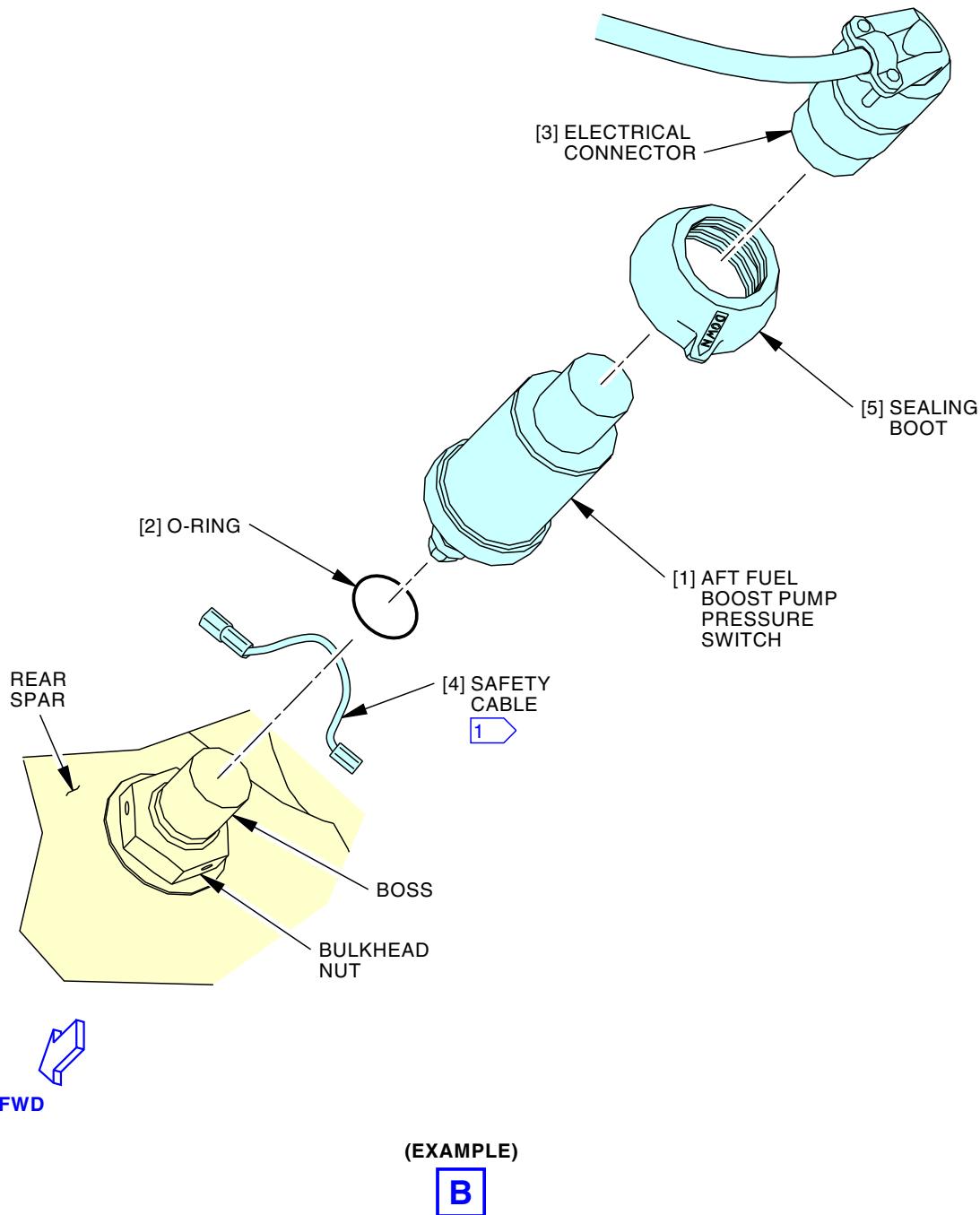
EFFECTIVITY
LOM 466-999; LOM 404, 411, 412, 415, 416, 420,
422-434, 439-447, 450-457, 461-465 PRE SB
737-28-1371

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2983076 S0000760664_V1

Aft Fuel Boost Pump Pressure Switch Installation

Figure 402/28-42-11-990-805 (Sheet 3 of 3)

EFFECTIVITY
 LOM 402, 406, 407, 437, 438, 458-460; LOM 404, 411,
 412, 415, 416, 420, 422-434, 439-447, 450-457,
 461-465 POST SB 737-28-1371

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-42-11-420-801

3. Fuel Boost Pump Pressure Switch Installation

(Figure 401 or Figure 402)

A. General

- (1) This task gives instructions to install the fuel Boost pump pressure switch.



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Obey these precautions at all times during this task:

- To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.
- Immediately set the applicable fuel pump switch(es) to the OFF position if the LOW PRESSURE light comes on and stays on.

B. References

Reference	Title
20-10-17-400-801	O-Rings Installation (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-42-11-700-801	Fuel Boost Pump Pressure Switch - Operational Test (P/B 501)
SWPM 20-60-03	Special Protection of Electrical Connectors

C. Consumable Materials

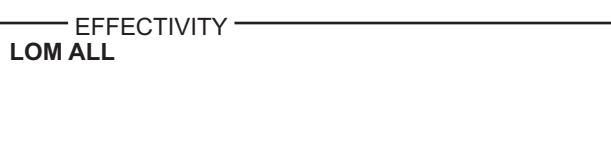
Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50171	Compound - Corrosion Inhibiting Compound, Interior Application - D5026NS or ZC-026	
G51372	Kit - Safety Cable, 321 CRES - 0.035 +/-0.003 Inch (1.0 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure switch	28-42-11-05-020	LOM ALL
		28-42-11-05-310	LOM ALL
2	O-ring	28-42-11-05-025	LOM ALL
		28-42-11-05-325	LOM ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right



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(Continued)

Zone	Area
511	Left Wing - Leading Edge To Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
611	Right Wing - Leading Edge to Front Spar
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
511AT	Inboard Leading Edge, Strakelet Upper Panel
611AT	Inboard Leading Edge, Strakelet Upper Access Panel

G. Pressure Switch of the Left Aft Fuel Boost Pump Installation

SUBTASK 28-42-11-420-002

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-420-003

- (2) Install the pressure switch [1] in the boss on the rear spar.
 - (a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

LOM 402, 406, 407, 437, 438, 458-460; LOM 404, 411, 412, 415, 416, 420, 422-434, 439-447, 450-457, 461-465 POST SB 737-28-1371

SUBTASK 28-42-11-420-014

- (3) Make sure that the surface of the pressure switch [1] and the nearest area are dry.
 - (a) If it is necessary, remove moisture.

NOTE: It is necessary to keep the pressure switch and area dry during installation.

SUBTASK 28-42-11-420-015

- (4) Install the sealing boot [5] on the pressure switch [1] with the drain hole in the down position.

NOTE: It is not necessary for the sealing boot drain hole to align with the fuel pressure switch vent hole.

- (a) Make sure that the bead in the larger end of the sealing boot is installed in the switch housing groove.

NOTE: The larger end must be flush with the threaded end of the pressure switch housing.

- (b) Make sure that the bead in the smaller end of the sealing boot is installed in the housing groove electrical connector end.

LOM ALL

SUBTASK 28-42-11-420-004

- (5) Install the safety cable [4] (MS20995NC32 lockwire, G01912, or safety cable kit, G51372) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

SUBTASK 28-42-11-910-001

- (6) Apply the sealant, A02315, fully around the nut on the boss.

SUBTASK 28-42-11-212-001

- (7) Before you connect the electrical connector [3], examine the connector for corrosion.

EFFECTIVITY
LOM ALL

28-42-11



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WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (a) If there is corrosion, refer to SWPM 20-60-03.

SUBTASK 28-42-11-390-007

- (8) Apply the compound, D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-420-005

- (9) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-700-005

- (10) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

H. Pressure Switch of the Left Forward Fuel Boost Pump Installation

SUBTASK 28-42-11-420-006

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-020-012

- (2) Install the pressure switch [1] in the boss on the front spar.

- (a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

SUBTASK 28-42-11-020-013

- (3) Install the safety cable [4] (MS20995NC32 lockwire, G01912, or safety cable kit, G51372) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

SUBTASK 28-42-11-390-011

- (4) Apply the sealant, A02315, fully around the nut on the boss.

SUBTASK 28-42-11-212-002

- (5) Before you connect the electrical connector [3], examine the connector for corrosion.



WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (6) If there is corrosion, refer to SWPM 20-60-03.

- (7) Apply the compound, D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-020-014

- (8) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

EFFECTIVITY
LOM ALL

28-42-11



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SUBTASK 28-42-11-700-006

- (9) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

I. Pressure Switch of the Left Center Tank Fuel Boost Pump Installation

SUBTASK 28-42-11-420-007

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-020-015



CAUTION

DO NOT INSTALL THE SEALING BOOT ON THE PRESSURE SWITCH OF THE CENTER TANK. IF YOU DO NOT OBEY, DAMAGE TO THE PRESSURE SWITCH CAN OCCUR.

- (2) Install the pressure switch [1] in the boss on the rear spar.
(a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

SUBTASK 28-42-11-020-016

- (3) Install the safety cable [4] (safety cable kit, G51372, or MS20995NC32 lockwire, G01912) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

SUBTASK 28-42-11-390-012

- (4) Apply the sealant, A02315 fully around the nut on the boss.

SUBTASK 28-42-11-212-003

- (5) Before you connect the electrical connector [3], examine the connector for corrosion.



WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (6) If there is corrosion, refer to SWPM 20-60-03.
(7) Apply D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-020-017

- (8) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-700-001

- (9) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

J. Pressure Switch of the Right Aft Fuel Boost Pump Installation

SUBTASK 28-42-11-420-008

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-420-009

- (2) Install the pressure switch [1] in the boss on the rear spar.
(a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

EFFECTIVITY
LOM ALL

28-42-11



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**LOM 402, 406, 407, 437, 438, 458-460; LOM 404, 411, 412, 415, 416, 420, 422-434, 439-447, 450-457,
461-465 POST SB 737-28-1371**

SUBTASK 28-42-11-420-016

- (3) Make sure that the surface of the pressure switch [1] and the nearest area are dry.

- (a) If it is necessary, remove moisture.

NOTE: It is necessary to keep the pressure switch and area dry during installation.

SUBTASK 28-42-11-420-017

- (4) Install the sealing boot [5] on the pressure switch [1] with the drain hole in the down position.

NOTE: It is not necessary for the sealing boot drain hole to align with the fuel pressure switch vent hole.

- (a) Make sure that the bead in the larger end of the sealing boot is installed in the switch housing groove.

NOTE: The larger end must be flush with the threaded end of the pressure switch housing.

- (b) Make sure that the bead in the smaller end of the sealing boot is installed in the housing groove electrical connector end.

LOM ALL

SUBTASK 28-42-11-420-010

- (5) Install the safety cable [4] (MS20995NC32 lockwire, G01912, or safety cable kit, G51372) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

SUBTASK 28-42-11-390-013

- (6) Apply the sealant, A02315, fully around the nut on the boss.

SUBTASK 28-42-11-212-004

- (7) Before you connect the electrical connector [3], examine the connector for corrosion.



DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE
DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR
POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL
AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL
CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL
CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE
FLIGHT.

- (a) If there is corrosion, refer to SWPM 20-60-03.

SUBTASK 28-42-11-390-008

- (8) Apply D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-420-011

- (9) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-700-002

- (10) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

EFFECTIVITY
LOM ALL

28-42-11



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AIRCRAFT MAINTENANCE MANUAL

K. Pressure Switch of the Right Forward Fuel Boost Pump Installation

SUBTASK 28-42-11-420-012

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-020-018

- (2) Install the pressure switch [1] in the boss on the front spar.
 - (a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

SUBTASK 28-42-11-020-019

- (3) Install the safety cable [4] (MS20995NC32 lockwire, G01912, or safety cable kit, G51372) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

SUBTASK 28-42-11-390-014

- (4) Apply the sealant, A02315, fully around the nut on the boss.

SUBTASK 28-42-11-212-005

- (5) Before you connect the electrical connector [3], examine the connector for corrosion.



WARNING
DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (a) If there is corrosion, refer to SWPM 20-60-03.

SUBTASK 28-42-11-390-009

- (6) Apply D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-020-020

- (7) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-700-003

- (8) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

L. Pressure Switch of the Right Center Fuel Boost Pump Installation

SUBTASK 28-42-11-420-013

- (1) Install a new O-ring [2] on the pressure switch [1] (TASK 20-10-17-400-801).

SUBTASK 28-42-11-020-021



CAUTION
DO NOT INSTALL THE SEALING BOOT ON THE PRESSURE SWITCH OF THE CENTER TANK. IF YOU DO NOT OBEY, DAMAGE TO THE PRESSURE SWITCH CAN OCCUR.

- (2) Install the pressure switch [1] in the boss on the rear spar.

- (a) Tighten the pressure switch [1] to 30 in-lb (3.4 N·m).

SUBTASK 28-42-11-020-022

- (3) Install the safety cable [4] (MS20995NC32 lockwire, G01912, or safety cable kit, G51372) from the pressure switch [1] to the bulkhead nut (TASK 20-10-44-400-801).

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SUBTASK 28-42-11-390-015

- (4) Apply the sealant, A02315, fully around the nut on the boss.

SUBTASK 28-42-11-212-006

- (5) Before you connect the electrical connector [3], examine the connector for corrosion.



DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (a) If there is corrosion, refer to SWPM 20-60-03.

SUBTASK 28-42-11-390-010

- (6) Apply D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).

SUBTASK 28-42-11-020-023

- (7) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-700-004

- (8) Do this task: Fuel Boost Pump Pressure Switch - Operational Test, TASK 28-42-11-700-801.

M. Put the Airplane Back to Its Usual Condition

SUBTASK 28-42-11-860-110



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

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LOM 402, 404, 406 (Continued)

(Continued)

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406
D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406
D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406
D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-42-11-860-079

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row Col Number Name

E 11 C00313 INDICATOR MASTER DIM SECT 1

F 12 C00318 INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-410-022

- (3) Close these access panels:

Number Name/Location

117A Electronic Equipment Access Door

511AT Inboard Leading Edge, Strakelet Upper Panel

611AT Inboard Leading Edge, Strakelet Upper Access Panel

———— END OF TASK ————

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FUEL BOOST PUMP PRESSURE SWITCH - ADJUSTMENT/TEST

1. General

- A. There are six pressure switches, one for each of these pumps:
 - (1) Left aft fuel boost pump
 - (2) Left forward fuel boost pump
 - (3) Left center fuel boost pump
 - (4) Right aft fuel boost pump
 - (5) Right forward fuel boost pump
 - (6) Right center fuel boost pump
- B. This procedure contains one task to test the pressure switches.

TASK 28-42-11-700-801

2. Fuel Boost Pump Pressure Switch - Operational Test

(Figure 501)

A. General

- (1) The task is a test for the correct operation of the fuel boost pump pressure switch(es).



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Obey these precautions at all times during this task:

- (a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and low pressure indication in the applicable tank.
- (b) Immediately set the applicable fuel pump switch(es) to the OFF position if the LOW PRESSURE light comes on and stays on.

B. References

Reference	Title
12-11-00-650-802	Pressure Refuel Procedure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
28-42-11-990-802	Figure: Fwd and Center Fuel Boost Pump Pressure Switch Installation (P/B 401)
28-42-11-990-805	Figure: Aft Fuel Boost Pump Pressure Switch Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-60-03	Special Protection of Electrical Connectors

C. Consumable Materials

Reference	Description	Specification
G50170	Compound - Corrosion Inhibiting Compound, Soft Film, Exterior Use - Ardrox AV25	
G50171	Compound - Corrosion Inhibiting Compound, Interior Application - D5026NS or ZC-026	

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D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
511	Left Wing - Leading Edge To Front Spar
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
611	Right Wing - Leading Edge to Front Spar
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
511AT	Inboard Leading Edge, Strakelet Upper Panel
611AT	Inboard Leading Edge, Strakelet Upper Access Panel
621GB	Refuel Access Panel - Slat Station 143.27

F. Prepare for the Test

SUBTASK 28-42-11-420-039



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 28-42-11-860-111

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-051

- (3) Get access to the Power Distribution Panel 1, P91, or Power Distribution Panel 2, P92.

- (a) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 28-42-11-650-001

- (4) Make sure that the fuel tanks, for the applicable fuel boost pump, have the minimum fuel quantity (Table 501).

Table 501/28-42-11-993-801 Fuel Tank - Minimum Fuel Quantity

FUEL TANK	FUEL QUANTITY
No. 1 Main Tank	500 lb (227 kg)
No. 2 Main Tank	500 lb (227 kg)

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Table 501/28-42-11-993-801 Fuel Tank - Minimum Fuel Quantity (Continued)

FUEL TANK	FUEL QUANTITY
Center Tank	3000 lb (1361 kg)

- (a) If it is necessary to refuel the fuel tanks, do this task: Pressure Refuel Procedure, TASK 12-11-00-650-802.

G. Left Aft Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-088

 WARNING	WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.
 WARNING	DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406
D 2 C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-42-11-200-001

- (2) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
(b) Examine the electrical connector [3] for corrosion.

 WARNING	DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.
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- 1) If there is corrosion, correct the problem (SWPM 20-60-03).

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- (c) Apply compound D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
- (d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-860-089

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-860-061

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-200-002

- (5) Make sure that the LOW PRESSURE AFT - 1 light of the fuel management panel, on the P5 overhead panel, comes on.

SUBTASK 28-42-11-860-090

 WARNING	WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.
 WARNING	DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (6) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999	D	1	C00826 FUEL BOOST PUMP TANK 1 AFT
LOM 402, 404, 406	D	2	C00826 FUEL BOOST PUMP TANK 1 AFT

LOM ALL

SUBTASK 28-42-11-410-004

- (7) Close this access door:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

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SUBTASK 28-42-11-700-007

- (8) Set the FUEL PUMPS AFT - 1 switch of the fuel management panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-42-11-700-008

- (9) Make sure that the LOW PRESSURE AFT - 1 light goes off in 15 seconds or less.

SUBTASK 28-42-11-700-009

- (10) Make sure that there is no fuel leakage at the pressure switch.

SUBTASK 28-42-11-700-010

- (11) Push the FUEL PUMPS AFT - 1 switch to the OFF position.

SUBTASK 28-42-11-700-036

- (12) Make sure that the LOW PRESSURE AFT - 1 light comes on.

SUBTASK 28-42-11-860-062

- (13) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 28-42-11-110-001

- (14) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03).

- (a) Do not remove the excess Ardrox AV25 compound, G50170.

H. Left Forward Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-092



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 1 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM 402, 404, 406

D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM ALL

SUBTASK 28-42-11-010-044

- (2) Get access to the pressure switch for the left forward boost pump.

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- (a) Open this access panel:

Number Name/Location

511AT Inboard Leading Edge, Strakelet Upper Panel

SUBTASK 28-42-11-200-003

- (3) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
(b) Examine the electrical connector [3] for corrosion.



WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- 1) If there is corrosion, correct the problem (SWPM 20-60-03).
(c) Apply compound D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
(d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-860-093

- (4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row Col Number Name

E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-860-064

- (5) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-700-012

- (6) Make sure that the LOW PRESSURE FWD - 1 light of the fuel management panel, on the P5 overhead panel, comes on.

SUBTASK 28-42-11-860-094



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (7) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 1 C00827 FUEL BOOST PUMP TANK 1 FWD
LOM 402, 404, 406
D 2 C00827 FUEL BOOST PUMP TANK 1 FWD

LOM ALL

SUBTASK 28-42-11-410-009

- (8) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-700-013

- (9) Push the FUEL PUMPS FWD - 1 switch of the fuel management panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-42-11-700-014

- (10) Make sure that the LOW PRESSURE FWD - 1 light goes off in 15 seconds or less.

SUBTASK 28-42-11-700-015

- (11) Make sure that there is no fuel leakage at the pressure switch.

SUBTASK 28-42-11-700-016

- (12) Push the FUEL PUMPS FWD - 1 switch to the OFF position.

SUBTASK 28-42-11-700-017

- (13) Make sure that the LOW PRESSURE FWD - 1 light comes on.

SUBTASK 28-42-11-110-002

- (14) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03).

(a) Do not remove the excess Ardrox AV25 compound, G50170.

SUBTASK 28-42-11-410-010

- (15) Close this access panel:

Number Name/Location

511AT Inboard Leading Edge, Strakelet Upper Panel

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I. Left Center Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-096



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT
LOM 402, 404, 406			
D	6	C00845	FUEL BOOST PUMP CTR TANK LEFT

LOM ALL

SUBTASK 28-42-11-200-004

- (2) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
- (b) Examine the electrical connector [3] for corrosion.



WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- 1) If there is corrosion, correct the problem (SWPM 20-60-03).
- (c) Apply the compound, D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
- (d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

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SUBTASK 28-42-11-860-066

- (3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-700-018

- (4) Make sure that the LOW PRESSURE CTR L light of the fuel management panel, on the P5 overhead panel, is off.

SUBTASK 28-42-11-860-097



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM 402, 404, 406

D 6 C00845 FUEL BOOST PUMP CTR TANK LEFT

LOM ALL

SUBTASK 28-42-11-410-028

- (6) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-860-098

- (7) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row Col Number Name

E 11 C00313 INDICATOR MASTER DIM SECT 1

F 12 C00318 INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-025

- (8) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-42-11-700-019

- (9) Set the FUEL PUMPS CTR L switch of the fuel management panel, on the P5 overhead panel, to the ON position.

EFFECTIVITY
LOM ALL

28-42-11



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SUBTASK 28-42-11-700-020

- (10) Make sure that the LOW PRESSURE CTR L light comes on, then goes off in 15 seconds or less.

SUBTASK 28-42-11-200-006

- (11) Make sure that there is no fuel leakage at the pressure switch.

SUBTASK 28-42-11-700-021

- (12) Set the FUEL PUMPS CTR L switch to the OFF position.

SUBTASK 28-42-11-700-022

- (13) Make sure that the LOW PRESSURE CTR L light is off.

SUBTASK 28-42-11-110-003

- (14) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03)
 - (a) Do not remove the excess Ardrox AV25 compound, G50170.

SUBTASK 28-42-11-410-013

- (15) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

J. Right Aft Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-086



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM 402, 404, 406

D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM ALL

SUBTASK 28-42-11-200-007

- (2) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

EFFECTIVITY
LOM ALL

28-42-11



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- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
- (b) Examine the electrical connector [3] for corrosion.

WARNING 
DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- 1) If there is corrosion, correct the problem (SWPM 20-60-03).
- (c) Apply compound D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
- (d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-860-100

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-860-069

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-700-023

- (5) Make sure that the LOW PRESSURE AFT - 2 light of the fuel management panel, on the P5 overhead panel, comes on.

SUBTASK 28-42-11-860-101

WARNING 

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-42-11



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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (6) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999
D 3 C00828 FUEL BOOST PUMP TANK 2 AFT
LOM 402, 404, 406
D 4 C00828 FUEL BOOST PUMP TANK 2 AFT

LOM ALL

SUBTASK 28-42-11-410-015

- (7) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-700-024

- (8) Push the FUEL PUMPS AFT - 2 switch of the fuel management panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-42-11-700-025

- (9) Make sure that the LOW PRESSURE AFT - 2 light goes off in 15 seconds or less.

SUBTASK 28-42-11-200-008

- (10) Make sure that there is no fuel leakage at the pressure switch.

SUBTASK 28-42-11-700-026

- (11) Set the FUEL PUMPS AFT - 2 switch to the OFF position.

SUBTASK 28-42-11-700-027

- (12) Make sure that the LOW PRESSURE AFT - 2 light comes on.

SUBTASK 28-42-11-110-004

- (13) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03).

(a) Do not remove the excess Ardrox AV25 compound, G50170.

K. Right Forward Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-103



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
LOM ALL

28-42-11



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(WARNING PRECEDES)



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999			
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD
LOM 402, 404, 406			
D	4	C00829	FUEL BOOST PUMP TANK 2 FWD

LOM ALL

SUBTASK 28-42-11-010-048

- (2) Get access to the pressure switch for the right forward boost pump.

- (a) Open this access panel:

Number Name/Location

611AT	Inboard Leading Edge, Strakelet Upper Access Panel
-------	--

SUBTASK 28-42-11-200-010

- (3) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
(b) Examine the electrical connector [3] for corrosion.



WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- 1) If there is corrosion, correct the problem (SWPM 20-60-03).
(c) Apply compound D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
(d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

EFFECTIVITY
LOM ALL

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SUBTASK 28-42-11-860-104

- (4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-860-072

- (5) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-200-011

- (6) Make sure that the LOW PRESSURE FWD - 2 light of the fuel management panel, on the P5 overhead panel, comes on.

SUBTASK 28-42-11-860-105



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (7) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 3 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM 402, 404, 406

D 4 C00829 FUEL BOOST PUMP TANK 2 FWD

LOM ALL

SUBTASK 28-42-11-410-017

- (8) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 28-42-11-700-028

- (9) Set the FUEL PUMPS FWD - 2 switch of the fuel management panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-42-11-700-029

- (10) Make sure that the LOW PRESSURE FWD - 2 light goes off in 15 seconds or less.

SUBTASK 28-42-11-200-012

- (11) Make sure that there is no fuel leakage at the pressure switch.

EFFECTIVITY
LOM ALL

28-42-11



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SUBTASK 28-42-11-700-030

- (12) Set the FUEL PUMPS FWD - 2, on the P5 panel, to the OFF position.

SUBTASK 28-42-11-700-031

- (13) Make sure that the LOW PRESSURE FWD - 2 light comes on.

SUBTASK 28-42-11-110-005

- (14) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03).
(a) Do not remove the excess Ardrox AV25 compound, G50170.

SUBTASK 28-42-11-410-018

- (15) Close this access panel that you opened before to get access to the pressure switch:

Number Name/Location

611AT Inboard Leading Edge, Strakelet Upper Access Panel

L. Right Center Fuel Boost Pump Pressure Switch Operational Test

SUBTASK 28-42-11-860-107



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-42-11-200-013

- (2) Do these steps to check for corrosion on the electrical connector [3]:

NOTE: If you are doing this operational test as part of the installation, this corrosion check is not necessary.

- (a) Remove the electrical connector [3] from the pressure switch [1] (Figure 28-42-11-990-802 or Figure 28-42-11-990-805).
(b) Examine the electrical connector [3] for corrosion.

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LOM ALL

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WARNING

DO THE STEPS BELOW IF THE AIRPLANE OPERATES WHERE DEICING FLUID THAT CONTAINS POTASSIUM FORMATE OR POTASSIUM ACETATE IS USED. ALSO, DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTORS ARE IN A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- 1) If there is corrosion, correct the problem (SWPM 20-60-03).
- (c) Apply compound D5026NS or ZC-026 compound, G50171, to the electrical connector [3] (SWPM 20-60-03).
- (d) Install the electrical connector [3] on the pressure switch [1].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 28-42-11-860-059

- (3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-42-11-200-014

- (4) Make sure that the LOW PRESSURE CTR R light of the fuel management panel, on the P5 overhead panel, is off.

SUBTASK 28-42-11-860-108



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (5) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Row Col Number Name

LOM 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

D 5 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM 402, 404, 406

D 6 C00846 FUEL BOOST PUMP CTR TANK RIGHT

LOM ALL

SUBTASK 28-42-11-410-029

- (6) Close this access door:

Number Name/Location

117A Electronic Equipment Access Door

EFFECTIVITY
LOM ALL

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SUBTASK 28-42-11-860-109

- (7) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 28-42-11-010-033

- (8) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 28-42-11-700-032

- (9) Push the FUEL PUMPS CTR R switch on the fuel management panel, on the P5 overhead panel, to the ON position.

SUBTASK 28-42-11-700-033

- (10) Make sure that the LOW PRESSURE CTR R light comes on, then goes off in 15 seconds or less.

SUBTASK 28-42-11-700-034

- (11) Make sure that there is no fuel leakage at the pressure switch.

SUBTASK 28-42-11-700-035

- (12) Set the FUEL PUMPS CTR R switch to the OFF position.

SUBTASK 28-42-11-110-006

- (13) Make sure that the LOW PRESSURE CTR R light is off.

SUBTASK 28-42-11-410-021

- (14) Apply Ardrox AV25 compound, G50170, to the mated electrical connector [3] completely, until the compound drips from the connector (SWPM 20-60-03),

(a) Do not remove the excess Ardrox AV25 compound, G50170.

SUBTASK 28-42-11-080-007

- (15) Close this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

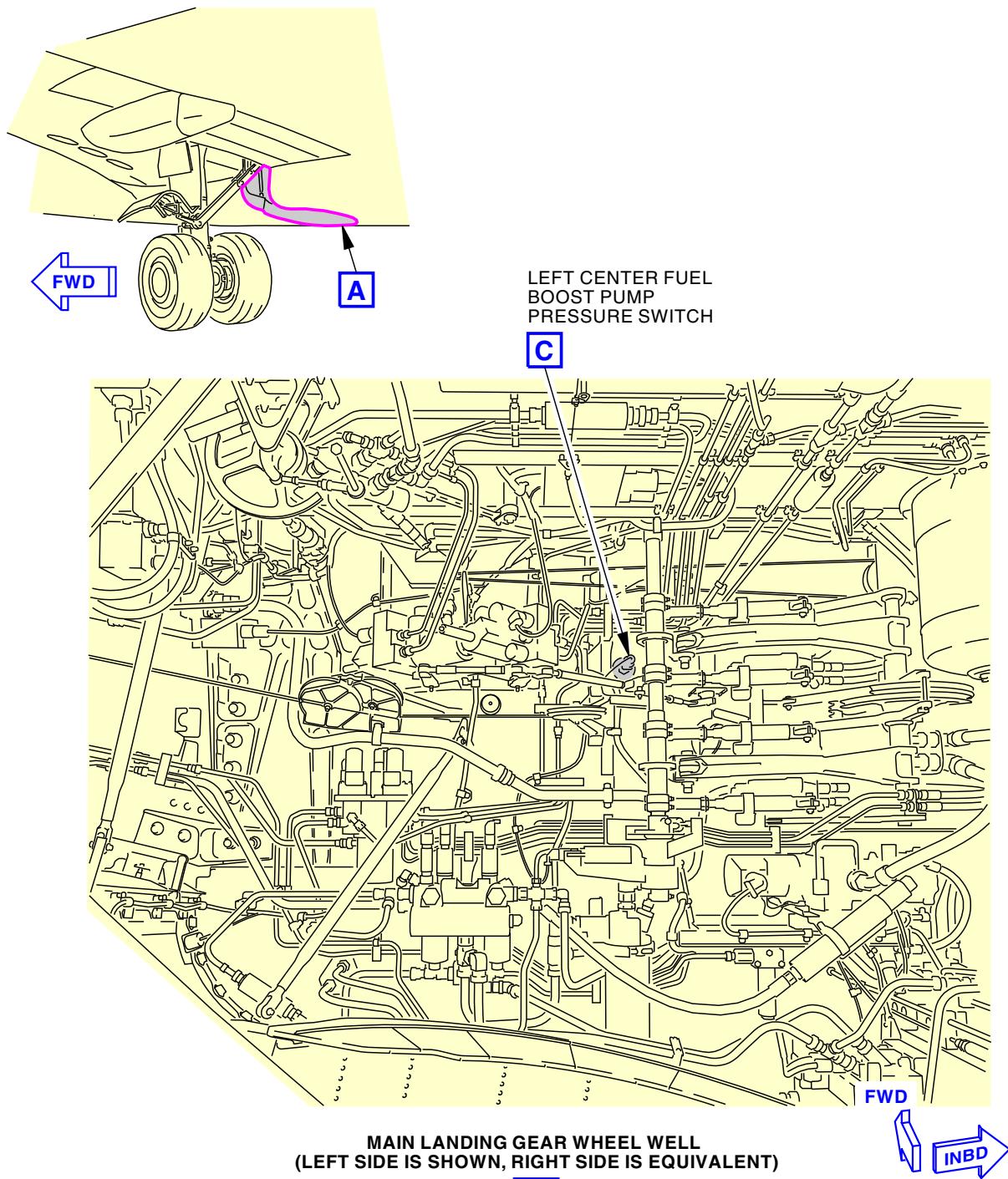
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28-42-11



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Fuel Boost Pump Pressure Switch Operational Test
Figure 501/28-42-11-990-803 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

28-42-11

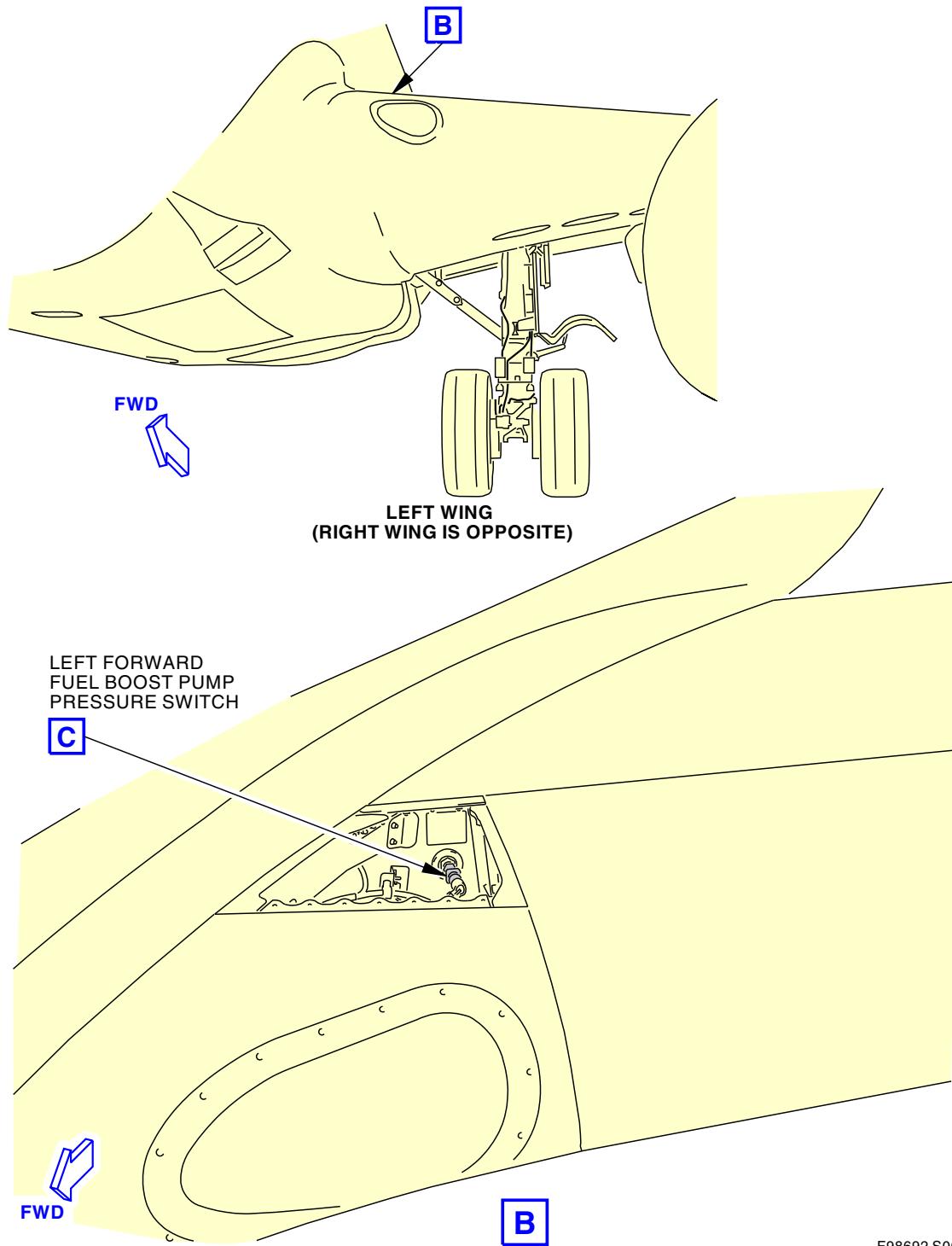
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F98692 S0006572337_V4

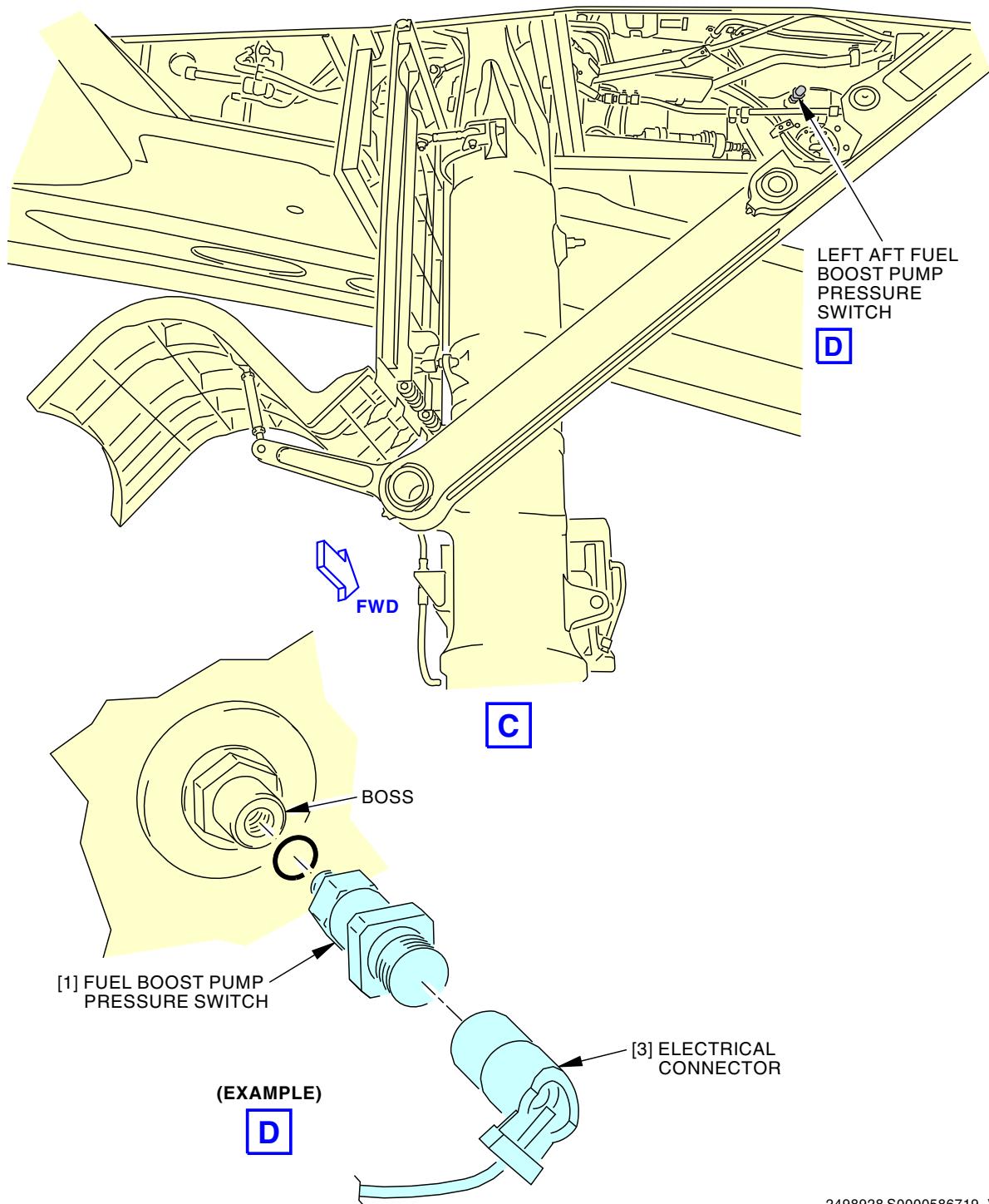
Fuel Boost Pump Pressure Switch Operational Test
Figure 501/28-42-11-990-803 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



2498928 S0000586719_V1

Fuel Boost Pump Pressure Switch Operational Test
Figure 501/28-42-11-990-803 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

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FUEL TEMPERATURE INDICATING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
 - (1) Fuel Temperature Indicating System Test (Master Thermometer)
 - (2) Fuel Temperature Indicator Functional Test (Spare Temperature Indicator)
 - (3) Fuel Temperature Indicator Functional Test (Decade Resistor)
 - (4) Fuel Temperature Bulb Resistance Test.
 - B. The fuel temperature indicating system test (master thermometer) does a test of the fuel temperature bulb.
 - (1) To do the test for the fuel temperature bulb, you measure the temperature at the bulb with a master thermometer. You then compare the value on the temperature indicator with the value on the master thermometer.
 - C. The fuel temperature indicator functional test (spare temperature indicator) does a test of the fuel temperature indicator.
 - (1) To do the test for the fuel temperature indicator, you compare the value on the airplane temperature indicator with the value on a spare temperature indicator.
- NOTE:** The spare temperature indicator is not installed on the airplane, but is equipment necessary to do the test.
- D. The functional test for the temperature indicator (decade resistor) can be used as an alternative to this task: Fuel Temperature Indicator Functional Test (Spare Temperature Indicator), TASK 28-43-00-720-801.
 - (1) To do the functional test for the temperature indicator, you stimulate the temperature bulb at three different temperatures with a decade resistor.

TASK 28-43-00-710-801

2. Fuel Temperature Indicating System Test (Master Thermometer)

(Figure 501, Figure 502)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1336	Thermometer - Digital, 0-150 +/- 2 Degrees F, with a Probe, Thermocouple or Equivalent

C. Location Zones

Zone	Area
211	Flight Compartment - Left
551	Left Wing - Rear Spar To Landing Gear Support Beam

D. Prepare for the System Test

SUBTASK 28-43-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

EFFECTIVITY
LOM ALL

28-43-00



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SUBTASK 28-43-00-860-002

- (2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-860-003

- (3) Permit the temperature to become stable for 10 minutes.

E. Fuel Temperature Indicating System Test

SUBTASK 28-43-00-970-001

- (1) Make a record of the values shown on the fuel temperature indicator on the P5 panel.

SUBTASK 28-43-00-010-001

- (2) Open the fixed trailing edge access panel immediately outboard of the left main landing gear.

SUBTASK 28-43-00-020-001

- (3) Remove the fuel temperature bulb.

NOTE: The fuel temperature bulb is on the aft side of the aft spar. It is on the outboard side of the left main landing gear.

- (a) Turn the locking cap for the temperature bulb to release the bulb from the pin.
(b) Pull the bulb from the housing.

SUBTASK 28-43-00-970-002

- (4) Measure the temperature in the bulb housing.

- (a) Put the 0-150 +/- 2 degrees F digital thermometer, STD-1336, in the bulb housing.
(b) Permit the temperature to become stable.
(c) Make a record of the temperature shown on the thermometer.

SUBTASK 28-43-00-970-003

- (5) Compare the value on the 0-150 +/- 2 degrees F digital thermometer, STD-1336, and the value on the fuel temperature indicator.

- (a) Make sure the two values are the same with a tolerance of $\pm 7^{\circ}\text{F}$ ($\pm 4^{\circ}\text{C}$).

SUBTASK 28-43-00-420-001

- (6) Put the fuel temperature bulb back in the housing.

SUBTASK 28-43-00-860-004

- (7) Open this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-710-001

- (8) Monitor the value shown on the fuel temperature indicator.

- (a) Make sure the pointer on the indicator goes back to its usual position at the bottom of the scale.

EFFECTIVITY
LOM ALL

28-43-00



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SUBTASK 28-43-00-860-032

- (9) Close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-43-00-410-001

- (1) Close the fixed leading edge access door immediately outboard of the left main landing gear.

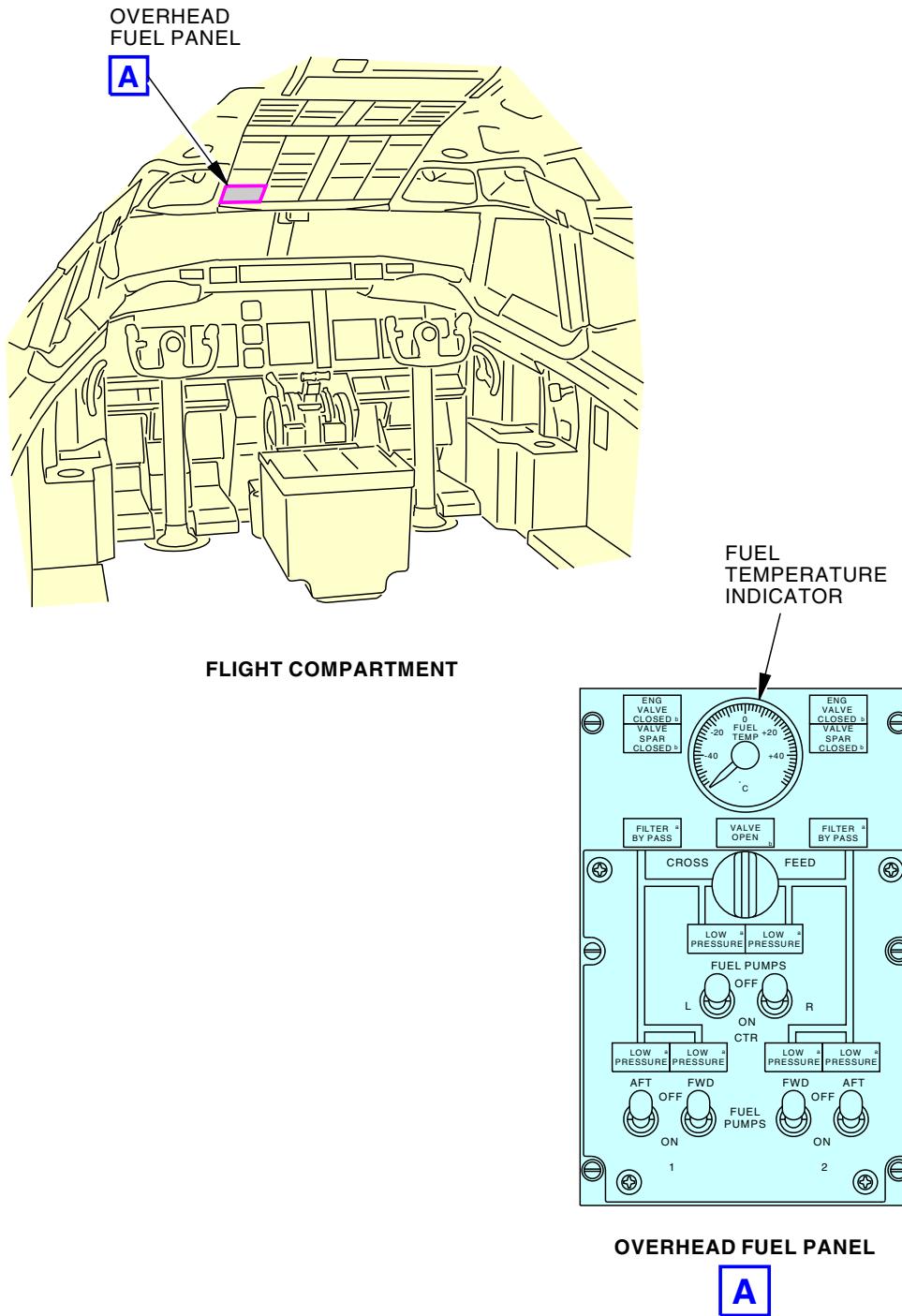
SUBTASK 28-43-00-860-008

- (2) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

28-43-00



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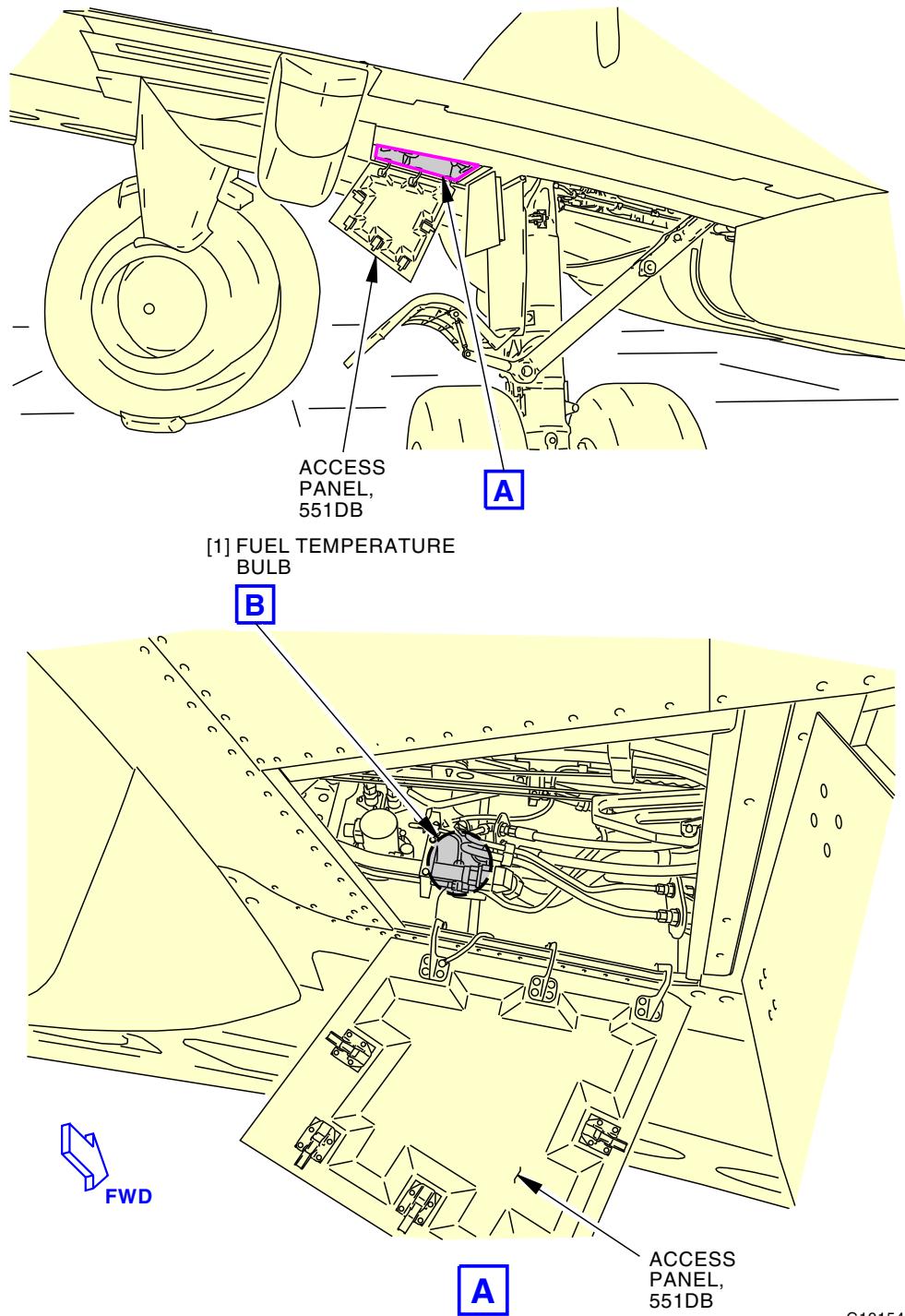
Fuel Temperature Indicator
Figure 501/28-43-00-990-803

EFFECTIVITY
 LOM ALL

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Fuel Temperature Bulb Location
Figure 502/28-43-00-990-804 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

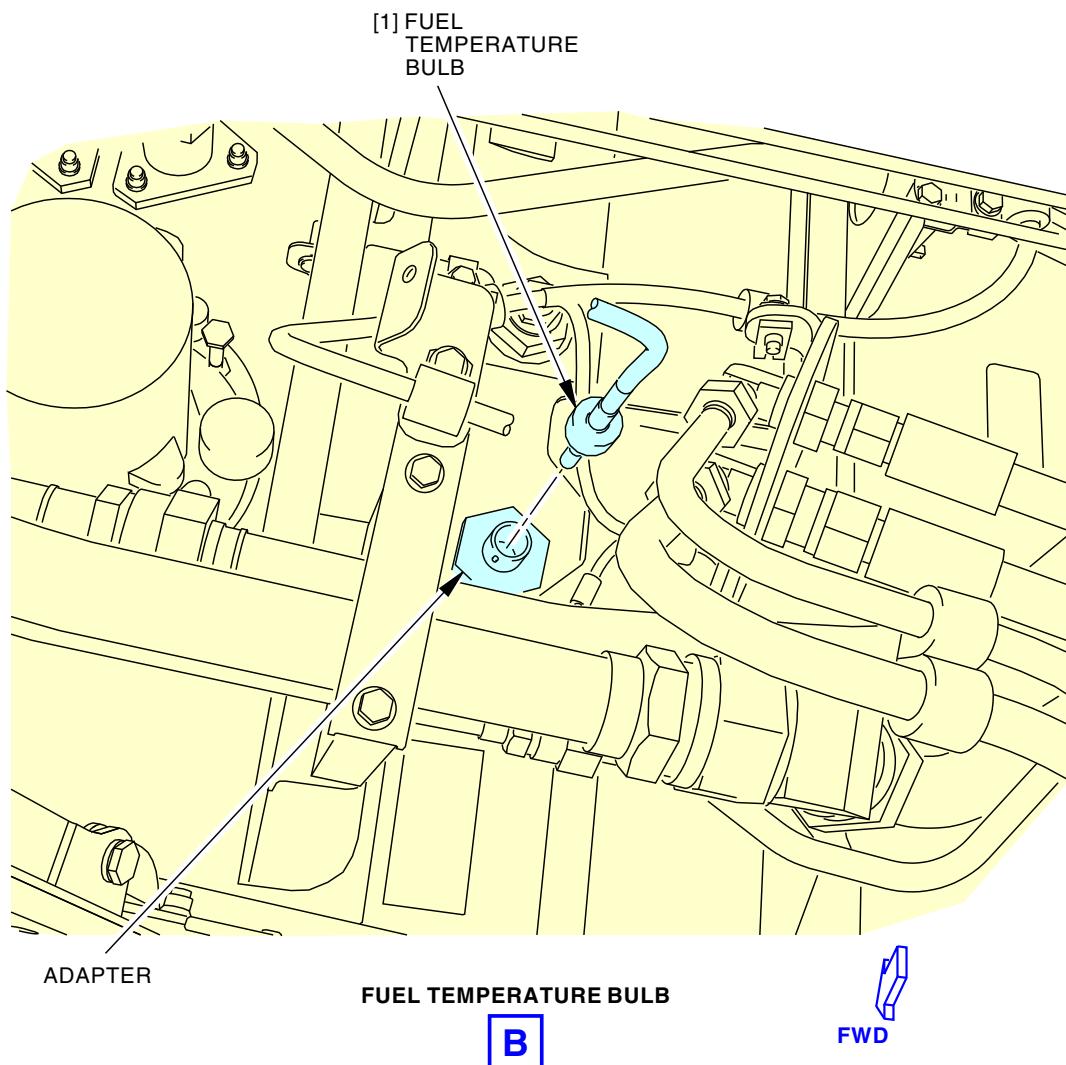
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BOEING
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Fuel Temperature Bulb Location
Figure 502/28-43-00-990-804 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 28-43-00-720-801

3. **Fuel Temperature Indicator Functional Test (Spare Temperature Indicator)**
(Figure 501, Figure 502)

A. General

- (1) As an alternative to this task, you can do a test for the fuel temperature indication with this task: Fuel Temperature Indicator Functional Test (Decade Resistor), TASK 28-43-00-710-802.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
551	Left Wing - Rear Spar To Landing Gear Support Beam

D. Prepare for the Functional Test

SUBTASK 28-43-00-860-022

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-43-00-860-023

- (2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-860-024

- (3) Permit the temperature to become stable for 10 minutes.

E. Fuel Temperature Indicator Functional Test

SUBTASK 28-43-00-970-010

- (1) Make a record of the values shown on the fuel temperature indicator.

SUBTASK 28-43-00-860-028

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-020-009

- (3) Disconnect the electrical connector from the fuel temperature indicator on the airplane.

SUBTASK 28-43-00-420-010

- (4) Connect the electrical connector to a spare fuel temperature indicator.

NOTE: This fuel temperature indicator is not installed on the airplane. A new or certified fuel temperature indicator is used to make sure the fuel temperature indicator installed on the airplane operates correctly.

EFFECTIVITY
LOM ALL

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SUBTASK 28-43-00-860-029

- (5) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-970-011

- (6) Compare the value shown on the spare indicator with the value from the fuel temperature indicator that you recorded before this step.
(a) These values must be the same within a tolerance of $\pm 9^{\circ}\text{F}$ ($\pm 5^{\circ}\text{C}$).

SUBTASK 28-43-00-860-025

- (7) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-020-010

- (8) Disconnect the spare fuel temperature indicator.

SUBTASK 28-43-00-420-011

- (9) Connect the fuel temperature indicator on the airplane to the electrical connector.

SUBTASK 28-43-00-860-026

- (10) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-970-012

- (11) Make sure the value shown on the fuel temperature indicator is the same as it was before you did the test.

SUBTASK 28-43-00-860-030

- (12) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-720-001

- (13) Monitor the value shown on the fuel temperature indicator.
(a) The pointer on the indicator must go back to its usual position at the bottom of the scale.

SUBTASK 28-43-00-860-031

- (14) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

EFFECTIVITY
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F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-43-00-860-027

- (1) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— END OF TASK ————

TASK 28-43-00-710-802

4. Fuel Temperature Indicator Functional Test (Decade Resistor)

A. General

- (1) The functional test can be used as an alternative to the task: Fuel Temperature Indicator Functional Test (Spare Temperature Indicator), TASK 28-43-00-720-801.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-9597	Box - Decade, Resistance (11,111.1 Ohms total, 0.01 ohm/step) Part #: 1433-20 Supplier: 62015 Part #: RDS-63-B Supplier: 0BHF9

D. Location Zones

Zone	Area
193	Lower Wing-To-Body Fairing - Wheel Well
212	Flight Compartment - Right

E. Prepare for the Procedure

SUBTASK 28-43-00-860-013

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-020-007

- (2) At the left wheel well, disconnect the connector, D46028P, from the panel, AL0675B, position 4.

SUBTASK 28-43-00-860-014

- (3) Set the decade resistance box, COM-9597, to 77.39 ohms.

SUBTASK 28-43-00-420-007

- (4) Connect the high terminal of the decade resistance box, COM-9597, to connector, D46028J, pin 16.

SUBTASK 28-43-00-420-008

- (5) Connect the low terminal of the decade resistance box, COM-9597, to connector, D46028J, pin 15 and connector, D46028P, pin 15.

EFFECTIVITY
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SUBTASK 28-43-00-860-015

- (6) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-43-00-860-016

- (7) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

F. Procedure

SUBTASK 28-43-00-210-001

- (1) At the fuel temperature indicator, located on the P5 overhead panel, make sure the fuel temperature indicator displays $-40 \pm 13^{\circ}\text{F}$ ($-40 \pm 7^{\circ}\text{C}$).

SUBTASK 28-43-00-860-017

- (2) Set the decade resistance box, COM-9597, to 90.38 ohms.

SUBTASK 28-43-00-210-002

- (3) At the fuel temperature indicator, located on the P5 overhead panel, make sure the fuel temperature indicator displays $32 \pm 13^{\circ}\text{F}$ ($0 \pm 7^{\circ}\text{C}$).

SUBTASK 28-43-00-860-018

- (4) Set the decade resistance box, COM-9597, to 104.6 ohms.

SUBTASK 28-43-00-210-003

- (5) At the fuel temperature indicator, located on the P5 overhead panel, make sure the fuel temperature indicator displays $104 \pm 13^{\circ}\text{F}$ ($40 \pm 7^{\circ}\text{C}$).

G. Put the Airplane Back to the Usual Condition

SUBTASK 28-43-00-860-019

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-020-008

- (2) Disconnect the decade resistance box, COM-9597, from connector, D46028J, and connector, D46028P.

SUBTASK 28-43-00-420-009

- (3) At the left wheel well, re-connect the connector, D46028P, to the panel, AL0675B, position 4.

SUBTASK 28-43-00-860-020

- (4) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-860-021

- (5) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

———— END OF TASK ————

EFFECTIVITY
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TASK 28-43-00-760-801

5. Fuel Temperature Bulb Resistance Test

(Figure 501Figure 502)

A. References

Reference	Title
WDM 28-42-11	Wiring Diagram Manual

B. Tools/Equipment

Reference	Description
STD-1336	Thermometer - Digital, 0-150 +/- 2 Degrees F, with a Probe, Thermocouple or Equivalent

C. Location Zones

Zone	Area
211	Flight Compartment - Left
551	Left Wing - Rear Spar To Landing Gear Support Beam

D. Procedure

SUBTASK 28-43-00-860-010

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-00-010-002

- (2) Open the fixed trailing edge access panel immediately outboard of the left main landing gear.

SUBTASK 28-43-00-020-004

- (3) Do these steps to remove the fuel temperature bulb:

NOTE: The fuel temperature bulb is on the aft side of the aft spar. It is on the outboard side of the left main landing gear.

- (a) Turn the locking cap for the temperature bulb to release the bulb from the pin.
- (b) Pull the bulb from the housing.

SUBTASK 28-43-00-970-007

- (4) Measure the temperature in the bulb housing.

- (a) Put the 0-150 +/- 2 degrees F digital thermometer, STD-1336 in the bulb housing.
- (b) Permit the temperature to become stable.
- (c) Write the temperature shown on the 0-150 +/- 2 degrees F digital thermometer, STD-1336.

SUBTASK 28-43-00-420-006

- (5) Do these steps to install the temperature bulb again:

- (a) Hold the temperature bulb by the locking cap.
- (b) Put the fuel temperature bulb into the bulb housing.
- (c) Push the fuel temperature bulb into the housing until it touches the pin.
- (d) Turn the locking cap to lock it around the pin.

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SUBTASK 28-43-00-020-005

- (6) Disconnect the connector, D616, from the fuel temperature indicator in the flight compartment (WDM 28-42-11).

SUBTASK 28-43-00-020-006

- (7) Disconnect the ground GD476-DC on the A leg of the temperature sensor wiring (WDM 28-42-11).

SUBTASK 28-43-00-970-008

- (8) Measure the resistance from pin 3 to pin 4 on the connector D616.

SUBTASK 28-43-00-970-009

- (9) Use the subsequent table of sensor temperature and resistance values to compare the resistance measurement with the temperature of the sensor.

NOTE: The resistance measured by this procedure includes the resistance of the wiring between the indicator and the sensor, approximately 0.8 ohms for 100 feet (30.5 meters) of wiring.

Table 501/28-43-00-993-801

TEMPERATURE (degrees Celsius)	RESISTANCE (ohms)
-30	80.56 + 0.40
-20	83.77 + 0.40
-10	87.04 + 0.40
0	90.38 + 0.40
10	93.80 + 0.40
20	97.31 + 0.40
30	100.91 + 0.40
40	104.60 + 0.40
50	108.39 + 0.40
60	112.28 + 0.40

SUBTASK 28-43-00-420-004

- (10) Connect the connector, D616, to the fuel temperature indicator in the flight compartment again (WDM 28-42-11).

SUBTASK 28-43-00-420-005

- (11) Connect the ground GD476-DC on the A leg of the temperature sensor wiring to ground again (WDM 28-42-11).

SUBTASK 28-43-00-410-002

- (12) Close the fixed leading edge access door immediately outboard of the left main landing gear.

SUBTASK 28-43-00-860-011

- (13) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00355	FUEL TEMP IND

———— END OF TASK ————

EFFECTIVITY
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FUEL TEMPERATURE BULB - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) A task to remove the fuel temperature bulb
 - (2) A task to install the fuel temperature bulb.

TASK 28-43-11-000-801

2. Fuel Temperature Bulb Removal

Figure 401

A. General

- (1) This task gives instructions to remove the Fuel Temperature Bulb.

B. Location Zones

Zone	Area
561	Left Wing - Rear Spar to Trailing Edge, Outboard Of Inboard Flap, Inboard of Fixed Trailing Edge

C. Prepare for the Removal

SUBTASK 28-43-11-860-001

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

D. Fuel Temperature Bulb Removal

SUBTASK 28-43-11-010-001

- (1) Open the fixed trailing edge access panel immediately outboard of the landing gear.

SUBTASK 28-43-11-020-001

- (2) Cut the wires that go to the fuel temperature bulb.

NOTE: The fuel temperature bulb is on the aft side of the aft spar. It is immediately outboard of the left main landing gear.

SUBTASK 28-43-11-020-002

- (3) Push the temperature bulb into the adapter with a maximum force of 4.0 lbf (17.8 N).

SUBTASK 28-43-11-020-003

- (4) Turn the bulb until it is free and pull the fuel temperature bulb [1] out of the adapter.

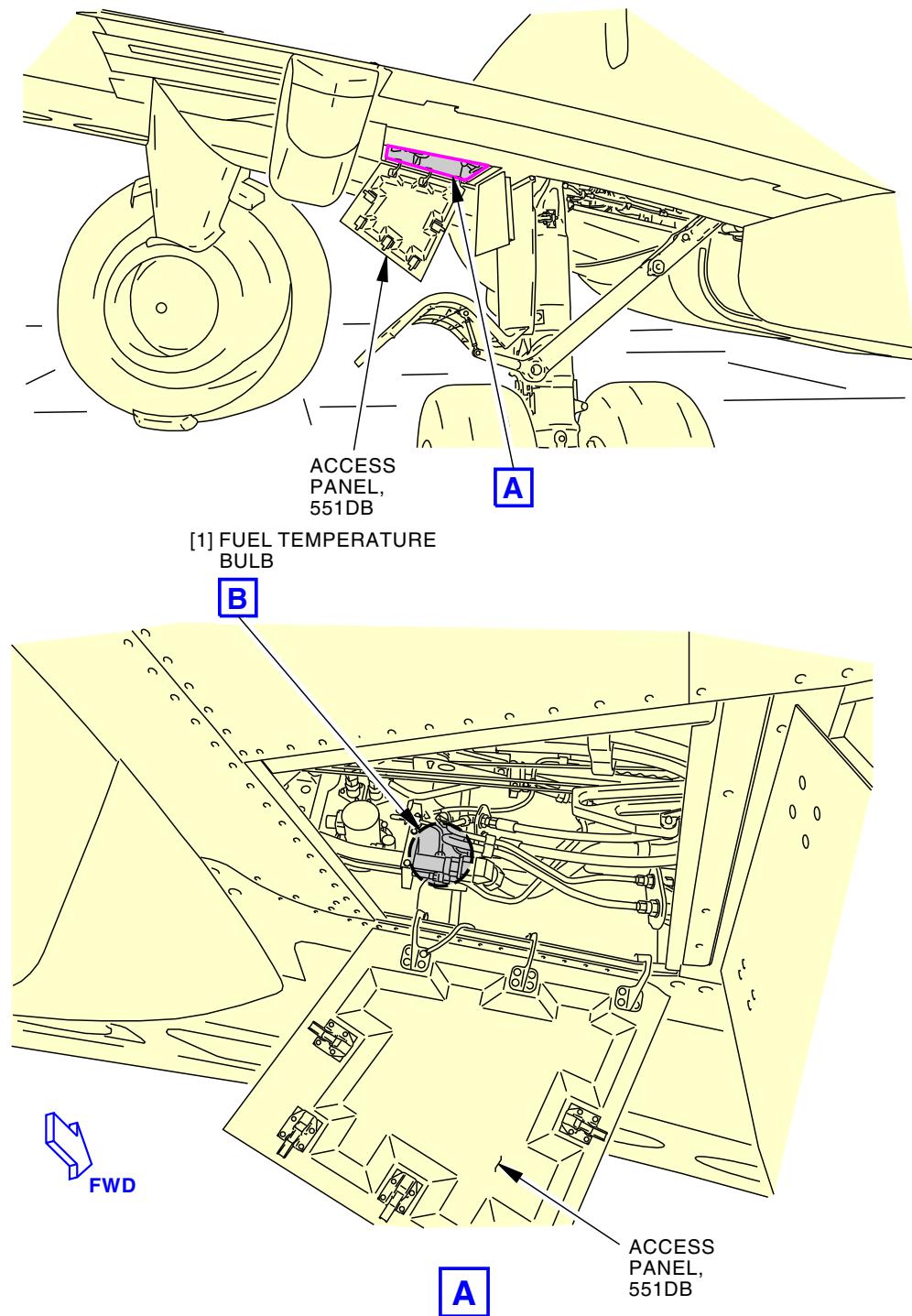
———— END OF TASK ————



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Fuel Temperature Bulb Installation
Figure 401/28-43-11-990-802 (Sheet 1 of 2)

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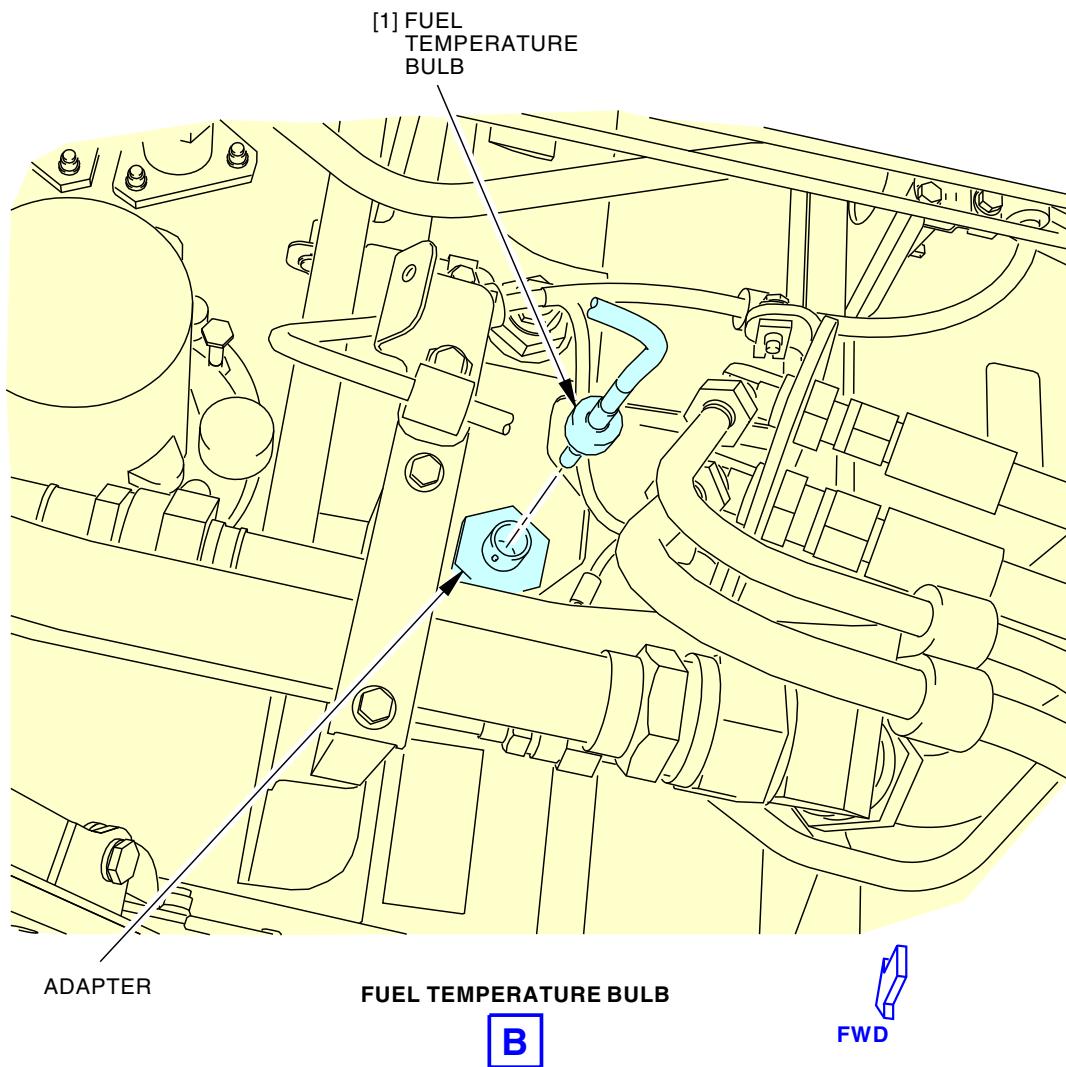
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Fuel Temperature Bulb Installation
Figure 401/28-43-11-990-802 (Sheet 2 of 2)

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TASK 28-43-11-400-801

3. Fuel Temperature Bulb Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel Temperature Bulb.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel temperature bulb	28-11-61-02-035	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-446
		28-11-61-03-055	LOM 447, 450-999

D. Fuel Temperature Bulb Installation

SUBTASK 28-43-11-420-001

- (1) Hold the temperature bulb by the locking cap.

SUBTASK 28-43-11-420-002

- (2) Put the fuel temperature bulb [1] into the adapter.

SUBTASK 28-43-11-420-003

- (3) Push the fuel temperature bulb into the adapter until it touches the pin.

SUBTASK 28-43-11-420-004

- (4) Turn the locking cap to lock it around the pin.

SUBTASK 28-43-11-420-005

- (5) Make a splice from the wires on the fuel temperature bulb to the airplane wire bundle.

E. Put the Airplane Back to its Usual Condition

SUBTASK 28-43-11-860-002

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-11-860-003

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 28-43-11-710-001

- (3) Monitor the fuel temperature on the indicator.

- (a) Make sure the indicator shows the correct temperature.

SUBTASK 28-43-11-410-001

- (4) Close the fixed trailing edge access panel immediately outboard of the landing gear.

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SUBTASK 28-43-11-860-004

- (5) If electrical power is not necessary for other tasks, do this task: Remove Electrical Power,
TASK 24-22-00-860-812

———— END OF TASK ————

— EFFECTIVITY —
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FUEL TEMPERATURE INDICATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) Fuel temperature indicator removal
 - (2) Fuel temperature indicator installation

TASK 28-43-21-020-801

2. Fuel Temperature Indicator Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the Fuel Temperature Indicator.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

C. Prepare for the Removal

SUBTASK 28-43-21-860-001

- (1) Do these steps to remove the fuel temperature indicator from the P5-2 overhead panel:
 - (a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

D. Fuel Temperature Indicator Removal

SUBTASK 28-43-21-020-003

- (1) Loosen the 6 quarter-turn fasteners that hold the P5-2 overhead panel.
- (2) Carefully pull the P5-2 overhead panel away from the rest of the P5 panel until there is sufficient access to the part of the fuel temperature indicator [1] behind the face of the P5-2 panel.
- (3) Disconnect the electrical connector from the fuel temperature indicator [1].
- (4) Loosen the release screw to loosen the clamp that holds the fuel temperature indicator [1] in its position.
- (5) Remove the fuel temperature indicator from the P5-2 panel.

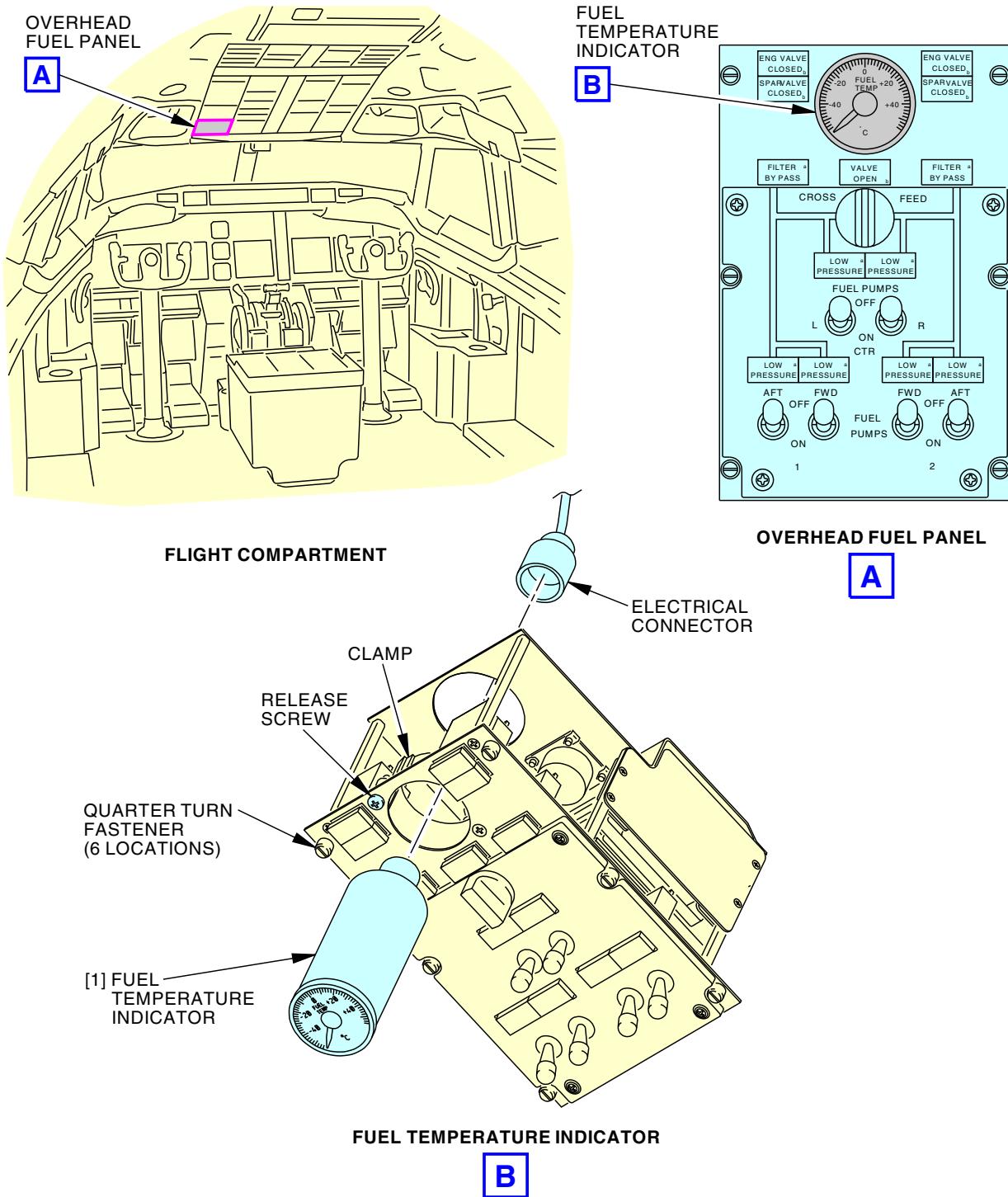
— END OF TASK —



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**Fuel Temperature Indicator Installation
Figure 401/28-43-21-990-801**

EFFECTIVITY
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TASK 28-43-21-020-802

3. Fuel Temperature Indicator Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the Fuel Temperature Indicator.

B. References

Reference	Title
28-43-00-710-801	Fuel Temperature Indicating System Test (Master Thermometer) (P/B 501)

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. Fuel Temperature Indicator Installation

SUBTASK 28-43-21-020-002

- (1) Do these steps to install the fuel temperature indicator from the P5-2 overhead panel:
- Put the fuel temperature indicator in its position in the P5-2 panel.
 - Tighten the release screw to tighten the clamp that holds the fuel temperature indicator [1] in its position.
 - Connect the electrical connector to the fuel temperature indicator [1].
 - Carefully put the P5-2 overhead panel into its position in the P5 panel until there is sufficient access to the part of the fuel temperature indicator behind the face of the P5-2 panel.
 - Tighten the 6 quarter-turn fasteners that hold the P5-2 overhead panel.

E. Fuel Temperature Indicator Installation Test

SUBTASK 28-43-21-860-003

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

SUBTASK 28-43-21-720-001

- (2) Do this test of the Fuel Temperature Indicating System: Fuel Temperature Indicating System Test (Master Thermometer), TASK 28-43-00-710-801.

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

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MEASURING STICK - REMOVAL/INSTALLATION

1. General

- A. This procedure contains these tasks:
 - (1) A removal of the fuel measuring stick
 - (2) An installation of the fuel measuring stick
 - (3) A removal of the fuel measuring stick mounting base
 - (4) An installation of the fuel measuring stick mounting base.
- B. The fuel measuring stick has a float at the top. This float holds the top of the fuel measuring stick at the top of the fuel in the tank.
- C. It is not necessary to defuel the fuel tanks to remove the fuel measuring stick. It is necessary to defuel the fuel tank to remove the fuel measuring stick mounting base.
- D. To remove the housing or the mounting base for the fuel measuring stick, it is necessary to remove the access panel where the housing is installed (TASK 28-11-11-000-801) or (TASK 28-11-31-000-801).

TASK 28-44-11-000-801

2. Fuel Measuring Stick Removal

(Figure 401)

A. General

- (1) This task gives instruction to remove the fuel measuring stick.

B. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Fuel Measuring Stick Removal

SUBTASK 28-44-11-860-001

- (1) Turn the screwdriver slot counterclockwise to release the applicable fuel measuring stick.

SUBTASK 28-44-11-020-001

- (2) Use snap ring pliers or a spanner wrench to remove the bayonet socket [10] or retainer [8] from the stick fitting or mounting base [36].

SUBTASK 28-44-11-020-002

- (3) Pull the stick subassembly [35] from the housing [26] with the retainer [8], spring [30], and guides [29].

NOTE: You can feel a small force when the steel armature on the stick subassembly goes through the magnet in the float.

SUBTASK 28-44-11-020-003

- (4) Remove the latch [9] from the stick subassembly [35].

SUBTASK 28-44-11-860-002

- (5) Keep the latch [9] for installation of the fuel measuring stick.



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SUBTASK 28-44-11-790-001

- (6) Do these steps to do a check for fuel leakage in the housing of the fuel measuring stick:
- Make sure that the applicable tank contains sufficient fuel to cover the base of the fuel measuring stick housing.

Table 401/28-44-11-993-807

TABLE 601. Fuel Necessary to Cover the Center Tank Measuring Sticks		
Fuel Measuring Stick Number	FUEL (LBS)	FUEL (KGS)
Stick No. 1	9197	4172
Stick No. 2	13722	6224

Table 402/28-44-11-993-808

TABLE 602. Fuel Necessary to Cover the No. 1 or No. 2 Tank Measuring Sticks		
Fuel Measuring Stick Number	FUEL (LBS)	FUEL (KGS)
Stick No. 3	1167	529
Stick No. 4	3402	1543
Stick No. 5	5665	2570
Stick No. 6	6710	3044
Stick No. 7	7570	3434
Stick No. 8	8262	3747

- Monitor the opening for the fuel measuring stick for five minutes after you remove the fuel measuring stick to make sure that there is no fuel leakage.

———— END OF TASK ————

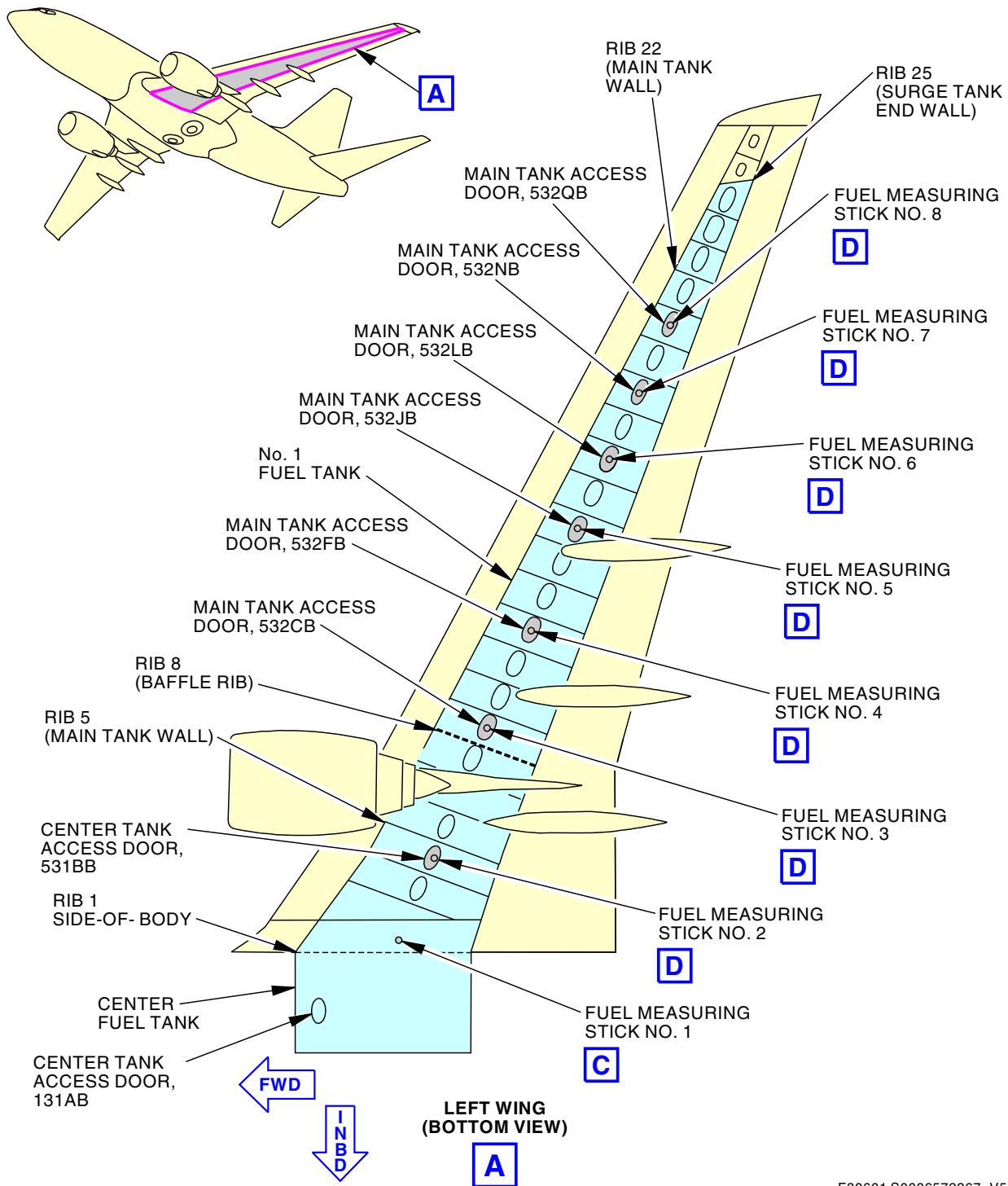
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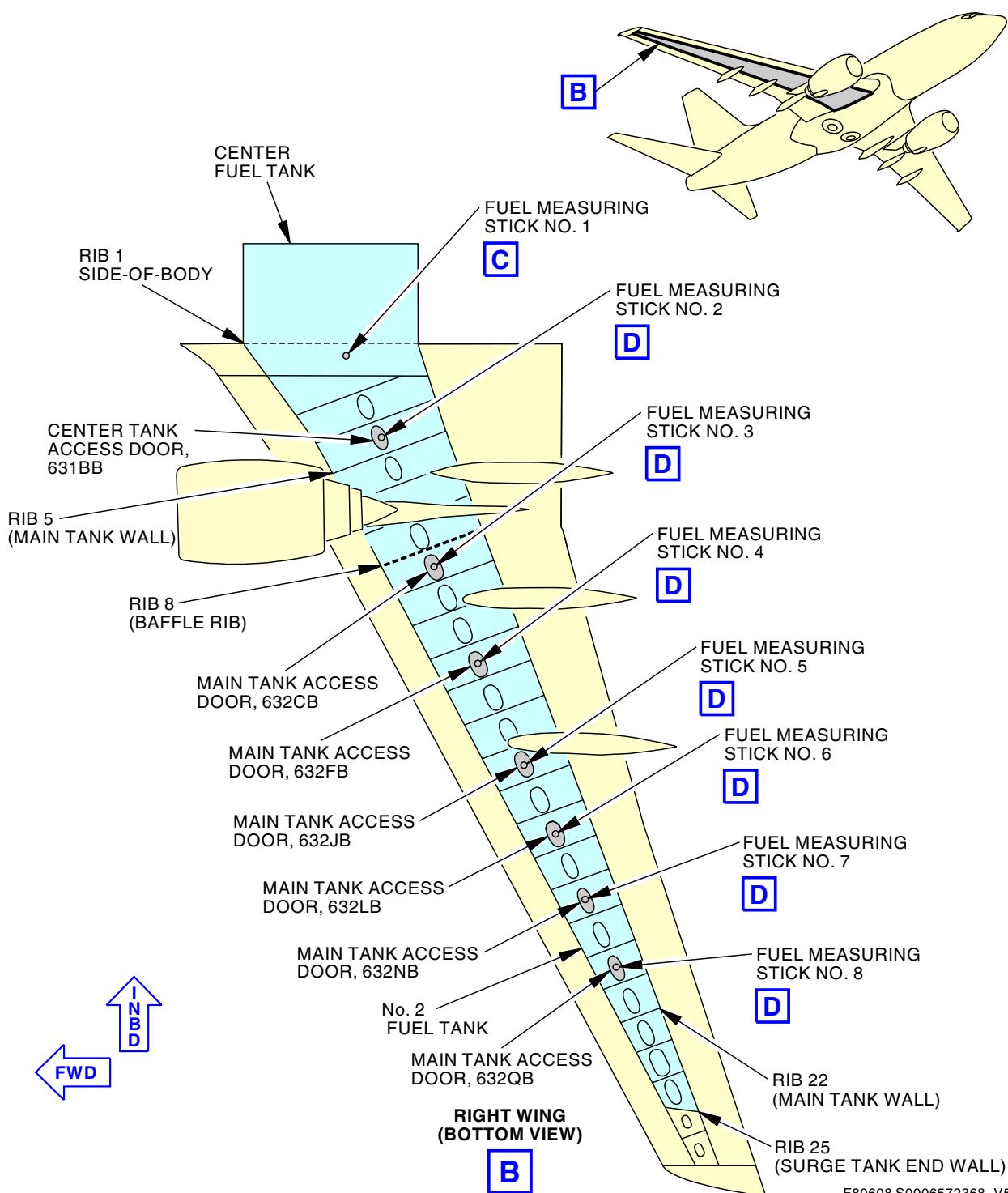
Fuel Measuring Stick Installation
Figure 401/28-44-11-990-803 (Sheet 1 of 5)

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**Fuel Measuring Stick Installation
Figure 401/28-44-11-990-803 (Sheet 2 of 5)**

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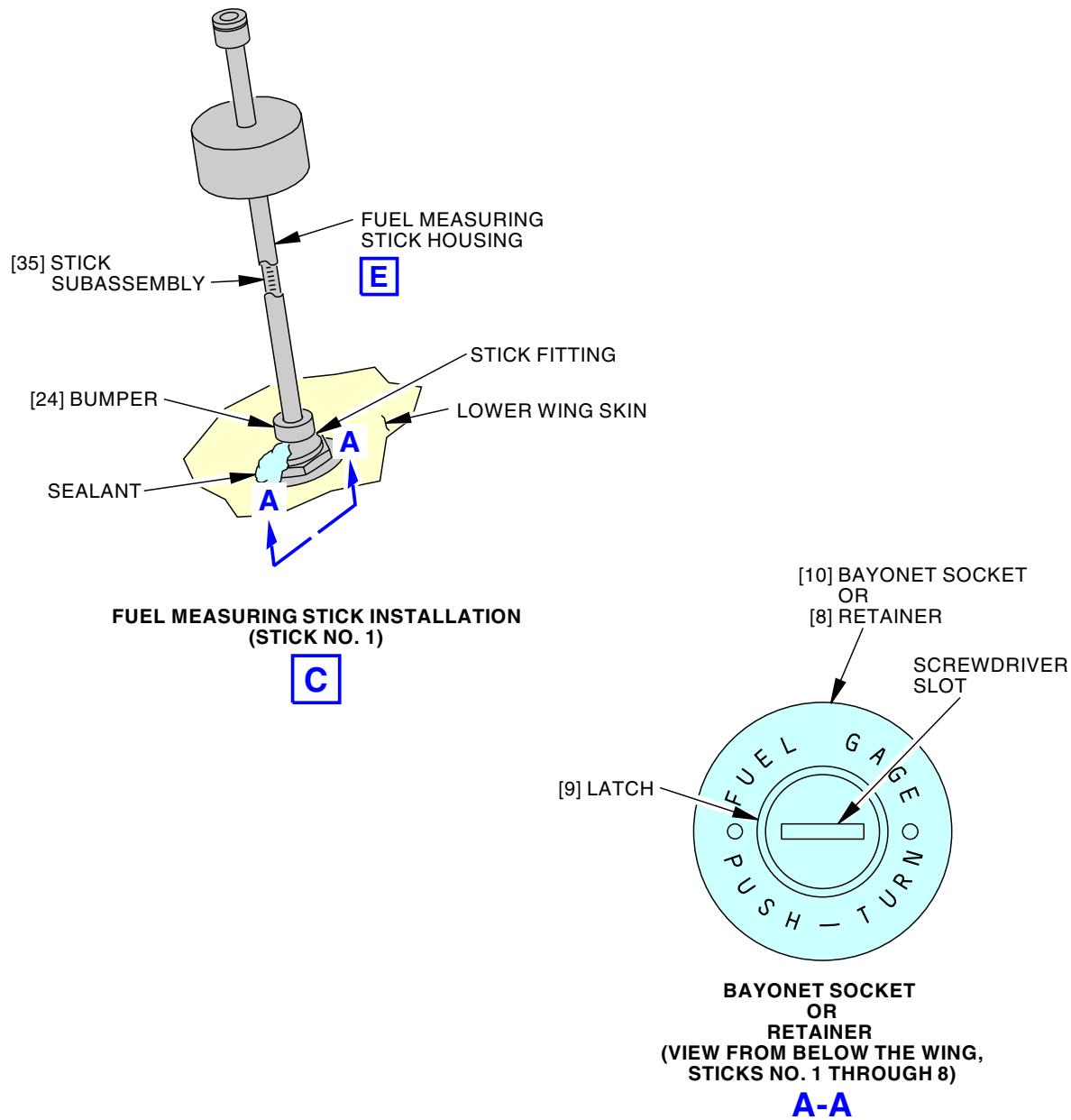
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Fuel Measuring Stick Installation
Figure 401/28-44-11-990-803 (Sheet 3 of 5)

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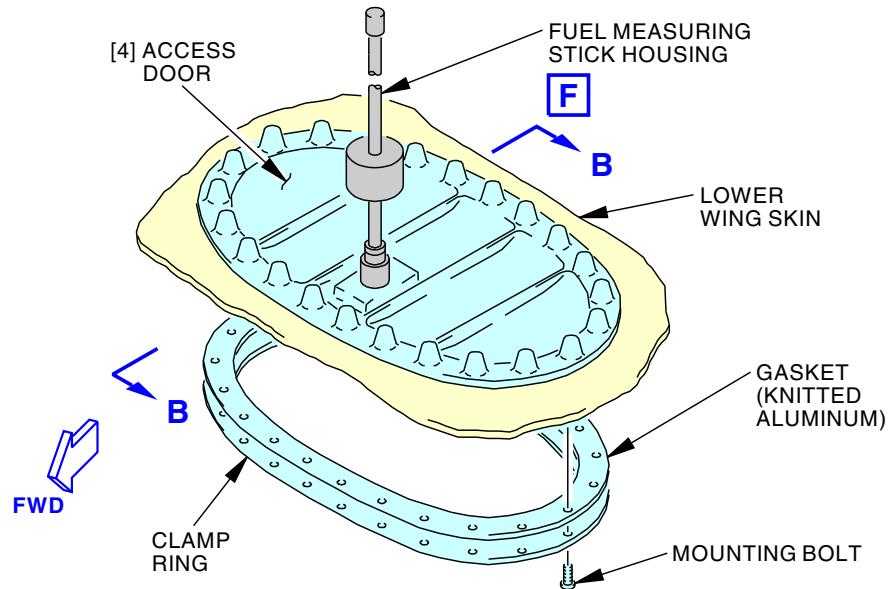
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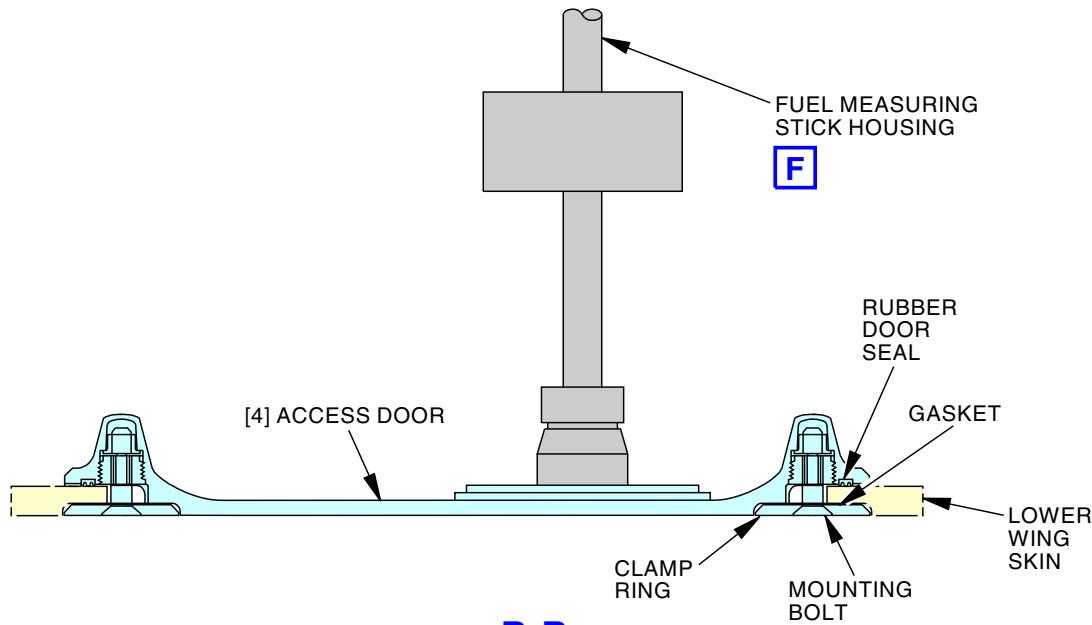


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FUEL MEASURING STICK INSTALLATION
(STICK NO. 2,3,4,5,6,7 AND 8)

D



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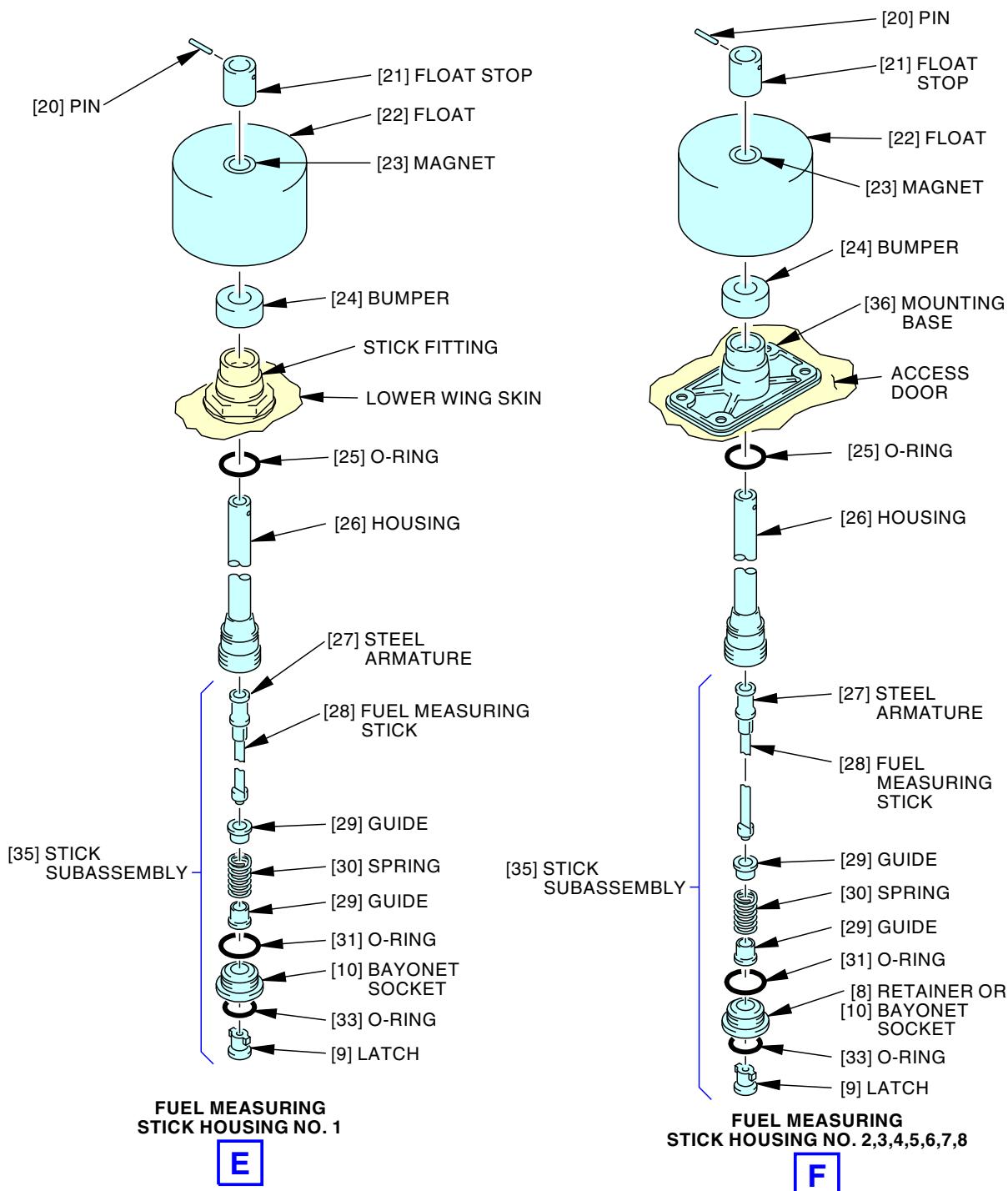
Fuel Measuring Stick Installation
Figure 401/28-44-11-990-803 (Sheet 4 of 5)

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Fuel Measuring Stick Installation
Figure 401/28-44-11-990-803 (Sheet 5 of 5)

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 28-44-11-400-801

3. Fuel Measuring Stick Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the fuel measuring stick.

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-5738	Spanner Wrench - Fuel Stick Retainer Part #: A28016-1 Supplier: 81205 Part #: T5-0497K Supplier: 86831

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
31	O-ring	28-44-01-02-060 28-44-01-03-060 28-44-01-04-060 28-44-01-05-040	LOM ALL LOM ALL LOM ALL LOM ALL
33	O-ring	28-44-01-02-055 28-44-01-03-055 28-44-01-04-055 28-44-01-05-035	LOM ALL LOM ALL LOM ALL LOM ALL
35	Stick subassembly	28-44-01-02-045 28-44-01-02-050 28-44-01-03-045 28-44-01-03-050 28-44-01-04-045 28-44-01-04-050 28-44-01-05-030	LOM ALL LOM ALL LOM ALL LOM ALL LOM ALL LOM ALL LOM ALL

D. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Fuel Measuring Stick Installation

SUBTASK 28-44-11-420-001

- (1) Install new O-ring [31] and O-ring [33] on the bayonet socket [10] or retainer [8].

SUBTASK 28-44-11-790-002

- (2) Do these steps to do a check for fuel leakage in the housing of the fuel measuring stick:

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- (a) Make sure that the applicable tank contains sufficient fuel to cover the base of the fuel measuring stick housing.

Table 403/28-44-11-993-809

TABLE 601. Fuel Necessary to Cover the Center Tank Measuring Sticks		
Fuel Measuring Stick Number	FUEL (LBS)	FUEL (KGS)
Stick No. 1	9197	4172
Stick No. 2	13722	6224

Table 404/28-44-11-993-810

TABLE 602. Fuel Necessary to Cover the No. 1 or No. 2 Tank Measuring Sticks		
Fuel Measuring Stick Number	FUEL (LBS)	FUEL (KGS)
Stick No. 3	1167	529
Stick No. 4	3402	1543
Stick No. 5	5665	2570
Stick No. 6	6710	3044
Stick No. 7	7570	3434
Stick No. 8	8262	3747

- (b) Make sure that there are no indications of fuel leakage from the housing before you install the fuel measuring stick in the opening.

SUBTASK 28-44-11-420-002

- (3) With the latch [9] of the stick subassembly removed, install the stick subassembly [35] in the housing [26].

SUBTASK 28-44-11-420-003

- (4) Install the guide [29], spring [30], second guide [29], and retainer [8] in the housing [26].

SUBTASK 28-44-11-420-004

- (5) Use a spanner wrench, SPL-5738, to tighten the bayonet socket [10] or retainer [8] in the housing.

Table 405/28-44-11-993-811 Torque Limits

Nomenclature	Torque	
	Min	Max
Bayonet Socket	50.0 in-lb (5.6 N·m)	60.0 in-lb (6.8 N·m)
Retainer	75.0 in-lb (8.5 N·m)	85.0 in-lb (9.6 N·m)

SUBTASK 28-44-11-420-005

- (6) Lower the stick subassembly [35] and install the latch [9] on the stick subassembly [35].

SUBTASK 28-44-11-860-003

- (7) Push the stick subassembly [35] into the housing [26].

SUBTASK 28-44-11-860-004

- (8) Turn the screwdriver slot on the latch [9] clockwise to lock the fuel measuring stick into the correct position.

———— END OF TASK ————

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TASK 28-44-11-000-802

4. Fuel Measuring Stick Mounting Base Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the fuel measuring stick mounting base.

NOTE: Fuel measuring stick mounting base applicable to sticks NO. 2 through 8 only.

B. References

Reference	Title
28-11-00-910-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-11-31-000-801	Center Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-625	Pen

D. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192
532CB	Main Tank Access Door - Wing Station 290
532FB	Main Tank Access Door - Wing Station 367
532JB	Main Tank Access Door - Wing Station 443
532LB	Main Tank Access Door - Wing Station 496
532NB	Main Tank Access Door - Wing Station 549
532QB	Main Tank Access Door - Wing Station 602
631BB	Center Tank Access Door - Wing Station 192
632CB	Main Tank Access Door - Wing Station 290
632FB	Main Tank Access Door - Wing Station 367
632JB	Main Tank Access Door - Wing Station 443
632LB	Main Tank Access Door - Wing Station 496
632NB	Main Tank Access Door - Wing Station 549
632QB	Main Tank Access Door - Wing Station 602



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F. Prepare for the Removal

SUBTASK 28-44-11-650-003

- (1) Defuel the applicable main tank (TASK 28-26-00-650-801) or transfer fuel out of the applicable tank (TASK 28-26-00-650-802).

SUBTASK 28-44-11-860-011



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Obey the fuel tank entry precautions (TASK 28-11-00-910-801).

SUBTASK 28-44-11-650-004

- (3) Drain and purge the applicable main fuel tank (TASK 28-11-00-910-802).

SUBTASK 28-44-11-020-016

- (4) Remove the applicable fuel tank access door(s):
(TASK 28-11-31-000-801, TASK 28-11-11-000-801)

<u>Number</u>	<u>Name/Location</u>
531BB	Center Tank Access Door - Wing Station 192
532CB	Main Tank Access Door - Wing Station 290
532FB	Main Tank Access Door - Wing Station 367
532JB	Main Tank Access Door - Wing Station 443
532LB	Main Tank Access Door - Wing Station 496
532NB	Main Tank Access Door - Wing Station 549
532QB	Main Tank Access Door - Wing Station 602
631BB	Center Tank Access Door - Wing Station 192
632CB	Main Tank Access Door - Wing Station 290
632FB	Main Tank Access Door - Wing Station 367
632JB	Main Tank Access Door - Wing Station 443
632LB	Main Tank Access Door - Wing Station 496
632NB	Main Tank Access Door - Wing Station 549
632QB	Main Tank Access Door - Wing Station 602

G. Fuel Measuring Stick Mounting Base Removal

SUBTASK 28-44-11-020-012

- (1) Make sure that the fuel measuring stick subassembly [35] is removed (TASK 28-44-11-000-801).

SUBTASK 28-44-11-020-013

- (2) Remove the old sealant from the mounting base [36] and fasteners.

SUBTASK 28-44-11-860-012

- (3) Make a mark on the mounting base [36] with a pen, STD-625, of an arrow that points in the forward direction.

NOTE: This arrow will make sure that the mounting base and fuel measuring stick are installed with the correct orientation.

SUBTASK 28-44-11-020-014

- (4) Remove the bolts, collars, and washers from the mounting base [36] (four locations).

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SUBTASK 28-44-11-020-015

- (5) Carefully remove the mounting base [36] and fuel measuring stick housing [26] from the fuel tank access door.

NOTE: The mounting base and fuel tank access door are bonded with faying surface sealant.

- (a) Keep the mounting base [36] and fuel measuring stick housing [26] for the installation.

———— END OF TASK ————

TASK 28-44-11-400-802

5. Fuel Measuring Stick Mounting Base Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the fuel measuring stick mounting base.

NOTE: Fuel measuring stick mounting base applicable to sticks NO. 2 through 8 only.

- (2) For sealants in the fuel tank structure(s), use sealant, A00767, for Class A and B applications:

(a) The sealant, A50153, and sealant, A50110, are also acceptable sealants.

- (3) For faying surface seal applications:

(a) Inside the fuel tank, use BMS 5-45 Class B-2 sealant, A50110, or BMS 5-45 Class C sealant, A50155.

(b) Outside the fuel tank, use BMS 5-45 Class B-2 sealant, A50110, BMS 5-45 Class C sealant, A50155, BMS 5-95 Class B sealant, A50231, or BMS 5-95 Class C sealant, A50296.

(c) Do not apply a faying surface seal with a temperature higher than 100°F (38°C).

(d) Do not use alternatives for faying surface sealants.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-300-803	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
28-11-31-400-801	Center Tank Access Door - Installation (P/B 401)
51-31-00-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

C. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C

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Reference	Description	Specification
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88) - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92) - Series 92	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50021	Pad - General Purpose Scrubbing - Scotch-Brite 96W	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
36	Mounting base	28-44-01-02-130	LOM ALL
		28-44-01-03-130	LOM ALL
		28-44-01-04-130	LOM ALL
		28-44-01-04-135	LOM ALL
		28-44-01-05-100	LOM ALL

F. Access Panels

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192
532CB	Main Tank Access Door - Wing Station 290
532FB	Main Tank Access Door - Wing Station 367
532JB	Main Tank Access Door - Wing Station 443
532LB	Main Tank Access Door - Wing Station 496
532NB	Main Tank Access Door - Wing Station 549
532QB	Main Tank Access Door - Wing Station 602
631BB	Center Tank Access Door - Wing Station 192
632CB	Main Tank Access Door - Wing Station 290
632FB	Main Tank Access Door - Wing Station 367
632JB	Main Tank Access Door - Wing Station 443
632LB	Main Tank Access Door - Wing Station 496
632NB	Main Tank Access Door - Wing Station 549
632QB	Main Tank Access Door - Wing Station 602

G. Fuel Measuring Stick Mounting Base Installation

SUBTASK 28-44-11-110-001

- (1) Remove the old sealant from these components (TASK 20-30-92-910-801):
 - (a) mounting base [36] (if re-used)
 - (b) bolts, collars, and washers.

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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushed/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801).
- 1) soft bristle brush, STD-123
 - 2) cotton wiper, G00034
 - 3) Scotch-Brite 96W pad, G50021.

SUBTASK 28-44-11-760-001

- (2) Do these steps to prepare the mounting base [36] and the fuel tank access door for an electrical faying surface bond (SWPM 20-20-00):



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- (a) Final clean the contact surfaces of the mounting base [36] and the fuel tank access door with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
- (b) Rub dry with a clean, dry cotton wiper, G00034.
- (c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.
- (d) Apply a thin continuous layer of BMS 5-45 Class B-2 sealant, A50110, or BMS 5-45 Class C sealant, A50155, to the contact area of the mounting base [36].
- 1) For the use of faster cure time sealants, refer to the figure "Sealant Usable Time" in TASK 28-11-00-300-803 for BMS 5-45 Class B or Class C sealants.

SUBTASK 28-44-11-420-012

- (3) Do these steps to install the mounting base [36] to the fuel tank access door:

- (a) Put the mounting base [36] onto the fuel tank access door.
- 1) Make sure that the arrow on the mounting base [36] is pointing in the forward direction.
- (b) Install the bolts, washers, and collars (four locations).

SUBTASK 28-44-11-390-001

- (4) On the in-tank side of the fuel tank access door, apply sealant, A50110, to these components:
- (a) A cap seal on the four bolts
 - (b) A fillet seal around the periphery of the mounting base [36] and the fuel tank access door (TASK 51-31-00-390-804).

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SUBTASK 28-44-11-760-003

- (5) Do these steps to do a check of the electrical bonding resistance for all fuel tank access doors except 531BB and 631BB (SWPM 20-20-00):
- (a) Measure the electrical bonding resistance between the mounting base [36] and the fuel tank access door.
- 1) Make sure that the resistance is less than 0.001 ohm (1 milliohm).

SUBTASK 28-44-11-760-004

- (6) Do these steps to do a check of the electrical bonding resistance for fuel tank access doors 531BB and 631BB only (SWPM 20-20-00):
- (a) Measure the electrical bonding resistance between the mounting base [36] and unpainted periphery of the aluminum face sheet.
- 1) Make sure that the resistance is less than 0.0025 ohm (2.5 milliohms).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-44-11-420-013

- (1) Install the applicable fuel tank access door(s):
(TASK 28-11-31-400-801, TASK 28-11-11-400-801)

Number	Name/Location
531BB	Center Tank Access Door - Wing Station 192
532CB	Main Tank Access Door - Wing Station 290
532FB	Main Tank Access Door - Wing Station 367
532JB	Main Tank Access Door - Wing Station 443
532LB	Main Tank Access Door - Wing Station 496
532NB	Main Tank Access Door - Wing Station 549
532QB	Main Tank Access Door - Wing Station 602
631BB	Center Tank Access Door - Wing Station 192
632CB	Main Tank Access Door - Wing Station 290
632FB	Main Tank Access Door - Wing Station 367
632JB	Main Tank Access Door - Wing Station 443
632LB	Main Tank Access Door - Wing Station 496
632NB	Main Tank Access Door - Wing Station 549
632QB	Main Tank Access Door - Wing Station 602

SUBTASK 28-44-11-400-001

- (2) Make sure to install the fuel measuring stick subassembly [35] (TASK 28-44-11-400-801).

— END OF TASK —

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FUEL MEASURING STICK - REPAIRS

1. General

- A. This procedure contains a task to replace the O-ring(s) that make a seal between the tube assembly and the housing for the magnetic fuel measuring sticks. If this location is not sealed correctly, it can be a cause of fuel leakage.

TASK 28-44-11-360-802

2. Replacement of the O-Ring Seal Between the Housing and the Base Assembly

(Figure 801)

A. References

Reference	Title
28-44-11-000-801	Fuel Measuring Stick Removal (P/B 401)
28-44-11-400-801	Fuel Measuring Stick Installation (P/B 401)

B. Location Zones

Zone	Area
531	Left Wing - Center Fuel Tank, Rib 1 to Rib 5
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
631	Right Wing - Center Fuel Tank, Rib 1 to Rib 5
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Replacement of the O-Ring Seal Between the Housing and the Base Assembly

SUBTASK 28-44-11-860-008

- (1) Make sure that the airplane has a roll between -1 degree and +1 degree (less than one degree left or right roll).

SUBTASK 28-44-11-860-009

- (2) Make sure that the airplane has a pitch between -1 and +1 degrees (less than one degree pitch up or down).

SUBTASK 28-44-11-860-010



OBEY THESE PRECAUTIONS. IF YOU SPILL FUEL, IT CAN CAUSE FIRES AND EXPLOSIONS. THESE CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Make sure that the fuel tank for the applicable fuel measuring stick has less than the maximum quantity of fuel given in the tables below (Table 801, Table 802).

Table 801/28-44-11-993-803 Maximum Fuel Quantity in Center Tank When the Fuel Measuring Stick Housing is Loosened

Fuel Measuring Stick	FUEL (LBS) *[1]	FUEL (KGS) *[2]
1	0	0
2	7774	3533

*[1] Based on a nominal density of 6.76 pounds per U.S. gallon

*[2] Based on a nominal density of 0.810 kilograms per liter

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Table 802/28-44-11-993-804 Maximum Fuel Quantity in No. 1 or No. 2 Tank When the Fuel Measuring Stick Housing is Loosened

Fuel Measuring Stick	FUEL (LBS) *[1]	FUEL (KGS) *[2]
3	608	276
4	1960	891
5	4394	1997
6	5746	2611
7	6760	3072
8	7436	3380

*[1] Based on a nominal density of 6.76 pounds per U.S. gallon

*[2] Based on a nominal density of 0.810 kilograms per liter

SUBTASK 28-44-11-010-002

- (4) Remove the fuel measuring stick [1] from its housing (TASK 28-44-11-000-801).

SUBTASK 28-44-11-020-008

- (5) Put a nine sixteenth inch (9/16 inch) hexagonal wrench through the bottom of the base and into the bottom of the housing until it has a good fit.

SUBTASK 28-44-11-020-009

- (6) Loosen the housing [3] from the base with the wrench.

SUBTASK 28-44-11-020-010



CAUTION

DO NOT MOVE THE HOUSING MORE THAN NECESSARY. YOU CAN CAUSE DAMAGE TO THE FLOAT AND FLOAT STOP.

- (7) Carefully move the housing down until it is possible to remove the O-ring [2] from the end of the housing.

SUBTASK 28-44-11-020-011

- (8) Use a plastic pick to remove the O-ring [2] from the housing.

SUBTASK 28-44-11-360-002

- (9) Install new O-ring [2] on the housing.

SUBTASK 28-44-11-420-009

- (10) Lift the housing into the base assembly.

SUBTASK 28-44-11-420-010

- (11) Tighten the housing into the base assembly with the hexagonal wrench to 40 in-lb (4.5 N·m) - 50 in-lb (5.6 N·m).

SUBTASK 28-44-11-650-002

- (12) Refuel the applicable tank until the fuel quantity is more than the minimum quantity shown in the tables below (Table 803, Table 804).

Table 803/28-44-11-993-805 Minimum Fuel Quantity in Center Tank To Do a Leakage Check After the Repair

Fuel Measuring Stick	FUEL (LBS) *[1]	FUEL (KGS) *[2]
1	2840	1291

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Table 803/28-44-11-993-805 Minimum Fuel Quantity in Center Tank To Do a Leakage Check After the Repair (Continued)

Fuel Measuring Stick	FUEL (LBS) *[1]	FUEL (KGS) *[2]
2	16224	7375

*[1] Based on a nominal density of 6.76 pounds per U.S. gallon

*[2] Based on a nominal density of 0.810 kilograms per liter

Table 804/28-44-11-993-806 Minimum Fuel Quantity in No. 1 or No. 2 Tank To Do a Leakage Check After the Repair

Fuel Measuring Stick	FUEL (LBS) *[1]	FUEL (KGS) *[2]
3	1555	707
4	4124	1875
5	6152	2797
6	7098	3227
7	7842	3565
8	8450	3841

*[1] Based on a nominal density of 6.76 pounds per U.S. gallon

*[2] Based on a nominal density of 0.810 kilograms per liter

SUBTASK 28-44-11-210-002

- (13) Do a check for fuel leakage in the area of the fuel measuring stick.

SUBTASK 28-44-11-410-002

- (14) If there is no fuel leakage, install the fuel measuring stick again (TASK 28-44-11-400-801).

SUBTASK 28-44-11-420-011

- (15) If the fuel leakage continues, replace the housing for the fuel measuring stick.

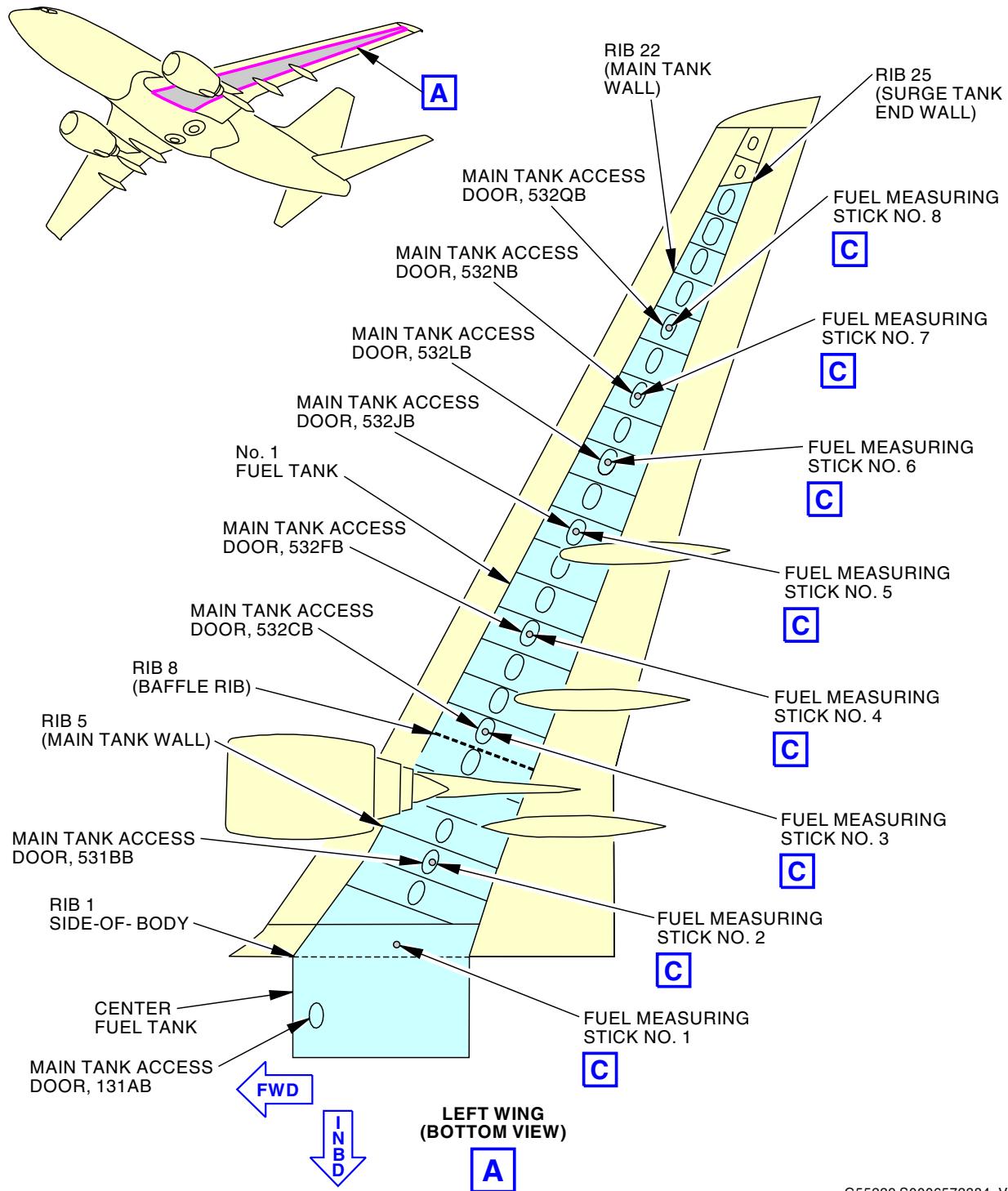
———— END OF TASK ———

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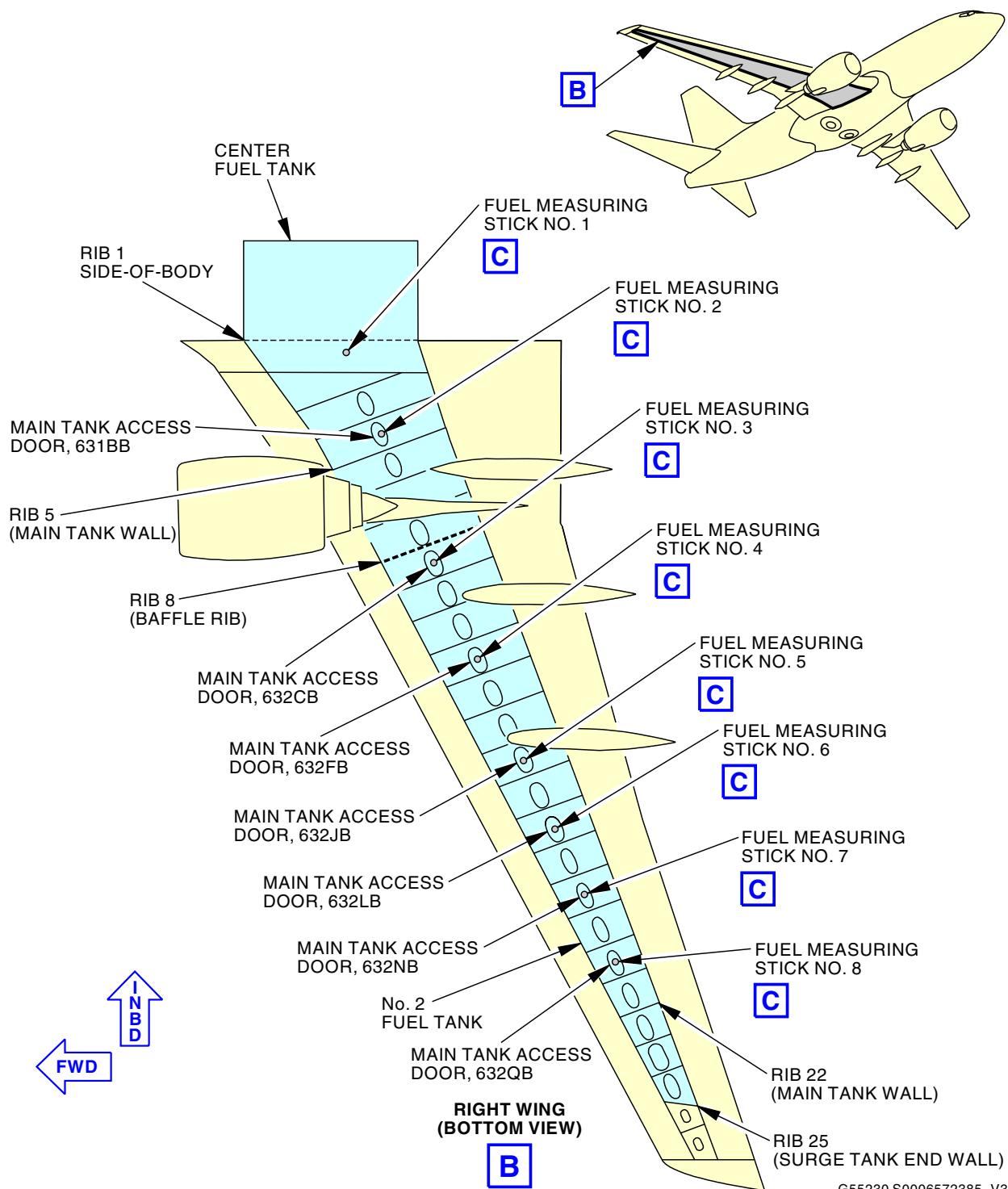
Fuel Measuring Stick Installation
Figure 801/28-44-11-990-802 (Sheet 1 of 3)

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Fuel Measuring Stick Installation
Figure 801/28-44-11-990-802 (Sheet 2 of 3)

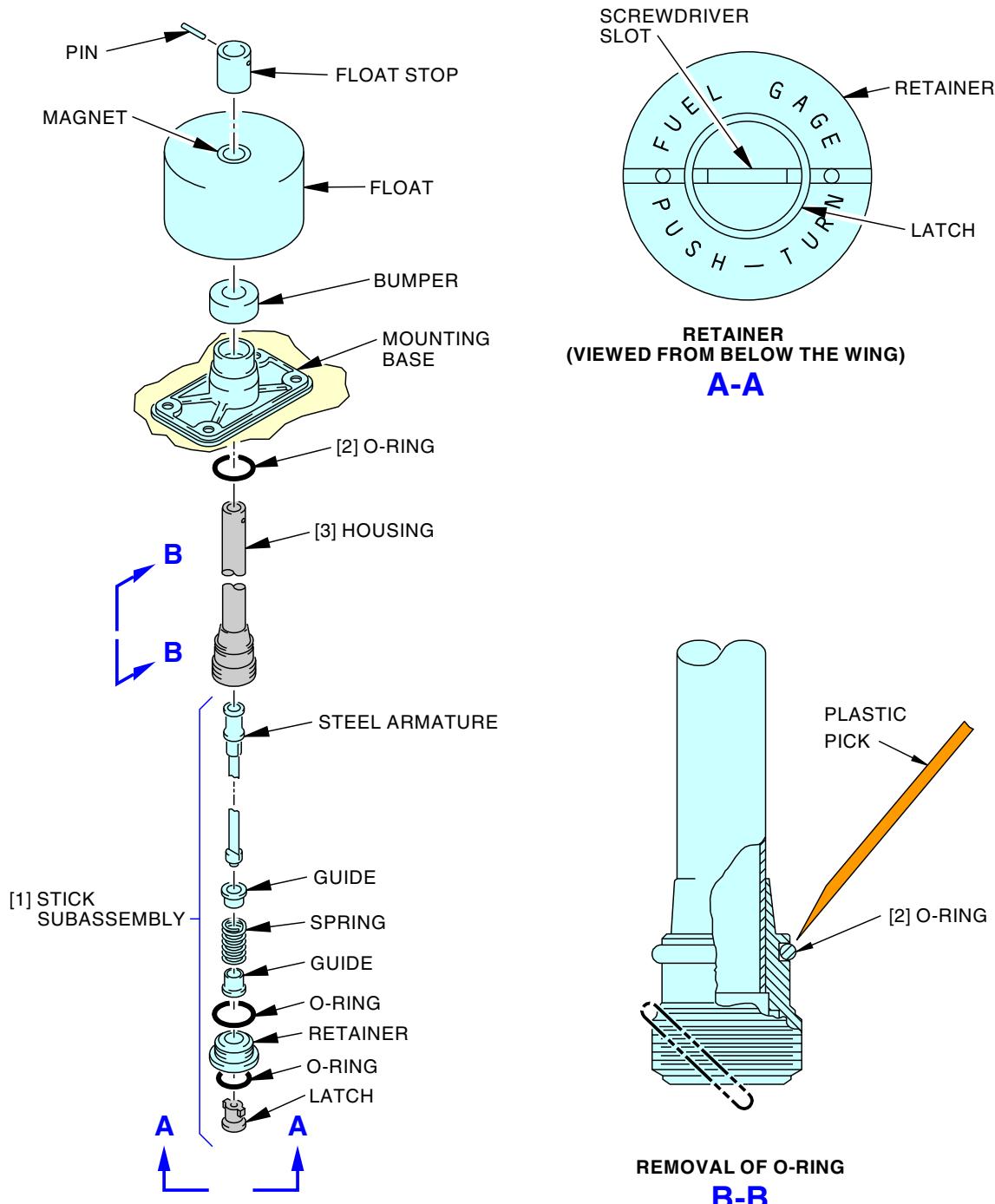
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**Fuel Measuring Stick Installation
Figure 801/28-44-11-990-802 (Sheet 3 of 3)**

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