

CHAPTER

12

SERVICING



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1 thru 8	Feb 15/2025		318	Feb 15/2023		305	Jun 15/2022	
12-CONTENTS			319	Oct 15/2024		306	Jun 15/2022	
1	Feb 15/2024		320	Oct 15/2024		307	Jun 15/2022	
2	Oct 15/2024		321	Feb 15/2023		308	Jun 15/2019	
O 3	Feb 15/2025		322	Feb 15/2023		309	Jun 15/2023	
4	Jun 15/2024		323	Feb 15/2023		310	Jun 15/2018	
5	Jun 15/2021		324	Feb 15/2023		311	Oct 15/2020	
6	Oct 15/2024		325	Jun 15/2021		312	Jun 15/2018	
7	Oct 15/2024		326	Jun 15/2021		313	Jun 15/2018	
8	Oct 15/2024		327	Jun 15/2021		314	Jun 15/2023	
O 9	Feb 15/2025		328	Jun 15/2021		315	Oct 15/2020	
O 10	Feb 15/2025		329	Jun 15/2022		316	Feb 15/2021	
O 11	Feb 15/2025		330	Jun 15/2024		317	Feb 15/2021	
12	BLANK		331	Feb 15/2024		318	Oct 15/2017	
12-00-00			332	Feb 15/2024		319	Oct 15/2017	
301	Oct 15/2014		333	Feb 15/2024		320	Oct 15/2020	
302	Oct 15/2015		334	Feb 15/2024		321	Oct 15/2017	
303	Oct 15/2015		335	Feb 15/2024		322	Jun 15/2022	
304	BLANK		336	Feb 15/2024		323	Feb 15/2022	
12-11-00			337	Feb 15/2024		324	Feb 15/2022	
301	Oct 15/2017		338	Feb 15/2024		325	Oct 15/2017	
302	Oct 15/2022		339	Feb 15/2024		326	BLANK	
303	Oct 15/2022		340	Feb 15/2024		12-12-00		12-13-21
304	Oct 15/2022		301	Oct 15/2023		301	Feb 15/2024	
305	Oct 15/2022		302	Oct 15/2024		R 302	Feb 15/2025	
306	Oct 15/2022		303	Oct 15/2023		R 303	Feb 15/2025	
307	Oct 15/2022		304	Oct 15/2023		O 304	Feb 15/2025	
308	Oct 15/2022		305	Oct 15/2023		305	Oct 15/2021	
309	Oct 15/2022		306	Oct 15/2016		306	Feb 15/2024	
310	Feb 15/2023		307	Oct 15/2016		307	Oct 15/2024	
311	Oct 15/2017		308	BLANK		308	Oct 15/2024	
312	Oct 15/2024		12-13-11			309	Oct 15/2024	
313	Jun 15/2018		R 301	Feb 15/2025		310	Oct 15/2024	
314	Oct 15/2024		R 302	Feb 15/2025		311	Oct 15/2024	
315	Oct 15/2022		R 303	Feb 15/2025		312	Oct 15/2021	
316	Feb 15/2023		R 304	Feb 15/2025		313	Feb 15/2024	
317	Feb 15/2023							

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314	Oct 15/2023	R 301	Feb 15/2025			302	Oct 15/2024	
315	Feb 15/2023	302	Feb 15/2024			303	Jun 15/2023	
316	Feb 15/2023	303	Feb 15/2024			304	Jun 15/2023	
317	Feb 15/2023	304	Feb 15/2024			305	Jun 15/2023	
318	Jun 15/2023	305	Feb 15/2024			306	Jun 15/2023	
12-13-31		R 306	Feb 15/2025			307	Jun 15/2022	
R 301	Feb 15/2025	307	Oct 15/2024			308	Jun 15/2022	
R 302	Feb 15/2025	R 308	Feb 15/2025			309	Jun 15/2023	
R 303	Feb 15/2025	309	Feb 15/2024			310	Jun 15/2023	
R 304	Feb 15/2025	310	Feb 15/2024			311	Jun 15/2023	
305	Oct 15/2015	R 311	Feb 15/2025			312	Oct 15/2023	
306	Oct 15/2015	312	BLANK			313	Oct 15/2023	
307	Jun 15/2023	12-15-21				314	Oct 15/2023	
308	Jun 15/2023	301	Oct 15/2024			315	Jun 15/2023	
309	Jun 15/2023	R 302	Feb 15/2025			316	Jun 15/2023	
310	Jun 15/2023	O 303	Feb 15/2025			317	Oct 15/2023	
311	Jun 15/2023	O 304	Feb 15/2025			318	Jun 15/2023	
312	Oct 15/2023	O 305	Feb 15/2025			319	Jun 15/2023	
313	Oct 15/2023	O 306	Feb 15/2025			320	Jun 15/2023	
314	Oct 15/2023	O 307	Feb 15/2025			12-15-31		
315	Oct 15/2023	O 308	Feb 15/2025			R 301	Feb 15/2025	
316	Oct 15/2023	O 309	Feb 15/2025			302	Oct 15/2024	
317	Oct 15/2023	O 310	Feb 15/2025			R 303	Feb 15/2025	
318	Oct 15/2023	O 311	Feb 15/2025			R 304	Feb 15/2025	
12-14-01		O 312	Feb 15/2025			R 305	Feb 15/2025	
301	Oct 15/2024	O 313	Feb 15/2025			306	Oct 15/2024	
302	Oct 15/2024	O 314	Feb 15/2025			R 307	Feb 15/2025	
303	Oct 15/2024	O 315	Feb 15/2025			R 308	Feb 15/2025	
304	Feb 15/2024	O 316	Feb 15/2025			R 309	Feb 15/2025	
305	Feb 15/2024	O 317	Feb 15/2025			R 310	Feb 15/2025	
306	Oct 15/2024	O 318	Feb 15/2025			R 311	Feb 15/2025	
307	Oct 15/2024	O 319	Feb 15/2025			R 312	Feb 15/2025	
308	Oct 15/2020	O 320	Feb 15/2025			R 313	Feb 15/2025	
309	Oct 15/2024	A 321	Feb 15/2025			314	Oct 15/2024	
310	Oct 15/2020	A 322	BLANK			R 315	Feb 15/2025	
311	Oct 15/2020	12-15-21 Config 2				R 316	Feb 15/2025	
312	BLANK	301	Jun 15/2023					

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R 317	Feb 15/2025		312	Oct 15/2023		304	Oct 15/2022	
R 318	Feb 15/2025		313	Feb 15/2024		305	Feb 15/2019	
R 319	Feb 15/2025		314	Feb 15/2024		306	Feb 15/2019	
R 320	Feb 15/2025		315	Feb 15/2024		307	Oct 15/2019	
12-15-41			316	Oct 15/2022		308	Oct 15/2019	
R 301	Feb 15/2025		317	Feb 15/2023		309	Oct 15/2019	
302	Oct 15/2024		318	Jun 15/2018		310	Oct 15/2019	
R 303	Feb 15/2025		12-15-61			12-21-11		
304	Oct 15/2024		301	Feb 15/2019		301	Jun 15/2023	
305	Oct 15/2024		302	Feb 15/2019		302	Jun 15/2023	
306	Oct 15/2024		12-16-02			303	Jun 15/2023	
307	Oct 15/2024		301	Oct 15/2024		304	Feb 15/2018	
308	Oct 15/2024		302	Oct 15/2024		305	Feb 15/2018	
R 309	Feb 15/2025		303	Oct 15/2024		306	Feb 15/2018	
O 310	Feb 15/2025		304	Jun 15/2024		307	Feb 15/2018	
311	Oct 15/2024		305	Jun 15/2024		308	Feb 15/2018	
312	Oct 15/2024		306	Oct 15/2024		309	Feb 15/2018	
R 313	Feb 15/2025		307	Oct 15/2024		310	Feb 15/2018	
R 314	Feb 15/2025		308	Oct 15/2024		311	Feb 15/2018	
R 315	Feb 15/2025		309	Jun 15/2024		312	Jun 15/2023	
O 316	Feb 15/2025		310	BLANK		R 313	Feb 15/2025	
O 317	Feb 15/2025		12-16-03			R 314	Feb 15/2025	
R 318	Feb 15/2025		301	Oct 15/2022		R 315	Feb 15/2025	
R 319	Feb 15/2025		302	Oct 15/2022		316	Oct 15/2015	
R 320	Feb 15/2025		303	Oct 15/2022		R 317	Feb 15/2025	
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301	Oct 15/2023		12-17-01			319	Feb 15/2022	
302	Oct 15/2023		301	Feb 15/2022		320	Feb 15/2021	
303	Oct 15/2023		302	Jun 15/2023		321	Feb 15/2021	
304	Oct 15/2023		303	Jun 15/2023		322	BLANK	
305	Oct 15/2023		304	Nov 15/2022		12-21-21		
306	Oct 15/2023		305	Oct 15/2024		301	Oct 15/2022	
307	Oct 15/2024		306	Jun 15/2023		302	Oct 15/2022	
308	Jun 15/2018		12-20-00			303	Oct 15/2015	
309	Jun 15/2018		301	Oct 15/2022		304	Jun 15/2018	
310	Jun 15/2018		302	Oct 15/2022		305	Oct 15/2022	
311	Feb 15/2024		303	Oct 15/2022		306	Oct 15/2022	

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307	Jun 15/2020		307	Feb 15/2022		308	Oct 15/2024	
308	Jun 15/2020		308	Feb 15/2022		309	Oct 15/2024	
12-21-32			309	Feb 15/2022	R 310	Feb 15/2025		
301	Jun 15/2020		310	Jun 15/2018	R 311	Feb 15/2025		
302	Jun 15/2020	12-22-31			312	Oct 15/2024		
303	Oct 15/2014		301	Oct 15/2021		313	Oct 15/2024	
304	Feb 15/2016		302	Oct 15/2021		314	Oct 15/2024	
305	Feb 15/2016		303	Feb 15/2021		315	Oct 15/2024	
306	Feb 15/2016		304	Oct 15/2015		316	Oct 15/2024	
12-22-11			305	Feb 15/2021	R 317	Feb 15/2025		
301	Oct 15/2023		306	Jun 15/2022	R 318	Feb 15/2025		
302	Oct 15/2023		307	Jun 15/2022	R 319	Feb 15/2025		
303	Oct 15/2023		308	Oct 15/2023		320	Oct 15/2024	
304	Jun 15/2021		309	Oct 15/2023		321	Oct 15/2024	
305	Jun 15/2021		310	Oct 15/2023		322	Oct 15/2024	
306	Jun 15/2021		311	Oct 15/2023	R 323	Feb 15/2025		
307	Oct 15/2024		312	Oct 15/2023	R 324	Feb 15/2025		
308	Jun 15/2021		313	Feb 15/2024	R 325	Feb 15/2025		
309	Jun 15/2021		314	Oct 15/2023		326	Oct 15/2024	
310	Oct 15/2024		315	Oct 15/2023		327	Oct 15/2024	
311	Oct 15/2024		316	Oct 15/2023		328	Oct 15/2024	
312	Jun 15/2024		317	Oct 15/2023			BLANK	
R 313	Feb 15/2025		318	Oct 15/2023	12-22-51			
314	Oct 15/2023		319	Feb 15/2024		301	Oct 15/2021	
315	Jun 15/2021		320	Feb 15/2024		302	Jun 15/2022	
316	Oct 15/2023		321	Oct 15/2023		303	Jun 15/2022	
317	Oct 15/2023		322	Oct 15/2023		304	Jun 15/2022	
318	Jun 15/2021		323	Oct 15/2023		305	Oct 15/2021	
319	Oct 15/2023		324	BLANK		306	Oct 15/2021	
320	Jun 15/2021	12-22-41				307	Oct 15/2021	
12-22-21			301	Jun 15/2024		308	Oct 15/2021	
301	Feb 15/2022		R 302	Feb 15/2025		309	Oct 15/2021	
302	Feb 15/2022		R 303	Feb 15/2025		310	Oct 15/2021	
303	Oct 15/2015		O 304	Feb 15/2025		311	Oct 15/2021	
304	Feb 15/2022		305	Jun 15/2024		312	Oct 15/2021	
305	Feb 15/2022		306	Oct 15/2024		313	Oct 15/2021	
306	Oct 15/2015		307	Oct 15/2024		314	Oct 15/2021	

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315	Oct 15/2021		351	Oct 15/2021		387	Oct 15/2024	
316	Oct 15/2021		352	Oct 15/2021		388	Oct 15/2024	
317	Oct 15/2021		353	Oct 15/2021		389	Oct 15/2024	
318	Oct 15/2021		354	Oct 15/2021		390	Oct 15/2024	
319	Oct 15/2021		355	Oct 15/2021		391	Oct 15/2024	
320	Oct 15/2021		356	Oct 15/2021		392	Oct 15/2024	
321	Oct 15/2021		357	Oct 15/2024		393	Oct 15/2024	
322	Oct 15/2021		358	Oct 15/2024		394	Oct 15/2024	
323	Oct 15/2021		359	Oct 15/2024		395	Oct 15/2024	
324	Oct 15/2021		360	Oct 15/2024		396	Oct 15/2024	
325	Oct 15/2021		361	Oct 15/2024	R	397	Feb 15/2025	
326	Oct 15/2021		362	Oct 15/2024		398	Oct 15/2024	
327	Oct 15/2021		363	Oct 15/2024		398.1	Oct 15/2024	
328	Oct 15/2021		364	Oct 15/2024		398.2	Oct 15/2024	
329	Oct 15/2021		365	Oct 15/2024		398.3	Oct 15/2024	
330	Oct 15/2021		366	Oct 15/2024		398.4	Oct 15/2024	
331	Oct 15/2021		367	Oct 15/2024		398.5	Oct 15/2024	
332	Oct 15/2021		368	Oct 15/2024		398.6	Oct 15/2024	
333	Oct 15/2021	R	369	Feb 15/2025		398.7	Oct 15/2024	
334	Oct 15/2021	R	370	Feb 15/2025		398.8	Oct 15/2024	
335	Oct 15/2021		371	Oct 15/2024		398.9	Oct 15/2024	
336	Oct 15/2021		372	Oct 15/2024		398.10	Oct 15/2024	
337	Oct 15/2021		373	Oct 15/2024		398.11	Oct 15/2024	
338	Oct 15/2021		374	Oct 15/2024		398.12	Oct 15/2024	
339	Oct 15/2021		375	Oct 15/2024		398.13	Oct 15/2024	
340	Oct 15/2021		376	Oct 15/2024		398.14	Oct 15/2024	
341	Oct 15/2021		377	Oct 15/2024		398.15	Oct 15/2024	
342	Oct 15/2021		378	Oct 15/2024		398.16	Oct 15/2024	
343	Oct 15/2021		379	Oct 15/2024		398.17	Oct 15/2024	
344	Oct 15/2021		380	Oct 15/2024		398.18	Oct 15/2024	
345	Oct 15/2021		381	Oct 15/2024		398.19	Oct 15/2024	
346	Oct 15/2021		382	Oct 15/2024		398.20	Oct 15/2024	
347	Oct 15/2021		383	Oct 15/2024		398.21	Oct 15/2024	
348	Oct 15/2021		384	Oct 15/2024		398.22	Oct 15/2024	
349	Oct 15/2021		385	Oct 15/2024		398.23	Oct 15/2024	
350	Oct 15/2021		386	Oct 15/2024		398.24	Oct 15/2024	

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398.25	Oct 15/2024		314	Feb 15/2023		309	Oct 15/2024	
398.26	Oct 15/2024		12-22-81			310	Oct 15/2024	
398.27	Oct 15/2024		301	Feb 15/2021		12-25-13		
398.28	Oct 15/2024		302	Feb 15/2021		R 301	Feb 15/2025	
398.29	Oct 15/2024		303	Oct 15/2015		R 302	Feb 15/2025	
398.30	BLANK		304	BLANK		R 303	Feb 15/2025	
12-22-61			12-25-07			R 304	Feb 15/2025	
301	Feb 15/2021		301	Oct 15/2022		R 305	Feb 15/2025	
302	Feb 15/2021		302	Oct 15/2022		O 306	Feb 15/2025	
303	Apr 15/2022		303	Jun 15/2019		O 307	Feb 15/2025	
304	Oct 15/2024		304	Jun 15/2019		O 308	Feb 15/2025	
305	Oct 15/2024		305	Jun 15/2019		O 309	Feb 15/2025	
306	Oct 15/2023		306	Jun 15/2019		O 310	Feb 15/2025	
307	Jun 15/2023		12-25-11			O 311	Feb 15/2025	
308	Oct 15/2024		301	Oct 15/2022		O 312	Feb 15/2025	
309	Oct 15/2023		302	Oct 15/2022		O 313	Feb 15/2025	
310	Oct 15/2023		303	Oct 15/2015		O 314	Feb 15/2025	
311	Oct 15/2024		304	Oct 15/2015		12-25-22		
312	Oct 15/2024		305	Oct 15/2015		301	Jun 15/2022	
313	Jun 15/2023		306	Oct 15/2015		302	Jun 15/2022	
314	Jun 15/2023		307	Oct 15/2024		303	Oct 15/2015	
315	Jun 15/2023		308	Oct 15/2024		304	Jun 15/2022	
316	BLANK		309	Oct 15/2015		12-25-31		
12-22-71			310	Oct 15/2015		301	Jun 15/2023	
301	Oct 15/2015		311	Oct 15/2015		302	Jun 15/2023	
302	Oct 15/2024		312	Oct 15/2015		303	Oct 15/2015	
303	Oct 15/2017		313	Oct 15/2015		304	BLANK	
304	Oct 15/2017		314	BLANK		12-25-41		
305	Oct 15/2017		12-25-12			301	Jun 15/2022	
306	Oct 15/2015		301	Oct 15/2024		302	Jun 15/2022	
307	Oct 15/2015		302	Oct 15/2024		303	Oct 15/2015	
308	Oct 15/2015		303	Oct 15/2024		304	Jun 15/2022	
309	Oct 15/2024		304	Oct 15/2024		305	Oct 15/2015	
310	Oct 15/2017		305	Oct 15/2024		306	Oct 15/2015	
311	Oct 15/2022		306	Oct 15/2024		307	Jun 15/2022	
312	Oct 15/2022		307	Oct 15/2024		308	Oct 15/2015	
313	Oct 15/2015		308	Oct 15/2024		309	Jun 15/2022	

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310	BLANK		331	Jun 15/2020		367	Oct 15/2024	
12-25-81			332	Jun 15/2020		368	Oct 15/2024	
301	Jun 15/2022		333	Jun 15/2020		369	Oct 15/2024	
302	Jun 15/2022		334	Jun 15/2020		370	Oct 15/2021	
303	Oct 15/2015		335	Jun 15/2020		371	Oct 15/2024	
304	Oct 15/2015		336	Oct 15/2020		372	Oct 15/2021	
12-26-00			337	Oct 15/2020		373	Oct 15/2024	
301	Jun 15/2022		338	Jun 15/2020		374	Oct 15/2021	
302	Jun 15/2022		339	Jun 15/2020		375	Jun 15/2020	
303	Jun 15/2020		340	Jun 15/2020		376	Jun 15/2023	
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305	Oct 15/2015		342	Jun 15/2020		378	Oct 15/2024	
306	Oct 15/2015		343	Jun 15/2020		379	Jun 15/2024	
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309	Oct 15/2015		346	Jun 15/2020		382	BLANK	
311	Oct 15/2015		347	Jun 15/2020	12-33-01			
312	Oct 15/2015		348	Jun 15/2020		301	Apr 15/2022	
313	Oct 15/2015		349	Jun 15/2024		302	Feb 15/2019	
314	Oct 15/2015		350	Jun 15/2020		303	Apr 15/2022	
315	Feb 15/2016		351	Oct 15/2024		304	Feb 15/2024	
316	Oct 15/2015		352	Oct 15/2024		305	Feb 15/2024	
317	Oct 15/2015		353	Jun 15/2020		306	Feb 15/2024	
318	Jun 15/2017		354	Jun 15/2020		307	Apr 15/2022	
319	Jun 15/2020		355	Jun 15/2020		308	Apr 15/2022	
320	Oct 15/2024		356	Jun 15/2020		309	Apr 15/2022	
321	Oct 15/2024		357	Oct 15/2021		310	Apr 15/2022	
322	Nov 15/2022		358	Jun 15/2020		311	Apr 15/2022	
323	Jun 15/2020		359	Jun 15/2020		312	Apr 15/2022	
324	Jun 15/2020		360	Jun 15/2020		313	Apr 15/2022	
325	Jun 15/2020		361	Jun 15/2020		314	Apr 15/2022	
326	Feb 15/2024		362	Feb 15/2021		315	Apr 15/2022	
327	Feb 15/2024		363	Oct 15/2024		316	Apr 15/2022	
328	Jun 15/2020		364	Jun 15/2020		317	Apr 15/2022	
329	Jun 15/2023		365	Oct 15/2021		318	Apr 15/2022	
330	Feb 15/2024		366	Jun 15/2020		319	Apr 15/2022	

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320	Oct 15/2022		205	Oct 15/2024		O 241	Feb 15/2025	
321	Oct 15/2022		R 206	Feb 15/2025		O 242	Feb 15/2025	
322	BLANK		R 207	Feb 15/2025		O 243	Feb 15/2025	
12-33-02			O 208	Feb 15/2025		O 244	Feb 15/2025	
301	Jun 15/2020		R 209	Feb 15/2025		12-40-04		
302	Oct 15/2024		O 210	Feb 15/2025		R 201	Feb 15/2025	
303	Oct 15/2024		O 211	Feb 15/2025		202	Oct 15/2023	
304	Jun 15/2020		O 212	Feb 15/2025				
305	Feb 15/2022		O 213	Feb 15/2025				
306	Jun 15/2020		O 214	Feb 15/2025				
307	Jun 15/2020		O 215	Feb 15/2025				
308	Oct 15/2024		O 216	Feb 15/2025				
309	Oct 15/2024		R 217	Feb 15/2025				
310	Oct 15/2024		O 218	Feb 15/2025				
311	Oct 15/2024		O 219	Feb 15/2025				
312	Nov 15/2022		O 220	Feb 15/2025				
313	Feb 15/2023		O 221	Feb 15/2025				
314	Nov 15/2022		O 222	Feb 15/2025				
315	Nov 15/2022		O 223	Feb 15/2025				
316	Oct 15/2024		O 224	Feb 15/2025				
317	Feb 15/2023		O 225	Feb 15/2025				
318	Jun 15/2023		O 226	Feb 15/2025				
319	Oct 15/2024		O 227	Feb 15/2025				
320	Oct 15/2024		O 228	Feb 15/2025				
321	Oct 15/2024		O 229	Feb 15/2025				
322	Nov 15/2022		O 230	Feb 15/2025				
323	Nov 15/2022		O 231	Feb 15/2025				
324	Jun 15/2023		O 232	Feb 15/2025				
325	Jun 15/2023		O 233	Feb 15/2025				
326	Jun 15/2023		O 234	Feb 15/2025				
327	Nov 15/2022		O 235	Feb 15/2025				
328	Nov 15/2022		R 236	Feb 15/2025				
12-40-00			201	Feb 15/2021		R 237	Feb 15/2025	
			202	Oct 15/2024		O 238	Feb 15/2025	
R 203	Feb 15/2025		R 204	Oct 15/2024		O 239	Feb 15/2025	
						O 240	Feb 15/2025	

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

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SERVICING

SUBJECT	CHAPTER	SECTION	SUBJECT	CONF	PAGE	EFFECT
<u>SERVICING - GENERAL</u>						
Servicing - General	12-00-00				301	LOM ALL
TASK 12-00-00-610-801					301	LOM ALL
<u>FUEL - SERVICING</u>	12-11-00				301	LOM ALL
Precautions and Limits for the Refuel Operation					301	LOM ALL
TASK 12-11-00-650-801						
Prepare the Airplane for a Refuel Operation					314	LOM ALL
TASK 12-11-00-650-807						
Pressure Refuel Procedure					315	LOM ALL
TASK 12-11-00-650-802						
Refuel Operation When the Refuel Quantity Indicators Flash					321	LOM ALL
TASK 12-11-00-650-808						
Refuel Operation When the Fuel Quantity Indicating System Does not Operate					322	LOM ALL
TASK 12-11-00-650-803						
Pressure Refueling Operation For A Refuel Valve That Does Not Open Electrically					326	LOM ALL
TASK 12-11-00-650-806						
Fuel System Sumping					328	LOM ALL
TASK 12-11-00-680-801						
Drain the Fuel from the Sumps after Defueling					338	LOM ALL
TASK 12-11-00-650-804						
<u>HYDRAULIC RESERVOIR - SERVICING</u>	12-12-00				301	LOM ALL
Hydraulic Reservoir Servicing					301	LOM ALL
TASK 12-12-00-610-801						
<u>ENGINE OIL - SERVICING</u>	12-13-11				301	LOM ALL
Replenish the Engine Oil					301	LOM ALL
TASK 12-13-11-600-801						
Replenish the Engine Oil (Remote Fill Procedure)					308	LOM ALL
TASK 12-13-11-600-806						
Drain the Engine Oil					314	LOM ALL
TASK 12-13-11-600-803						
Flush the Engine Oil System					320	LOM ALL
TASK 12-13-11-100-801						

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Oil Sampling For Analysis TASK 12-13-11-750-801					322	LOM ALL
<u>INTEGRATED DRIVE GENERATOR (IDG) - SERVICING</u>	12-13-21				301	LOM ALL
IDG Oil Level Check TASK 12-13-21-200-801					301	LOM ALL
IDG Servicing (Oil Fill) TASK 12-13-21-600-801					306	LOM ALL
IDG Differential Pressure Indicator (DPI) Check TASK 12-13-21-200-802					309	LOM ALL
IDG Oil Change TASK 12-13-21-600-802					313	LOM ALL
<u>APU GEARBOX - SERVICING</u>	12-13-31				301	LOM ALL
APU Oil Level Inspection TASK 12-13-31-200-801					301	LOM ALL
Drain the APU Oil TASK 12-13-31-610-801					307	LOM ALL
Flush the APU Oil TASK 12-13-31-610-802					311	LOM ALL
Fill the APU Gearbox TASK 12-13-31-610-803					312	LOM ALL
<u>POTABLE WATER SYSTEM - SERVICING</u>	12-14-01				301	LOM ALL
Potable Water System - Drain TASK 12-14-01-600-801					301	LOM ALL
Potable Water Tank - Fill TASK 12-14-01-600-802					304	LOM ALL
<u>HYDRAULIC BRAKE ACCUMULATOR - SERVICING</u>	12-15-11				301	LOM ALL
Check of the Brake Accumulator Pre-charge Pressure TASK 12-15-11-610-801					301	LOM ALL
Hydraulic Brake Accumulator Servicing TASK 12-15-11-420-801					306	LOM ALL

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OXYGEN - SERVICING		12-15-21		301	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999
Crew Oxygen Cylinder Replacement TASK 12-15-21-600-801				301	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999
Crew Oxygen Cylinder Dispatch Pressure Check TASK 12-15-21-210-801				321	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999
OXYGEN - SERVICING	12-15-21	2		301	LOM 443, 444, 450
Remote Fill Panel Servicing TASK 12-15-21-610-801-002		2		301	LOM 443, 444, 450
Crew Oxygen Cylinder Replacement TASK 12-15-21-600-803-002		2		309	LOM 443, 444, 450
Crew Oxygen Cylinder Dispatch Pressure Check TASK 12-15-21-210-801-002		2		320	LOM 443, 444, 450
MAIN LANDING GEAR SHOCK STRUT - SERVICING	12-15-31			301	LOM ALL
Main Landing Gear Shock Strut Fluid Check TASK 12-15-31-610-801				301	LOM ALL
Main Landing Gear Shock Strut Servicing, Airplane on the Ground TASK 12-15-31-610-802				304	LOM ALL
Main Landing Gear Strut Servicing, Airplane on Jacks TASK 12-15-31-610-805				315	LOM ALL
NOSE LANDING GEAR SHOCK STRUT - SERVICING	12-15-41			301	LOM ALL
Nose Landing Gear Shock Strut Fluid Check TASK 12-15-41-610-801				301	LOM ALL
Nose Landing Gear Shock Strut Servicing, Airplane on the Ground TASK 12-15-41-610-802				309	LOM ALL
Nose Landing Gear Shock Strut Servicing, Airplane on Jacks TASK 12-15-41-610-805				314	LOM ALL

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LANDING GEAR TIRE - SERVICING		12-15-51		301	LOM ALL
Landing Gear Tire Pressure Check and Tire Servicing				301	LOM ALL
TASK 12-15-51-780-801					
Main Landing Gear and Nose Gear Hot Tire Pressure Check				311	LOM ALL
TASK 12-15-51-780-802					
Add Nitrogen or Air to the Tire				316	LOM ALL
TASK 12-15-51-610-802					
LANDING GEAR SHOCK STRUT FLUID - SERVICING	12-15-61			301	LOM ALL
Landing Gear Shock Strut Fluids				301	LOM ALL
TASK 12-15-61-610-801					
FLIGHT COMPARTMENT WINDOWS - SERVICING	12-16-02			301	LOM ALL
Clean the Glass Flight Compartment Windows - Inner Surface				301	LOM ALL
TASK 12-16-02-100-801					
Clean the Glass Flight Compartment Windows - Outer Surface				304	LOM ALL
TASK 12-16-02-100-802					
Clean the Acrylic Flight Compartment Windows - Inner Surface				305	LOM ALL
TASK 12-16-02-100-803					
Clean the Acrylic Flight Compartment Windows - Outer Surface				308	LOM ALL
TASK 12-16-02-100-804					
PASSENGER COMPARTMENT WINDOWS - SERVICING	12-16-03			301	LOM ALL
Clean The Passenger Compartment Windows				301	LOM ALL
TASK 12-16-03-100-801					
Apply Antistatic Solution to the Passenger Compartment Windows				302	LOM ALL
TASK 12-16-03-600-801					
WASTE TANK - SERVICING	12-17-01			301	LOM ALL
Waste Tank Servicing				301	LOM ALL
TASK 12-17-01-610-801					

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<u>AIRPLANE LUBRICATION - SERVICING</u>		12-20-00		301	LOM ALL
General Instructions for Lubrication				301	LOM ALL
TASK 12-20-00-640-801					
Intermixing or Purging of Greases				306	LOM ALL
TASK 12-20-00-640-802					
Lubrication of Landing Gear During Cold Weather Operation				307	LOM ALL
TASK 12-20-00-600-801					
<u>MAIN LANDING GEAR - SERVICING</u>	12-21-11			301	LOM ALL
Main Landing Gear Upper End Components Servicing				301	LOM ALL
TASK 12-21-11-640-801					
Main Landing Gear Lower End Components Servicing				312	LOM ALL
TASK 12-21-11-640-802					
Main Landing Gear Bushings Servicing				318	LOM ALL
TASK 12-21-11-620-801					
<u>NOSE LANDING GEAR - SERVICING</u>	12-21-21			301	LOM ALL
Nose Landing Gear Upper End Components Servicing				301	LOM ALL
TASK 12-21-21-640-801					
Nose Landing Gear Lower End Components Servicing				305	LOM ALL
TASK 12-21-21-640-802					
<u>STRUT ATTACH FITTING LUBRICATION</u>	12-21-32			301	LOM ALL
Lubricate the Strut Attach Fittings				301	LOM ALL
TASK 12-21-32-600-801					
<u>AILERON - SERVICING</u>	12-22-11			301	LOM ALL
Aileron Hinge Lubrication				301	LOM ALL
TASK 12-22-11-640-801					
Aileron Balance Tab Lubrication				306	LOM ALL
TASK 12-22-11-600-801					
Aileron Tab Control Rods Lubrication				312	LOM ALL
TASK 12-22-11-640-802					

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Aileron Wing Quadrant Control Rod Lubrication TASK 12-22-11-640-803				316	LOM ALL
Aileron Power Output Lever Lubrication TASK 12-22-11-640-804				319	LOM ALL
RUDDER - SERVICING	12-22-21			301	LOM ALL
Rudder Power Control Units (PCUs) Lubrication TASK 12-22-21-600-801				301	LOM ALL
Spring Slider Shaft Lubrication TASK 12-22-21-600-802				304	LOM ALL
Rudder Hinge Lubrication TASK 12-22-21-640-801				307	LOM ALL
ELEVATOR - SERVICING	12-22-31			301	LOM ALL
Elevator Buss Crank and Master Arm Fitting - Lubrication TASK 12-22-31-600-801				301	LOM ALL
Elevator Hinge Bearings - Lubrication TASK 12-22-31-640-801				306	LOM ALL
Elevator Tab Hinge Lubrication TASK 12-22-31-640-802				314	LOM ALL
Elevator Balance Panel - Lubrication TASK 12-22-31-600-802				318	LOM ALL
STABILIZER CONTROL SYSTEM - SERVICING	12-22-41			301	LOM ALL
Stabilizer Jackscrew, Ballnut and Gimbal - Lubrication TASK 12-22-41-600-801				301	LOM ALL
Stabilizer Trim System Chain - Lubrication TASK 12-22-41-600-802				312	LOM ALL
Stabilizer Trim Flexible Shaft - Lubrication TASK 12-22-41-600-803				317	LOM ALL
Horizontal Stabilizer Actuator Brake - Servicing TASK 12-22-41-610-802				323	LOM ALL
TRAILING EDGE FLAP SYSTEM - SERVICING	12-22-51			301	LOM ALL
Trailing Edge Flap Torque Tube and Torque Tube Support Lubrication TASK 12-22-51-640-801				301	LOM ALL

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Inboard Flap Inboard Ballscrew Lubrication and U-Joint Lubrication				315	LOM ALL
TASK 12-22-51-640-802					
Inboard Flap Outboard Ballscrew and U-Joint Lubrication				320	LOM ALL
TASK 12-22-51-640-803					
Outboard Flap Inboard Ballscrew and U-Joint Lubrication				325	LOM ALL
TASK 12-22-51-640-804					
Outboard Flap Outboard Ballscrew and U-Joint Lubrication				331	LOM ALL
TASK 12-22-51-640-805					
U-Joint and Tee Angle Gearbox Lubrication				337	LOM ALL
TASK 12-22-51-640-806					
Inboard Flap Inboard Skew Mechanism Lubrication				341	LOM ALL
TASK 12-22-51-640-807					
Inboard Flap Outboard Skew Mechanism Lubrication				345	LOM ALL
TASK 12-22-51-640-808					
Outboard Flap Inboard Skew Mechanism Lubrication				349	LOM ALL
TASK 12-22-51-640-809					
Outboard Flap Outboard Skew Mechanism Lubrication				353	LOM ALL
TASK 12-22-51-640-810					
Inboard Main Flap and Aft Flap Roller and Linkage Lubrication				357	LOM ALL
TASK 12-22-51-640-811					
Outboard Main Flap and Aft Flap Roller and Linkage Lubrication				368	LOM ALL
TASK 12-22-51-640-812					
Inboard Flap Inboard Flap Track Lubrication				383	LOM ALL
TASK 12-22-51-640-813					
Inboard Flap Outboard Flap Track Lubrication				387	LOM ALL
TASK 12-22-51-640-814					
Outboard Flap Inboard Flap Track Lubrication				390	LOM ALL
TASK 12-22-51-640-815					

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Outboard Flap Outboard Flap Track Lubrication TASK 12-22-51-640-816				393	LOM ALL
Trailing Edge Flap Power Drive Unit Servicing TASK 12-22-51-610-801				396	LOM ALL
Trailing Edge Flap Power Drive Unit Fluid Replacement TASK 12-22-51-610-802				398.2	LOM ALL
Trailing Edge Flap Transmission Servicing TASK 12-22-51-610-803				398.6	LOM ALL
Trailing Edge Flap Transmission Oil Replacement TASK 12-22-51-610-804				398.13	LOM ALL
Trailing Edge Flap Electric Motor Servicing TASK 12-22-51-610-805				398.26	LOM ALL
SPOILER CONTROL SYSTEM - SERVICING	12-22-61			301	LOM ALL
Spoiler Mixer Lubrication TASK 12-22-61-600-801				301	LOM ALL
Flight Spoiler Actuator Quadrant and Rod End Lubrication TASK 12-22-61-600-802				303	LOM ALL
Outboard Ground Spoiler Actuator Lubrication TASK 12-22-61-640-801				311	LOM ALL
LEADING EDGE SLAT - SERVICING	12-22-71			301	LOM ALL
Leading Edge Slat Main Track Rollers Lubrication TASK 12-22-71-600-801				301	LOM ALL
Leading Edge Main and Auxiliary Tracks Lubrication TASK 12-22-71-640-801				308	LOM ALL
SPEED BRAKE LUBRICATION - SERVICING	12-22-81			301	LOM ALL
Speed Brake Lever Brake Assembly Lubrication TASK 12-22-81-600-801				301	LOM ALL
MAIN LANDING GEAR SUPPORT BEAM - SERVICING	12-25-07			301	LOM ALL
Lubricate the Support Beam Assembly of the Main Landing Gear TASK 12-25-07-600-801				301	LOM ALL

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FORWARD ENTRY DOOR - SERVICING		12-25-11		301	LOM ALL
Forward Entry Door Servicing - Components				301	LOM ALL
TASK 12-25-11-640-801					
Forward Entry Door Servicing - Mechanism				307	LOM ALL
TASK 12-25-11-640-802					
AFT ENTRY DOOR - SERVICING		12-25-12		301	LOM ALL
Aft Entry Door Lubrication - Components				301	LOM ALL
TASK 12-25-12-640-801					
Aft Entry Door Servicing - Mechanism				306	LOM ALL
TASK 12-25-12-640-802					
GALLEY SERVICE DOORS - SERVICING		12-25-13		301	LOM ALL
Forward Galley Service Door Servicing - Components				301	LOM ALL
TASK 12-25-13-640-801					
Aft Galley Service Door Servicing - Components				306	LOM ALL
TASK 12-25-13-640-803					
Forward Galley Service Door Lubrication - Mechanism				307	LOM ALL
TASK 12-25-13-640-802					
Aft Galley Service Door Lubrication - Mechanism				313	LOM ALL
TASK 12-25-13-640-804					
EMERGENCY EXIT DOOR - SERVICING		12-25-22		301	LOM ALL
Emergency Exit Door Servicing				301	LOM ALL
TASK 12-25-22-640-801					
CARGO DOORS - SERVICING		12-25-31		301	LOM ALL
Cargo Door Servicing				301	LOM ALL
TASK 12-25-31-640-801					
ACCESS AND SERVICE DOORS - SERVICING		12-25-41		301	LOM ALL
Electronic Equipment Access Door Servicing				301	LOM ALL
TASK 12-25-41-640-801					
Forward Access Door Servicing				307	LOM ALL
TASK 12-25-41-640-802					

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<u>NO. 2 SLIDING WINDOW LUBRICATION - SERVICING</u>		12-25-81		301	LOM ALL
	No. 2 Sliding Window Lubrication TASK 12-25-81-600-801			301	LOM ALL
<u>CABLE LUBRICATION - SERVICING</u>		12-26-00		301	LOM ALL
	Control Cable Lubrication TASK 12-26-00-600-801			301	LOM ALL
<u>COLD WEATHER MAINTENANCE - SERVICING</u>		12-33-01		301	LOM ALL
	Cold Weather Maintenance Procedure TASK 12-33-01-600-802			301	LOM ALL
<u>EXTREME COLD WEATHER MAINTENANCE - SERVICING</u>		12-33-02		301	LOM ALL
	Cold Weather Attended Parking TASK 12-33-02-600-804			301	LOM ALL
	Return the Airplane to Service After Cold Weather Attended Parking TASK 12-33-02-600-810			307	LOM ALL
	Cold Weather Unattended Parking at Temperatures Below 32°F (0°C) TASK 12-33-02-600-805			312	LOM ALL
	Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C) TASK 12-33-02-600-806			317	LOM ALL
<u>AIRPLANE CLEANING AND POLISHING - MAINTENANCE PRACTICES</u>		12-40-00		201	LOM ALL
	Clean (Wet Wash) the External Surfaces of the Airplane TASK 12-40-00-100-801			201	LOM ALL
	Clean (Waterless Wash) the External Surfaces of the Airplane TASK 12-40-00-100-803			232	LOM ALL
	Polish the External Surfaces of the Airplane TASK 12-40-00-100-802			234	LOM ALL

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Clean the Exterior Surface of Volcanic and Fire Ash					240	LOM ALL
TASK 12-40-00-100-805						
<u>BIRD STRIKE CLEANING - MAINTENANCE PRACTICES</u>			12-40-04		201	LOM ALL
Bird Strike Cleaning					201	LOM ALL
TASK 12-40-04-100-801						

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SERVICING - GENERAL

1. General

A. This section contains information for Replenishment of the system reservoirs or components.

TASK 12-00-00-610-801

2. Servicing - General

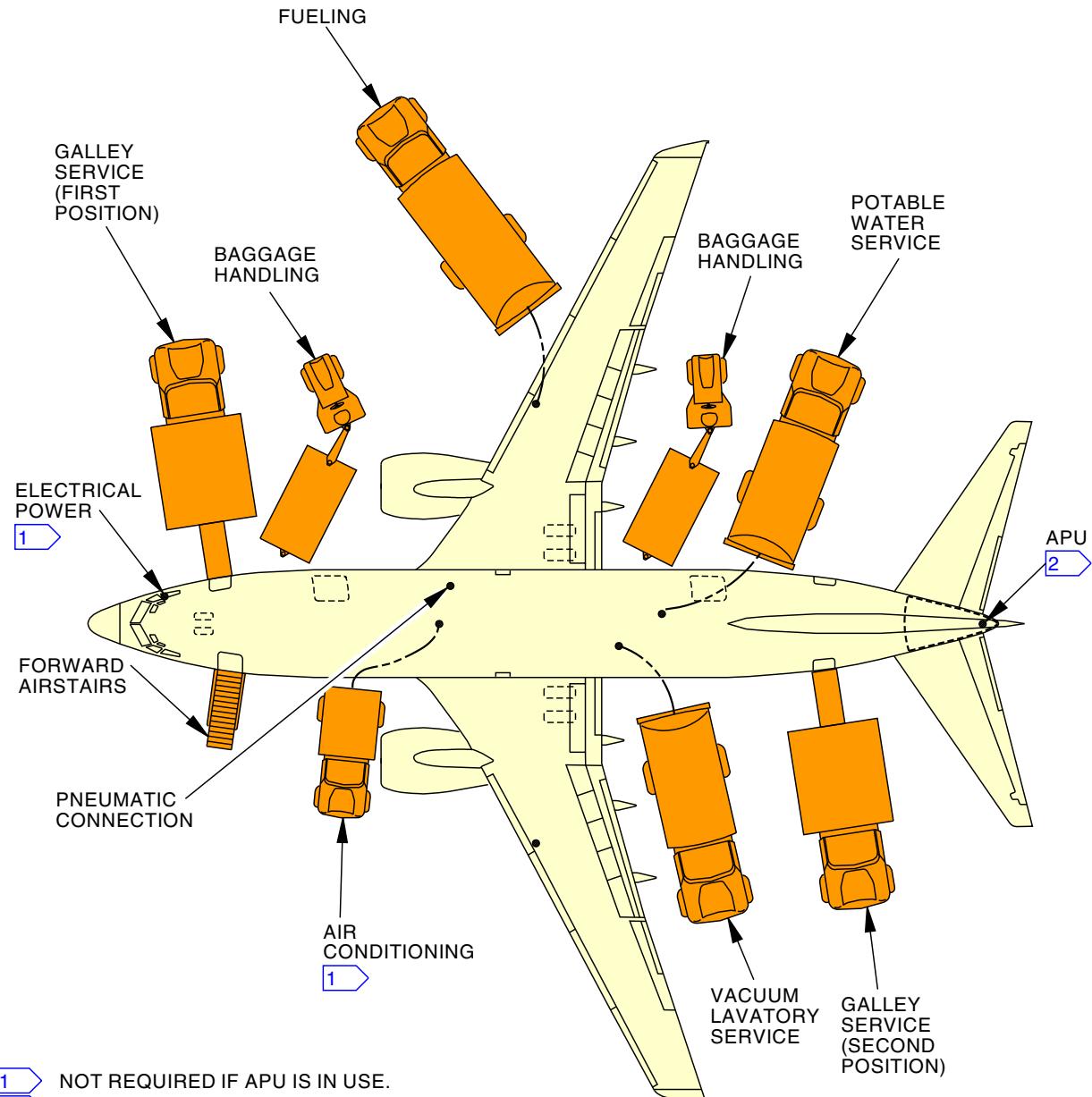
A. General

(1) For reservoir servicing locations see (Figure 301, Figure 302).

———— END OF TASK ———

EFFECTIVITY
LOM ALL

12-00-00



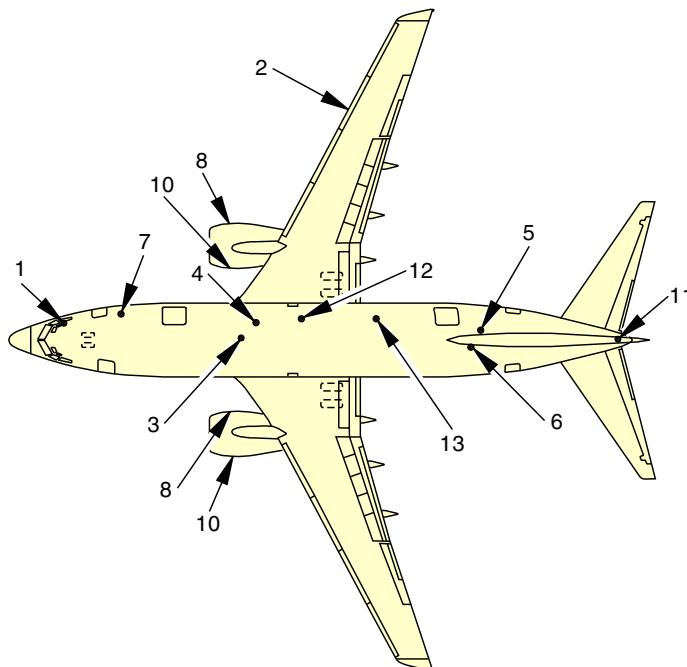
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Terminal Service Arrangement (Example)
Figure 301/12-00-00-990-801

EFFECTIVITY
 LOM ALL

12-00-00

D633A101-LOM

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POINT	SERVICE POINT	LOCATION
1	ELECTRICAL	BELLOW FLIGHT DECK WINDOW
2	PRESSURE FUELING	WING LEADING EDGE
3	CONDITIONED AIR	AFT OF THE FORWARD CARGO COMPARTMENT ON BOTTOM OF FUSELAGE
4	PNEUMATICS	AFT OF CONDITIONED AIR SERVICING POINT ON BOTTOM OF FUSELAGE
5	POTABLE WATER	BETWEEN RIGHT SIDE AFT CARGO DOOR AND PASSENGER SERVICE DOOR
6	VACUUM LAV SERVICE	FORWARD OF LEFT SIDE PASSENGER SERVICE DOOR
7	OXYGEN SERVICE (OPT)	AFT OF E/E COMPARTMENT EXTERNAL ACCESS DOOR ON BOTTOM OF AIRPLANE
8	ENGINE NO. 1 (OIL) ENGINE NO. 2 (OIL)	RIGHT SIDE OF ENGINE
10	ENGINE NO. 1 IDG (OIL) ENGINE NO. 2 IDG (OIL)	LEFT SIDE OF ENGINE
11	APU OIL	BACK OF AIRPLANE
12	HYDRAULIC RESERVOIR	RIGHT MAIN LANDING GEAR WHEEL WELL FORWARD BULKHEAD
13	BRAKE ACCUMULATOR	RIGHT MAIN LANDING GEAR WHEEL WELL AFT WALL

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Location of Ground Service Points
Figure 302/12-00-00-990-802

EFFECTIVITY
LOM ALL

12-00-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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FUEL - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) Precautions and Limits for the Refuel Operation
 - (2) Prepare the Airplane for a Refuel Operation
 - (3) Pressure Refuel Procedure
 - (4) Refuel Operation When the Refuel Quantity Indicators Flash
 - (5) Refuel Operation When the Fuel Quantity Indicating System (FQIS) Does Not Operate
 - (6) Pressure Refueling Operation For a Refuel Valve That Does Not Open Electrically
 - (7) Fuel System Drainage
 - (8) Drain the fuel from the Sumps after Defueling
- B. You must not permit the fuel tanks to collect too much water. Do the procedure to drain the sumps drain valves for each tank regularly.
- C. Fuel Servicing Regulations
 - (1) Each operator is responsible for complying with the local, state and national regulations regarding aircraft fuel servicing. It is possible that fire codes and standards make it necessary to use different or more restrictive procedures than those given below. Make sure the procedures used during the refuel operation give sufficient protection to persons and equipment.
 - (2) Obey all of the safety precautions supplied in this task: "Precautions and Limits for the Refuel Operation".
 - (3) If you make a decision not to do this recommended procedure, you must have an approved alternative procedure.

TASK 12-11-00-650-801

2. Precautions and Limits for the Refuel Operation

A. General

- (1) Obey all of the precautions in this task when you refuel the airplane.

B. 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)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)
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
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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(Continued)

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

D. Emergency Procedures

SUBTASK 12-11-00-650-025

- (1) Obey all airport and operator provided fire protection, rescue and fuel spill emergency procedures. Emergency procedures include these subjects:
 - (a) Location of emergency fuel shutoff
 - (b) Airport fire department phone numbers
 - (c) Evacuation of airplane passengers
 - (d) Fuel spill containment and ignition source reduction
 - (e) Location and use of fire extinguishers
 - (f) Responsibilities of fuel servicing and airplane servicing personnel.

SUBTASK 12-11-00-650-026

- (2) Refuel the airplane in areas which allow the free movement of air, fire fighting equipment and other emergency equipment.

SUBTASK 12-11-00-650-027

- (3) Stop the refuel operation if any conditions change which could cause an unsafe condition for persons or equipment.

E. Fuel Spills

SUBTASK 12-11-00-650-028

- (1) Each fuel spill event is different. Variables such as the size of the spill, weather conditions, equipment location, aircraft occupancy, emergency equipment and personnel available will determine the correct response to control the fire hazard.

SUBTASK 12-11-00-650-029

- (2) During a refuel operation, continuously monitor the airplane for fuel leaks and fuel spills at the wingtip.

SUBTASK 12-11-00-650-030

- (3) If a fuel spill occurs, do these steps:
 - (a) Stop the fuel flow.
 - (b) Unload and shutdown the Auxiliary Power Unit (APU) (TASK 49-11-00-860-802).
 - (c) Follow the fire department and operator provided fuel spill and fire protection emergency procedures.
 - (d) Find the cause of the fuel spill and correct it.
 - (e) Inspect enclosed areas to make sure they are free of fuel vapor.
 - (f) Do not start the refuel operation or start the APU again until the fire department or the person(s) in charge have given approval.

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F. Passenger Precautions

SUBTASK 12-11-00-650-031



WARNING

OBEY THESE PASSENGER PRECAUTIONS WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, INJURIES TO PERSONS CAN OCCUR.

- (1) Obey all airport and operator procedures if you refuel the airplane with passengers onboard.

SUBTASK 12-11-00-650-032

- (2) For each airplane type, a hazardous area must be identified for boarding or unloading passengers during a refuel operation. Barriers must be in place to stop passengers from entering this hazardous area.

G. Airplane System Precautions

SUBTASK 12-11-00-650-033



WARNING

OBEY THESE AIRPLANE SYSTEM PRECAUTIONS WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Do not operate these airplane systems during a refuel operation:
 - (a) High Frequency (HF) communications system

SUBTASK 12-11-00-650-035

- (2) The SATCOM system can be operated during a refuel operation.

SUBTASK 12-11-00-650-036

- (3) Obey these restrictions on maintenance tasks during a refuel operation:
 - (a) Do not connect or disconnect the battery chargers, aircraft ground-power generators or other electrical ground-power components. Do not test the power equipment until after the refuel operation is complete.
 - (b) Do not fill or change oxygen bottles.
 - (c) Do not remove electrical power.
NOTE: Damage to the refuel system components can occur.
 - (d) Do not start refueling if any part of the landing gear is unusually hot.

SUBTASK 12-11-00-650-037



CAUTION

DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 250 GALLONS/946 LITERS (1675 POUNDS/760 KILOGRAMS) OF FUEL IN IT. YOU CAN ALSO USE A PORTABLE EXTERNAL OIL COOLER (PEOC). IF YOU CONTINUE TO OPERATE THE EMDP, THE HYDRAULIC FLUID CAN BECOME TOO HOT. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do not operate a hydraulic system for more than two minutes if the tank that contains the exchanger for that hydraulic system has less than 250 gal (946 l) (1675 lb (760 kg)) of fuel.
 - (a) Do not operate hydraulic system A (placard controls) for more than two minutes if the No. 1 tank has less than 250 gal (946 l) (1675 lb (760 kg)) of fuel.

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- (b) Do not operate hydraulic system B or the standby hydraulic system (placard controls) for more than two minutes if the No. 2 tank has less than 250 gal (946 l) (1675 lb (760 kg)) of fuel.
- (c) If the hydraulic exchangers are not below the top level of the fuel, the system becomes too hot.

SUBTASK 12-11-00-650-038

- (5) Make sure these components are in the closed position before you start the refuel operation:

NOTE: Fuel spills, damage to the airplane or inability to close doors can occur if these components are not closed.

- (a) Wing pressure relief valves (two locations).
- (b) Make sure the wingtip vents are not blocked before you start the refuel operation.

SUBTASK 12-11-00-420-004



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.

- (6) Do an inspection of the refuel adapter before you connect the refuel 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 refuel adapter (TASK 28-21-11-000-801 and TASK 28-21-11-400-801).
- (c) Make sure the refuel/defuel handle is in the refuel position.

SUBTASK 12-11-00-650-039

- (7) Make sure the landing gear wheel chocks do not touch the tires. The wheel chocks can wedge against the tire after you add fuel.

SUBTASK 12-11-00-650-040

- (8) A refuel operation with a main engine operating is an emergency procedure. Obey all airport-and operator-provided emergency procedures.

H. APU Operations During Refueling and Defueling - Limits and Precautions

SUBTASK 12-11-00-860-019



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.

- (1) If the APU is operating during refueling, do these steps:

- (a) Obey the limits for the operation of the APU (TASK 49-11-00-710-802)
and, do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) You can start the APU during refueling if the start is an initial start or a restart after normal shutdown.
- (c) You can shut down the APU (manual or automatic) during the refueling operation.

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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 refueling before you try to start the APU again.
 - 2) Stop the refueling operation and disconnect the fuel hose(s) from the airplane fueling adapter(s) before you start the APU again.



WARNING

DO THESE STEPS IF AN APU FIRE OCCURS WHILE YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE STEPS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (e) If an APU fire occurs, do these steps in this sequence:
- 1) Stop the refueling operation.
 - 2) The APU should shut down automatically. 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) Notify persons on board the airplane and Airport Fire Services.



WARNING

OBEY THE PROCEDURES FOR THE APU IF YOU SPILL FUEL WHILE YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE REQUIREMENTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (f) If fuel spillage occurs, do these steps:
- 1) Stop the refueling operation.
 - 2) Notify persons on board 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 fueling vehicles are in a position that avoids any risk of coming in the path of the APU exhaust stream.

NOTE: Make sure the APU exhaust stream does not impinge on fueling vehicles for other airplanes. Make sure the fueling vehicles for this airplane are out of the APU exhaust stream of adjacent airplanes.

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I. Airplane Separation Distance Limits

SUBTASK 12-11-00-650-041



WARNING

OBEY THESE SEPARATION DISTANCES DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU DO NOT OBEY THESE SEPARATION DISTANCES, A FIRE OR AN EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Maintain the separation distance given in Table 301.

Table 301/12-11-00-993-807

EQUIPMENT OR IGNITION SOURCES	REFUEL/DEFUEL SEPARATION DISTANCE ^{*[1]}
Adjacent aircraft engine or APU	50 ft (15 m)
Fuel service equipment - measured from engine or exhaust system	10 ft (3 m) from fuel vents
Ground Power Units	20 ft (6 m)
Aircraft servicing equipment = measured from the engine or exhaust system	10 ft (3 m)
Electrical equipment that is likely to cause arcs or sparks	50 ft (15 m)
Photographic equipment	10 ft (3 m)
Battery powered equipment	10 ft (3 m) from fuel servicing equipment or fuel spills ^{*[2]}
Open flames, heat sources, lighted smoking material, and any other potential ignition sources	50 ft (15 m)
Electrical transmitting equipment	Refer to Table 302

*[1] The distance is measured from a point on the ground directly below the fuel vents or from fueling equipment.

*[2] Does not apply to battery powered equipment approved (by an independent testing laboratory) for use in Class I Division 1 hazardous locations.

SUBTASK 12-11-00-650-042



WARNING

OBEY THESE SEPARATION DISTANCES FOR THE ELECTRICAL SYSTEM DURING THE FUELING OF THE AIRPLANE. IF YOU DO NOT OBEY THIS PRECAUTION, A FIRE OR AN EXPLOSION CAN OCCUR.

- (2) Maintain the separation distance given in Table 302

Table 302/12-11-00-993-808

POWER (EIRP ^{*[1]} OF EQUIPMENT TRANSMITTING RADAR OR RADIO	REFUEL/DEFUEL SEPARATION DISTANCE ^{*[2]}
More than 100 watts (radio or radar)	200 ft (61 m)
25 to 100 watts (radio or radar)	50 ft (15 m)
Less than 25 watts ^{*[3]}	10 ft (3 m)

*[1] EIRP is Effective Isotropic Radiated Power in watts.

*[2] The distance is measured from a point on the ground directly below the fuel vents or from fueling equipment.

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- *[3] This category includes mobile phones, pagers, two-way radios, and similar wireless communication equipment. There are low power, intrinsically safe communication systems that are approved for use in hazardous locations. These devices can be used safely in areas that contain fuel vapor (UL 913 or equivalent standards).

J. Fuel Requirements

SUBTASK 12-11-00-650-043



WARNING

OBEY THESE FUEL GRADE LIMITS. THE INCORRECT GRADE OF FUEL CAN CAUSE AN ENGINE FLAMEOUT, DECREASE ENGINE PERFORMANCE, OR CAUSE DAMAGE.

- (1) Make sure the fuel source contains the correct fuel grade as specified by the Airplane Flight Manual (AFM).

SUBTASK 12-11-00-650-019



WARNING

DO NOT USE WIDE-CUT FUEL WHEN IT IS NOT PERMITTED. A FLAMEOUT CAN OCCUR, AND ENGINE POWER CAN DECREASE SUDDENLY. INJURIES TO PERSONS AND DAMAGE TO THE AIRPLANE CAN OCCUR IF YOU USE AN INCORRECT FUEL.

- (2) Do not use wide cut fuels.

NOTE: There is a placard on the refueling station that prevents the use of wide cut fuels. Wide cut fuel is fuel which satisfies ASTM D 6615, JET B or MIL-T-5624, JP-4. Wide cut fuel contains both kerosene and naphtha (gasoline) fractions. It is not certified for use on the Boeing 737-600/700/800 model of airplane.

K. Fuel Servicing Equipment Precautions

SUBTASK 12-11-00-650-044



WARNING

OBEY THESE PRECAUTIONS FOR FUEL SERVICING EQUIPMENT WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Obey all separation distance requirements (Table 301).

SUBTASK 12-11-00-650-045

- (2) Use only approved fuel servicing equipment in a serviceable condition.

SUBTASK 12-11-00-650-046

- (3) Do not disable deadman shutoff controls.

NOTE: Wire, rope or tools used to disable the deadman control can prevent the immediate shutoff of pressurized fuel. A disabled deadman control can cause a fuel spill hazard.

SUBTASK 12-11-00-650-047

- (4) When you position fuel servicing vehicles make sure the equipment:

- Has a clear exit path at all times.
- Does not interfere with access to the aircraft for rescue or fire protection.
- Does not obstruct the passenger evacuation routes.
- Does not obstruct the chute deployment areas.

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L. Ground Equipment and Airplane Servicing Equipment Precautions

SUBTASK 12-11-00-650-048



WARNING

OBEY THESE PRECAUTIONS FOR FUEL SERVICING EQUIPMENT WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Obey all separation distance requirements (Table 301).

SUBTASK 12-11-00-650-049

- (2) Do not put ground equipment below the fuel system vents at the wingtips. The fuel tanks are vented through the wingtips vents. An explosive mixture of fuel vapor can exist at these locations.

SUBTASK 12-11-00-650-050

- (3) Added fuel weight will compress the landing gear shock struts and lower the airplane. Make sure all stands, ladders, vehicles, and equipment that can come in contact with the airplane are removed before the refuel operation starts.

M. Personnel Precautions

SUBTASK 12-11-00-650-051



WARNING

YOU MUST OBEY THE SUBSEQUENT PERSONNEL PRECAUTIONS. IF YOU DO NOT OBEY THESE REQUIREMENTS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Personnel that refuel the airplane must be trained in the safe operation of these systems and procedures:
 - (a) 737 fuel servicing operations
 - (b) Fuel servicing equipment
 - (c) Fuel spill prevention
 - (d) Emergency controls
 - (e) Emergency equipment
 - (f) Emergency fuel spill and fire protection procedures
 - (g) Fuel vapor hazard locations (wing tips, engine locations, and other hazard locations)

SUBTASK 12-11-00-650-052

- (2) At some airport locations, a fuel safety person may be added to oversee aircraft refueling operations.

N. Fueling Zone

SUBTASK 12-11-00-650-053

- (1) Refuel operations must only be done in airport approved areas. Fire protection, emergency rescue equipment and correct separation distances will be available in these areas.

SUBTASK 12-11-00-650-054

- (2) A fueling zone exists around the airplane at any time when an airplane is preparing for or during a refuel operation.

SUBTASK 12-11-00-650-055

- (3) Fire and rescue equipment, including approved fire extinguishers, must be available.

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SUBTASK 12-11-00-650-056

- (4) Within the fueling zone, obey these requirements:
- (a) Obey the equipment separation requirements (Table 301, Table 302).
 - (b) Only authorized persons and vehicles are permitted.
 - (c) Passengers are not permitted.
 - (d) All personnel must assume that a refuel operation is in progress any time a fuel servicing vehicle is in the fueling zone.
 - (e) Limit maintenance activity on the airplane to work that does not increase the risk of igniting fuel vapor.
 - (f) All electrical equipment must be rated for the hazardous location zone where it will operate.
 - (g) Do not keep vehicle engines running unless necessary for aircraft maintenance or servicing.
 - (h) Metal wheels or studded tires are not permitted.
 - (i) Do not approach within 50 ft (15 m) of the airplane with these items:
 - 1) Open flames
 - 2) Heat sources
 - 3) Lighted smoking material
 - 4) Shoes with metal clips
 - 5) Other potential ignition sources.

O. Adverse Weather Conditions Precautions

SUBTASK 12-11-00-650-057



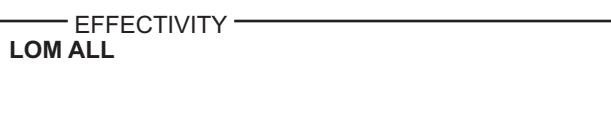
WARNING

DO NOT REFUEL THE AIRPLANE WHEN YOU SEE LIGHTNING, OR THERE IS HIGH ATMOSPHERIC ELECTRICAL ACTIVITY. STOP THE REFUEL OPERATION IF YOU SEE LIGHTNING. DO NOT CONNECT A HEADSET. DO NOT TOUCH ELECTRICAL CONNECTIONS TO THE AIRPLANE. LIGHTNING STRIKES CAN CAUSE INJURIES TO PERSONNEL, A FIRE, OR AN EXPLOSION.

- (1) When thunderstorms or lightning are in the area, approximately a 10 mi (16 km) radius, do these steps:
- (a) Contact the airport authority, air traffic control, or flight deck crew for guidance on the decision to continue or suspend fueling operations.
 - (b) Stop the refuel operation when fueling operations are suspended.
 - (c) Disconnect and remove any external headsets.
 - (d) Do not touch any electrical connections.

SUBTASK 12-11-00-650-058

- (2) Refueling operations must stop if strong wind conditions are present. 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 can also cause the unwanted movement of items or equipment which can cause injury to persons or strike the airplane.



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P. Refueling Precautions

SUBTASK 12-11-00-650-083



CAUTION

MAKE SURE THAT YOU PUT THE SAME QUANTITY OF FUEL INTO THE NO. 1 TANK AND THE NO. 2 TANK. IF THE FUEL QUANTITIES ARE DIFFERENT, THE AIRPLANE FLIGHT PROPERTIES WILL BE INCORRECT, AND DAMAGE TO THE WINGS CAN OCCUR.

- (1) Put approximately the same quantity of fuel in the No. 1 tank and the No. 2 tank.

SUBTASK 12-11-00-650-084

- (2) 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)

SUBTASK 12-11-00-650-086

- (3) You can put fuel into all of the tanks at the same time or you can put fuel into each of the tanks in a sequence.

SUBTASK 12-11-00-940-003

- (4) Obey all of the approved procedures and precautions during a refuel operation.

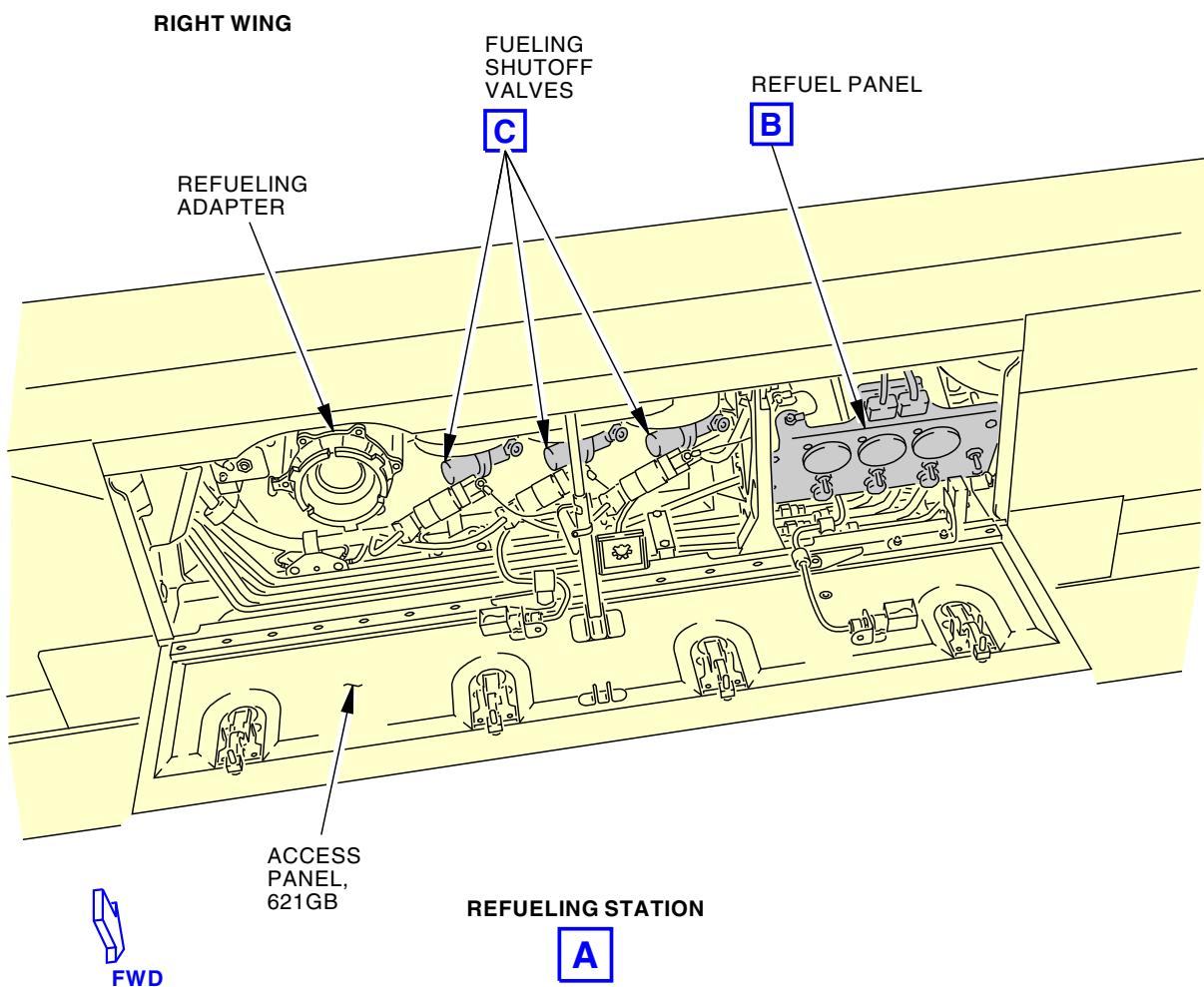
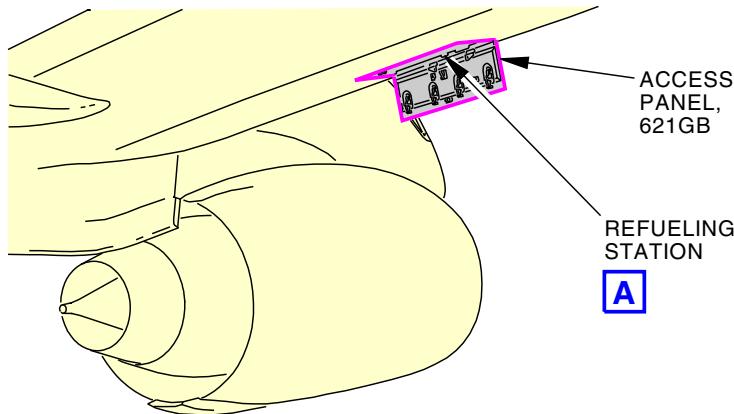
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Pressure Refueling
Figure 301/12-11-00-990-807 (Sheet 1 of 3)

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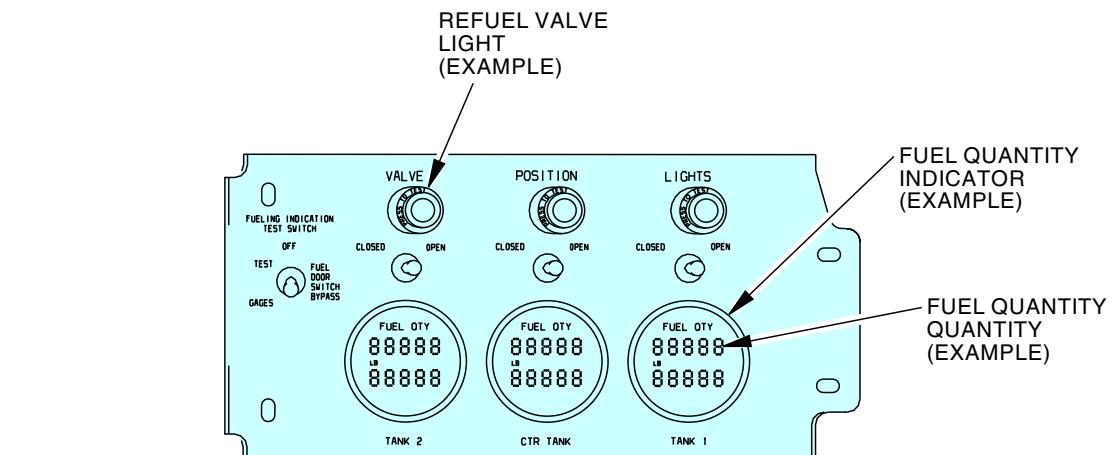
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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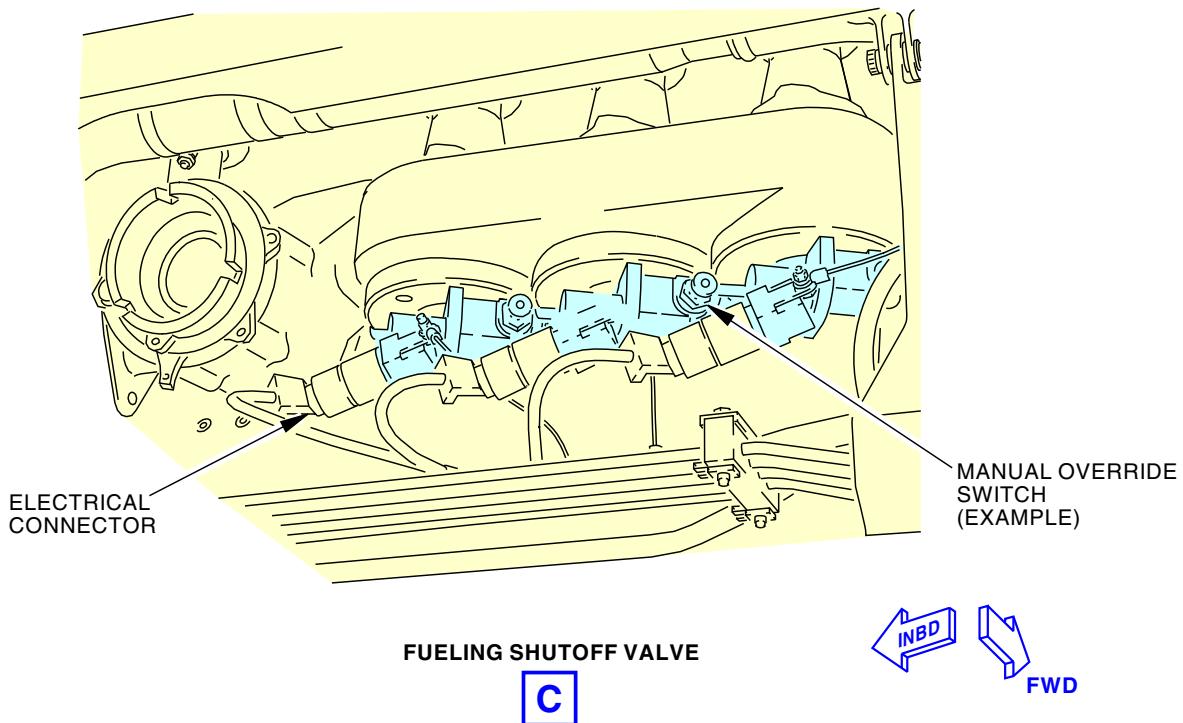
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REFUEL PANEL

B



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Pressure Refueling
Figure 301/12-11-00-990-807 (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

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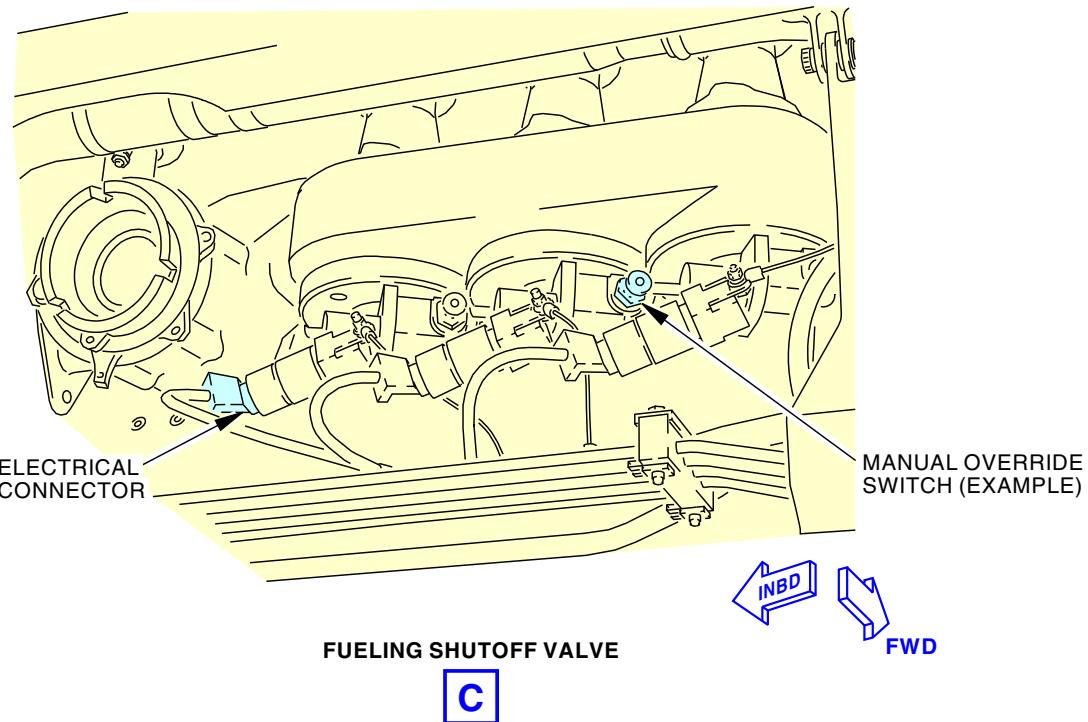
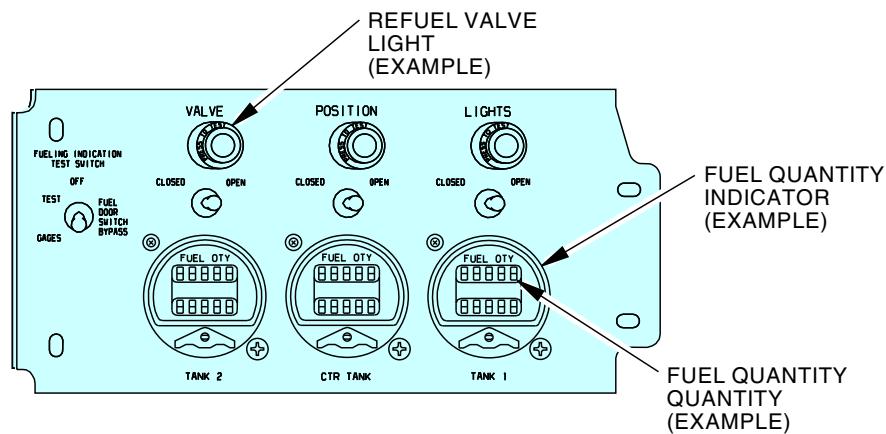
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Pressure Refueling
Figure 301/12-11-00-990-807 (Sheet 3 of 3)

EFFECTIVITY
LOM 422, 425, 432-434, 440, 442-444, 446, 447,
453-456, 466-999

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TASK 12-11-00-650-807

3. Prepare the Airplane for a Refuel Operation

A. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
28-13-41-400-802	Pressure Relief Valve - Manual Operation (P/B 601)
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

B. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-00-650-059

- (1) Read and obey the precautions for fuel servicing. Do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801.

SUBTASK 12-11-00-860-022

- (2) If it is necessary, do these steps to supply electrical power from the airplane battery:
- (a) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
---	---	C01341	STATIC INVERTER RCCB
A	5	C01340	BATTERY BUS

- (b) Set the BAT switch on the P5-13 panel to ON.

NOTE: Complete the refuel operation as soon as it is possible. This procedure keeps a maximum quantity of power in the battery. A fully charged battery can be expected to operate the refuel system for 15 minutes with sufficient power remaining to start the APU. In some cases, there may not be sufficient power in the battery to fill the fuel tanks completely and to start the APU. Make sure there will be sufficient power remaining in the battery to start the APU after the refueling operation.

SUBTASK 12-11-00-860-023

- (3) If the APU is to supply power, obey all the applicable precautions. To do this, do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801

SUBTASK 12-11-00-860-024

- (4) Make sure the airplane has a ground attitude of 1.14 degrees nose down pitch and 0.0 degree roll (+/- 2.0 degrees pitch and roll).

NOTE: A ground attitude of 1.14 degrees nose down pitch and 0.0 degrees roll permits you to put the maximum quantity of fuel in the tanks.

SUBTASK 12-11-00-680-011

- (5) Drain the water from the fuel tank sumps before you refuel the airplane. To do this, do this task: Fuel System Sumping, TASK 12-11-00-680-801

SUBTASK 12-11-00-860-025

- (6) Make sure the wing pressure relief valves (2 locations) are in the closed position. To do this, do this task: Pressure Relief Valve - Manual Operation, TASK 28-13-41-400-802.

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SUBTASK 12-11-00-480-004



WARNING

INSTALL LEADING EDGE FLAP LOCKS TO PREVENT INADVERTENT OPERATION OF LEADING EDGE FLAPS. FLAPS ARE FAST ACTING AND CAN CAUSE SERIOUS INJURY TO PERSONNEL.

- (7) If the leading edge flaps are extended, make sure leading edge flap locks are installed. If leading edge flap locks are not installed, do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 12-11-00-860-026

- (8) Make sure the onboard fuel load is in a valid fuel distribution configuration (equivalent to after a flight operation).
(a) If it is necessary, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802.

———— END OF TASK ————

TASK 12-11-00-650-802

4. Pressure Refuel Procedure

(Figure 301)

A. General

- (1) You can fill all of the tanks at the same time.
(2) You can fill only one tank if it is necessary.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

- (3) For Airplanes with Preselect Indicators:
(a) The P15 fueling panel permits automatic and manual control of the fueling shutoff valves. The fueling station receives 28VDC hot battery bus power when the fueling panel access door is open. After the panel receives power, the digital tank indicators will show the fuel quantity on the top display.
(b) On the lower display, there will be a "1" for tank number 1. A "C" will show for the center tank. A "2" will show for tank number 2. The mode of operation is manual when the "1", "2", and "C" show in the bottom display of the indicators.
(c) For manual mode operation, the fueling valve switch must be in the OPEN position for the tank to receive fuel. Do not turn the knob that selects the fuel quantity because this sets the panel to the automatic mode. When the fuel increases to the necessary quantity, you must set the fueling valve switch to the CLOSED position.
(d) To select the automatic fueling mode (preselect), turn the knob that selects the fuel quantity on each tank indicator. When you turn the select knob of tank No. 1, 2, or the CTR tank, the applicable indicator will show a number. Set the necessary fuel to be added to the tanks and the applicable fueling valve switch to the open position. When the fuel quantity in the tanks increases to the correct quantity, the fueling valves will automatically close. The float switch will remove power from the fueling valves when the fuel quantity is at the Volumetric Shutoff (VSO) level.
(e) To select the manual mode you can close the access panel 621GB and open it again. When panel 621GB opens again, the fueling panel P15 will come on in manual mode. The lower window of the indicator will show that "1" for tank No. 1. That "2" shows for tank No. 2 and "C" shows for the CTR tank.

— EFFECTIVITY —
LOM ALL

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LOM ALL

- (4) If you make a decision not to do this recommended procedure, you must have an alternative procedure. Make sure the conditions during the fueling operation give sufficient protection to the persons and equipment used in the procedure. It is possible that local fire codes and standards make it necessary to use different procedures or more procedures than those defined in the subsequent steps.

B. References

Reference	Title
20-40-11-760-801	Electrical Bonding (P/B 201)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
28-26-00-650-802	Tank to Tank Fuel Transfer (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. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-00-650-020



OBEY ALL OF THE APPLICABLE PRECAUTIONS, AND LIMITS FOR PRESSURE FUELING. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801.

SUBTASK 12-11-00-650-060

- (2) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-00-650-807.

F. Connect the Fueling Equipment

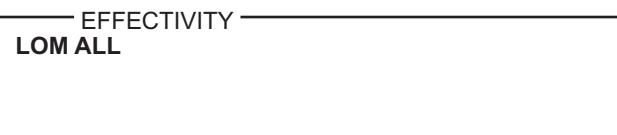
SUBTASK 12-11-00-420-001



WARNING

OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-40-11-760-801).



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SUBTASK 12-11-00-010-001

- (2) Open this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 12-11-00-480-001



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.

- (3) Do these steps to connect the fuel nozzle to the refuel adapter:

- (a) Make sure that there are no fuel leaks.
- (b) Make sure that the refuel adapter is clean and not damaged.
 - 1) Make sure that the screws that attach to the refuel adapter are not loose, damaged, or missing.
 - 2) Make sure that the lugs on the refuel adapter are not bent, cracked, or missing.
- (c) Connect the refuel nozzle to the refuel adapter.

G. Prepare the P15 Refuel Control Panel

SUBTASK 12-11-00-010-005

- (1) Make sure this access panel is open:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 12-11-00-650-062

- (2) Make sure that the panel floodlights are on.

SUBTASK 12-11-00-650-063

- (3) If the floodlights do not come on (no ground power), then do these steps:

- (a) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
---	---	C01341	STATIC INVERTER RCCB
A	5	C01340	BATTERY BUS

- (b) Set the battery switch to ON.

NOTE: Complete the refuel operation as soon as it is possible. This procedure keeps a maximum quantity of power in the battery. A fully charged battery can be expected to operate the refuel system for 15 minutes with sufficient power remaining to start the Auxiliary Power Unit (APU). In some cases, there may not be sufficient power in the battery to fill the fuel tanks completely and to start the APU. Make sure there will be sufficient power remaining in the battery to start the APU after the refueling operation.

SUBTASK 12-11-00-710-003

- (4) Push the position lights for the refuel valve to make sure they operate correctly.

- (a) Make sure that each of the PRESS TO TEST indicator lights comes on when you push it.

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SUBTASK 12-11-00-650-064

- (5) Do a test of the refuel quantity indicators:

- Push and hold the FUELING INDICATION TEST SWITCH in the TEST GAGES position.
- Make sure that all the indicator displays show blank for two seconds, then show 888.8 for two seconds.

NOTE: The test display will continue to cycle until you release the 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 test switch.
- Make sure that all fuel quantity displays go back to the usual indication.

H. Prepare the Fuel Sheet

SUBTASK 12-11-00-650-065

- (1) Use the operator-supplied fuel sheet to record the pre-uplift fuel quantity for each tank.

SUBTASK 12-11-00-650-066

- (2) If it is necessary, calculate the fuel to be uplifted converted to volume.

SUBTASK 12-11-00-650-067

- (3) If it is necessary, record the uplift quantity on the fuel sheet.

I. Set the Fuel Quantity

SUBTASK 12-11-00-860-027

- (1) If you are scheduled to fill the tanks fully, do these steps:

- Set all of the refuel valve switches to the OPEN position.

NOTE: If you refuel tanks to full and there is a float switch fault, fuel will spill.

SUBTASK 12-11-00-860-004

- (2) If you are scheduled to refuel the tanks to a specified quantity (less than full), do these steps:



OBEY ALL OF THE APPLICABLE SAFETY PRECAUTIONS AND THE LOAD LIMITS. DAMAGE TO THE AIRPLANE CAN OCCUR.

CAUTION

- Calculate the value that each refuel quantity indicator must show when the necessary quantity of fuel is in the tank.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

- Use the preselect knob on the front of the display to set the PRESET display to the correct quantity of fuel for each tank (Figure 301).

NOTE: Refer to the General section of this task for more data about the PRESET display.

LOM ALL

J. Start the Refuel Operation

SUBTASK 12-11-00-650-068

- (1) Do these steps to start the refuel operation:

- Set the refuel valve switches for the tanks to be refueled to the OPEN position.
- Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.

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- (c) Make sure that the refuel pressure is between 35 psi (241 kPa) and 55 psi (379 kPa).
- (d) Make sure that the refuel valve indication lights are on (valves open).
- (e) Make sure that the No. 1 and No. 2 tanks refuel at approximately the same rate, while fueling both main tanks at the same time.



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.



DO NOT TRY TO PUT MORE FUEL INTO THE TANK AFTER THE REFUEL OPERATION STOPS AUTOMATICALLY. THE FUEL WILL FLOW OUT OF THE TANK.

- (f) Put the necessary quantity of fuel in the tank or tanks.

NOTE: The float switch in each fuel tank closes each refuel shutoff valve when each tank is filled to the maximum approved volume.

- 1) Monitor the refueling panel at all times, from the start to the finish of the refueling process.
- 2) 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.

K. Stop the Refuel Operation

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 423, 424, 426-431, 437-439, 441, 445, 450-452, 457-465

SUBTASK 12-11-00-650-069

- (1) When the refuel indicators show the necessary quantities (calculated before), set the refuel valve switches to the CLOSE position.
 - (a) Release the deadman switch.

LOM 422, 425, 432-434, 440, 442-444, 446, 447, 453-456, 466-999

SUBTASK 12-11-00-650-070

- (2) Release the deadman switch to stop the fuel flow when all of the refuel valve position lights are off.
 - (a) Set the refuel valve switches to the CLOSE position.

LOM ALL

SUBTASK 12-11-00-650-071

- (3) Make sure that the onboard fuel load is in a valid pre-flight fuel distribution.

SUBTASK 12-11-00-650-072

- (4) Transfer fuel to balance the fuel load if it is necessary (TASK 28-26-00-650-802).

SUBTASK 12-11-00-650-073

- (5) Wait one minute to let the Fuel Quantity Indication System (FQIS) system become stable.

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SUBTASK 12-11-00-650-074

- (6) Record the actual fuel quantities from the refuel quantity indicators.

SUBTASK 12-11-00-650-075

- (7) Record the actual fuel quantity from the fuel vehicle flow meter.

SUBTASK 12-11-00-650-076

- (8) Do the discrepancy check and make sure it is within limits.

NOTE: Refer to the operator's requirement.

SUBTASK 12-11-00-650-077

- (9) Complete the Fuel Sheet.

SUBTASK 12-11-00-650-078

- (10) Complete the Delivery Receipt if it is necessary.

SUBTASK 12-11-00-650-079

- (11) Give a copy of the forms to the airline representative or flight crew.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 12-11-00-860-028

- (1) Make sure that all the P15 panel valve switches are in the CLOSED position.

SUBTASK 12-11-00-650-080

- (2) Disconnect the fuel hose nozzle from the airplane.

SUBTASK 12-11-00-860-032

- (3) Make sure that the refuel adapter is not damaged.

SUBTASK 12-11-00-160-001

- (4) If there is a fuel spill at the refuel station, remove the fuel with a sponge or dry cloth.

SUBTASK 12-11-00-860-039

- (5) Push the position lights for the refuel shutoff valve to make sure they operate correctly.

SUBTASK 12-11-00-410-002

- (6) Close and security latch this access panel:

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 12-11-00-080-008

- (7) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-40-11-760-801).

SUBTASK 12-11-00-080-009



CAREFULLY REMOVE THE LEADING EDGE FLAP AND SLAT ACTUATORS LOCKOUT SET. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY IF YOU DO NOT REMOVE THE LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) If it is necessary, do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

SUBTASK 12-11-00-860-030

- (9) If you used power from the airplane battery, do these steps:

- (a) Set the standby power switch to the AUTO position.
- (b) Set the battery switch to the OFF position.

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SUBTASK 12-11-00-800-007

- (10) Do the operator-supplied procedures to remove the fuel vehicle.

———— END OF TASK ————

TASK 12-11-00-650-808

5. Refuel Operation When the Refuel Quantity Indicators Flash

A. General

- (1) Do this procedure if one of the refuel panel indicators starts to flash during the refueling operation (at one-second intervals).
- (2) If the refuel panel indicators flash, and the refueling operation stops automatically, then it is not always necessary to do a check of the quantity of fuel in the tank. Do the steps below if the indicator continues to flash for 60 seconds or more. If the indicator stops flashing in less than 60 seconds, then the sensed overfill condition was probably caused by fuel movement or hysteresis related to the fueling operation. In this case, no more maintenance is necessary.

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. Refuel Operation

SUBTASK 12-11-00-650-081

- (1) Do a check of the outboard fuel measuring stick for the tank with the flashing indicator.

SUBTASK 12-11-00-810-003

- (2) Do these steps for the applicable tank to complete the refuel operation:
 - (a) For the No. 1 or the No. 2 tank; if the fuel quantity is less than 1288 gallons (4876 liters), then use the fuel measuring sticks to put the correct quantity of fuel into the tank.

NOTE: The volume 1288 gallons (4876 liters) is equivalent to 8630 pounds (3915 kilograms) at a density of 6.7 pounds/gallon (0.8029 kilograms/liter). You can use the fuel measuring stick table to find out if you have this volume.

 - 1) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM) (Table 303).

Table 303/12-11-00-993-809

FMSM Number	Document Title
D634A122	737-600/700/800/900 Fuel Measuring Stick Manual - Pounds
D634A123	737-600/700/800/900 Fuel Measuring Stick Manual - Kilograms
D634A124	737-600/700/800/900 Fuel Measuring Stick Manual -Gallons
D634A125	737-600/700/800/900 Fuel Measuring Stick Manual - Liters

- (b) For the center tank; if the fuel quantity is less than 4299 gallons (16273 liters), then use the fuel measuring sticks to put the correct quantity of fuel into the tank.

NOTE: The volume 4299 gallons (16273 liters) is equivalent to 28803 pounds (13066 kilograms) at a density of 6.7 pounds/gallon (0.8029 kilograms/liter). You can use the fuel measuring stick table to find out if you have this volume.

- 1) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM) (Table 303).

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- (c) For the No. 1 or the No. 2 tank; if the fuel quantity is more than 1288 gallons (4876 liters), then do these steps:

NOTE: The volume 1288 gallons (4876 liters) is equivalent to 8630 pounds (3915 kilograms) at a density of 6.7 pounds/gallon (0.8029 kilograms/liter). You can use the fuel measuring stick table to find out if you have this volume.

- 1) Remove fuel from the applicable tank to the desired quantity, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802 or Fuel Tank Defueling, TASK 28-26-00-650-801.
- 2) Use the fuel measuring sticks to make sure the correct quantity of fuel is in the tank.
 - a) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM) (Table 303).

- (d) For the center tank; if the fuel quantity is more than 4299 gallons (16273 liters), then do these steps:

NOTE: The volume 4299 gallons (16273 liters) is equivalent to 28803 pounds (13066 kilograms) at a density of 6.7 pounds/gallon (0.8029 kilograms/liter). You can use the fuel measuring stick table to find out if you have this volume.

- 1) Remove fuel from the applicable tank to the desired quantity, do this task: Tank to Tank Fuel Transfer, TASK 28-26-00-650-802 or Fuel Tank Defueling, TASK 28-26-00-650-801.
- 2) Use the fuel measuring sticks to make sure the correct quantity of fuel is in the tank.
 - a) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM) (Table 303).

————— END OF TASK ————

TASK 12-11-00-650-803

6. Refuel Operation When the Fuel Quantity Indicating System Does not Operate

(Figure 301, Figure 302)

A. General

- (1) You can refuel a tank with a fuel quantity indicating system that does not operate correctly (a bad indicator). You can do this task with the fuel measuring sticks in the No. 1 tank, the No. 2 tank, or the center tank. You must do the applicable procedure to calculate the fuel quantity from the values on the fuel measuring sticks. You can also transfer fuel to refuel one of the wing tanks as an alternative to the fuel measuring stick procedure (TASK 28-26-00-650-802).

B. References

Reference	Title
28-26-00-650-802	Tank to Tank Fuel Transfer (P/B 201)

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



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D. Use the Fuel Measuring Sticks to Refuel a Fuel Tank When the Fuel Quantity Indicating System Does Not Operate

SUBTASK 12-11-00-650-021



OBEY ALL OF THE APPLICABLE PRECAUTIONS AND LIMITS FOR PRESSURE FUELING. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801.

SUBTASK 12-11-00-860-007

- (2) Release the fuel measuring sticks on the fuel tank with the bad indicators.

NOTE: Let the stick fall freely and lift it slowly to lock on the float assembly.

SUBTASK 12-11-00-860-008

- (3) Use the fuel measuring sticks to monitor the fuel quantity.

(a) Make sure you know the attitude of the airplane.

(b) Use the fuel measuring stick procedure in the FMSM to calculate the fuel quantity.

- 1) Refer to the applicable Fuel Measuring Stick Manual (FMSM) (Table 304).

Table 304/12-11-00-993-810

FMSM Number	Document Title
D634A122	737-600/700/800/900 Fuel Measuring Stick Manual - Pounds
D634A123	737-600/700/800/900 Fuel Measuring Stick Manual - Kilograms
D634A124	737-600/700/800/900 Fuel Measuring Stick Manual -Gallons
D634A125	737-600/700/800/900 Fuel Measuring Stick Manual - Liters

SUBTASK 12-11-00-650-008

- (4) Put fuel in the tank until the fuel measuring sticks show the necessary quantity of fuel.

SUBTASK 12-11-00-650-009

- (5) Stop the refuel operation.

SUBTASK 12-11-00-650-010

- (6) Permit the fuel level in the tank to become stable for five minutes.

SUBTASK 12-11-00-650-011

- (7) Examine the fuel measuring sticks again.

SUBTASK 12-11-00-650-012

- (8) If the fuel measuring sticks show a fuel quantity less than the necessary quantity, continue the refuel operation.

SUBTASK 12-11-00-650-013

- (9) Continue to refuel the tank until the fuel measuring sticks show the necessary quantity after the five minute time.

SUBTASK 12-11-00-860-009

- (10) Lock the fuel measuring sticks in the retracted position.

SUBTASK 12-11-00-650-014

- (11) Do the necessary procedure to refuel the remaining tanks.

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E. Move Fuel From a Different Tank to Refuel a Tank with a Refuel Quantity Indicator That Does Not Operate

NOTE: You can use this procedure to refuel the center tank, the No. 1 tank, or the No. 2 tank.

SUBTASK 12-11-00-650-015



CAUTION

OBEY ALL OF THE APPLICABLE SAFETY PRECAUTIONS AND THE LOAD LIMITS. DAMAGE TO THE AIRPLANE CAN OCCUR.

- (1) Move the fuel from the tank with the bad indicators to a different tank or tanks (TASK 28-26-00-650-802).

SUBTASK 12-11-00-970-001

- (2) Calculate the weight of the quantity of fuel that you must put into the tank with the bad indicator.

SUBTASK 12-11-00-650-016

- (3) Move the quantity of fuel (calculated before) from a tank with good refuel quantity indicators to the defueled tank.

SUBTASK 12-11-00-650-017

- (4) Refuel the tank from which you moved the fuel.

———— END OF TASK ————

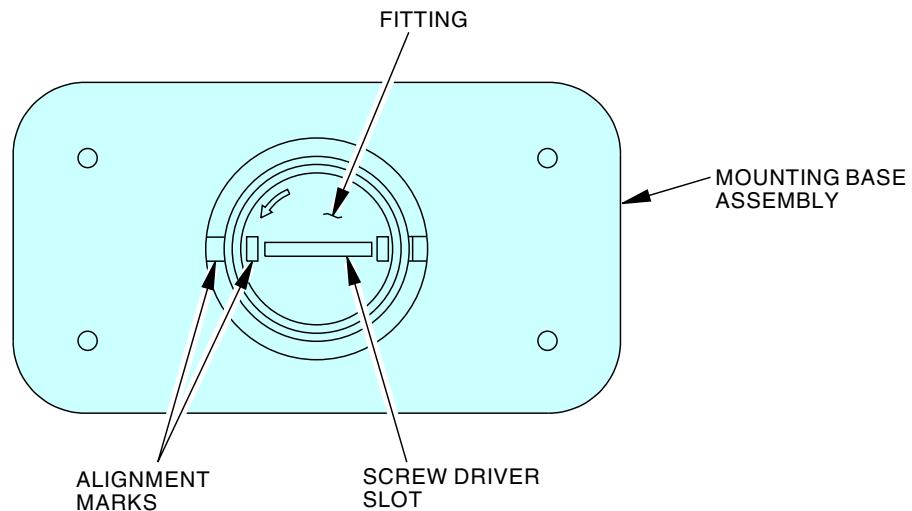
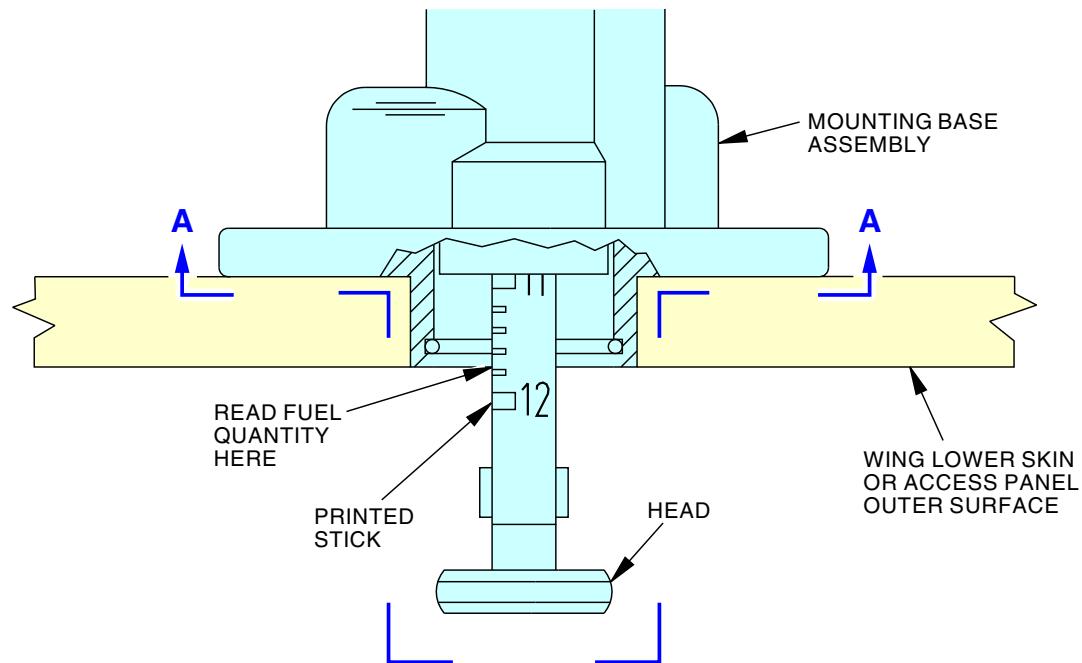
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**A-A**

NOTE: SOME PARTS ARE NOT SHOWN TO MAKE
THE ILLUSTRATION EASIER TO READ.

F82079 S0006560787_V2

Fuel Measuring Stick Extended Position (Example)
Figure 302/12-11-00-990-802

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 12-11-00-650-806

7. Pressure Refueling Operation For A Refuel Valve That Does Not Open Electrically
(Figure 301, Figure 302)

A. General

- (1) You can refuel a tank with a refuel valve that does not open electrically but can be opened manually.

B. References

Reference	Title
20-40-11-760-801	Electrical Bonding (P/B 201)
20-40-11-910-801	Static Grounding (P/B 201)
28-21-00-700-801	Pressure Fueling System - Test (P/B 501)
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
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. Access Panels

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

E. Procedure

SUBTASK 12-11-00-650-023



WARNING

OBEY ALL OF THE APPLICABLE PRECAUTIONS, AND LIMITS FOR PRESSURE FUELING. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801.

SUBTASK 12-11-00-860-014

- (2) Electrically ground the airplane and the fuel vehicle (TASK 20-40-11-910-801).

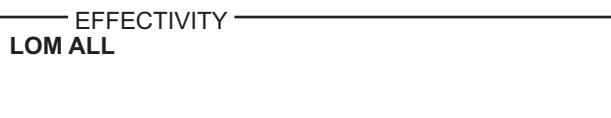
SUBTASK 12-11-00-860-040

- (3) Connect a bonding cable from the fueling vehicle to an approved electrical grounding or bonding connection on the airplane (TASK 20-40-11-760-801).

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 12-11-00-010-003

- (4) Make sure this access panel is open:
(Figure 301)



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Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 12-11-00-210-001

- (5) Make sure the fuel tank quantity indicator for the tank you will refuel is operative.

SUBTASK 12-11-00-420-003



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.

- (6) Do an inspection of the refuel adapter before you connect the refuel nozzle:

- (a) Make sure there are no fuel leaks.
(b) Make sure there is no contamination at the refuel adapter.



CAUTION

MAKE SURE THAT THE REFUEL ADAPTER IS CLEAN AND DOES NOT HAVE DAMAGE. IF THE REFUEL ADAPTER HAS DAMAGE, IT CAN CAUSE A FUEL LEAK.

- (c) Make sure the refuel adapter is clean and does not have any damage (TASK 28-21-00-700-801).
1) Make sure the screws that attach to the refuel adapter are not loose, damaged or missing.
2) Make sure the lugs on the refuel adapter are not bent, cracked or missing.

SUBTASK 12-11-00-650-024

- (7) Do these steps to put fuel into the tank with the refuel valve that does not open:

- (a) Connect the refueling hose nozzle to the refuel adapter.
(b) Start the fuel source pump.



WARNING

IF ONE OF THE OVERFILL LIGHTS COMES ON, DO NOT CONTINUE TO REFUEL THE AIRCRAFT. IMMEDIATELY REMOVE FUEL-SUPPLY PRESSURE. THIS WILL HELP PREVENT INJURY TO PERSONS AND DAMAGE TO THE AIRCRAFT.



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.



CAUTION

THERE IS NO AUTOMATIC REFUEL SHUTOFF OR OVERFILL PROTECTION WHEN THE REFUEL VALVES ARE FAILED OPEN.

- (c) For the tank whose refuel valve does not open, push the red fueling manual override button to open the refuel valve for that tank.
(d) Continue to hold down the red button.
(e) Monitor the fueling indicator for the tank with the refuel valve that does not open.

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- (f) When the fueling indicator shows a full tank or the fuel quantity scheduled for that tank, release the red manual override button.
- (g) Stop the fuel source pump.
- (h) Remove the refueling hose nozzle from the refuel adapter.

SUBTASK 12-11-00-080-006

- (8) Disconnect the ground cables from the fuel source and the airplane (TASK 20-40-11-910-801).

SUBTASK 12-11-00-080-007

- (9) Disconnect the bonding cable between the fueling vehicle and the airplane (TASK 20-40-11-760-801).

SUBTASK 12-11-00-010-004

- (10) Close this access door if the refueling operation is completed:
(Figure 301)

Number Name/Location

621GB Refuel Access Panel - Slat Station 143.27

SUBTASK 12-11-00-810-002

- (11) At the next maintenance opportunity, do this task: Fuel Does Not Flow Into The Fuel Tank With Fueling Shutoff Valve Switch in the OPEN Position and Refueling Manifold Pressurized, FIM 28-21 TASK 808.

———— END OF TASK ————

TASK 12-11-00-680-801

8. Fuel System Sumping

(Figure 303, Figure 304)

A. General

- (1) You must not permit the fuel tanks to collect too much water. Do the procedure to drain the sumps drain valves for each tank regularly if conditions cause fuel tanks to collect water.
- (2) There are five sump drain valves in total, installed on the airplane. There is one sump drain valve installed in the center fuel tank, one in each main fuel tank and one in each surge tank. The best airplane attitude to drain the sumps is a pitch of 1.14 degree nose-down and a roll of zero degrees.
- (3) FOR THE SUMP DRAIN VALVES INSTALLED IN THE CENTER, NO. 1 AND NO. 2 FUEL TANKS;

It is recommended to drain the fuel tank sumps regularly to remove water from the fuel tanks. Each fuel tank sump has a sump drain valve to permit you to drain water from the tank. The fuel tank sumps should be drained before or after refueling, but not during refueling. You must permit the water to go to the bottom of the tanks before you drain the sumps. During refueling, water mixes in the fuel. In cold weather the water can freeze and prevent the sump drain valve from opening. If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps. For cold weather maintenance, refer to Cold Weather Maintenance Procedure, TASK 12-33-01-600-802.

NOTE: Wait for a sufficient time to permit the water in the fuel to move to the bottom of the fuel tank. Water sinks in fuel at the rate of approximately one foot per hour.

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MAKE SURE THAT THE FUEL DOES NOT HAVE RED OR A PINK COLOR.
IF THE FUEL DOES HAVE A RED OR PINK COLOR, DO THE
APPLICABLE CHECK FOR FUEL CONTAMINATION. IF THE FUEL HAS
CONTAMINATION, DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Drain fuel samples from each sump drain valve into a transparent container. Do a check of each sample independently for water, ice or contamination. If the fuel has a pink or a red color, refer to the task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802, to do an inspection for contamination. Water in fuel usually shows as a layer below the fuel, or as small bubbles in the fuel. Ice crystal usually appear as cloudiness or haziness and make the fuel less transparent. Fuel with no water, ice, or contamination, is clear and bright and very transparent. The words "clear and bright" mean that you cannot see undissolved water, sediment, and suspended material when you examine the sample in a clear glass container. If the fuel is free of these types of contamination, it is clear and bright.
- NOTE: Jet-A fuel can have a range of colors from yellow (straw) color to no color. The words "clear and bright" do not refer to color of the fuel. Yellow fuel or fuel that has no color can be "clear and bright" as specified above.
- (b) If one or two drops of food coloring that is water soluble is put into the container of fuel, then water in the fuel will be shown by a color. You can put the food coloring into the container before you get the sample.
- (c) A large quantity of water drained from one fuel tank before refueling can show a blocked water scavenge jet pump. To examine the water scavenge jet pump, refer to Center Tank Water Scavenge Jet Pump - Check, TASK 28-22-13-200-801 or No. 1 or No. 2 Tank Water Scavenge Jet Pump - Check, TASK 28-22-13-200-802.
- (d) Drain the tank sums sufficiently to make sure you remove water or other contamination from the system.
- (e) Drain the sums a maximum time of one hour after you remove the airplane from the hangar if the temperature has these conditions:
- 1) The ambient temperature is less than 32°F (0°C).
 - 2) The temperature of the hangar is more than the ambient temperature.
- (f) If the ambient temperature is less than 32°F (0°C), do one of these steps to raise the temperature of the fuel:
- 1) Fill the tanks with warm fuel.
 - 2) Move the airplane to a warm hanger.

(4) FOR THE SUMP DRAIN VALVES INSTALLED IN THE SURGE TANKS;

The sump drain valves in the surge tanks are installed to do a check for fuel in the surge tank before you remove the access door for entry. Fuel in the surge tank will drain into the main fuel tanks through the drain check valve in each surge tank. If the main fuel tank is full and there is fuel in the surge tank, you can defuel the main tank to remove the fuel in the surge tank.

NOTE: The drain check valve installed in the surge tank will drain the fuel to a lower level than the sump drain valve.

B. References

Reference	Title
12-33-01-600-802	Cold Weather Maintenance Procedure (P/B 301)
20-40-11-760-801	Electrical Bonding (P/B 201)

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Reference	Title
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)
28-10-00-200-802	Detection Test for Microbial Growth (P/B 201)
28-11-00-100-802	Clean the Fuel Tanks Contaminated with Red Dye (P/B 701)
28-22-13-200-801	Center Tank Water Scavenge Jet Pump - Check (P/B 601)
28-22-13-200-802	No. 1 or No. 2 Tank Water Scavenge Jet Pump - Check (P/B 601)

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-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
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735

E. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
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

F. Access Panels

Number	Name/Location
192G	Sump Drain Access Door

G. Sumping Operation for the No. 1 Tank and the No. 2 Tank

(Figure 303)

SUBTASK 12-11-00-480-002

 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.
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- (1) If biocide was used in the fuel tanks, use personal protective equipment before sumping the tanks.

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WARNING

DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the sump drain valve [1].
 - (a) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-760-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the area immediately adjacent to the sump drain valve.

SUBTASK 12-11-00-860-010

- (3) Put the top end of the fuel sampling equipment, COM-1535, against the bottom side of the poppet on the sump drain valve [1].
 - (a) Push the tool up and turn it until the tabs on the tool hold it in the correct position and fuel flows into the 5-gallon (19-liter) fuel resistant container, STD-1054.

SUBTASK 12-11-00-680-001

- (4) Drain each sump until the fuel that flows into the 5-gallon (19-liter) fuel resistant container, STD-1054, has no water.

SUBTASK 12-11-00-860-011

- (5) Remove the fuel sampling equipment, COM-1535, from the sump and permit the valve to close.

SUBTASK 12-11-00-210-002

- (6) Do a visual inspection of the fuel in the container.
 - (a) If you see red dye in the fuel, do this task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802.
 - (b) If you see other contamination, do these steps:
 - 1) Clean the fuel sampling equipment with alcohol, B00130, and dry it completely.
 - 2) With a sterilized glass container, get another sample of fuel.
 - 3) Do this task: Detection Test for Microbial Growth, TASK 28-10-00-200-802.

H. Sumping Operation for the Surge Tanks

(Figure 303)

SUBTASK 12-11-00-480-005



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) If biocide was used in the fuel tanks, use personal protective equipment before sumping the tanks.

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WARNING

DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the surge tank sump drain valve.
 - (a) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-760-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the area immediately adjacent to the sump drain valve.

SUBTASK 12-11-00-860-041

- (3) Put the top end of the fuel sampling equipment, COM-1535, against the bottom side of the poppet on the surge tank sump drain valve.
 - (a) Push the tool up and turn it until the tabs on the tool hold it in the correct position and fuel flows into the 5-gallon (19-liter) fuel resistant container, STD-1054.

NOTE: There may not be any fuel or fluid to drain from the surge tank.

SUBTASK 12-11-00-680-016

- (4) Drain each sump until the all the fuel or water that flows into the 5-gallon (19-liter) fuel resistant container, STD-1054, is removed.

SUBTASK 12-11-00-860-042

- (5) Remove the fuel sampling equipment, COM-1535, from the sump and permit the valve to close.

SUBTASK 12-11-00-210-005

- (6) Do a visual inspection of the fuel in the container.
 - (a) If you see red dye in the fuel, do this task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802.
 - (b) If you see other contamination, do this task: 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.

I. Sumping Operation for the Center Fuel Tank

(Figure 304)

SUBTASK 12-11-00-860-012



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) If biocide was used in the fuel tanks, use personal protective equipment before sumping the tanks.
- (2) To drain the maximum quantity of water from the center tank sump, put the airplane in this attitude, if it is possible:
 - (a) Pitch: 1.14 degrees nose-down

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- (b) Roll: 0.0 degrees
- (c) Permit the fuel to go to the bottom of the tank before you open the sump drain valve [1].

SUBTASK 12-11-00-010-002

- (3) For access to the sump drain valve [1], do this step:

- (a) Open this access panel:

Number Name/Location

192G Sump Drain Access Door

SUBTASK 12-11-00-680-002



WARNING DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND

EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (4) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the sump drain valve [1].

- (a) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-760-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the area immediately adjacent to the sump drain valve.

SUBTASK 12-11-00-680-034

- (5) Pull the actuating rod [3] down and hold the rod to drain the sump.
 - (a) Hold the actuating rod [3] in this position until the fuel that goes into the container has no water.
 - (b) Use a 0.5 in. (12.7 mm) ID hose and clamp that you can make locally or fuel sampling equipment, COM-1535, to help you drain the fuel.

SUBTASK 12-11-00-860-013

- (6) Release the actuating rod [3] to close the sump drain valve [1].
 - (a) Remove the hose.
 - (b) Close this access panel:

Number Name/Location

192G Sump Drain Access Door

SUBTASK 12-11-00-210-003

- (7) Do a visual inspection of the fuel in the container.
 - (a) If you see red dye in the fuel, do this task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802.
 - (b) If you see other contamination, do these steps:
 - 1) Clean the fuel sampling equipment with alcohol, B00130, and dry it completely.
 - 2) With a sterilized glass container, get another sample of fuel.
 - 3) Do this task: Detection Test for Microbial Growth, TASK 28-10-00-200-802.

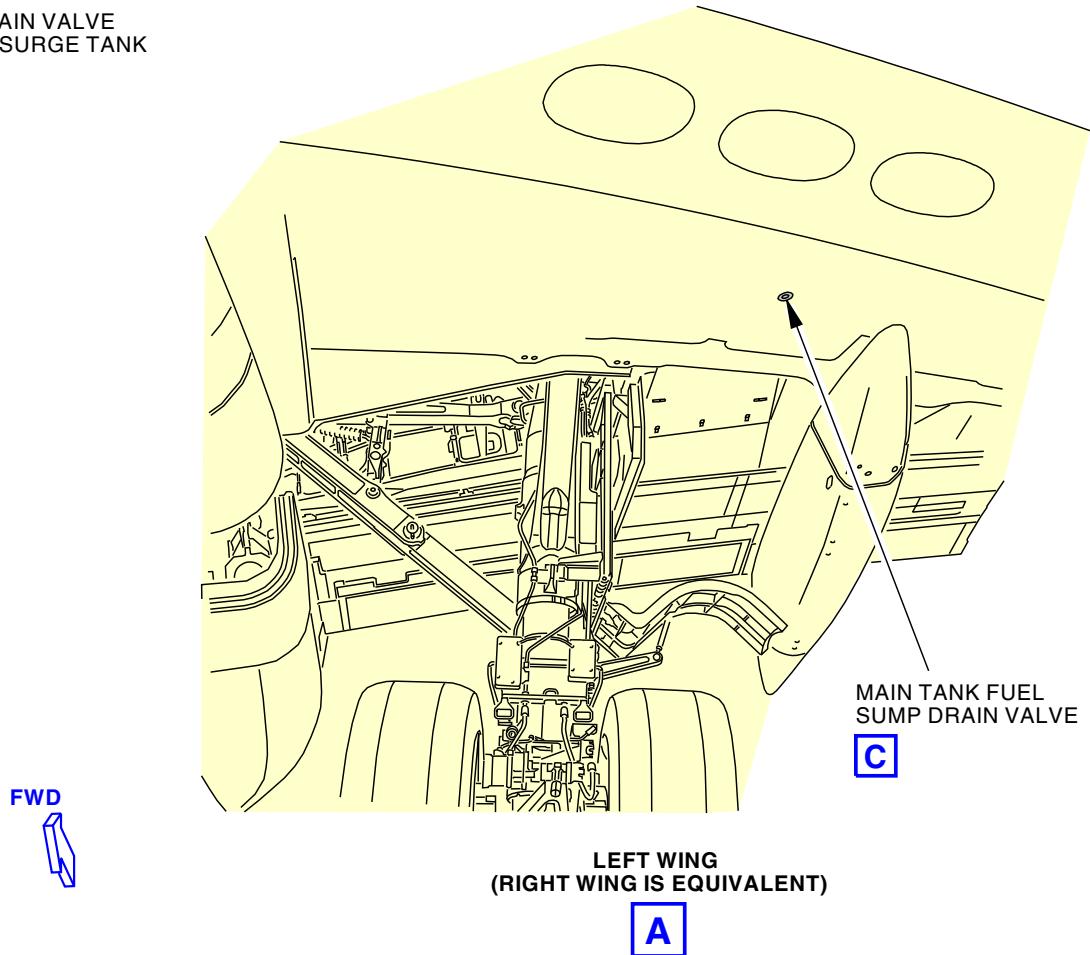
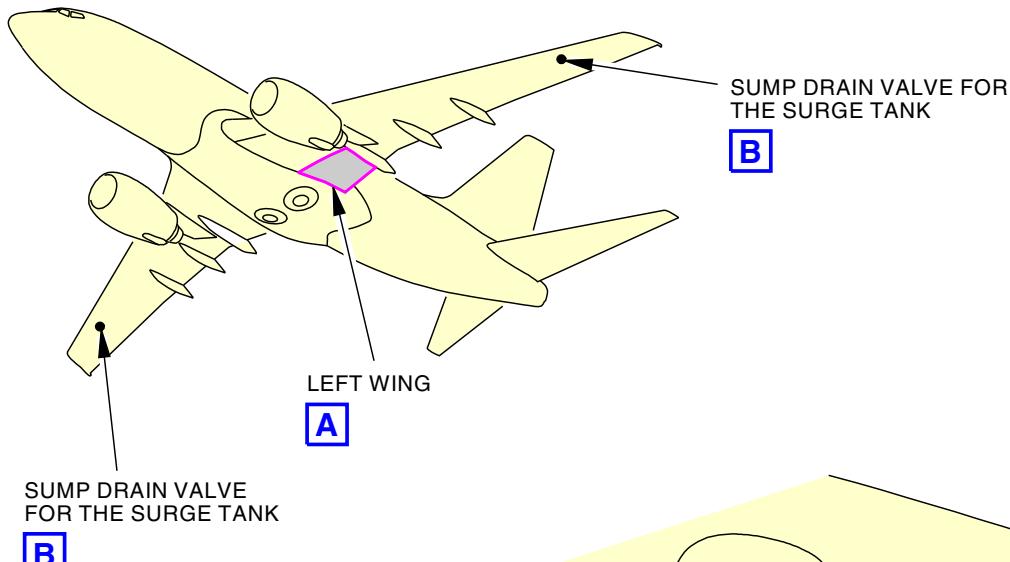
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F82719 S0006560791_V3

Main Tank Fuel Sump Drain Valve
Figure 303/12-11-00-990-803 (Sheet 1 of 2)

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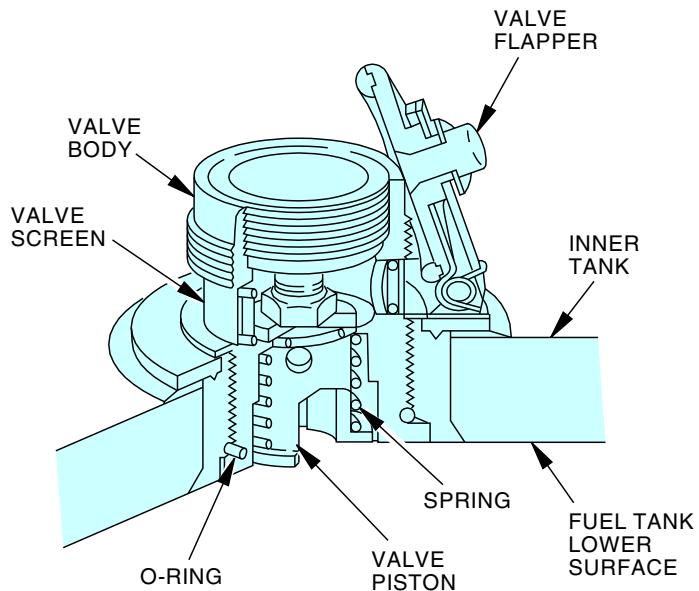
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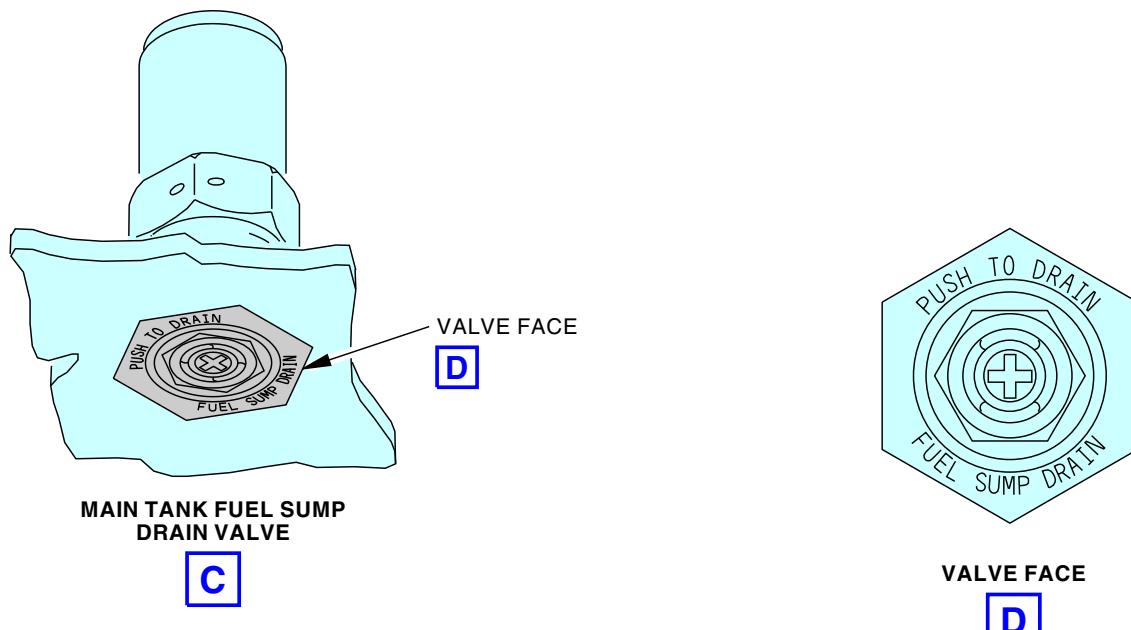


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SURGE TANK FUEL SUMP DRAIN VALVE

B



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Main Tank Fuel Sump Drain Valve
Figure 303/12-11-00-990-803 (Sheet 2 of 2)

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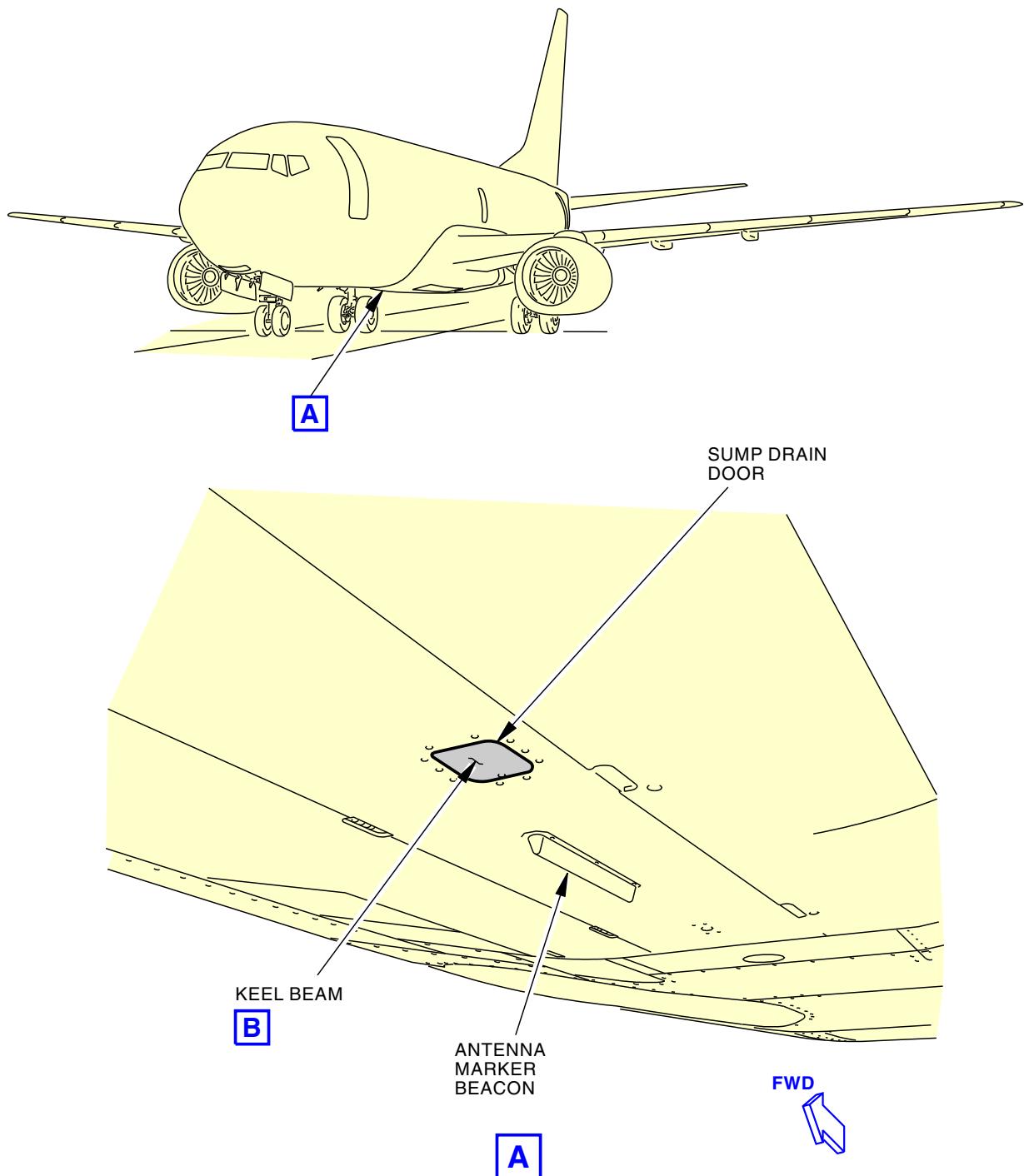
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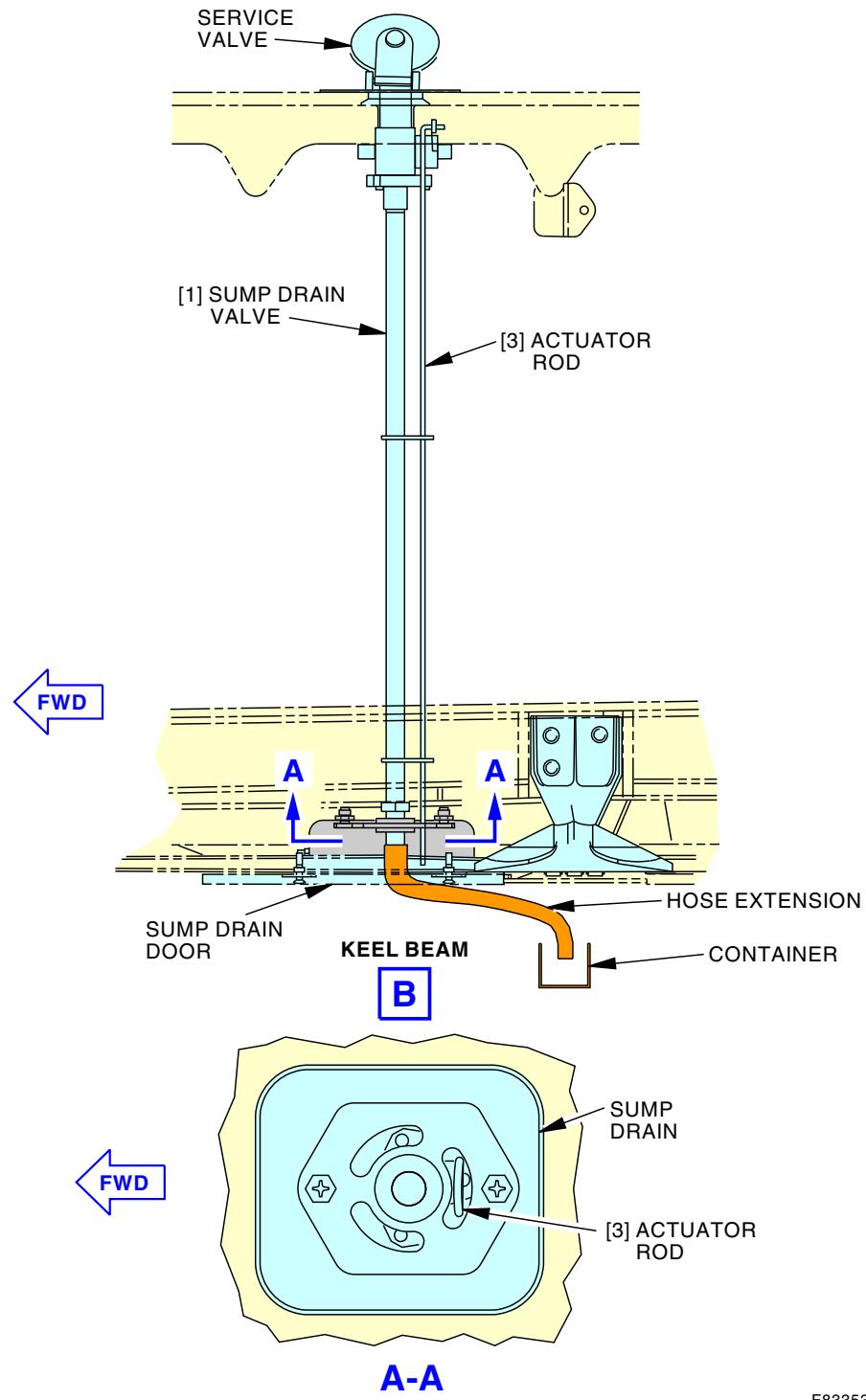
Center Tank Sump Drain Valve
Figure 304/12-11-00-990-804 (Sheet 1 of 2)

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Center Tank Sump Drain Valve
Figure 304/12-11-00-990-804 (Sheet 2 of 2)

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TASK 12-11-00-650-804

9. Drain the Fuel from the Sumps after Defueling

(Figure 303, Figure 304)

A. General

- (1) This task removes the fuel that remains after defueling each tank. There are three procedures:
 - (a) A procedure to drain the fuel from the sumps of the No. 1 or the No. 2 tank
 - (b) A procedure to drain the fuel from the sump of the surge tank
 - (c) A procedure to drain the fuel from the sump of the center tank

B. References

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)
28-11-00-910-802	Fuel Tank - Purging and Tank Entry (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-10360	Sump Drain Equipment - Fuel Part #: 94-8136 Supplier: 99321
SPL-9698	Drain Equipment, Surge Tank Sump Part #: 100-0128-04 Supplier: 99321 Part #: C12002-7 Supplier: 81205 Opt Part #: V799 Supplier: 20661
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

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
192G	Sump Drain Access Door



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F. Drain the Fuel from the Sumps of the No. 1 or No. 2 Tank

SUBTASK 12-11-00-650-018



WARNING

DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Drain the sump fuel from the No. 1 or the No. 2 tank that you defueled.

NOTE: The best attitude to drain the sumps is 1.14 degrees pitch nose-down and zero degree roll.

- (a) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-910-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the area immediately adjacent to the sump drain valve.
- (b) Put the top end of the fuel sump drain equipment, COM-10360, against the bottom side of the poppet on the sump drain valve (Figure 303).
- (c) Push the tool up and turn it until the tabs on the tool hold it in the correct position and fuel flows into the 5-gallon (19-liter) fuel resistant container, STD-1054.
- (d) When the fuel flow stops, remove the tool.

G. Drain the Fuel from the Sump of the Surge Tank

SUBTASK 12-11-00-680-015



WARNING

DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Drain the sump fuel from the defueled surge tank.

NOTE: The best attitude to drain the sumps is 1.14 degrees pitch nose-down and zero degree roll.

- (a) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-910-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the area immediately adjacent to the sump drain valve.
 - (b) Put the top end of a drain equipment, SPL-9698, against the bottom side of the poppet on the surge tank sump drain valve (Figure 303).
 - (c) Push the tool up and turn it until the tabs on the tool hold it in the correct position and fuel flows into the 5-gallon (19-liter) fuel resistant container, STD-1054.
- NOTE: There may not be any fuel or fluid to drain from the surge tank.
- (d) When the fuel flow stops, remove the tool.

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H. Drain the Fuel from the Sump of the Center Tank

SUBTASK 12-11-00-680-003



WARNING

DURING THE SUMPING PROCEDURE, ELECTRICALLY GROUND THE METAL CONTAINER AND ALL RELATED SUMP EQUIPMENT. MAKE THE GROUND AWAY FROM THE AREA THAT IS IMMEDIATELY ADJACENT TO THE DRAINAGE. FLAMMABLE FUMES CAN OCCUR. FIRE AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Drain the sump fuel from the defueled center tank.
 - (a) Adjust the airplane attitude to 1.14 degrees pitch nose-down and zero-degree roll to drain the maximum quantity of fuel.
 - (b) Open this access panel for the sump valve for the center tank:
(Figure 304)

<u>Number</u>	<u>Name/Location</u>
192G	Sump Drain Access Door
 - (c) Electrically ground the 5-gallon (19-liter) fuel resistant container, STD-1054, and other applicable equipment to the airplane structure (TASK 20-40-11-910-801).
 - 1) Do not connect the 5-gallon (19-liter) fuel resistant container, STD-1054, and other equipment to the airplane structure in the immediate area of the sump drain.
 - (d) Pull the rod that operates the sump drain valve down.
 - 1) Hold the rod down until the fuel flow stops.
 - 2) Use a 0.5 inch ID hose (approximately 30 inches long) and a clamp that you can make locally to help you drain the fuel.
 - (e) Release the sump drain valve and turn it counterclockwise to close it.
 - (f) Release the rod that operates the sump drain valve to close the valve.
 - 1) Remove the clamp and the hose.
 - 2) Close this access panel for the sump drain valve:

Number Name/Location

192G Sump Drain Access Door

SUBTASK 12-11-00-680-004

- (2) Open the drain valves for the boost pumps.
 - (a) Drain the fuel from the pumps.

SUBTASK 12-11-00-680-005

- (3) Close the drain valves for the boost pumps.

SUBTASK 12-11-00-680-006



WARNING

MAKE SURE YOU FULLY DRAINED THE SUMP FUEL WITH THE AIRPLANE IN THE CORRECT ATTITUDE BEFORE YOU GO INTO THE CENTER TANK. UNWANTED FUEL WILL COME OUT OF THE TANK WHEN YOU REMOVE THE ACCESS PANEL.

- (4) If you are scheduled to go into the tank that you defueled, for the applicable tank, do this task:
Fuel Tank - Purging and Tank Entry, TASK 28-11-00-910-802.

— END OF TASK —

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HYDRAULIC RESERVOIR - SERVICING

1. General

- A. This procedure contains this task:
- (1) Hydraulic reservoir servicing.

TASK 12-12-00-610-801

2. Hydraulic Reservoir Servicing

(Figure 301)

A. General

- (1) Operators should inspect both reservoirs for proper servicing during the same inspection. If it is noted that one reservoir is under serviced, while the other is over serviced, then hydraulic fluid transfer may be occurring. In this case, it is important to remove excess fluid from the over serviced reservoir to decrease potential fluid entry into the air conditioning system. If this continues to occur, it is recommended to do Hydraulic Fluid Transfers from System A to System B - Fault Isolation, FIM 29-10 TASK 806 or Hydraulic Fluid Transfers from System B to System A - Fault Isolation, FIM 29-10 TASK 807 to inspect for faulty components that can lead to inter-system hydraulic fluid transfer.
- (2) If one of the two hydraulic systems has been serviced again and again because of a low reservoir condition. It is recommended to do Reservoir Fluid Quantity Problems - Fault Isolation, FIM 29-11 TASK 802 to look for internal hydraulic leaks in the engine strut or fuel tank.
- (3) The equipment that is necessary to fill the hydraulic fluid is on the forward bulkhead of the right wheel well. The equipment includes a reservoir manual fill pump, a pressure fill connection, a reservoir fill filter module for the hydraulic fluid, and a reservoir fill selector valve.
- (4) There is a fluid quantity indicator on the system A and B reservoirs. The standby reservoir is filled through the system B reservoir. When the fluid quantity indicator for system B shows full, the system B reservoir and the standby reservoir are full.
- (5) The fluid chilling at high altitude and the large ambient temperature changes between departure and arrival locations can result in a decrease in fluid levels. These cold soak effects will not have an impact on the operation of the systems but it can shrink the fluid sufficiently to indicate a need for servicing, even if the reservoirs were serviced at a warm location before the previous flight. Under such circumstances, if you service the airplane "high" at the cold location before the airplane is sent back to the warm location, it is possible to cause an overfill of the reservoir and fluid can overflow from the drain line.
- (6) If the ambient temperature on the ground is 20°F (-7°C) or lower at an arrival location and a fluid level is below "REFILL", service the reservoir to just above "REFILL" to avoid the overflow of fluid at the next warmer location.

B. References

Reference	Title
29-00-00-870-801	Bleed the Hydraulic Systems (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

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Reference	Title
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)
FIM 29-10 TASK 806	Hydraulic Fluid Transfers from System A to System B - Fault Isolation
FIM 29-10 TASK 807	Hydraulic Fluid Transfers from System B to System A - Fault Isolation
FIM 29-11 TASK 802	Reservoir Fluid Quantity Problems - Fault Isolation

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-1536	Cart - Service, Hydraulic System Part #: 06-5020-3600 Supplier: 59603 Part #: 06-5021-3600 Supplier: 59603 Part #: 06-5022-6600 Supplier: 59603 Part #: 06-5024-3610 Supplier: 59603 Part #: 06-5043-3600 Supplier: 59603 Part #: BOB05 Supplier: D2029 Part #: MODEL 160 Supplier: 94861 Part #: MODEL 370 Supplier: 94861 Part #: PF53467-1P Supplier: 94861 Part #: PF54115-6P Supplier: 94861 Part #: PF55451 Supplier: 94861 Opt Part #: WF160 Supplier: 94861
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1140	Hose - Flexible, 1/2 Inch ID, BMS 3-11 Resistant, 10 Foot

D. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G51674	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule), 12 Inches Long	BACC13AT3K12

E. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right



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F. Hydraulic Reservoir Servicing

SUBTASK 12-12-00-863-001

- (1) Supply power to the hydraulic systems A, B, and standby hydraulic system.
 - (a) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.
 - (b) Do this task: Standby Hydraulic System Pressurization, TASK 29-21-00-000-801.

SUBTASK 12-12-00-210-001

- (2) Make sure that the flaps and the leading edge are up.

SUBTASK 12-12-00-866-001

- (3) Make sure that the spoilers and landing gear are in the down position.

SUBTASK 12-12-00-860-013

- (4) Make sure that the flight controls are in the neutral position.

SUBTASK 12-12-00-860-014

- (5) If the thrust reversers are not retracted, do one of these tasks: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00 or Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

SUBTASK 12-12-00-860-001

- (6) Remove power from the hydraulic systems A, B, and standby hydraulic system:

NOTE: It is not necessary to release head pressure from the hydraulic reservoirs before you fill them.

- (a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
- (b) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 12-12-00-210-002

- (7) Before you fill the system B reservoir, make sure that the brake accumulator has a minimum of 2800 psig (19,305 kPa) of pressure in it (with the hydraulic pumps off).

SUBTASK 12-12-00-480-001

- (8) If the hand pump is used, put the end of the suction hose in the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.

SUBTASK 12-12-00-480-002



CAUTION DO NOT SUPPLY HYDRAULIC FLUID AT MORE THAN 75 PSIG (517 KPA) TO THE PRESSURE FILL CONNECTION. A PRESSURE OF MORE THAN 75 PSIG (517 KPA) CAN CAUSE DAMAGE TO THE HYDRAULIC SYSTEM.

- (9) If the hydraulic system service cart, COM-1536, is used, connect the hose from the hydraulic system service cart, COM-1536, to the pressure fill connection.

SUBTASK 12-12-00-860-002

- (10) Turn the reservoir fill selector valve to the reservoir to be filled.

NOTE: PORT A fills reservoir A, and PORT B fills the standby reservoir and reservoir B.

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SUBTASK 12-12-00-610-001



WARNING

MAKE SURE THAT THE CORRECT QUANTITY OF FLUID IS PRESENT IN BOTH HYDRAULIC RESERVOIRS. OVERSERVICED RESERVOIR(S) CAN CAUSE FLUID TO ENTER THE PNEUMATIC DUCTS AND THE AIR CONDITIONING PACKS AND SUBSEQUENT SMOKE AND FUMES IN THE FLIGHT COMPARTMENT AND PASSENGER COMPARTMENT (ALTHOUGH THE HYDRAULIC RESERVOIR PRESSURIZATION SYSTEM IS DESIGNED TO MITIGATE THESE EVENTS). HYDRAULIC FLUID CONTAMINATION OF THE PNEUMATIC SYSTEM CAN ALSO CAUSE DAMAGE TO TITANIUM DUCTS. SMOKE AND FUMES FROM HYDRAULIC FLUID CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID, BMS 3-11 CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU EAT OR DRINK THE HYDRAULIC FLUID, GET MEDICAL AID.



CAUTION

USE CLEAN HYDRAULIC FLUID AND CLEAN EQUIPMENT WHEN YOU FILL THE HYDRAULIC RESERVOIRS. DIRT CAN CAUSE DAMAGE TO THE HYDRAULIC SYSTEM.

- (11) Add hydraulic fluid, D00153, or hydraulic fluid, D50269, using the following requirements until the reservoir indicators are as specified below:

- (a) Fill the hydraulic reservoir until the quantity indicator is approximately 2/3 between RFL (refill) and F (full), which is approximately 92%.

NOTE: This will have no effect on system operation and will make sure that the reservoirs are not over filled.

NOTE: The indicator needle will be closer to the F (full) mark than the RFL (refill) mark.

NOTE: For hydraulic system A reservoir, the quantity for the FULL mark is approximately 5.7 gal (21.6 l). For hydraulic system B and standby reservoirs, the quantity for the FULL mark is 8.2 gal (31.0 l). The reservoir fill connection permits fluid servicing from the ground servicing system to the system A and system B reservoirs.

NOTE: All currently qualified BMS 3-11, Type IV or Type V hydraulic fluids are interchangeable and intermixable in any proportion.

- (b) If the ambient temperature on the ground is 20°F (-7°C) or lower and the fluid level is below RF (refill), service the reservoir so that the fluid level is just above the RFL indication.

NOTE: This will prevent the reservoir from being too full at a warmer location.

SUBTASK 12-12-00-860-003

- (12) Put the reservoir fill selector valve in the CLOSED position.

SUBTASK 12-12-00-080-001

- (13) Put the handle and suction hose for the hand pump in their usual positions, or disconnect the hydraulic system service cart, COM-1536.

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- (a) Before storage of the suction hose assembly, make sure that drain all the hydraulic fluid in the suction hose.

NOTE: This will minimize the quantity of hydraulic fluid caught in the hose assembly when stowed.

SUBTASK 12-12-00-210-003

- (14) Look at the gages, for the hydraulic fluid quantity, that are in the flight compartment.
(a) Make sure that the gages show the hydraulic fluid quantity are above refill (greater than 76%).

SUBTASK 12-12-00-870-001

- (15) If it is necessary, do this task: Bleed the Hydraulic Systems, TASK 29-00-00-870-801.
NOTE: It is not necessary to bleed the hydraulic system if only a small amount of hydraulic fluid is added during servicing. It is necessary to bleed the hydraulic system if maintenance activity allows air to enter the system, or, if you add a large amount of fluid and believe that air has entered the system from the reservoir.

SUBTASK 12-12-00-680-001

- (16) If the hydraulic fluid level is too high (more than 100%), do these steps:
(a) To release head pressure from the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.
NOTE: The air charging valve manifold allows both hydraulic reservoirs to be depressurized with one valve.



WARNING

DO NOT GET HYDRAULIC FLUID ON YOU. HYDRAULIC FLUID, BMS 3-11 CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU EAT OR DRINK THE HYDRAULIC FLUID, GET MEDICAL AID.

- (b) Install ten foot hose (1/2 inch ID), STD-1140, as follows:
1) Put one end of the ten foot hose (1/2 inch ID), STD-1140, on the outlet of the reservoir drain valve.
2) Put the opposite end of the ten foot hose (1/2 inch ID), STD-1140, into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.
(c) Remove lockwire or safety cable on the handle of the reservoir drain valve.
(d) To lower the hydraulic fluid level, do these steps:
1) Monitor the reservoir quantity gages while you drain fluid from the reservoir.
2) Open the reservoir drain valve to drain the hydraulic fluid into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.
3) Close the reservoir drain valve when the reservoir quantity gage is above refill.
(e) Remove the ten foot hose (1/2 inch ID), STD-1140, from the reservoir drain valve.
(f) Install MS20995NC32 lockwire, G50347, or safety cable kit, G51674, on the handle of the reservoir drain valve with double twist method.
(g) To pressurize the hydraulic reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

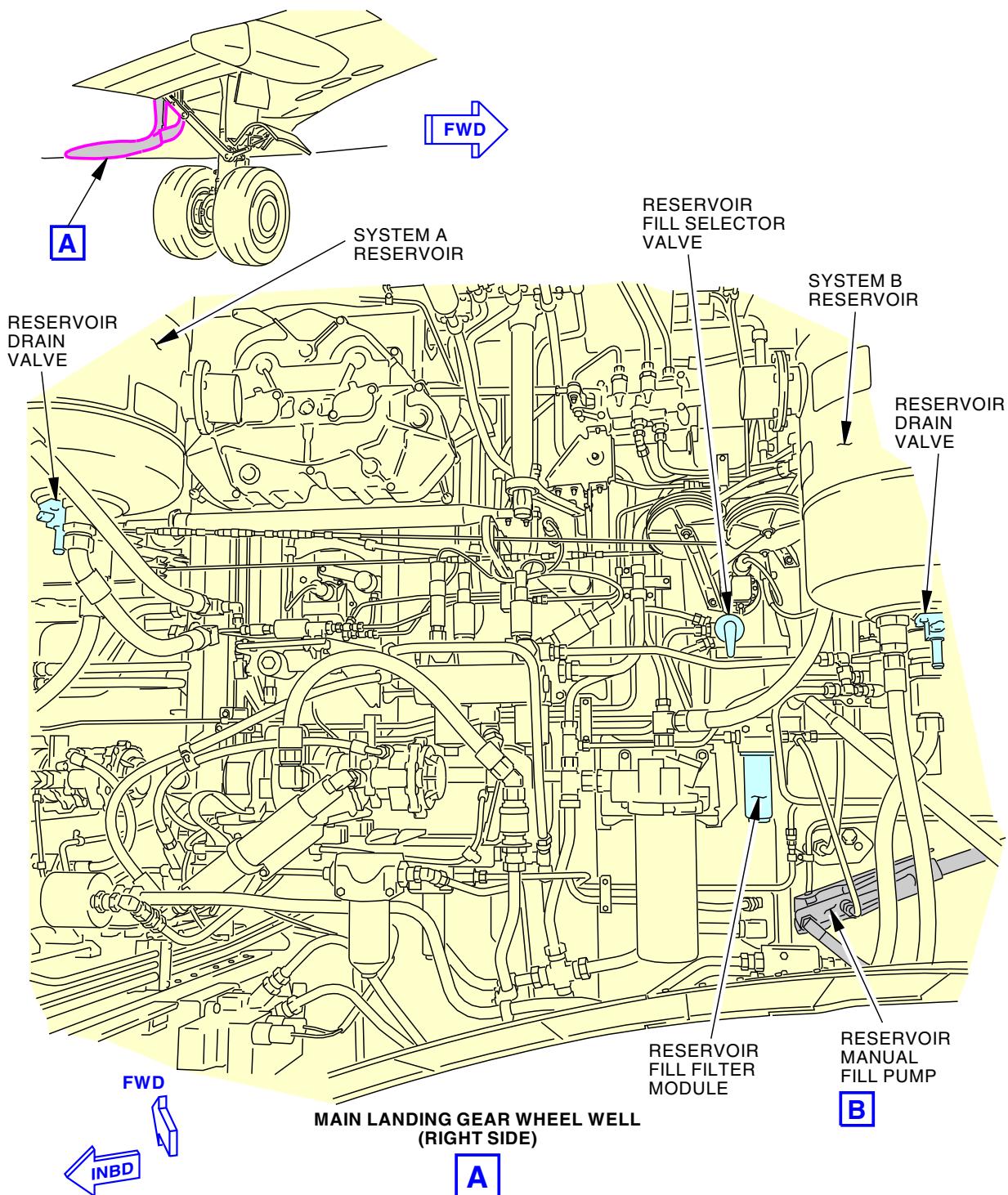
— END OF TASK —

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Hydraulic Reservoir Servicing
Figure 301/12-12-00-990-801 (Sheet 1 of 2)

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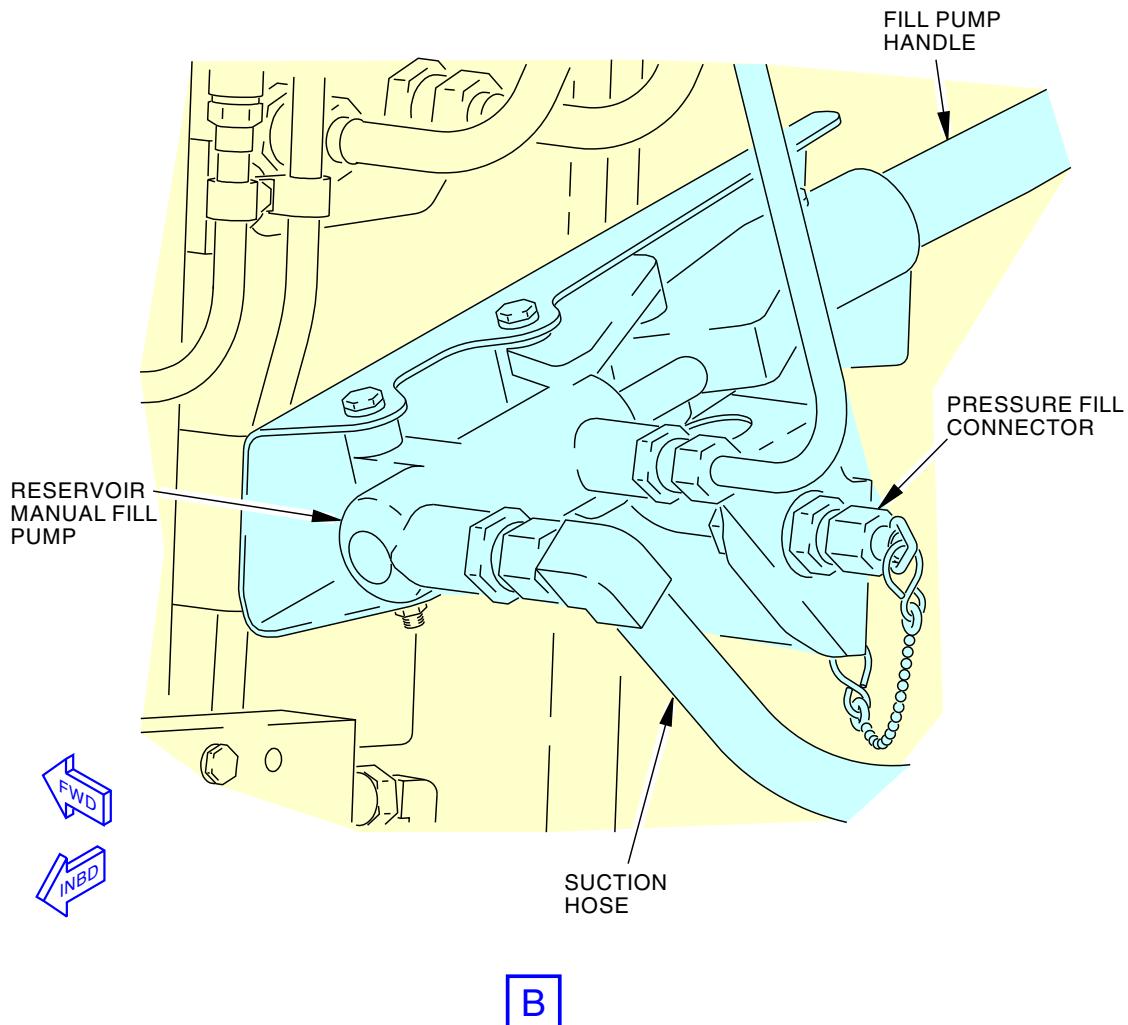
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Hydraulic Reservoir Servicing
Figure 301/12-12-00-990-801 (Sheet 2 of 2)

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ENGINE OIL - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Replenish the Engine Oil
 - (2) Replenish the Engine Oil (Remote Fill Procedure)
 - (3) Drain the Engine Oil
 - (4) Flush the Engine Oil System
 - (5) Oil Sampling for Analysis.

TASK 12-13-11-600-801

2. Replenish the Engine Oil

(Figure 301)

A. General

- (1) This task is the procedure to replenish the engine oil.
- (2) The total oil tank capacity for Engine 1 is 5.34 gal (20.2 l) and for Engine 2 is 5.4 gal (20.4 l).
- (3) Oil should be added not less than 5 minutes and no greater than 60 minutes after engine shutdown while the oil in the tank is still warm. This will prevent the over-servicing of the engine.
 - (a) If the oil in the tank is cool or cold, the oil density will increase (volume decreases) and the oil tank can be over-serviced.
 - (b) If the oil tank is over-serviced, this will not damage the engine. The extra oil will be blown overboard through the engine vent system.
 - (c) The quantity of oil can cause incorrect calculations for the consumption rate.
- (4) The oil tank should be serviced on a regular basis such that the oil level indication, with the engine not running, is equal to or greater than 60 percent full or 12 qt (11.4 l).

NOTE: An indicated oil level 60% minimum will prevent transient low oil level indications during takeoff phase due to gulping and airplane pitch and longitudinal acceleration.

- (5) Oil tank servicing is usually done daily, after the last engine shutdown of the day. This frequency can, however, be increased depending on each operator's airplane use rate unless these conditions occur:
 - (a) The oil level indication is less than 60 percent full or 12 qt (11.4 l).
 - (b) The specific oil consumption rate is higher than usual.
- (6) You must flush the oil system if the system contains contamination.
- (7) Do not mix different approved brands of oil unless you refer to CFM SB 79-0001.
- (8) When you change the fleet from one approved brand to a different approved brand, make sure that you follow the CFM SB 79-0001 instructions when you service the engine.

B. References

Reference	Title
73-11-07-000-801-F00	Servo Fuel Heater Removal (P/B 401)
73-11-07-400-801-F00	Servo Fuel Heater Installation (P/B 401)
79-11-01-300-801-F00	Replacement of the Filler Cap Packing or Filler Cap (P/B 801)
79-21-02-000-801-F00	Main Oil/Fuel Heat Exchanger Removal (P/B 401)

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Reference	Title
79-21-02-400-801-F00	Main Oil/Fuel Heat Exchanger 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-7517	Test Kit - Oil Condition
	Part #: MODEL V3A Supplier: 96009 Opt Part #: MODEL V-3 Supplier: 96009

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	AMS3819 Class 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Location Zones

Zone	Area
414	Engine 1 - Fan Cowl, Right
424	Engine 2 - Fan Cowl, Right

F. Access Panels

Number	Name/Location
414AR	Oil Tank Access Door, Engine 1
424AR	Oil Tank Access Door, Engine 2

G. Oil Level Requirements

SUBTASK 12-13-11-970-007

- (1) Find the minimum oil level necessary to dispatch the airplane with these recommendations:
 - (a) Before each flight, the indicated engine oil level in the flight compartment with engine not in operation must be 60% full or 12 qt (11.4 l) or more.
 - 1) If the airplane has more than one flight between oil servicing, make sure there is enough oil in the tank so the indicated level is always greater than 60% before each flight.
 - 2) There must be 7 qt (6.62 l) or more of oil remaining in the tank by the end of the scheduled flights for possible takeoff and go around (TOGA) operation.
 - (b) Calculate the oil usage from the flight(s) duration and the specific engine oil consumption.
 - (c) The minimum oil level necessary for dispatch should include the 60% and the oil usage.

H. Check the Oil Quantity

SUBTASK 12-13-11-970-005

- (1) With the engine not in operation, examine the oil level indication in the flight compartment and oil tank sight gage.
 - (a) Make sure that the oil level is enough to meet the oil level requirements above.

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- (b) If the indicated oil level is less than the necessary minimum oil level, replenish the oil tank.
- (c) Make sure that the oil level is visible on the oil tank sight gage.

I. Replenish the Engine Oil

SUBTASK 12-13-11-970-006

- (1) Open the applicable access doors on the right fan cowl panel.

Number Name/Location

414AR	Oil Tank Access Door, Engine 1
424AR	Oil Tank Access Door, Engine 2

SUBTASK 12-13-11-210-009

- (2) Do a check of the oil quantity with the sight gage.
 - (a) If the oil level is below the full mark, add engine oil.

SUBTASK 12-13-11-020-009



WARNING

DO NOT REMOVE THE FILLER CAP OF THE OIL TANK FOR FIVE MINUTES AFTER AN ENGINE SHUTDOWN. THE OIL IN THE TANK IS HOT AND PRESSURIZED DURING ENGINE OPERATION. IF THE CHECK VALVE IS DEFECTIVE, HOT OIL CAN SPRAY FROM THE OIL TANK AND CAUSE INJURY TO PERSONS.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

IMMEDIATELY CLEAN THE PAINTED SURFACES ON WHICH OIL FALLS. THE OIL WILL PUT STAINS ON CLOTHES AND CAN MAKE PAINT SOFT.



CAUTION

DO THE REPLENISH THE ENGINE OIL PROCEDURE BEFORE THE OIL TANK BECOMES COOL (60 MINUTES AFTER THE ENGINE SHUTDOWN). IF THE TANK IS COOL, YOU CAN FILL IT TOO MUCH AND CAUSE AN INCORRECT INDICATION OF THE OIL CONSUMPTION RATE.

- (3) Do these steps to remove the filler cap from the oil tank:



CAUTION

MAKE SURE THAT THE OIL TANK AND SCUPPER ARE CLEAN. IF THE OIL TANK AND SCUPPER ARE NOT CLEAN, CONTAMINATION OF THE OIL TANK AND OIL SAMPLE CAN OCCUR DURING THE SAMPLING OPERATION.

- (a) If necessary clean the oil tank scupper with a cotton wiper, G00034.
- (b) Lift the filler cap handle.
- (c) Turn the filler cap handle counterclockwise to open it.
- (d) Pull the filler cap from the gravity fill port.

SUBTASK 12-13-11-200-005

- (4) When you open the filler cap, do a check for fuel in the oil:

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CAUTION

IF YOU SMELL FUEL FUMES WHEN YOU REMOVE THE OIL FILLER CAP, DO A CHECK FOR FUEL IN THE OIL. IF THERE IS FUEL IN THE OIL TANK, DO THESE PROCEDURES: REPLACE THE MAIN OIL/FUEL HEAT EXCHANGER. REPLACE THE SERVO FUEL HEATER. FLUSH THE ENGINE OIL SYSTEM. FUEL CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (a) If you think there is fuel in the oil, use the oil condition test kit, COM-7517, to examine the oil.
- 1) If the viscometer is not available, use a gas detector or do a flash point check of the oil to look for fuel.
 - 2) If the viscosity test is incorrect then fuel is found, do these steps:
 - a) Replace the main oil/fuel heat exchanger (TASK 79-21-02-000-801-F00 and TASK 79-21-02-400-801-F00).
 - b) Replace the servo fuel heater (TASK 73-11-07-000-801-F00 and TASK 73-11-07-400-801-F00).
 - c) Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.
 - 3) If the viscosity test is correct, no fuel is found.

SUBTASK 12-13-11-610-029



CAUTION

FLUSH THE ENGINE OIL SYSTEM IF IT CONTAINS CONTAMINATION. OIL CONTAMINATION CAN CAUSE ENGINE DAMAGE.



CAUTION

DO NOT MIX TYPE 1 AND 2 OILS. DO NOT DO OIL SERVICING FROM NON-APPROVED OILS. FLUSH AND FILL THE OIL SYSTEM IMMEDIATELY WITH THE CORRECT ENGINE OIL IF ONE OF THE ERRORS THAT FOLLOW OCCURS (IF YOU USE MORE THAN 10 PERCENT OF A DIFFERENT OIL TYPE OR IF YOU USE MORE THAN 10 PERCENT OF A NON-APPROVED OIL). DAMAGE TO EQUIPMENT CAN OCCUR IF YOU OPERATE THE ENGINE IN ONE OF THESE CONDITIONS.



CAUTION

DO THE REPLENISH THE ENGINE OIL PROCEDURE BEFORE THE OIL TANK BECOMES COOL (60 MINUTES AFTER THE ENGINE SHUTDOWN). IF THE TANK IS COOL, YOU CAN FILL IT TOO MUCH AND CAUSE AN INCORRECT INDICATION OF THE OIL CONSUMPTION RATE.

- (5) Add oil, D00599 [CP2442], to the gravity fill port of the oil tank and stop before the full mark of the sight gage.
- (a) If non-approved oils or different oil types were added to the engine oil, do these steps:
- 1) If the quantity is less than 10 percent (2 qt (1.9 l) or less), no action is necessary.
 - 2) If the quantity is more than 10 percent (more than 2 qt (1.9 l)), you must drain and replenish the oil tank before the subsequent flight.

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SUBTASK 12-13-11-420-011



WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THERE IS A RISK OF INJURY TO YOUR FINGERS.



WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THE HANDLE OF THE FILLER CAP CAN ACCIDENTALLY MOVE TO ITS (UNLOCKED) VERTICAL POSITION. IF IT DOES THIS, THERE IS A RISK THAT PRESSURIZED HOT OIL WILL FLOW OUT OF THE TANK AND CAUSE INJURY (DANGEROUS BURNS).

- (6) Do these steps to install the filler cap in the oil tank:
 - (a) Examine the packing on the filler cap.
 - (b) Make sure that the packing is in its position.
 - 1) If the packing is damaged or shows deterioration, replace the packing (TASK 79-11-01-300-801-F00).
 - (c) Put the filler cap in its position in the gravity fill port.
 - 1) Make sure that the filler cap handle is in the unlocked position.
 - (d) Push the filler cap in and turn the filler cap handle clockwise to close it.
 - (e) Push the filler cap handle down to the locked position.

J. Put the Airplane Back to Its Usual Condition

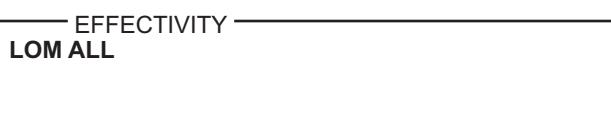
SUBTASK 12-13-11-410-016

- (1) Close the applicable access doors on the right fan cowl panel.

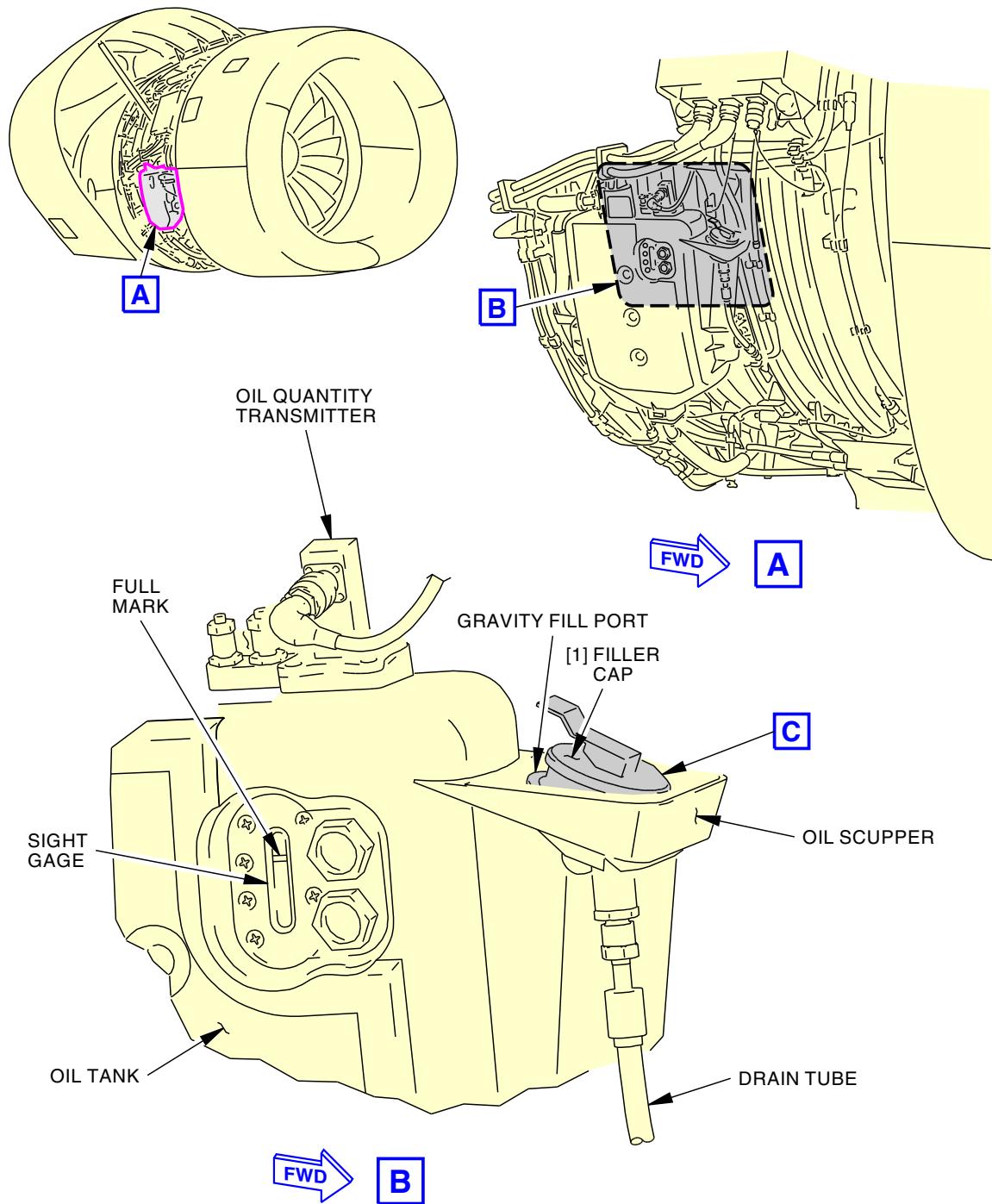
Number Name/Location

414AR	Oil Tank Access Door, Engine 1
424AR	Oil Tank Access Door, Engine 2

———— END OF TASK ————



12-13-11



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Oil Tank Servicing

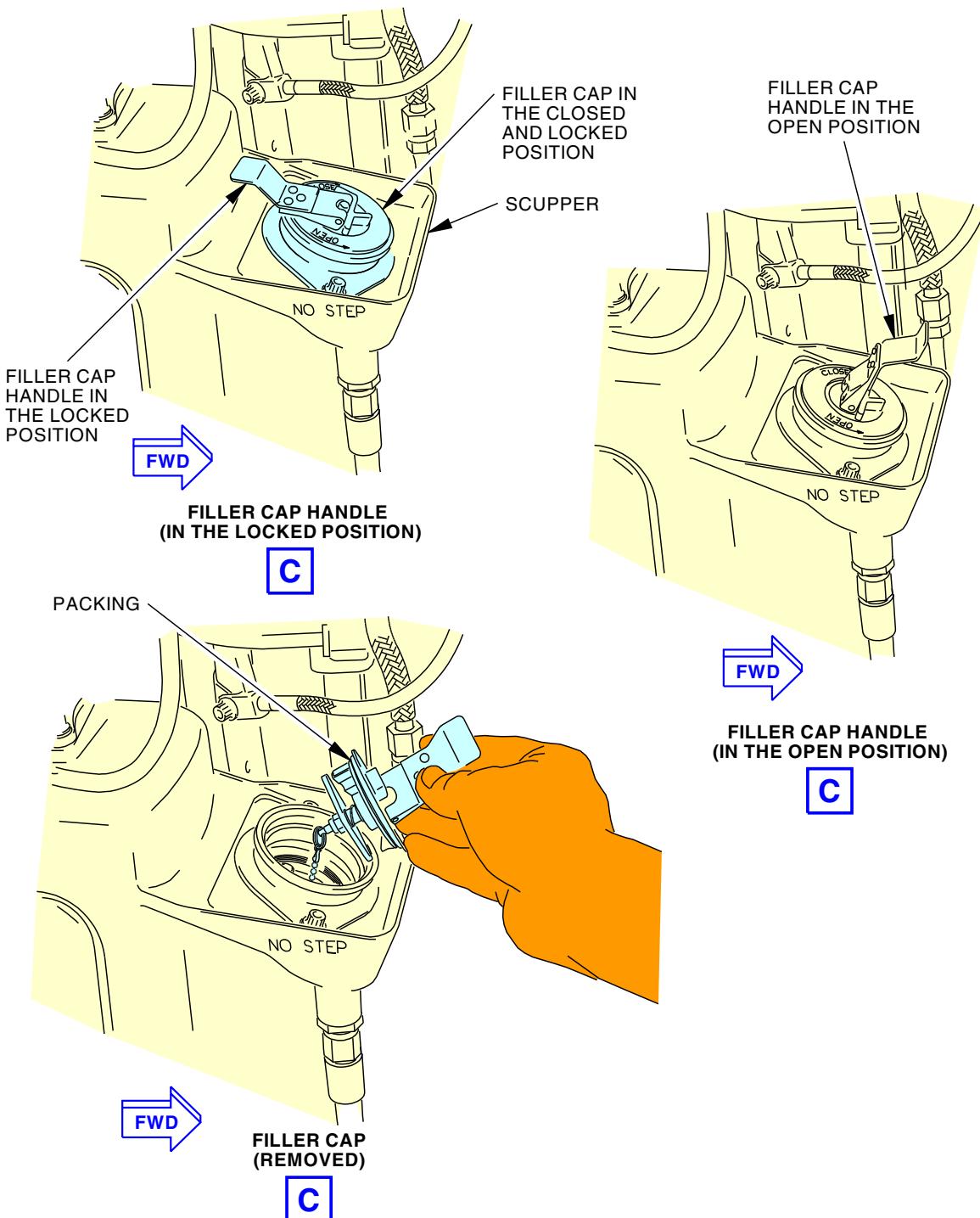
Figure 301/12-13-11-990-813 (Sheet 1 of 2)

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Oil Tank Servicing

Figure 301/12-13-11-990-813 (Sheet 2 of 2)

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TASK 12-13-11-600-806

3. Replenish the Engine Oil (Remote Fill Procedure)

A. General

- (1) This task is the procedure to replenish the engine oil (Remote Fill Procedure).
- (2) The total oil tank capacity for Engine 1 is 5.34 U.S. gallons (20.2 liters) and for Engine 2 is 5.4 U.S. gallons (20.4 liters).
- (3) Oil should be added not less than 5 minutes and no greater than 60 minutes after engine shutdown while the oil in the tank is still warm. This will prevent the over-servicing of the engine.
 - (a) If the oil in the tank is cool or cold, the oil density will increase (volume decreases) and the oil tank can be over-serviced.
 - (b) If the oil tank is over-serviced, this will not damage the engine. The extra oil will be blown overboard through the engine vent system.
 - (c) The quantity of oil can cause incorrect calculations for the consumption rate.
- (4) The oil tank should be serviced on a regular basis such that the oil level indication, with the engine not running, is equal to or greater than 60 percent full or 12.00 U.S. quarts (11.40 liters).

NOTE: An indicated oil level 60% minimum will prevent transient low oil level indications during takeoff phase due to gulping and airplane pitch and longitudinal acceleration.

- (5) Oil tank servicing is usually done daily, after the last engine shutdown of the day. This frequency can, however, be increased depending on each operator's airplane use rate unless these conditions occur:
 - (a) The oil level indication is less than 60 percent full or 12.00 U.S. quarts (11.40 liters).
 - (b) The specific oil consumption rate is higher than usual.
- (6) You must flush the oil system if the system contains contamination.
- (7) Do not mix different approved brands of oil unless you refer to CFM SB 79-0001.
- (8) When you change the fleet from one approved brand to a different approved brand, make sure that you follow the CFM SB 79-0001 instructions when you service the engine.

B. References

Reference	Title
73-11-07-000-801-F00	Servo Fuel Heater Removal (P/B 401)
73-11-07-400-801-F00	Servo Fuel Heater Installation (P/B 401)
79-21-02-000-801-F00	Main Oil/Fuel Heat Exchanger Removal (P/B 401)
79-21-02-400-801-F00	Main Oil/Fuel Heat Exchanger 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-7517	Test Kit - Oil Condition Part #: MODEL V3A Supplier: 96009 Opt Part #: MODEL V-3 Supplier: 96009





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D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	

E. Location Zones

Zone	Area
414	Engine 1 - Fan Cowl, Right
424	Engine 2 - Fan Cowl, Right

F. Access Panels

Number	Name/Location
414AR	Oil Tank Access Door, Engine 1
424AR	Oil Tank Access Door, Engine 2

G. Oil Level Requirements

SUBTASK 12-13-11-970-003

- (1) Find the minimum oil level necessary to dispatch the airplane with these recommendations:
 - (a) Before each flight, the indicated engine oil level in the flight compartment with the engine not in operation must be 60% full or 12.00 U.S. quarts (11.40 liters) or more.
 - 1) If the airplane has more than one flight between oil servicing, make sure there is enough oil in the tank so the indicated level is always greater than 60% before each flight.
 - 2) There must be 7 quarts (6.65 liters) or more of oil remaining in the tank by the end of the scheduled flights for possible takeoff and go-around (TOGA) operation.
 - (b) Calculate the oil usage from the flight(s) duration and the specific engine oil consumption.
 - (c) The minimum oil level necessary for dispatch should include the 60% and the oil usage.

H. Do a Check of the Oil Quantity

SUBTASK 12-13-11-210-007

- (1) With the engine not in operation, examine the oil level indication in the flight compartment.
 - (a) Make sure the oil level is enough to meet the oil level requirements above.
 - (b) If the indicated oil level is less than the necessary minimum oil level, replenish the oil tank.

I. Replenish the Engine Oil

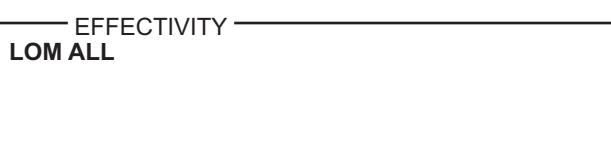
SUBTASK 12-13-11-010-015

- (1) Open the applicable access doors on the right fan cowl panel.

Number	Name/Location
414AR	Oil Tank Access Door, Engine 1
424AR	Oil Tank Access Door, Engine 2

SUBTASK 12-13-11-210-008

- (2) Do a check of the oil quantity with the sight gage (Figure 302).
 - (a) If the oil level is below the full mark, add engine oil.



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SUBTASK 12-13-11-020-008



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

IMMEDIATELY CLEAN THE PAINTED SURFACES ON WHICH OIL FALLS. THE OIL WILL PUT STAINS ON CLOTHES AND CAN MAKE PAINT SOFT.

- (3) Remove the plugs from the remote fill coupling [4] and the remote overflow coupling [3] (Figure 302):

NOTE: Do the "Replenish The Engine Oil" procedure before the oil tank becomes cool (60 minutes after the engine shutdown). If the tank is cool, you can fill it too much and cause an incorrect indication of the oil consumption rate.

SUBTASK 12-13-11-612-006



CAUTION

MAKE SURE THAT THE PRESSURE LUBE SYSTEM HAS A HAND PUMP. IF YOU USE OTHER TYPES OF PRESSURE LUBE SYSTEMS, AN OVERFILL CONDITION CAN OCCUR.

- (4) Connect a hose coupling from the pressure lube system to the remote fill coupling [4].

NOTE: It is recommended to use a pressure lube system equipped with a hand pump. The use of a hand pump will permit you to easily follow the increase in the oil level and to prevent the over-servicing of the engine oil system. Do not use an oil pump with a flow rate more than 66 US gallons per hour (250 liters per hour) for the remote fill operation, or overfill of the engine oil system can occur.

SUBTASK 12-13-11-612-007

- (5) Connect a Hose (overflow hose), made of clear plastic, to the remote overflow coupling [3].

NOTE: Use a clear plastic hose to permit the detection of oil at the overflow coupling location (oil tank is full). This will give a visual indication that the oil tank is full.

SUBTASK 12-13-11-200-004



WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THERE IS A RISK OF INJURY TO YOUR FINGERS.



WARNING

IF THE HANDLE POSITION IS OPPOSITE TO THE OIL QUANTITY TRANSMITTER, THE HANDLE OF THE FILLER CAP CAN ACCIDENTALLY MOVE TO ITS (UNLOCKED) VERTICAL POSITION. IF IT DOES THIS, THERE IS A RISK THAT PRESSURIZED HOT OIL WILL FLOW OUT OF THE TANK AND CAUSE INJURY (DANGEROUS BURNS).

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(WARNING PRECEDES)



CAUTION

IF YOU SMELL FUEL FUMES WHEN YOU REMOVE THE OIL FILLER CAP, DO A CHECK FOR FUEL IN THE OIL. IF THERE IS FUEL IN THE OIL TANK, DO THESE PROCEDURES: REPLACE THE MAIN OIL/FUEL HEAT EXCHANGER. REPLACE THE SERVO FUEL HEATER. FLUSH THE ENGINE OIL SYSTEM. FUEL CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (6) Open the filler cap [1] and do a check for fuel in the oil:
- (a) If you think there is fuel in the oil, use the oil condition test kit, COM-7517, to examine the oil.
 - 1) If the viscometer is not available, use a gas detector or do a flash point check of the oil to look for fuel.
 - 2) If the viscosity test is incorrect then fuel is found, do these steps:
 - a) Replace the main oil/fuel heat exchanger (TASK 79-21-02-000-801-F00 and TASK 79-21-02-400-801-F00).
 - b) Replace the servo fuel heater (TASK 73-11-07-000-801-F00 and TASK 73-11-07-400-801-F00).
 - c) Do this task: Flush the Engine Oil System, TASK 12-13-11-100-801.
 - 3) If the viscosity test is correct, no fuel is found.
 - (b) Close the filler cap [1].

SUBTASK 12-13-11-610-028



CAUTION

FLUSH THE ENGINE OIL SYSTEM IF IT CONTAINS CONTAMINATION. OIL CONTAMINATION CAN CAUSE ENGINE DAMAGE.



CAUTION

DO NOT MIX TYPE 1 AND TYPE 2 OILS. DO NOT DO OIL SERVICING WITH BRANDS THAT ARE NOT APPROVED. FLUSH AND REPLENISH THE OIL SYSTEM IMMEDIATELY WITH THE CORRECT ENGINE OIL IF ONE OF THE ERRORS THAT FOLLOW OCCURS: 1) IF 10 PERCENT OR MORE OF A DIFFERENT OIL TYPE WAS USED, OR 2) IF 10 PERCENT OR MORE OF A NON-APPROVED OIL WAS USED. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU OPERATE THE ENGINE IN ONE OF THESE CONDITIONS.

- (7) Add oil, D00599 [CP2442], to the oil tank until the oil is visible through the Hose (overflow hose).

NOTE: Do the "Replenish The Engine Oil" procedure before the oil tank becomes cool (60 minutes after the engine shutdown). If the tank is cool, you can fill it too much and cause an incorrect indication of the oil consumption rate.

- (a) If non-approved oils or different oil types were added to the engine oil, do these steps:
 - 1) If the quantity is less than 10 percent (2 quarts or less) (1.9 liters or less), no action is necessary.
 - 2) If the quantity is more than 10 percent (2 quarts or more) (1.9 liters or more), you must drain and replenish the oil tank before the subsequent flight.

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SUBTASK 12-13-11-420-010



CAUTION

DO NOT REMOVE THE OVERFLOW HOSE BEFORE THE FLOW OF OIL STOPS. IF YOU REMOVE THE OVERFLOW HOSE, IT CAN CAUSE THE TANK TO BE MORE THAN FULL. THIS WILL NOT CAUSE DAMAGE TO THE ENGINE, BUT IT WILL BE A PROBLEM FOR THE SERVICE RECORDS.

- (8) When the oil flow from the Hose (overflow hose) stops, disconnect the pressure lube system from the oil tank.

- (a) Do a check for oil leakage from the remote fill coupling [4] and the remote overflow coupling [3].

- 1) No leaks are permitted.

NOTE: A lightly, wet surface, which is not sufficient to make one drop, is permitted.

SUBTASK 12-13-11-420-009

- (9) Put the plugs on the remote fill coupling [4] and the remote overflow coupling [3].
- (a) Tighten the remote overflow coupling to 270-300 inch-pounds (30.5-34 newton-meters).
- (b) Tighten the remote fill coupling to 180-200 inch-pounds (20.5-23 newton-meters).

J. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-11-410-015

- (1) Close the applicable access doors on the right fan cowl panel.

Number Name/Location

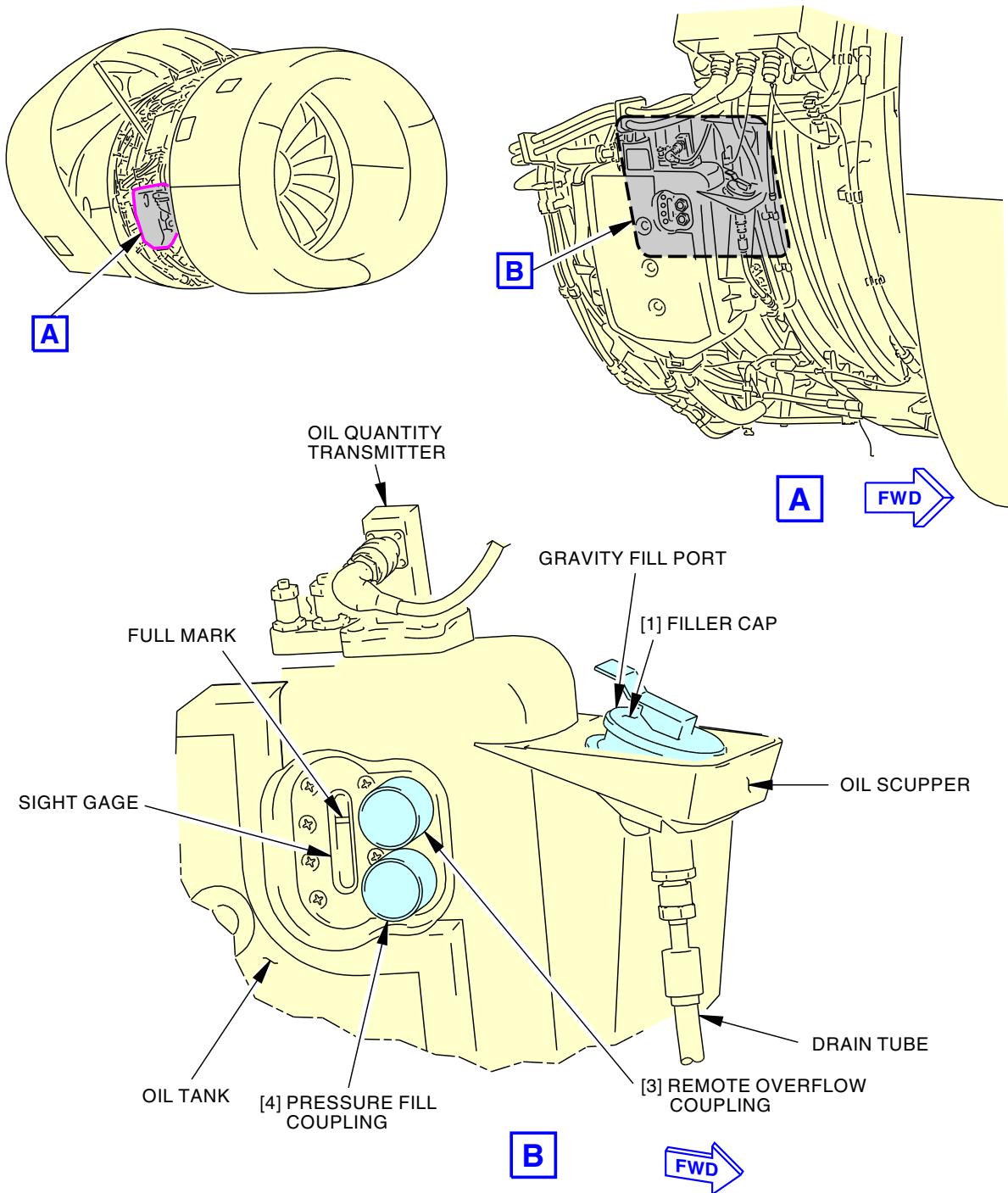
414AR Oil Tank Access Door, Engine 1

424AR Oil Tank Access Door, Engine 2

———— END OF TASK ————

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Oil Tank Servicing (Remote Fill)
Figure 302/12-13-11-990-809

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TASK 12-13-11-600-803

4. Drain the Engine Oil

(Figure 301 and Figure 303)

A. General

- (1) This task is the procedure to drain the engine oil.
- (2) The total oil tank capacity for Engine 1 is 5.34 US gallons (20.2 liters) and for Engine 2 is 5.4 US gallons (20.4 liters).
- (3) Do these steps when you change the engine oil:
 - (a) Drain the oil tank and accessory gearbox.
 - (b) Replenish the oil tank with the same brand of oil.
- (4) Do not mix different approved brands, if the oil belongs to a different type (CFM SB 79-0001).
- (5) You must flush the oil system if the system contains contamination.
- (6) When you change the fleet from one approved brand to a different approved brand, make sure that you follow the CFM SB 79-0001 instructions when you service the engine.

B. References

Reference	Title
71-00-00-800-811-F00	Power Plant Test Reference Table (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-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-3938	Container - Oil Resistant, 10 U.S. Gallon (38 Liter)

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
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. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Packing	79-11-01-01-115	LOM ALL
24	Packing	72-63-00-06-150	LOM ALL

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine



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G. Prepare to Drain the Engine Oil

SUBTASK 12-13-11-860-009

- (1) 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	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 12-13-11-860-010

- (2) 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>
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

SUBTASK 12-13-11-010-003

- (3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. Drain the Engine Oil

SUBTASK 12-13-11-020-005



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 REMOVE THE FILLER CAP OF THE OIL TANK FOR FIVE MINUTES AFTER AN ENGINE SHUTDOWN. THE OIL IN THE TANK IS HOT AND PRESSURIZED DURING ENGINE OPERATION. IF THE CHECK VALVE IS DEFECTIVE, HOT OIL CAN SPRAY FROM THE OIL TANK AND CAUSE INJURY TO PERSONS.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

IMMEDIATELY CLEAN THE PAINTED SURFACES ON WHICH OIL FALLS. THE OIL WILL PUT STAINS ON CLOTHES AND CAN MAKE PAINT SOFT.



CAUTION

DO THE "REPLENISH THE ENGINE OIL" PROCEDURE BEFORE THE OIL TANK BECOMES COOL (60 MINUTES AFTER THE ENGINE SHUTDOWN). IF THE TANK IS COOL, YOU CAN FILL IT TOO MUCH AND CAUSE AN INCORRECT INDICATION OF THE OIL CONSUMPTION RATE.

- (1) Do these steps to remove the filler cap from the oil tank:



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CAUTION

MAKE SURE THAT THE OIL TANK AND SCUPPER ARE CLEAN. IF THE OIL TANK AND SCUPPER ARE NOT CLEAN, CONTAMINATION OF THE OIL TANK AND OIL SAMPLE CAN OCCUR DURING THE SAMPLING OPERATION.

- (a) Use a cotton wiper, G00034, to clean the oil scupper.
- (b) Lift the filler cap handle.
- (c) Turn the filler cap handle counterclockwise to open it.
- (d) Pull the filler cap from the gravity fill port.

SUBTASK 12-13-11-610-003



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (2) Do these steps to drain the oil tank:

- (a) Put a oil resistant container (10 gal), STD-3938, below the oil tank.
- (b) Remove the drain plug [22].
 - 1) Let the oil drain in the container.
- (c) Remove and discard the packing [21].

SUBTASK 12-13-11-420-003

- (3) Do these steps to install the drain plug [22]:



CAUTION

MAKE SURE THAT YOU INSTALL THE PACKING ON THE DRAIN PLUG. IF YOU DO NOT, ENGINE OIL LEAKS AND ENGINE DAMAGE CAN OCCUR.

- (a) Make sure that the groove in the drain plug [22] is clean.
- (b) Lubricate a new packing [21] with oil, D00599 [CP2442].
- (c) Install the new packing [21] in the groove of the drain plug [22].
- (d) Carefully install the drain plug [22] in the bottom of the oil tank.
 - 1) Tighten the drain plug to 135 in-lb (15 N·m) - 150 in-lb (17 N·m).
- (e) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006].

SUBTASK 12-13-11-610-004

- (4) Do these steps to drain the Accessory Gearbox (AGB):

- (a) Put a 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the AGB.
- (b) Remove the drain plug [23].
 - 1) Let the oil drain in the container.
- (c) Remove and discard the packing [24].

SUBTASK 12-13-11-420-004

- (5) Do these steps to install the drain plug [23]:

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CAUTION
MAKE SURE THAT YOU INSTALL THE PACKING ON THE DRAIN PLUG.
IF YOU DO NOT, ENGINE OIL LEAKS AND ENGINE DAMAGE CAN OCCUR.

- (a) Make sure that the groove in the drain plug [23] is clean.
- (b) Lubricate a new packing [24] with oil, D00599 [CP2442].
- (c) Install the packing [24] in the groove of the drain plug [23].
- (d) Carefully install the drain plug [23] in the AGB.
 - 1) Tighten the drain plug to 180 in-lb (20 N·m) - 220 in-lb (25 N·m).
- (e) Install the safety wire, G02345 [CP8001] or cable, G50065 [CP8006].

SUBTASK 12-13-11-610-005

- (6) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-11-410-008

- (1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 12-13-11-860-025

- (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	4	C01390	ENGINE 1 ALTN PWR CHAN B
A	5	C01314	ENGINE 1 ALTN PWR CHAN A

SUBTASK 12-13-11-860-026

- (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>
D	7	C01391	ENGINE 2 ALTN PWR CHAN B
D	8	C01315	ENGINE 2 ALTN PWR CHAN A

J. Installation Test

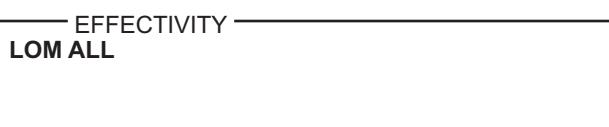
SUBTASK 12-13-11-800-001

- (1) Do the tests that are listed in the Power Plant Test Reference Table (TASK 71-00-00-800-811-F00).

SUBTASK 12-13-11-610-018

- (2) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

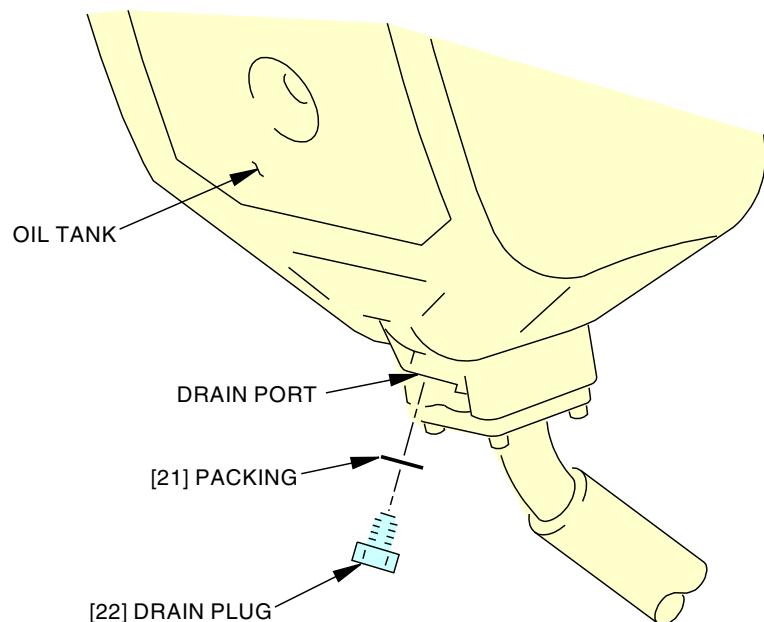
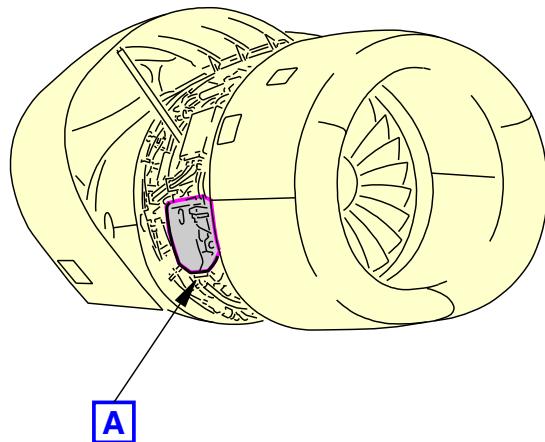
———— END OF TASK ————



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Oil System Drain Plugs Installation
Figure 303/12-13-11-990-802 (Sheet 1 of 2)

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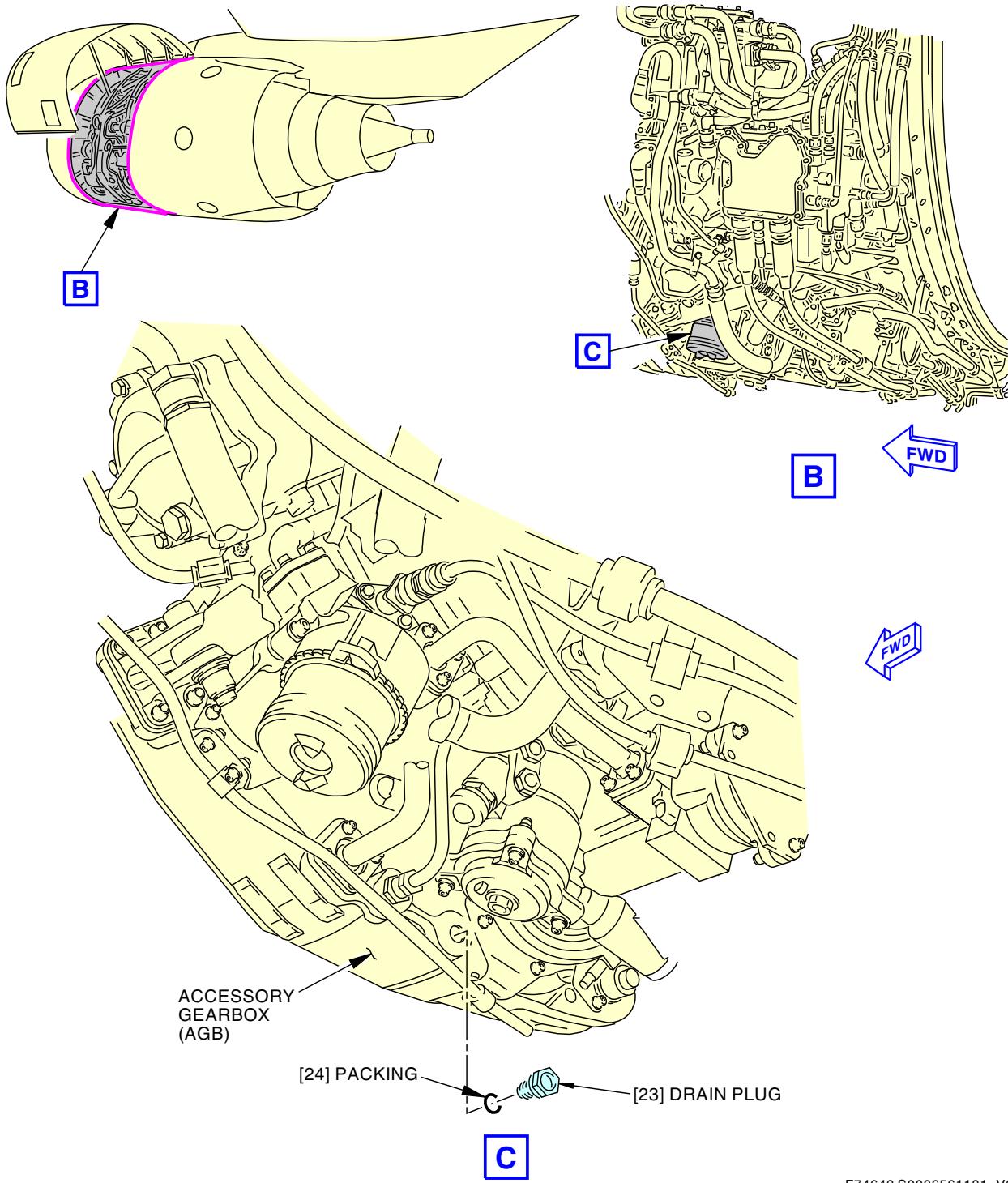
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Oil System Drain Plugs Installation
Figure 303/12-13-11-990-802 (Sheet 2 of 2)

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TASK 12-13-11-100-801

5. Flush the Engine Oil System

(Figure 301 and Figure 303)

A. General

- (1) This task is the procedure to flush the engine oil.
- (2) Fill the oil tank and the AGB with the same brand of oil.
NOTE: If you fill the oil tank when it is cool (60 minutes from engine shutdown), you can fill it too much. This cannot cause damage to the engine, but it can cause an incorrect indication of the oil consumption rate.
- (3) Do not mix different approved brands, if the oil belongs to a different type (CFM SB 79-0001).
- (4) You must flush the oil system if the system contains contamination.
- (5) When you change the fleet from one approved brand to a different approved brand, make sure that you follow the CFM SB 79-0001 instructions when you service the engine.

B. References

Reference	Title
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)
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)
79-00-00-200-804-F00	Chip Detectors and Scavenge Screens - Inspection (P/B 601)
79-21-03-000-802-F00	Oil Supply Filter Removal (P/B 401)
79-21-03-400-801-F00	Oil Supply Filter Installation (P/B 401)
79-21-06-000-801-F00	Scavenge Oil Filter Element Removal (P/B 401)
79-21-06-400-801-F00	Scavenge Oil Filter Element Installation (P/B 401)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Prepare to Flush the Engine Oil

SUBTASK 12-13-11-010-005

- (1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. Flush the Engine Oil

SUBTASK 12-13-11-750-001

- (1) If you think that there is contamination in the engine oil system, do this task: Oil Sampling For Analysis, TASK 12-13-11-750-801.

SUBTASK 12-13-11-610-019

- (2) Do this task: Drain the Engine Oil, TASK 12-13-11-600-803.

SUBTASK 12-13-11-610-020

- (3) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

NOTE: The engine manufacturer, CFM, confirms that an oil tank that is 1/2 full is a sufficient quantity to operate the engines at idle power for 10 minutes and flush the oil system.

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SUBTASK 12-13-11-710-001

- (4) Start the engine and then, operate it at ground idle for 10 minutes
(TASK 71-00-00-800-807-F00).

SUBTASK 12-13-11-710-003

- (5) Do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00.

SUBTASK 12-13-11-610-025

- (6) Do these steps to make sure that the engine is serviceable and all contamination is removed to an acceptable level:
- (a) Do this task: Drain the Engine Oil, TASK 12-13-11-600-803.
 - (b) Examine the chip detectors and scavenge screens (TASK 79-00-00-200-804-F00).
 - 1) Do this step if you find deposits that are satisfactory:
 - a) Clean and install the chip detectors and scavenge screens (TASK 79-00-00-200-804-F00).
 - 2) If you find unsatisfactory deposits, do the applicable corrective action that is given in the reference task (TASK 79-00-00-200-804-F00).
 - (c) Do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.
 - (d) Start the engine and then, operate it at ground idle for 10 minutes (TASK 71-00-00-800-807-F00).
 - (e) Do this task: Stop the Engine Procedure (Usual Engine Stop),
TASK 71-00-00-700-819-F00.
 - (f) Do a visual and a smell inspection for the presence of contaminants in the oil.
 - 1) If you still think there is contamination, repeat the above steps again to make sure the engine is serviceable and all contamination is removed to an acceptable level.

SUBTASK 12-13-11-960-002

- (7) Replace the scavenge oil filter element (TASK 79-21-06-000-801-F00 and
TASK 79-21-06-400-801-F00).

SUBTASK 12-13-11-960-001

- (8) Replace the oil supply filter (TASK 79-21-03-000-802-F00 and TASK 79-21-03-400-801-F00).

SUBTASK 12-13-11-210-005

- (9) After the engine shutdown, do a check of the oil quantity with the sight gage in 60 minutes or less.

SUBTASK 12-13-11-610-023

- (10) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-11-410-005

- (1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———— END OF TASK ———

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TASK 12-13-11-750-801

6. Oil Sampling For Analysis

(Figure 301 and Figure 304)

A. General

- (1) This task is the procedure for oil sampling for analysis.
- (2) Do not mix different approved brands, if the oil belongs to a different type (CFM SB 79-0001).
- (3) You must flush the oil system if the system contains contamination.
- (4) When you change the fleet from one approved brand to a different approved brand, make sure that you follow the CFM SB 79-0001 instructions when you service the engine.

B. References

Reference	Title
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)
79-11-01-300-801-F00	Replacement of the Filler Cap Packing or Filler Cap (P/B 801)

C. Tools/Equipment

Reference	Description
STD-1283	Bottle - Plastic, Oil Resistant, 1 Quart

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
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Oil Sampling for Analysis

SUBTASK 12-13-11-010-008

- (1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 12-13-11-020-003

 WARNING	DO NOT REMOVE THE FILLER CAP OF THE OIL TANK FOR FIVE MINUTES AFTER AN ENGINE SHUTDOWN. THE OIL IN THE TANK IS HOT AND PRESSURIZED DURING ENGINE OPERATION. IF THE CHECK VALVE IS DEFECTIVE, HOT OIL CAN SPRAY FROM THE OIL TANK AND CAUSE INJURY TO PERSONS.
---	---

 WARNING	DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.
---	--

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(WARNING PRECEDES)



WARNING

TRY NOT TO TOUCH THE OIL OR HAVE IT SPLASH WHEN YOU REMOVE THE DRAIN PLUG. HOT OIL CAN CAUSE A BURN. IF YOU DO NOT OBEY, INJURY TO PERSONNEL CAN OCCUR.



CAUTION

IMMEDIATELY CLEAN THE PAINTED SURFACES ON WHICH OIL FALLS. THE OIL WILL PUT STAINS ON CLOTHES AND CAN MAKE PAINT SOFT.

- (2) Do these steps to remove the filler cap to the oil tank:

NOTE: Sampling must be taken after engine shutdown and before you add oil to the oil tank. Allow 15 to 30 minutes for the engine to cool before sampling.



CAUTION

MAKE SURE THAT THE OIL SCUPPER IS CLEAN. IF THE OIL TANK IS NOT CLEAN, CONTAMINATION OF THE OIL TANK DURING THE SAMPLING OPERATIONS CAN OCCUR.

- (a) Use cotton wiper, G00034, to clean the oil scupper.
- (b) Lift the filler cap handle.
- (c) Turn the filler cap handle counterclockwise to open it.
- (d) Pull the filler cap from the gravity fill port.

SUBTASK 12-13-11-110-001



CAUTION

USE CLEAN, SCREW-TOP, NEW PLASTIC BOTTLES AND NEW PLASTIC TUBES. DO NOT USE THE PLASTIC BOTTLES AND PLASTIC TUBES AGAIN. IF YOU DO NOT OBEY, CONTAMINATION OF THE SAMPLE COULD OCCUR.

- (3) Squeeze a bottle, STD-1283, with your fingers and then dip the tube end in the oil to get a sample.

SUBTASK 12-13-11-970-001

- (4) Put a label on the plastic bottle with oil sample data as follows:

NOTE: Samples for the chemical and the spectrometric analysis must be sent to the laboratory as soon as possible.

- (a) Engine total operating time.
- (b) Operating time since the last sample.
- (c) The date of the sample.
- (d) Identification of the engine (serial number).
- (e) The type and the brand of oil you use.

SUBTASK 12-13-11-610-024

- (5) If the oil level is low, do this task: Replenish the Engine Oil, TASK 12-13-11-600-801.

SUBTASK 12-13-11-420-007

- (6) Do these steps to install the filler cap in the oil tank:

- (a) Examine the packing on the filler cap.
- (b) Make sure that the packing is in its position.

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- 1) If the packing is damaged or shows deterioration, replace the packing (TASK 79-11-01-300-801-F00).
 - (c) Put the filler cap in its position in the gravity fill port.
 - (d) Push the filler cap in and turn the filler cap handle clockwise to lock it.
 - (e) Push the filler cap handle down to the closed position.

G. Put the Airplane Back to Its Usual Condition

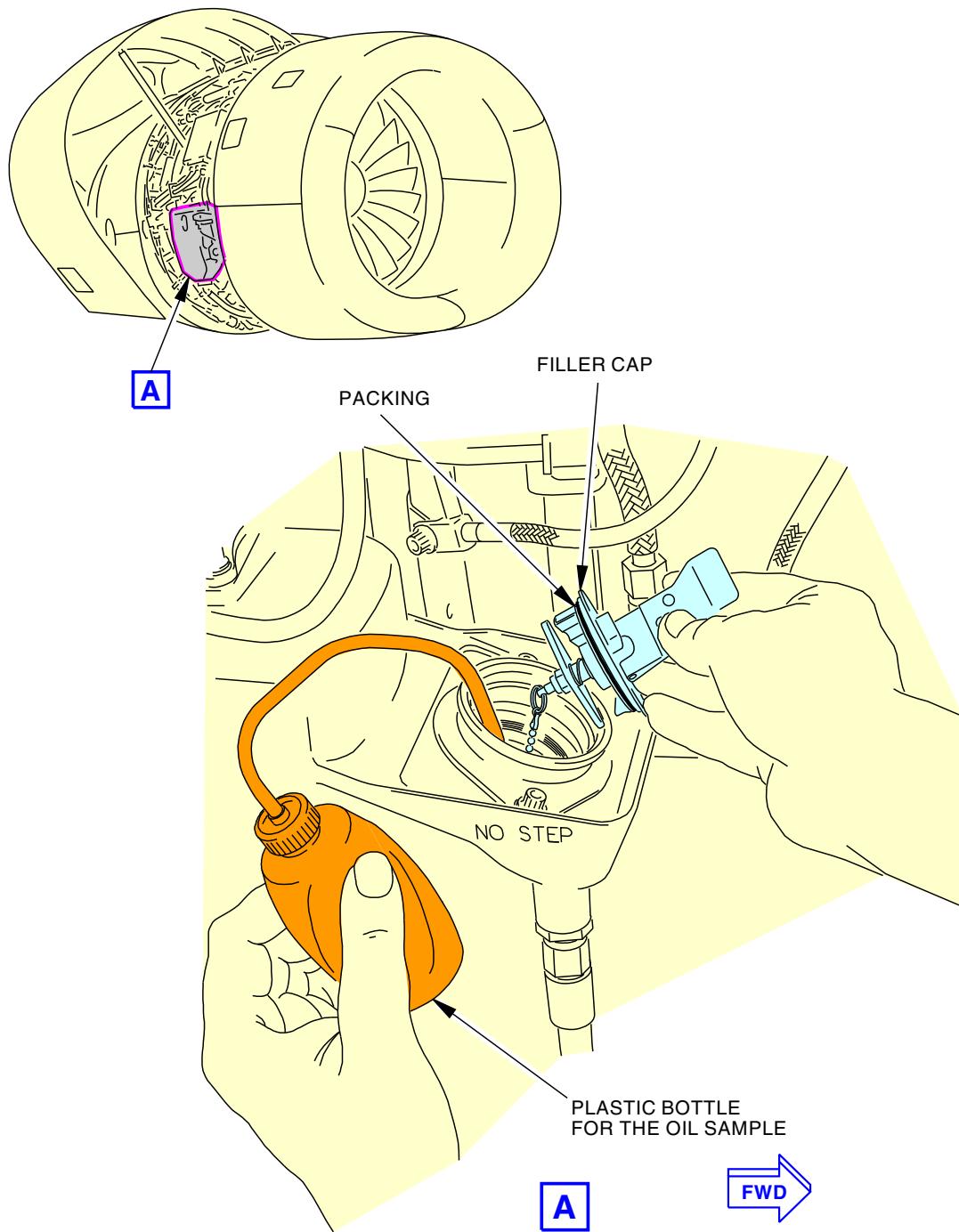
SUBTASK 12-13-11-410-006

- (1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———— END OF TASK ————

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Oil Sampling for Analysis
Figure 304/12-13-11-990-803

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INTEGRATED DRIVE GENERATOR (IDG) - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) IDG Oil Level Check
 - (2) IDG Servicing (Oil Fill)
 - (3) IDG Differential Pressure Indicator (DPI) Check
 - (4) IDG Oil Change.

TASK 12-13-21-200-801

2. IDG Oil Level Check

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task uses the sight glass on the Integrated Drive Generator (IDG) to check the oil level.
- (2) The oil volume for the IDG and external cooling circuit is as follows:
 - (a) IDG oil volume - 6.82 qt (6450 cc)
 - (b) External cooling circuit oil volume - 2.16 qt (2040 cc)
 - (c) Total oil volume - 8.97 qt (8490 cc).

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
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

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Reference	Description	Specification
G51490	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule), 18 Inches Long	BACC13AT3K18, AMS 5689
G51526	Kit - Safety Cable, 321 CRES - 0.022 Inch (0.56 mm) Diameter, (Contains both Cable and Ferrule), 18 Inches Long	BACC13AT2K18, AMS5689

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	24-11-11-50-025	LOM ALL

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Access Panels

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

H. Prepare for the IDG Oil Level Check

SUBTASK 12-13-21-010-005

- (1) Open the applicable access panels to get access to IDG:

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

I. IDG Oil Level Check

SUBTASK 12-13-21-210-001



DO THE CHECK OF THE OIL LEVEL. THE OPERATION OF THE IDG WITH AN INCORRECT OIL INDICATION CAN CAUSE DAMAGE TO THE IDG.

- (1) Do a check of the IDG oil level as follows:

NOTE: Do not do a check of the oil level on a disconnected IDG, because the indication will be incorrect.

- (a) Make sure that the engine has been shutdown for a minimum of 5 minutes before checking oil level.
- (b) If it is necessary, clean the sight glass with clean cotton wiper, G00034.
- (c) Push the PUSH-TO-VENT valve for a minimum of 15 seconds before you view the sight glass.

NOTE: The PUSH-TO-VENT valve is located near the top of the sight glass.

- (d) View the sight glass for the oil level.

- 1) For the number 1 IDG, use the LEFT FULL mark on the sight glass.

NOTE: The FULL mark is at the top of the silver band.

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- 2) For the number 2 IDG, use the RIGHT FULL mark on the sight glass.

NOTE: The FULL mark is at the top of the silver band.



CAUTION

DO NOT OPERATE THE IDG IF THE OIL LEVEL IS TOO HIGH OR
TOO LOW. THIS CAN CAUSE DAMAGE TO THE IDG.

- 3) If the oil level is in the black area below the silver band, the oil level is too low and servicing is necessary, do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

- 4) If the oil is within the silver band, the oil level is correct and no servicing is necessary.

- 5) If the oil is warm or hot and the oil level is above the silver band but below the DRAIN line, the oil level is correct and no servicing is necessary.

NOTE: Warm or hot is defined as 50°F above ambient temperature. The IDG should be considered warm or hot up to 2 hours after engine shutdown.

- 6) If the oil is cold and the oil level is above the silver band but below the DRAIN line, the IDG has been overfilled a little.

- a) Drain some of the oil until the oil level is at the top of the silver band.

- b) Do the steps below to drain some of the oil.



CAUTION

DO NOT OPERATE THE IDG IF THE OIL LEVEL IS TOO HIGH OR
TOO LOW. THIS CAN CAUSE DAMAGE TO THE IDG.

- 7) If the oil level is in the black area above the DRAIN line, the oil level is too high, do the steps below to drain some of the IDG oil.

- 8) Do these steps to drain some of the oil:

- a) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF
YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY.
THIS CAN CAUSE INJURY TO PERSONS.

- b) Push the PUSH-TO-VENT VALVE for a minimum of 15 seconds.

- c) Place an oil resistant container (5 gal)(19 Liter), STD-1055, below the IDG to catch the oil.

- d) Remove the lockwire from the case drain plug [1] on the IDG.

- e) Remove the case drain plug [1], and let the oil drain into the container.

- f) Remove the O-ring [2] from the case drain plug and discard.

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CAUTION

USE ONLY THE M83485 O-RING ON THE IDG INPUT SHAFT WHEN YOU USE HIGH THERMAL STABILITY (HTS) OIL COMPATIBLE TO MILSPEC-23699 IN THE ENGINE (FOR EXAMPLE: BP/EASTMAN TURBO OIL 2197, AEROSHELL TURBINE OIL 560, MOBIL JET OIL 254). DO NOT USE OTHER O-RING STANDARDS (FOR EXAMPLE: M83248 OR AS3209) WITH HTS OIL. IF YOU DO, IT WILL CAUSE A DECREASE IN O-RING LIFE, ENGINE OIL LEAKAGE, AND A POSSIBLE ENGINE SHUTDOWN.

- g) Apply oil, D00071, or oil, D00068, or oil, D50369, to new O-ring [2].
- h) Install the new O-ring [2] onto case drain plug [1].
- i) Install case drain plug [1] on the IDG.
- j) Tighten the case drain plug to 65 ± 10 in-lb (7 ± 1 N·m).
- k) Install MS20995C32 lockwire, G01048, or safety cable kit, G51526, or safety cable kit, G51490 (TASK 20-10-44-400-801).
- l) Fill the IDG to the correct oil level.
 - <1> Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.
- m) Do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.
- n) Make sure that there is no leak trough the case drain plug.

J. Put the Airplane Back to Its Usual Condition

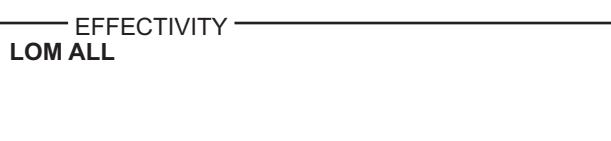
SUBTASK 12-13-21-410-005

- (1) Close these access panels:

Number Name/Location

413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

———— END OF TASK ————

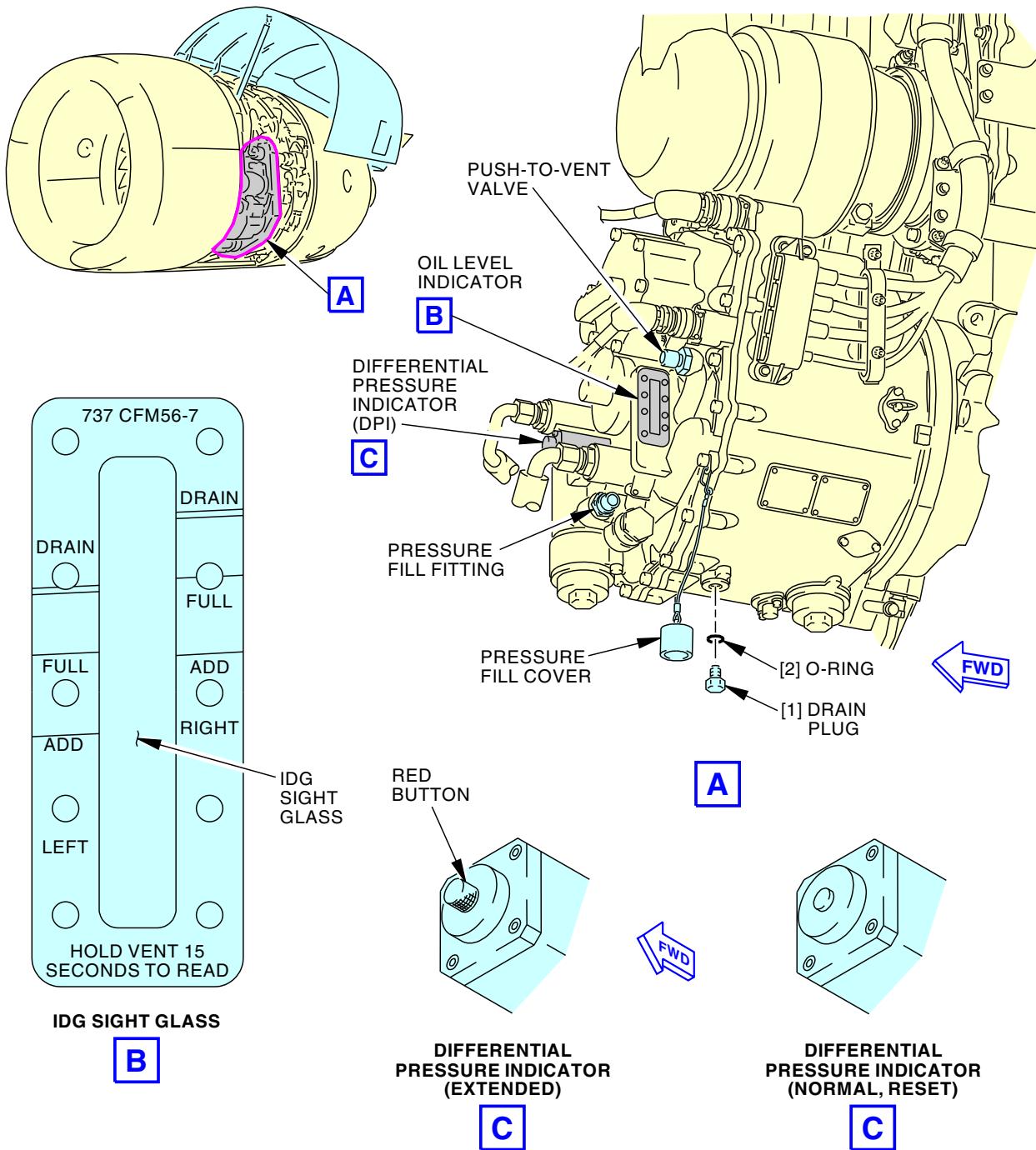


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Integrated Drive Generator (IDG) Servicing
Figure 301/12-13-21-990-801

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TASK 12-13-21-600-801

3. IDG Servicing (Oil Fill)

(Figure 301)

A. General

- (1) This task fills the Integrated Drive Generator (IDG) with oil to the proper level.
- (2) The oil volume for the IDG and external cooling circuit is as follows:
 - (a) IDG oil volume - 6.82 qt (6450 cc)
 - (b) External cooling circuit oil volume - 2.16 qt (2040 cc)
 - (c) Total oil volume - 8.97 qt (8490 cc).
- (3) Do not service a disconnected IDG.

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-1529	Gun - Oil Replenishment, Portable, Manual, Hand Held Part #: 7011 Supplier: K6057 Opt Part #: UZ/7/1826 Supplier: K6057
COM-1537	Dispenser - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: BOB02 Supplier: D2029 Part #: BOB05 Supplier: D2029 Part #: BOB20 Supplier: D2029 Part #: MODEL 150 Supplier: 94861 Part #: Model 250 Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Opt Part #: 150-3 Supplier: 94861 Opt Part #: PF53361-2PWS Supplier: 94861 Opt Part #: PF53361-8PWS Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF150-1 Supplier: 94861 Opt Part #: WF174410 Supplier: 94861
COM-1542	Dispenser - Oil, One Quart (1 Liter) Container Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF150-1 Supplier: 94861 Opt Part #: WF174410 Supplier: 94861

C. Consumable Materials

Reference	Description	Specification
B00679 [C04-035]	Alcohol - Isopropyl	

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Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
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
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Access Panels

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

F. Prepare for the IDG Servicing

SUBTASK 12-13-21-010-011

- (1) Open the applicable access panels to get access to the IDG:

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

G. IDG Servicing

SUBTASK 12-13-21-610-007



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

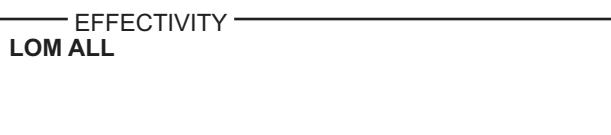
- (1) Do the IDG oil servicing as follows:



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- (a) Push the PUSH-TO-VENT VALVE for a minimum of 15 seconds.



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- (b) Remove the pressure fill cover from the pressure fill fitting on the IDG.
NOTE: If an overfill condition is observed and a fuel odor is present, the IDG oil cooler may be leaking fuel in to the generator oil circuit.
- (c) To prevent the IDG oil contamination during oil servicing, make sure that the oil service area is clean.
- 1) If it is necessary, wipe all engine service fittings with a clean cotton wiper, G00034, wet with alcohol, B00679 [C04-035], and blow dry with dry air or nitrogen to remove airborne contamination before oil servicing.
- (d) Connect the pressure fill hose from the service equipment, engine oil servicing dispenser, COM-1537, dispenser, COM-1542, or oil replenishment gun, COM-1529, to the pressure fill fitting on the IDG.



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (e) Use the service equipment to fill the IDG with oil, D00071, or oil, D00068, or oil, D50369, using a maximum of 40 psi (276 kPa).
NOTE: If you change the oil type or brand, contact the vendor, Hamilton Sundstrand, for their list of approved oils.
- (f) Press the PUSH-TO-VENT valve frequently while filling the IDG with oil.
- (g) Press the PUSH-TO-VENT valve when it is done filling the IDG and just prior to determining the final oil level.



DO NOT OVER FILL OR UNDER FILL THE IDG. OVER FILLING AND UNDER FILLING CAN CAUSE DAMAGE TO THE IDG. MAKE SURE THAT THE ENGINE WILL BE SHUT-DOWN FOR A MINIMUM OF 5 MINUTES BEFORE YOU CHECK THE OIL LEVEL. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT CAN OCCUR.

- (h) Use the sight glass on the IDG to determine the correct oil level.
- 1) For the number 1 IDG fill to the LEFT FULL mark on the sight glass.
 - a) Do not fill above the FULL mark.
NOTE: The FULL mark is at the top of the silver band.
 - 2) For the number 2 IDG fill to the RIGHT FULL mark on the sight glass.
 - a) Do not fill above the FULL mark.
NOTE: The FULL mark is at the top of the silver band.
- (i) Remove the pressure fill hose from the pressure fill fitting on the IDG.
- (j) Install the cover on the IDG pressure fill fitting.

H. Put the Airplane Back to Its Usual Condition.

SUBTASK 12-13-21-410-007

- (1) Close the applicable access panels:

Number Name/Location

413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

— END OF TASK —

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TASK 12-13-21-200-802

4. IDG Differential Pressure Indicator (DPI) Check

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task does visual check of the Differential Pressure Indicator (DPI) located on the IDG.

NOTE: If the scavenge filter and the IDG oil condition are satisfactory, and the DPI Resets decal (if installed) shows it is not the 4th extension, the DPI can be reset up to three times without removing the IDG, provided:

1. The filters are removed and the filter and filter covers are examined for metal debris.
2. No other indications of electrical power system problems are present, for example, IDG fault indication or DP (feeder) fault.
3. The filters and oil are changed prior to resetting the DPI.
4. Prior to implementation of this procedure on a new airplane, operators perform a one-time oil and filter change, at some time between 125 and 500 operating hours.

B. References

Reference	Title
24-11-11 P/B 401	INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION
24-11-21 P/B 401	IDG AIR/OIL COOLER - REMOVAL/INSTALLATION
24-11-41 P/B 201	IDG SCAVENGE/CHARGE OIL FILTER - MAINTENANCE PRACTICES
73-11-06 P/B 401	IDG OIL COOLER - REMOVAL/INSTALLATION

C. Tools/Equipment

Reference	Description
STD-205	Container - Oil Resistant, 5 U.S. Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Access Panels

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

F. Prepare for DPI check

SUBTASK 12-13-21-010-004

- (1) Open the applicable access panels to get access to IDG DPI:

Number	Name/Location
413AL	IDG Access Door, Engine 1
423AL	IDG Access Door, Engine 2

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G. IDG Differential Pressure Indicator (DPI) Check

SUBTASK 12-13-21-210-009

- (1) Do these steps to visually examine the differential pressure indicator (DPI):

NOTE: The DPI is the red button adjacent to the scavenge/charge filter on the IDG.

- (a) If the DPI is in the up position, examine the scavenge/charge filter condition, the IDG oil condition and do actions in the DPI extension table below.

NOTE: When the DPI is in the up position and if the DPI resets decal (if installed) shows it is the 4th DPI extension, the IDG must be replaced.

- 1) If the IDG was replaced, no more work is necessary.
- 2) If the IDG was not replaced, check the DPI resets decal (if installed) on the scavenge/charge filter cover for the number of DPI resets that has been done.

NOTE: When the DPI is in the up position and if the actions in the DPI extension table does not require to replace the IDG, the DPI can be reset 3 times.

NOTE: When the DPI is set, an inspection must occur at an interval of 100 flight hours.

NOTE: After four consecutive 100 flight hour check without DPI extension, the DPI check can revert back to the normal interval.

- a) If the DPI resets decal (if installed) shows it is the fourth (4th) DPI extension, replace the IDG (PAGEBLOCK 24-11-11/401).
- b) If the DPI resets decal (if installed) shows it is not the fourth (4th) DPI extension, use a blunt tool to rub out the next number on the DPI resets decal and use finger to push the DPI red button down.

- (b) If the button is in the down position, do these steps:

- 1) If other regular IDG service maintenance is not required, no more work is necessary.
- 2) If other regular IDG service maintenance tasks are required, do those tasks.

DPI EXTENSION

SCAVENGE/CHARGE FILTER CONDITION	IDG OIL CONDITION	ACTION
No visible magnetic or non-metallic particles (See NOTE for more scavenge/charge filter data) * ^[1]	No oil discoloration. No sign of over-heating. No chemical contamination of the oil is suspected.	<ol style="list-style-type: none">1. Drain the oil in the oil resistant container (5 gal), STD-205.2. Replace the scavenge/charge filter (PAGEBLOCK 24-11-41/201).3. Service with oil (PAGEBLOCK 12-13-21/301).

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DPI EXTENSION (Continued)

SCAVENGE/CHARGE FILTER CONDITION	IDG OIL CONDITION	ACTION
No visible magnetic or non-metallic particles (See NOTE for more scavenge/charge filter data)* ^[1]	Oil discoloration, signs of overheating or chemical contamination of the oil is suspected (Hydraulic fluid and water)	<ol style="list-style-type: none"> 1. Drain the oil in the oil resistant container (5 gal), STD-205. 2. Replace the scavenge/charge filter (PAGEBLOCK 24-11-41/201). 3. Service with oil (PAGEBLOCK 12-13-21/301). 4. Run the engine for 5 minutes to raise the temperature of the oil. 5. Drain the oil in the oil resistant container (5 gal), STD-205. 6. Replace the scavenge/charge filter (PAGEBLOCK 24-11-41/201). 7. Service with oil (PAGEBLOCK 12-13-21/301).
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is not breached. (See NOTE for more scavenge/charge filter data)* ^[1]	No oil discoloration. No sign of over-heating. No chemical contamination of the oil is suspected.	<ol style="list-style-type: none"> 1. Replace the IDG (PAGEBLOCK 24-11-11/401).
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is not breached. (See NOTE for more scavenge/charge filter data)* ^[1]	Oil discoloration, signs of overheating or chemical contamination of the oil is suspected (Hydraulic fluid and water)	<ol style="list-style-type: none"> 1. Flush the IDG oil system (IDG Oil Change, TASK 12-13-21-600-802).
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is breached. (See NOTE for more scavenge/charge filter data)* ^[1]	Oil condition is not a factor	<ol style="list-style-type: none"> 1. Remove the IDG (PAGEBLOCK 24-11-11/401). 2. Replace the IDG air/oil cooler (PAGEBLOCK 24-11-21/401). 3. Replace the IDG oil cooler (PAGEBLOCK 73-11-06/401) 4. Replace the IDG oil cooler lines. 5. Install the IDG (PAGEBLOCK 24-11-11/401).

*[1] If the scavenge/charge filter element or filter cover shows a number of moderately scattered, small metallic flakes (bronze or silver colored metal), flakes of generator insulation, black epoxy flakes, or sleeving, do not replace the IDG. These products are normal wear during IDG operation. If the filter element shows bright metal deposits that can be clearly specified as chunks or pieces caused by breakage, or a large number of small metallic flakes (bronze or silver-colored metal), replace the IDG. These are indications of IDG internal damage. The filter is breached if the filter is damaged or missing, the O-ring is damaged or missing, or the filter cap is damaged or loose.

SUBTASK 12-13-21-410-002

- (2) Close the applicable access panels:

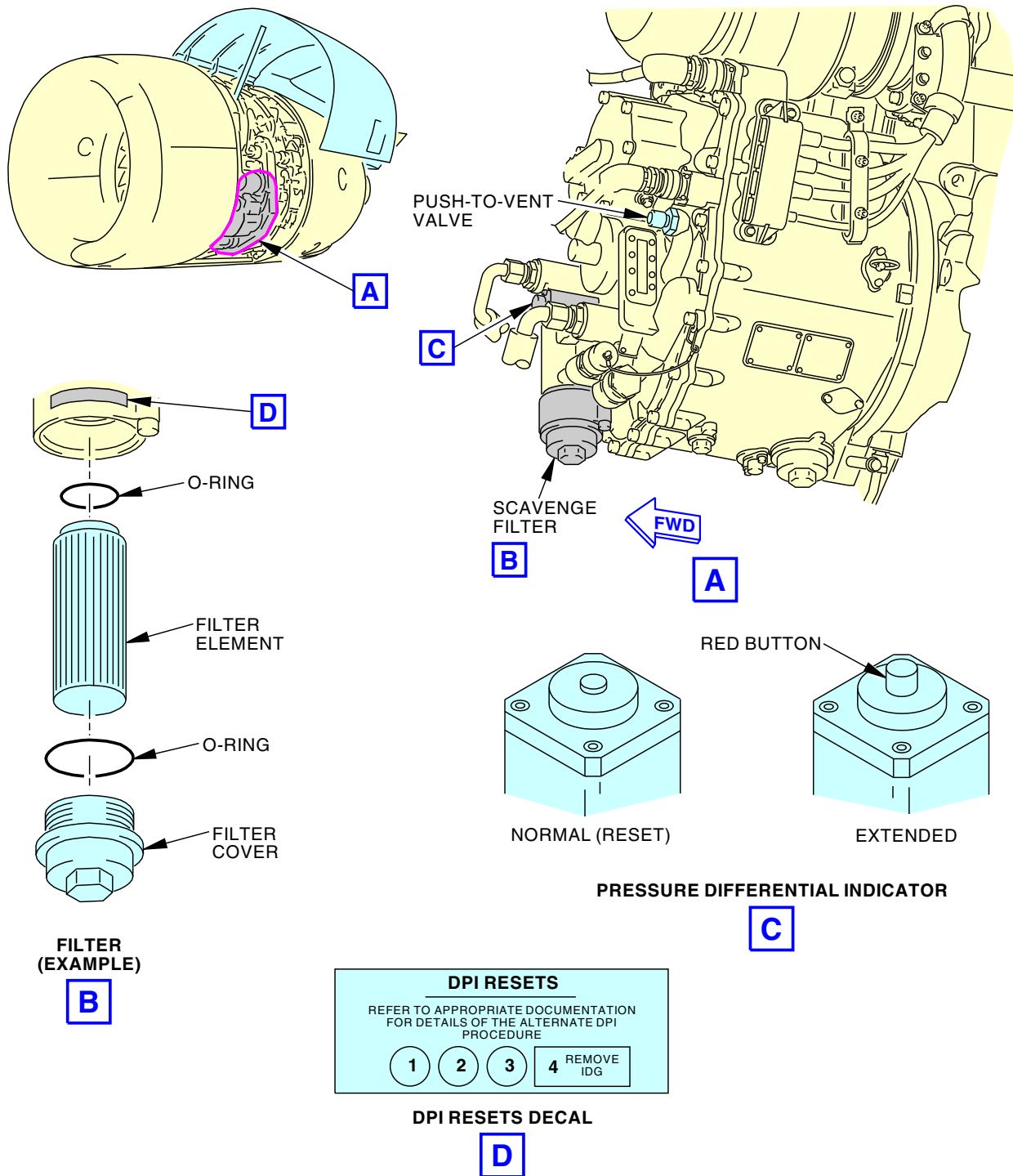
Number Name/Location

- | | |
|-------|---------------------------|
| 413AL | IDG Access Door, Engine 1 |
| 423AL | IDG Access Door, Engine 2 |

— END OF TASK —

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DPI Reset Procedure
Figure 302/12-13-21-990-803

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TASK 12-13-21-600-802

5. IDG Oil Change

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task removes the oil from the Integrated Drive Generator (IDG) system and replaces it with new oil.
- (2) If IDG oil is being replaced because of possible contamination, you must do the IDG Oil Change, operate the engine, and repeat the IDG Oil Change.
- (3) If IDG oil is being replaced because of different type or brand of oil, you must do the IDG Oil Change, operate the engine, and repeat the IDG Oil Change.
- (4) The oil volume for the IDG and external cooling circuit is as follows:
 - (a) IDG oil volume - 6.82 qt (6450 cc)
 - (b) External cooling circuit oil volume - 2.16 qt (2040 cc)
 - (c) Total oil volume - 8.97 qt (8490 cc).

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-11-41-000-801	IDG Scavenge and Charge Filter - Removal (P/B 201)
24-11-41-400-801	IDG Scavenge and Charge Filter - Installation (P/B 201)
71-00-00-700-810-F00	Test 2 - Dry Motor Leak Test (P/B 501)
71-00-00-700-821-F00	Dry Motor the Engine (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)

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-1529	Gun - Oil Replenishment, Portable, Manual, Hand Held Part #: 7011 Supplier: K6057 Opt Part #: UZ/7/1826 Supplier: K6057

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Reference	Description
COM-1537	Dispenser - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: BOB02 Supplier: D2029 Part #: BOB05 Supplier: D2029 Part #: BOB20 Supplier: D2029 Part #: MODEL 150 Supplier: 94861 Part #: Model 250 Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Opt Part #: 150-3 Supplier: 94861 Opt Part #: PF53361-2PWS Supplier: 94861 Opt Part #: PF53361-8PWS Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF150-1 Supplier: 94861 Opt Part #: WF174410 Supplier: 94861
COM-1542	Dispenser - Oil, One Quart (1 Liter) Container Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF150-1 Supplier: 94861 Opt Part #: WF174410 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G51490	Kit - Safety Cable, 321 CRES - 0.032 Inch (0.81 mm) Diameter, (Contains both Cable and Ferrule), 18 Inches Long	BACC13AT3K18, AMS 5689
G51526	Kit - Safety Cable, 321 CRES - 0.022 Inch (0.56 mm) Diameter, (Contains both Cable and Ferrule), 18 Inches Long	BACC13AT2K18, AMS5689

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	24-11-11-50-025	LOM ALL



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F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. Prepare for the IDG Oil Change

SUBTASK 12-13-21-010-002

- (1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

H. IDG Oil Change

SUBTASK 12-13-21-610-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOUR SKIN. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (1) Change the IDG oil as follows:



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT COULD CAUSE HOT OIL TO SPRAY AND CAN CAUSE INJURY TO PERSONS.

- Push the PUSH-TO-VENT VALVE for a minimum of 15 seconds.
- Place an oil resistant container (5 gal)(19 Liter), STD-1055, below the IDG to catch the oil.
- Remove the lockwire from the case drain plug [1] on the IDG.
- Remove the case drain plug [1], and let the oil drain into the oil resistant container (5 gal)(19 Liter), STD-1055.
- Remove the used O-ring [2] from the case drain plug [1] and discard it.
- Replace the IDG scavenge and charge filters, do these steps:

NOTE: If the oil change procedure is performed as a part of the oil/brand switch, the filter removed during first round of oil flush, can be re-used for this first round provided that:

- After filter is removed it is drained and no metallic particulates are found.
- The filter and its O-ring are not damaged and the DPI is not extended.

NOTE: If metal particles are found in the removed filter then generator will need to be removed, oil flushed from the circuit, and a new generator installed.

- Do this task: IDG Scavenge and Charge Filter - Removal, TASK 24-11-41-000-801
- Do this task: IDG Scavenge and Charge Filter - Installation, TASK 24-11-41-400-801.

- Remove the pressure fill cover from the pressure fill fitting on the IDG.

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- (h) Connect the pressure fill hose from the service equipment, engine oil servicing dispenser, COM-1537, dispenser, COM-1542, or oil replenishment gun, COM-1529, to the pressure fill fitting on the IDG.



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (i) Use the service equipment (maximum 40 psi (276 kPa)) to flush the IDG external cooling circuit with one of the oil types listed below:

- 1) oil, D00071
- 2) oil, D00068
- 3) oil, D50369.

- (j) Pump oil into the IDG until approximately 3 qt (2839 cc) - 4 qt (3785 cc) of oil drains from the IDG drain port.

NOTE: The 3 qt (2839 cc) - 4 qt (3785 cc) does not include the oil that was drained when the drain plug was removed.



USE ONLY THE M83485 O-RING ON THE IDG INPUT SHAFT WHEN YOU USE HIGH THERMAL STABILITY (HTS) OIL COMPATIBLE TO MILSPEC-23699 IN THE ENGINE (FOR EXAMPLE: BP/EASTMAN TURBO OIL 2197, AEROSHELL TURBINE OIL 560, MOBIL JET OIL 254). DO NOT USE OTHER O-RING STANDARDS (FOR EXAMPLE: M83248 OR AS3209) WITH HTS OIL. IF YOU DO, IT WILL CAUSE A DECREASE IN O-RING LIFE, ENGINE OIL LEAKAGE, AND A POSSIBLE ENGINE SHUTDOWN.



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (k) Lubricate the new O-ring [2] with one of the oil types listed below:

- 1) oil, D00071
- 2) oil, D00068
- 3) oil, D50369

- (l) Install the new O-ring [2] onto the case drain plug [1].

- (m) Install the case drain plug [1] on the IDG.

- (n) Tighten the case drain plug [1] to 65 ± 10 in-lb (7 ± 1 N·m).

- (o) Install MS20995C32 lockwire, G01048, or safety cable kit, G51526, or safety cable kit, G51490 (TASK 20-10-44-400-801).

- (p) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

SUBTASK 12-13-21-610-005

- (2) If the IDG oil is replaced because of possible contamination, or you changed the type or brand of oil, do these steps:
(a) Do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

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WARNING DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING DO NOT LET HOT OIL GET ON YOUR SKIN. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (b) Change the IDG oil as follows:



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT COULD CAUSE HOT OIL TO SPRAY AND CAN CAUSE INJURY TO PERSONS.

- 1) Push the PUSH-TO-VENT VALVE for a minimum of 15 seconds.
- 2) Place an oil resistant container (5 gal)(19 Liter), STD-1055, below the IDG to catch the oil.
- 3) Remove the lockwire from the case drain plug [1] on the IDG.
- 4) Remove the case drain plug [1], and let the oil drain into the oil resistant container (5 gal)(19 Liter), STD-1055.
NOTE: It is not necessary to replace the O-ring again if there is no damage.
- 5) Replace the IDG scavenge and charge filters, do these steps:
 - a) Do this task: IDG Scavenge and Charge Filter - Removal, TASK 24-11-41-000-801
 - b) Do this task: IDG Scavenge and Charge Filter - Installation, TASK 24-11-41-400-801.
- 6) Remove the pressure fill cover from the pressure fill fitting on the IDG.
- 7) Connect the pressure fill hose from the service equipment, engine oil servicing dispenser, COM-1537, dispenser, COM-1542, or oil replenishment gun, COM-1529, to the pressure fill fitting on the IDG.



CAUTION

DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- 8) Use the service equipment (maximum 40 psi (276 kPa)) to flush the IDG external cooling circuit with one of the oil types listed below:
 - a) oil, D00071
 - b) oil, D00068
 - c) oil, D50369
- 9) Pump oil into the IDG until approximately 3 qt (2839 cc) - 4 qt (3785 cc) of oil drains from the IDG drain port.
NOTE: The 3 qt (2839 cc) - 4 qt (3785 cc) does not include the oil that was drained when the drain plug was removed.
- 10) Install the case drain plug [1] on the IDG.

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- 11) Tighten the case drain plug [1] to 65 ± 10 in-lb (7 ± 1 N·m).
- 12) Install MS20995C32 lockwire, G01048, or safety cable kit, G51526, or safety cable kit, G51490 (TASK 20-10-44-400-801).
- 13) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

SUBTASK 12-13-21-610-006

- (3) Do this task: Test 2 - Dry Motor Leak Test, TASK 71-00-00-700-810-F00.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-21-010-003

- (1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———— END OF TASK ————

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APU GEARBOX - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) APU oil level inspection
 - (2) Drain the APU oil
 - (3) Flush the APU oil
 - (a) You must do this task if you change oil types.
 - (4) Fill the APU gearbox.
- B. You must drain the oil while the APU is warm from the operation, the last APU usual shutdown occurred in less than one hour or the oil temperature is more than 160°F (71°C). If it is necessary, start and operate the APU for two to five minutes. Permit the oil temperature to increase to the usual operation temperature. Stop the APU and drain the oil.
- C. The auxiliary power unit is referred to as the APU.

TASK 12-13-31-200-801

2. APU Oil Level Inspection

(Figure 301)

A. General

- (1) There are two procedures to examine the Auxiliary Power Unit (APU) oil level. The first procedure uses the APU BITE to examine the APU oil level. The second procedure uses the oil sight glass on the aft side of the APU gearbox.
- (2) If you do the APU BITE procedure, you must examine the APU oil level in the no APU operation (APU shutdown) condition.
NOTE: Refer to APU CONTROLS, SUBJECT 49-61-00, for more information about the APU BITE procedure.
- (3) If you do the oil sight glass procedure, you can examine the APU oil level during an APU operation or in the no APU operation (APU shutdown) condition.
- (4) When dry, the APU oil capacity is approximately 8.8 qt (8.3 l), after the APU oil lines and oil cooler are filled, the gearbox sump holds approximately 5.7 qt (5.4 l).
 - (a) The FULL level is approximately 5.7 qt (5.4 l).
 - (b) The ADD level is approximately 4.3 qt (4.1 l).
 - (c) The LOW level is below approximately 3.8 qt (3.6 l).
NOTE: Refer to the Systems Description Section (SDS) 49-90-00 for more information about the APU oil system.
- (5) Use one of the two procedures that follow to do a check of the APU oil level.
NOTE: Refer to task: APU Operation Limits, TASK 49-11-00-710-802, Figure 201, Oil Consumption Limit, for more information about oil consumption.

B. References

Reference	Title
49-11-00-710-802	APU Operation Limits (P/B 201)
49-61-00	APU CONTROLS
49-61-00-700-801	APU BITE Procedure (P/B 201)

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C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. APU Oil Level Inspection - APU BITE Procedure

SUBTASK 12-13-31-860-012

- (1) Make sure that the APU master switch, on the P5 forward overhead panel, is OFF.

SUBTASK 12-13-31-860-021

- (2) If it is necessary, set the APU master switch, on the P5 forward overhead panel, to the OFF position.

NOTE: To get an accurate indication, you must examine the APU oil level in the no APU operation (APU shutdown) condition.

SUBTASK 12-13-31-740-001

- (3) Get access to the OIL QUANTITY REPORT page from the MAIN MENU page for the APU BITE TEST on the Control Display Unit (CDU), do these steps:

- Get access to the MAIN MENU page for the APU BITE TEST, do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- Get access to the OIL QUANTITY REPORT page by pushing the line select key adjacent to OIL QUANTITY> on the MAIN MENU page.

NOTE: The OIL QUANTITY REPORT page shows on the CDU display.

- If the OIL QUANTITY REPORT page shows FULL for the oil level, the APU oil level is satisfactory.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428 PRE SB 737-49-1162; APUS WITH ECU S/W PRIOR TO 491A-TUS-A51-00 (CCC)

NOTE: If the oil level shows FULL, you will not see the APU hours for a FULL oil condition.

LOM ALL

- If the OIL QUANTITY REPORT page shows ADD for the oil level, you must add oil to the APU gearbox in 30-50 APU hours.
- If the OIL QUANTITY REPORT page shows LOW for the oil level, do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428 PRE SB 737-49-1162; APUS WITH ECU S/W PRIOR TO 491A-TUS-A51-00 (CCC)

NOTE: If the oil level shows ADD or LOW, you will see the APU hours from the first time the electronic control unit senses this ADD or LOW oil condition.

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F. APU Oil Level Inspection - Oil Sight Glass Procedure

SUBTASK 12-13-31-860-001

- (1) If it is necessary, set the APU master switch, on the P5 forward overhead panel, to the OFF position.

NOTE: You can examine the APU oil level during an APU operation or in the no APU operation (APU shutdown) condition.

NOTE: It is recommended that you examine the APU oil level after one hour from an APU usual shutdown to let the oil decrease in temperature (less than 160°F (71°C)). After one hour, the oil sight glass will show the correct oil level in the APU gearbox.

NOTE: It is normal to see air bubbles in the sight glass during APU operation.

SUBTASK 12-13-31-010-001

- (2) Open this access door, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel under the center latch.

- 1) Open the three latches.

- (b) Open the APU Cowl Door, 315A.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (e) Disconnect the two hold-open rods from the two spring clips.

- (f) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (g) Install the two retainer pins in the two rod ends.

SUBTASK 12-13-31-210-001

- (3) To examine the APU oil level on the oil sight glass [1], do these steps:

- (a) If the oil level is on the FULL mark on the oil sight glass [1], APU oil level is satisfactory.

NOTE: There are two FULL and ADD marks on the oil sight glass. The left side of the oil sight glass shows the oil level during APU operation. The right side of the oil sight glass shows the oil level for the no APU operation (APU shutdown) condition.

- (b) If the oil level is above the ADD mark on the oil sight glass [1], APU oil level is satisfactory.

NOTE: It is not necessary to add oil to the APU gearbox if the oil level is above the ADD mark. If the oil level is on the ADD mark, you must add oil to the APU gearbox in 30-50 APU hours.

NOTE: If present on oil sight glass, the 1QT line is one quart lower than FULL with APU OFF and checked within 20-30 minutes after shutdown.

- (c) If the APU oil level is below the ADD mark, do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

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SUBTASK 12-13-31-410-001

- (4) Close this access door, do these steps:

Number **Name/Location**

315A APU Cowl Door

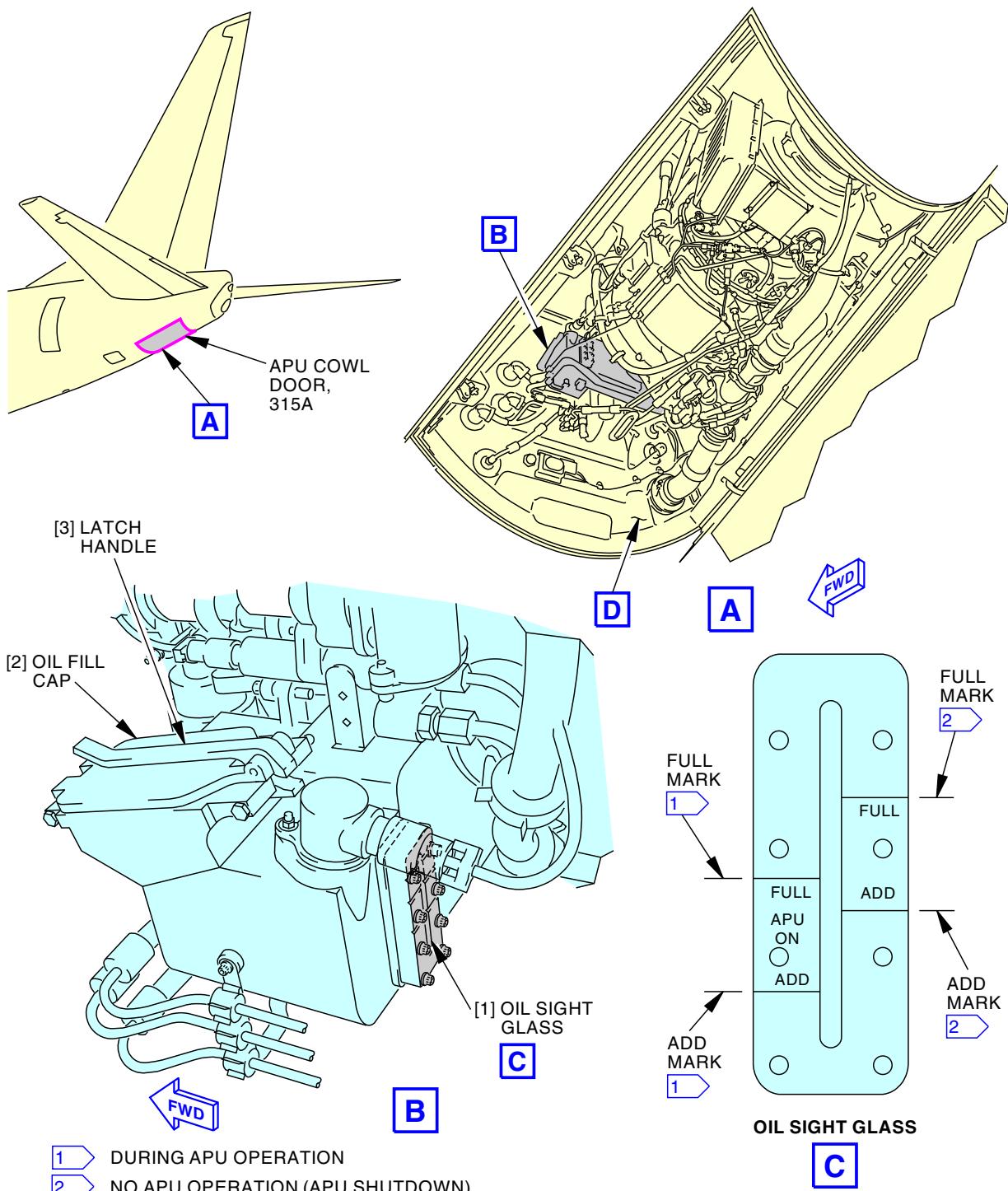
- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— END OF TASK ————

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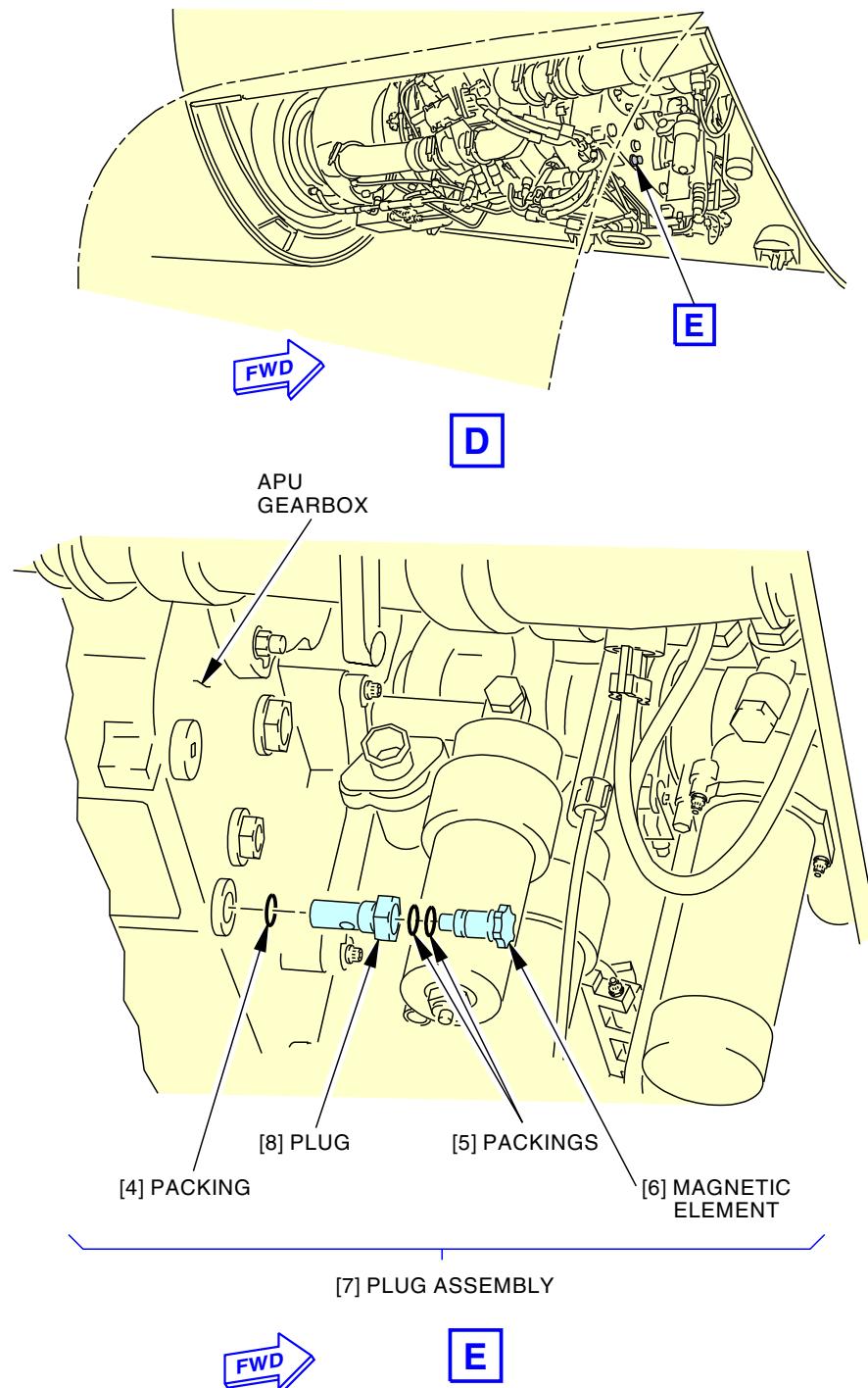
F62097 S0006561215_V2

APU Gearbox Servicing
Figure 301/12-13-31-990-801 (Sheet 1 of 2)

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D633A101-LOM



F62159 S0006561216_V3

APU Gearbox Servicing
Figure 301/12-13-31-990-801 (Sheet 2 of 2)

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 12-13-31-610-801

3. Drain the APU Oil

(Figure 301)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Packing	49-91-81-02-035	LOM ALL
5	Packing	49-91-81-02-030	LOM ALL
7	Plug assembly	49-91-81-02-025	LOM ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Prepare to Drain the APU Oil

SUBTASK 12-13-31-860-003

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is in the OFF position.
 - (a) Install a DO NOT OPERATE tag, STD-858, on the APU master switch.

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SUBTASK 12-13-31-860-004

- (2) 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 12-13-31-010-002

- (3) Open this access panel:

Number Name/Location

315A	APU Cowl Door
------	---------------

- (a) Open this access panel as follows:

- 1) Support the APU access door under the center latch.
- 2) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- 3) Remove the retainer pin from the rod end of the forward hold-open rod on this access panel.
- 4) Remove the retainer pin from the spring clip on the aft hold-open rod.
- 5) Disconnect the two hold-open rods from the two spring clips.
- 6) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- 7) Install the two retainer pins in the two rod ends.

SUBTASK 12-13-31-860-005

- (4) Do these steps if the time from the last APU shutdown to the start of the APU oil is drain more than one hour or the APU oil temperature is less than 160°F (71°C):

- (a) 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

- (b) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch.

- (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

- (d) Operate the APU at a no load condition for a minimum of five minutes.

NOTE: When the APU is operated, the oil will flow through the engine. When the oil flows, it will collect the unwanted material that the oil filter elements do not collect.

- (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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- (f) Install a DO NOT OPERATE tag, STD-858, to the APU master switch.
- (g) 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

H. Drain the APU Oil

SUBTASK 12-13-31-020-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS.
HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the magnetic element [6] from the plug [8]:

- (a) Remove the magnetic element [6] from the plug [8].

NOTE: The plug assembly has the magnetic element and plug.

- 1) Push in on the magnetic element [6] and turn the magnetic element [6] counterclockwise for the removal.

- (b) Remove the packings [5] from the magnetic element [6].

- 1) Discard the packings [5].

SUBTASK 12-13-31-210-002

- (2) Do these steps to inspect the magnetic element [6] for metal particles:

NOTE: Metal particles on the magnetic element give an indication of internal damage to the engine. If you see metal particles on the magnetic element, examine the engine to find the cause and quantity of the damage.

- (a) If the magnetic element [6] is free of metal particles, the APU is satisfactory.
 - (b) A small quantity of metal particles that are not silver color is permitted.
 - (c) If you find silver color particles or a medium quantity of metal particles that are not silver color, do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.

SUBTASK 12-13-31-680-001



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

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CAUTION

DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS.
IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE
DAMAGE TO PAINT AND RUBBER.

- (3) Do these steps to drain the APU oil:



WARNING

DO NOT LET OIL GET ON YOU. OIL CAN FLOW OUT OF THE APU
GEARBOX WHEN YOU ADD OIL TO THE FULL MARK ON THE SIGHT
GLASS. BE CAREFUL WHEN YOU ADD THE OIL NEAR THE FULL MARK.
OIL CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO THE
APU AND AIRPLANE COMPONENTS.

- (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055, below the plug [8].
- (b) Pull the latch handle [3] away from the oil fill cap [2].
- (c) Loosen the oil fill cap [2] to help the oil drain from the APU gearbox.
- (d) Remove the lockwire from the plug [8].
- (e) Remove the plug [8] from the APU gearbox.
- (f) Use the oil resistant container (5 gal)(19 Liter), STD-1055, to drain the oil from the APU gearbox.
- (g) Remove the packing [4] from the plug [8].
 - 1) Discard the packing [4].
- (h) Remove the oil resistant container (5 gal)(19 Liter), STD-1055.
- (i) Close the oil fill cap [2].
- (j) Engage the latch handle [3] on the oil fill cap [2].
- (k) Do these steps to install the plug assembly [7]:

NOTE: The plug assembly has the plug and the magnetic element. First install the plug in the APU gearbox, then install the magnetic element in the plug.

- 1) Lubricate the new packing [4] and new packings [5] with a light coat of Santovac 5 lubricant, D00341, oil, D00071, or oil, D00068.
- 2) Install the packing [4] on the plug [8].
- 3) Install the plug [8] in the APU gearbox.
 - a) Tighten the plug [8] to 85 ± 5 in-lb (9.6 ± 0.6 N·m).
- 4) Install the MS20995C20 lockwire, G50225, on the plug [8].
- 5) Install the packings [5] on the magnetic element [6].
- 6) Install the magnetic element [6] in the plug [8].
 - a) Push in on the magnetic element [6] and turn the magnetic element [6] clockwise for the installation.

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SUBTASK 12-13-31-860-010



DO NOT OPERATE THE APU WITHOUT OIL. IT WILL CAUSE DAMAGE TO THE APU.

CAUTION

- (4) Do this step if you do not fill the APU gearbox immediately with oil or if it is necessary to do other tasks while keeping the APU inoperative.
- (a) 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

———— END OF TASK ————

TASK 12-13-31-610-802

4. Flush the APU Oil

A. General

- (1) If you change oil types, you must flush the APU oil. This procedure gives the steps necessary to flush the APU gearbox.

B. References

Reference	Title
49-91-12-000-802	Lube Filter Element Removal (P/B 401)
49-91-12-000-803	Starter-Generator Filter Element Removal (P/B 401)
49-91-12-400-802	Lube Filter Element Installation (P/B 401)
49-91-12-400-803	Starter-Generator Filter Element Installation (P/B 401)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Procedure

SUBTASK 12-13-31-170-001

- (1) Do these steps to flush the oil from the APU gearbox:
- (a) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.
NOTE: It is not necessary to install the lockwire on the plug at this time.
- (b) Do this task to add the new oil type: Fill the APU Gearbox, TASK 12-13-31-610-803.
- (c) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.
- (d) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.
- (e) Attach a service tag to the APU to show the oil brand and/or oil type in the APU gearbox.
- (f) Replace the lube filter element.

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These are the tasks:Lube Filter Element Removal, TASK 49-91-12-000-802,Lube Filter Element Installation, TASK 49-91-12-400-802

- (g) Replace the starter-generator filter element.

These are the tasks:

Starter-Generator Filter Element Removal, TASK 49-91-12-000-803,

Starter-Generator Filter Element Installation, TASK 49-91-12-400-803.

———— END OF TASK ————

TASK 12-13-31-610-803

5. Fill the APU Gearbox

(Figure 301)

A. General

- (1) This procedure gives the steps necessary to fill the Auxiliary Power Unit (APU) gearbox with oil. It is recommended that you fill the APU gearbox in the no APU operation (APU shutdown) condition for an accurate indication of the oil quantity level and to prevent oil contamination.
- (2) The APU gearbox holds 5.7 qt (5.4 l). The oil fill cap [2] is located on the left side of the APU gearbox.
- (3) APU OIL LEVEL INSPECTION - APU Built-In-Test Equipment (BITE) PROCEDURE:

Before you fill the APU gearbox with oil, there are two initial conditions for the electronic control unit and the airplane:

NOTE: The two initial conditions are necessary if you do the APU BITE procedure for the APU oil level inspection or troubleshooting low oil quantity problems in the Fault Isolation Manual (FIM).

- (a) The first condition is that the power to the electronic control unit must be removed and then applied to show the correct oil level indication. The electronic control unit does a check of the APU oil level during its power-up cycle only. The electronic control unit cannot sense a change in the oil level when energized. To remove and then apply power to the electronic control unit, the APU master switch is in the OFF position and then you do the APU BITE procedure.
- (b) The second condition is that the air/ground switch must show GRD on the INPUT MONITORING page for the APU BITE procedure.
- (4) It is recommended that you use Type 1 oil if the APU will be started in very cold conditions below -40°F (-40°C) or do periodic in-flight starts (start sampling).
- (5) Use only these types and brands of oil:

NOTE: For additional information about approved oils for the APU, please refer to Honeywell SB 49-7933. This Service Bulletin (SB) also contains information about approved oils that are no longer produced.

- (a) Synthetic Base Oil, Type I - MIL-PRF-7808 (-65°F (-54°C) to 130°F (54°C)):
- 1) Castrol 399
 - 2) Eastman Turbo Oil 2389, D00637.
- (b) Def Stan 91-94, Type I (-65°F (-54°C) to 130°F (54°C)):
- 1) Aeroshell 390 oil, D00635
 - 2) Castrol 325 oil, D00636.
- (c) Synthetic Base Oil, Type II - MIL-PRF-23699 (-40°F (-40°C) to 130°F (54°C)):

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- 1) Aeroshell 500 lubricant, D00668
 - 2) Aeroshell Turbine Oil 560, D50201
 - 3) Eastman Turbo Oil 2380, D00519
 - 4) Mobil Jet Oil II, D00520
 - 5) Royco Turbine Oil 500, D50341
 - 6) Royco 560 Turbine Oil, D50202
 - 7) turbonycoil 600 engine oil, D50169.
- (d) Synthetic Base Oil, Type II - MIL-PRF-23699 (High Performance capability):
- 1) Eastman Turbo Oil 2197, D50016
 - 2) Mobil Jet Oil 254, D00521
 - 3) Mobil Jet Oil 387, D50311.
- (e) Type II - MIL-PRF-23699 (Standard):
- 1) Aeroshell 500 lubricant, D00668
 - 2) Eastman Turbo Oil 2380, D00519
 - 3) lubricating oil, D50178
 - 4) Hatcol 3211, D50338
 - 5) Hatcol 3611, D50339
 - 6) Mobil Jet Oil II, D00520
 - 7) Royco Turbine Oil 500, D50341
 - 8) turbonycoil 600 engine oil, D50169.
- (f) Type II - MIL-PRF-23699 (Corrosion Inhibiting):
- 1) Royco 899, D50340.
- (g) Type II, MIL-PRF-23699, (High Thermal Stability):
- 1) Eastman Turbo Oil 2197, D50016
 - 2) Mobil Jet Oil 254, D00521
 - 3) Royco 560 Turbine Oil, D50202
 - 4) Aeroshell Turbine Oil 560, D50201
 - 5) Mobil Jet Oil 387, D50311.
- (h) DOD-L-85734 and Def Stan 91-100, Type II (-40°F (-40°C) to 130°F (54°C)):
- 1) Aeroshell 555 oil, D00513
 - 2) Royco 555 oil, D50031
 - 3) Eastman Turbo Oil 25, D00671.

B. References

Reference	Title
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-858	Tag - DO NOT OPERATE



ECCN 9E991 BOEING PROPRIETARY - See title page for details

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D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00513	Oil - Turbine - Aeroshell 555	
D00519	Oil - Engine - Eastman Turbo Oil 2380	MIL-PRF-23699-STD and UK spec DEF STAN 91-101/2
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699-Class STD (Standard)
D00521	Oil - Engine - Mobil Jet Oil 254	MIL-PRF-23699 - HTS (High Thermal Stability)
D00612	Oil - Assembly - Castrol 98	
D00635	Oil - Engine - Aeroshell 390	
D00636	Oil - Engine - Castrol 325	
D00637	Oil - Engine - Eastman Turbo Oil 2389	MIL-PRF-7808L grade 3
D00668	Lubricant - Turbine Oil - Aeroshell 500	
D00671	Oil - Engine - Eastman Turbo Oil 25	DOD-L-85734(AS) and DEF STAN 91-100/1 (DERD 2497)
D50016	Oil - Engine - Eastman Turbo Oil 2197	MIL-PRF-23699 Class HTS (High Thermal Stability)
D50031	Oil - Turbine Engine, Type II (5 Centistokes) - Royco 555	
D50169	Oil - Turbine Engine (NYCO Turbonycoil 600)	MIL-PRF-23699 Class STD (Standard)
D50178	Oil - Lubricating - Castrol 5000 (use until stock depleted)	
D50201	Lubricant - Aeroshell Turbine Oil 560	MIL-PRF-23699, DERRD 2499 Grade OX-27, OX-28, NATO O-156
D50202	Lubricant - Royco 560 Turbine Oil	MIL-PRF-23699 - HTS (High Thermal Stability)
D50311	Oil - Engine - Mobil Jet Oil 387	SAE AS5780, MIL-PRF-23699
D50338	Oil - Engine - Hatcol 3211	MIL-PRF-23699 Class STD (Standard)
D50339	Oil - Engine - Hatcol 3611	MIL-PRF-23699 Class STD (Standard)
D50340	Oil - Engine - Royco 899	MIL-PRF-23699 Class C/I (Corrosion Inhibiting)
D50341	Oil - Engine - Royco Turbine Oil 500	MIL-PRF-23699 Class STD (Standard)

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E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Prepare to Fill the APU Gearbox

SUBTASK 12-13-31-860-013

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 12-13-31-860-007

- (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 12-13-31-010-003

- (3) Open this access panel:

Number	Name/Location
315A	APU Cowl Door

- (a) Open this access panel as follows:

- 1) Support the APU panel under the center latch.
- 2) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- 3) Remove the retainer pin from the rod end of the forward hold-open rod on this access panel.
- 4) Remove the retainer pin from the spring clip on the aft hold-open rod.
- 5) Disconnect the two hold-open rods from the two spring clips.
- 6) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- 7) Install the two retainer pins in the two rod ends.

H. Procedure

SUBTASK 12-13-31-610-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

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(WARNING PRECEDES)



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to fill the APU gearbox with oil:

NOTE: It is recommended that you fill the APU oil after one hour from an APU usual shutdown. This will decrease the oil temperature (less than 160°F (71°C)). After one hour, the oil sight glass [1] will show the correct oil level in the APU gearbox.

- (a) Pull the latch handle [3] away from the oil fill cap [2].
(b) Open the oil fill cap [2].



WARNING

DO NOT LET OIL GET ON YOU. OIL CAN FLOW OUT OF THE APU GEARBOX WHEN YOU ADD OIL TO THE FULL MARK ON THE SIGHT GLASS. BE CAREFUL WHEN YOU ADD THE OIL NEAR THE FULL MARK. OIL CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO THE APU AND AIRPLANE COMPONENTS.



CAUTION

DO NOT MIX TWO TYPES OF OIL WHEN YOU ADD THE OIL IN THE APU. IT IS PERMITTED TO MIX DIFFERENT BRANDS OF OIL WITH THE SAME TYPE OF OIL WHEN YOU ADD THE OIL IN THE APU. A MIXTURE OF TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.



CAUTION

DO NOT FILL THE APU GEARBOX WITH OIL ABOVE THE FULL MARK. UNWANTED OIL CAN GO INTO THE APU EXHAUST DUCT AND CAUSE DAMAGE TO THE AIR/OIL SEPARATOR.

- (c) Slowly add the oil, D00071, oil, D00068, Aeroshell 390 oil, D00635, Castrol 325 oil, D00636, Eastman Turbo Oil 25, D00671, Aeroshell 555 oil, D00513, Mobil Jet Oil II, D00520 or Castrol 98 oil, D00612 to the APU gearbox until the oil level is at the FULL mark on the oil sight glass [1].

NOTE: There are two FULL and ADD marks on the oil sight glass [1]. The left side of the oil sight glass [1] shows the oil level during APU operation. The right side of the oil sight glass [1] shows the oil level for the no APU operation (APU shutdown) condition.

NOTE: The oil level is full when the oil level is at the FULL mark on the oil sight glass [1]. The APU gearbox holds 5.7 qt (5.4 l).

- (d) Close the oil fill cap [2].

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- (e) Engage the latch handle [3] on the oil fill cap [2].

I. Oil Check

SUBTASK 12-13-31-860-008

- (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 12-13-31-860-009

- (2) Remove the DO NOT OPERATE tag, STD-858 from the APU master switch on the P5 forward overhead panel.

SUBTASK 12-13-31-790-001

- (3) If you drain or flush the oil from the APU gearbox, do a leak check for the plug assembly [7]:
- Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - During the APU operation, examine the plug assembly [7] for signs of oil leakage.
 - If you find oil leakage, do these steps to repair the leakage:
 - Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - Install a DO NOT OPERATE tag, STD-858 to the APU master switch on the P5 forward overhead panel.
 - Repair the cause of the oil leakage.
 - Remove the DO NOT OPERATE tag, STD-858 from the APU master switch on the P5 forward overhead panel.
 - Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - During the APU operation, examine the plug assembly [7] for signs of oil leakage.
 - If you find oil leakage, do the leakage repair again.
 - If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - Make sure that the APU oil system is full. To do a check of the oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-31-410-002

- (1) Close this access panel:

Number Name/Location

315A APU Cowl Door

- (a) Close this access panel as follows:

- Remove the two retainer pins from the two hold-open rods in the APU compartment.
- Disconnect the two hold-open rods from the two brackets.
- Put the two hold-open rods in the two spring clips on this access panel.
- Install the retainer pin in the rod end of the forward hold-open rod.

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- 5) Install the retainer pin to the spring clip on the aft hold-open rod.
- 6) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— END OF TASK ————

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POTABLE WATER SYSTEM - SERVICING

1. **General**

- A. This procedure has these tasks:
- (1) Potable water system - drain
 - (2) Potable water tank - fill

TASK 12-14-01-600-801

2. **Potable Water System - Drain**

(Figure 301, Figure 302 or Figure 303)

A. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
200	Upper Half of Fuselage

B. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door
146AR	Water Service Door

C. **Drain the Potable Water System**



WARNING

DRAIN, OR USE THE POTABLE WATER SYSTEM A MINIMUM OF ONE TIME EACH THREE DAYS. IF YOU DO NOT DRAIN, OR USE THE WATER SYSTEM FREQUENTLY, BACTERIA CAN GROW IN THE WATER. IF YOU DRINK WATER WITH BACTERIA IN IT, ILLNESS CAN OCCUR.



CAUTION

DO NOT USE SHARP INSTRUMENT TO CLEAR THE ICE BUILD-UP BLOCKAGE. THIS CAN CAUSE DAMAGE TO THE WATERLINES.

SUBTASK 12-14-01-010-001

- (1) Open this access panel:

Number Name/Location

146AR Water Service Door

SUBTASK 12-14-01-480-001

- (2) Connect a drain line to each of the drain ports.

NOTE: There are two drain port locations. The first is the forward drain port for the forward lavatory/galley. The second is the aft drain/overflow port for the water service panel. The drain ports have 1/2 - 14 ANPT threads.

SUBTASK 12-14-01-860-007

- (3) Make sure that the shutoff valve for each wet galley is in the OPEN position.

NOTE: The shutoff valve is found adjacent to the sink of a wet galley.

EFFECTIVITY
LOM ALL

12-14-01

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SUBTASK 12-14-01-860-015

- (4) If the potable water system is not pressurized, turn the handle for the water fill/overflow valve, on the water service panel, to open the fill/overflow valve.

NOTE: If system pressurization is unavailable, the water fill/overflow valve can be opened to make it easier to drain the water.

SUBTASK 12-14-01-680-001

- (5) Turn the handle for the water drain valve on the water service panel to open the water tank drain valve.

NOTE: This drains the potable water tank and the water system aft of the wings.

SUBTASK 12-14-01-680-002

- (6) Make sure that the supply shutoff valve for each lavatory is in the ON position.

NOTE: The supply shutoff valve is found below the sink in the lavatory.

SUBTASK 12-14-01-680-003

- (7) Turn the handle, of the drain valve, for the forward lavatory to the OPEN position.

NOTE: The drain valve is found below the sink in the lavatory.

SUBTASK 12-14-01-680-004

- (8) If it is installed, open the drain valve to drain the water from each coffee maker or water boiler.

SUBTASK 12-14-01-680-005

- (9) Open the galley water faucet to drain the water from the galley water system.

(a) Close the galley water faucet when the water flow stops.

SUBTASK 12-14-01-860-002

- (10) Make sure that the potable water system is empty.

SUBTASK 12-14-01-040-001

- (11) If you do not fill the potable water tank immediately after you drain the system, choose one of the steps below to deactivate the lavatory water heater:

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	13	C00104	LAVATORY WATER HEATER A
LOM 402, 404, 406, 407, 411, 412, 415, 416, 422-434, 437-447, 450-999	F	14	C01073 LAVATORY WATER HEATER D
LOM 402, 404, 406, 407, 411, 412, 415, 416, 422-434, 437-447, 450-465	F	15	C01096 LAVATORY WATER HEATER E
LOM 445	F	16	C01510 LAVATORY WATER HEATER G

LOM ALL

(b) Set the water heater power switch (S1) to the OFF position.

SUBTASK 12-14-01-040-002

- (12) If you do not fill the potable water tank immediately after you drain the system, do these steps:

(a) To get access to the P91 panel, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

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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.

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

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 402, 404, 406

A 18 C00873 POT WATER COMPRESSOR

LOM ALL

C 9 C00138 WATER QTY IND

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

D 11 C00873 POT WATER COMPRESSOR

LOM ALL

SUBTASK 12-14-01-860-003

- (13) If it is installed, move the drain valve for each coffee maker or water boiler to the CLOSED position.

SUBTASK 12-14-01-860-004

- (14) Move the drain valve in forward lavatory to the CLOSED position.

SUBTASK 12-14-01-860-011

- (15) Turn the handle for the water fill/overflow valve, on the water service panel, to close the fill/overflow valve.

SUBTASK 12-14-01-860-005

- (16) Turn the handle for the drain valve on the water service panel to close the water tank drain valve.

SUBTASK 12-14-01-080-001

- (17) Disconnect the drain lines from the drain ports.

SUBTASK 12-14-01-410-001

- (18) Close this access panel:

Number Name/Location

146AR Water Service Door

———— END OF TASK ————

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LOM ALL

12-14-01

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TASK 12-14-01-600-802

3. Potable Water Tank - Fill

(Figure 301)

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-1141	Equipment - Potable Water Servicing
	Part #: 19-4301-0000 Supplier: 59603
	Part #: 19-4303-0000 Supplier: 59603
	Part #: 2198-310 Supplier: 6L481
	Part #: CPW-100 Supplier: 32526
	Part #: CPW-100-1 Supplier: 32526
	Part #: CPW-100-2 Supplier: 32526
	Part #: PW100 Supplier: 1CSJ2
	Part #: SPW-350 Supplier: 32526
	Part #: SPW-500PL Supplier: 32526
	Part #: WC100E (ID 2026505) Supplier: 0T652
	Part #: WSP-900 Supplier: 6L481
	Part #: WTM-900 Supplier: 6L481
	Opt Part #: 2303 Supplier: 00365
	Opt Part #: SPW-250 Supplier: 32526

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
146AR	Water Service Door

D. Fill the Potable Water Tank

SUBTASK 12-14-01-860-014

- (1) Make sure that the supply shutoff valve is in the OFF position.

SUBTASK 12-14-01-480-002



WARNING DRAIN, OR USE THE POTABLE WATER SYSTEM A MINIMUM OF ONE TIME EACH THREE DAYS. IF YOU DO NOT DRAIN, OR USE THE WATER SYSTEM FREQUENTLY, BACTERIA CAN GROW IN THE WATER. IF YOU DRINK WATER WITH BACTERIA IN IT, ILLNESS CAN OCCUR.

- (2) Connect the service potable water servicing equipment, COM-1141, or the water source as follows:

- (a) Do not use a water pressure of more than 55 psi (379 kPa).

NOTE: The recommended pressure is 25 psi (172 kPa).

- (b) Open this access panel:

Number Name/Location

146AR Water Service Door

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LOM ALL

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- (c) Open the cap on the water fill fitting.
- (d) Connect the water supply hose to the water fill fitting.

SUBTASK 12-14-01-610-001

- (3) Turn the handle to open the fill/overflow valve.

SUBTASK 12-14-01-610-002

- (4) Start the water supply to the potable water tank.

SUBTASK 12-14-01-860-006

- (5) Fill the potable water tank until you see water flow from the potable water drain/overflow port.

SUBTASK 12-14-01-610-003

- (6) Stop the water supply to the potable water tank.

SUBTASK 12-14-01-710-001

- (7) Turn the handle to close the fill/overflow valve.

SUBTASK 12-14-01-080-002

- (8) Do these steps to disconnect the service potable water servicing equipment, COM-1141, or the water source:

- (a) Disconnect the water supply hose from the water fill fitting.
- (b) Let the water drain from the water fill line to make sure that no water stays in the fill line.

NOTE: Keep the cap for the water fill fitting open for approximately one minute to permit the liquid to drain from the fill line.

- (c) Close the cap on the water fill fitting.
- (d) Close this access panel:

Number **Name/Location**

146AR Water Service Door

SUBTASK 12-14-01-440-001

- (9) If the circuit breakers for the potable water system were opened after the system was drained, do these steps:



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.

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

Power Distribution Panel Number 1, P91

Row Col Number Name

LOM 402, 404, 406

A 18 C00873 POT WATER COMPRESSOR

LOM ALL

C 9 C00138 WATER QTY IND

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

D 11 C00873 POT WATER COMPRESSOR

LOM ALL

- (b) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

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

CAPT Electrical System Panel, P18-3

Row Col Number Name

F 13 C00104 LAVATORY WATER HEATER A

LOM 402, 404, 406, 407, 411, 412, 415, 416, 422-434, 437-447, 450-999

F 14 C01073 LAVATORY WATER HEATER D

LOM 402, 404, 406, 407, 411, 412, 415, 416, 422-434, 437-447, 450-465

F 15 C01096 LAVATORY WATER HEATER E

LOM 445

F 16 C01510 LAVATORY WATER HEATER G

LOM ALL

- (d) Set the water heater power switch (S1) to the ON position.

SUBTASK 12-14-01-860-012

- (10) Move the supply shutoff valve to the SUPPLY ON position.

SUBTASK 12-14-01-860-013

- (11) Push the lavatory faucet until the water flows into the lavatory sink.

SUBTASK 12-14-01-790-001

- (12) If the potable water system was drained before the system was filled, examine the AFT and FWD drain ports for leakage.

NOTE: Leakage from the AFT drain port shows an open water tank valve. Leakage from the FWD drain port shows an open lavatory drain valve.

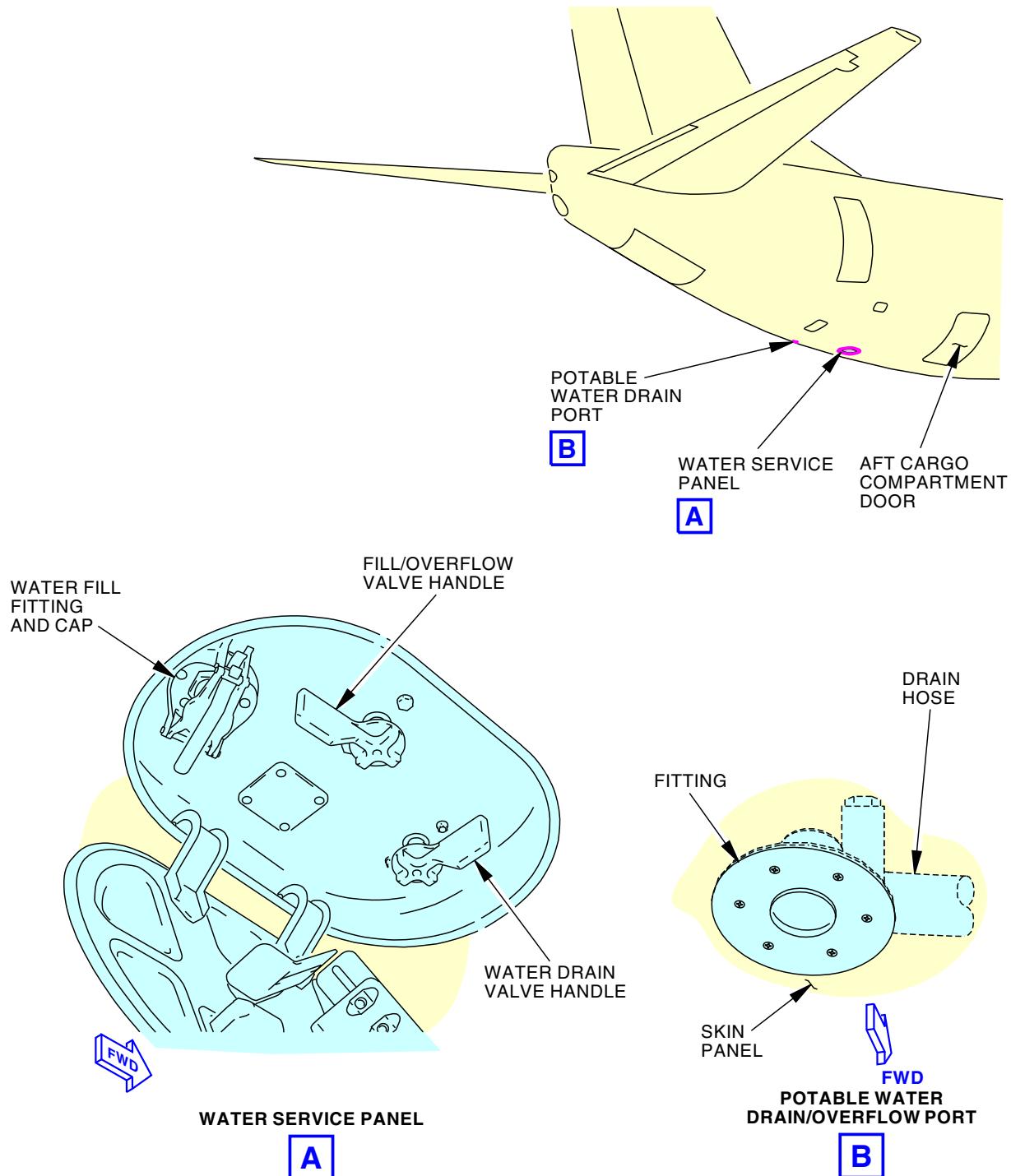
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EFFECTIVITY
LOM ALL

12-14-01



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F80455 S0006561232_V2

Potable Water System Servicing
Figure 301/12-14-01-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-431, 433, 434, 437-447, 450-465

12-14-01

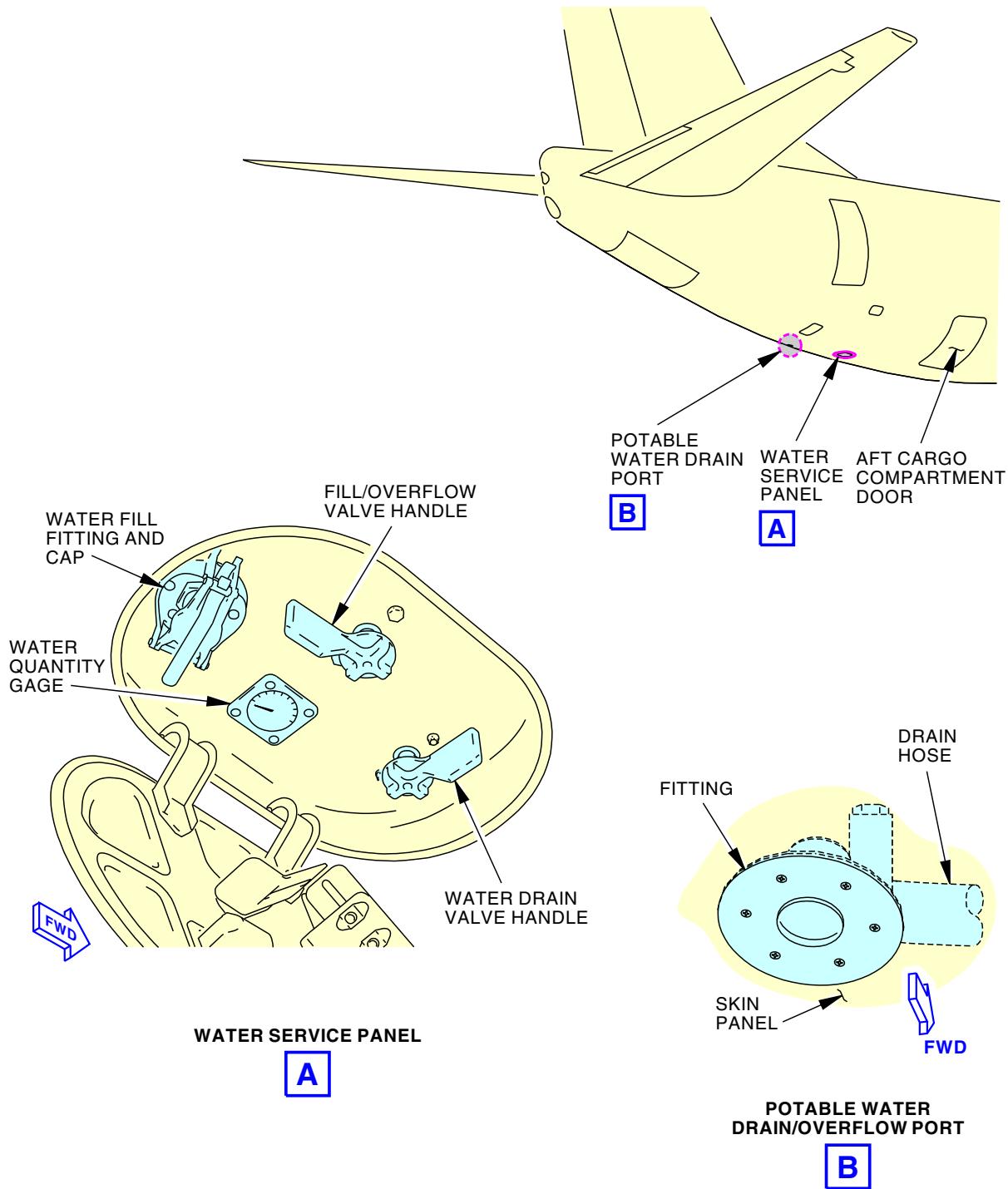
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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L49327 S0006561234_V2

Potable Water System Servicing
Figure 301/12-14-01-990-801 (Sheet 2 of 2)

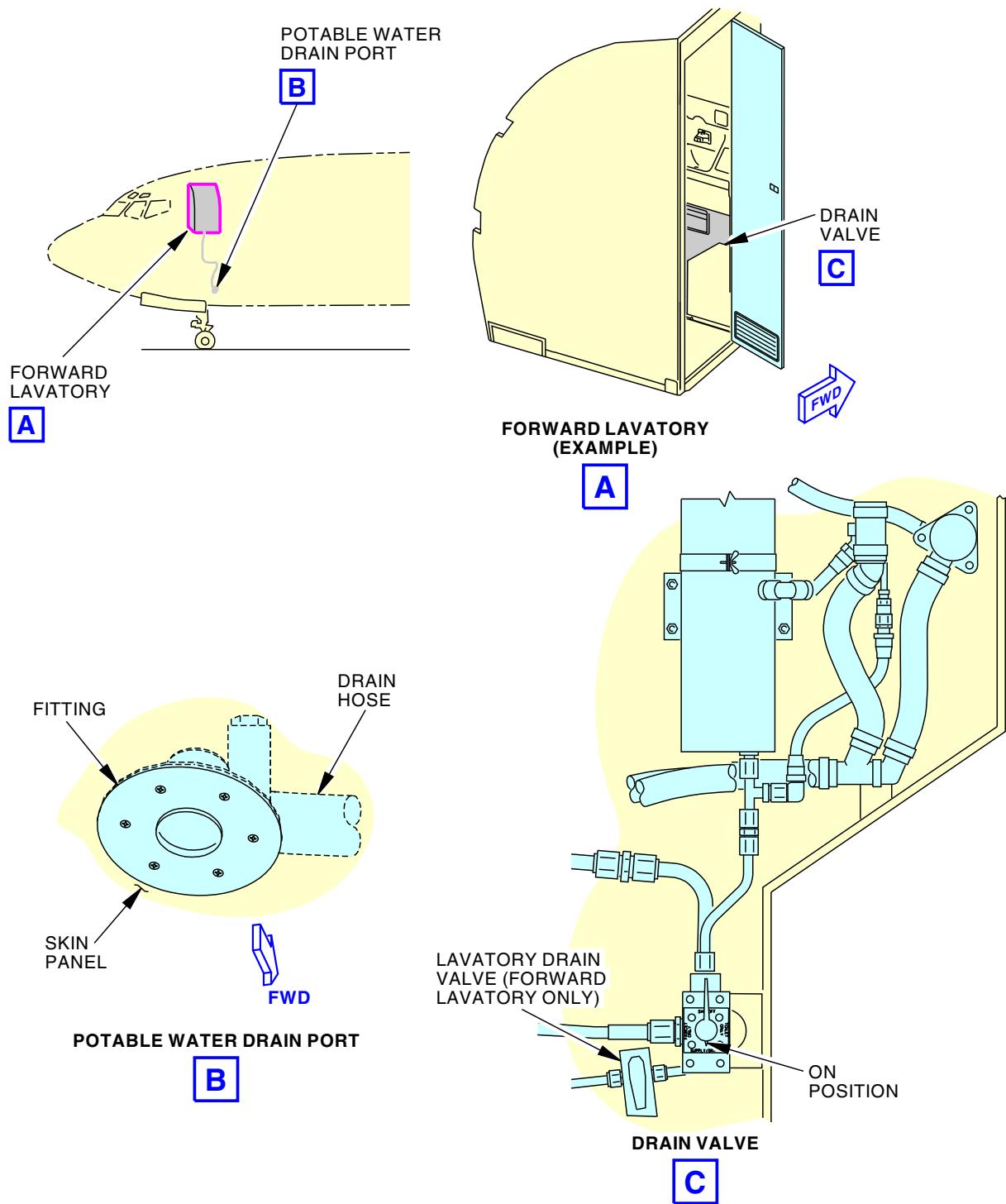
EFFECTIVITY
LOM 432, 466-999

12-14-01

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F80576 S0006561235_V4

Drain Valve Location
Figure 302/12-14-01-990-802

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-464

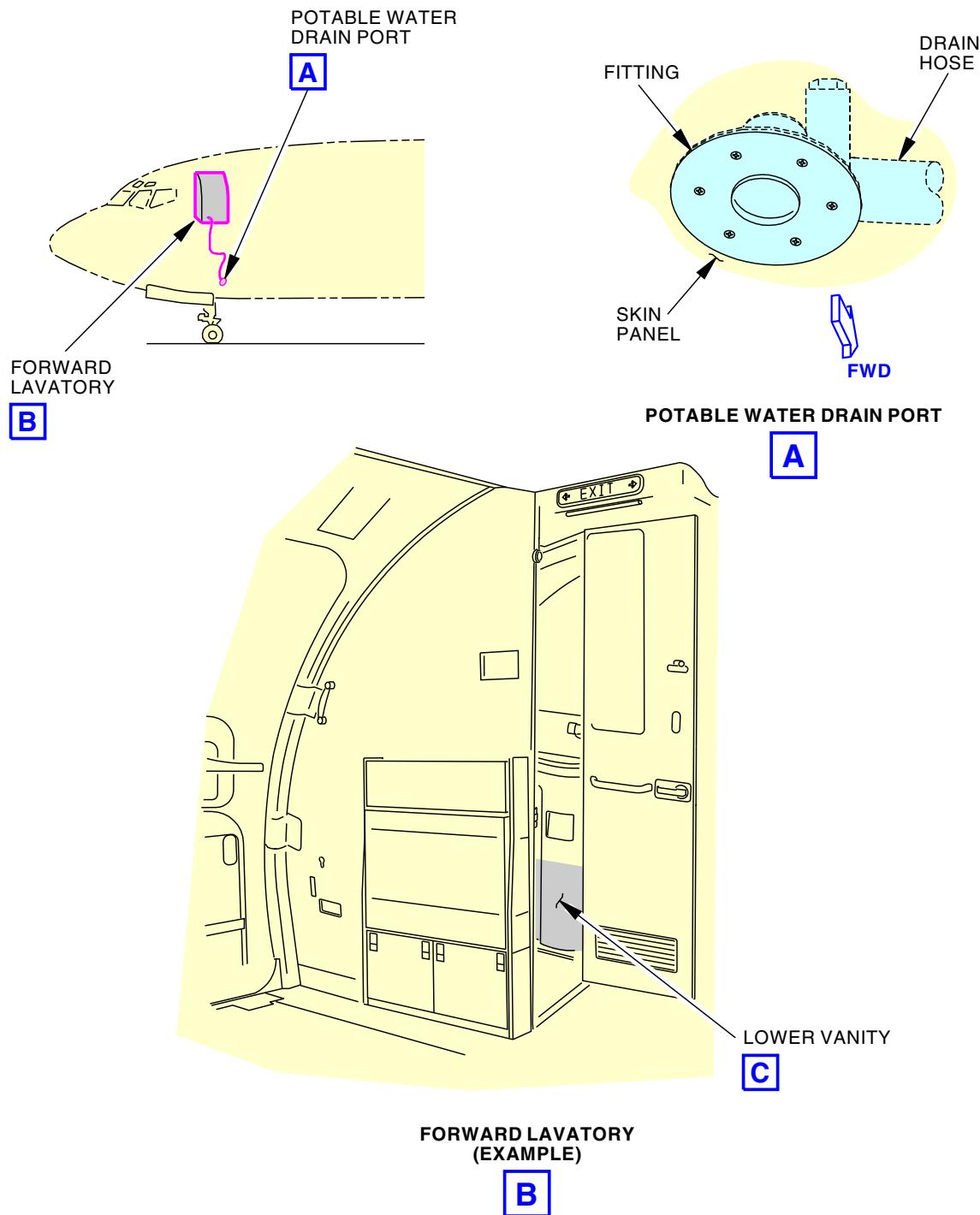
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL



2408627 S0000556652_V1

Drain Valve Location
Figure 303/12-14-01-990-803 (Sheet 1 of 2)

EFFECTIVITY
LOM 465-999

12-14-01

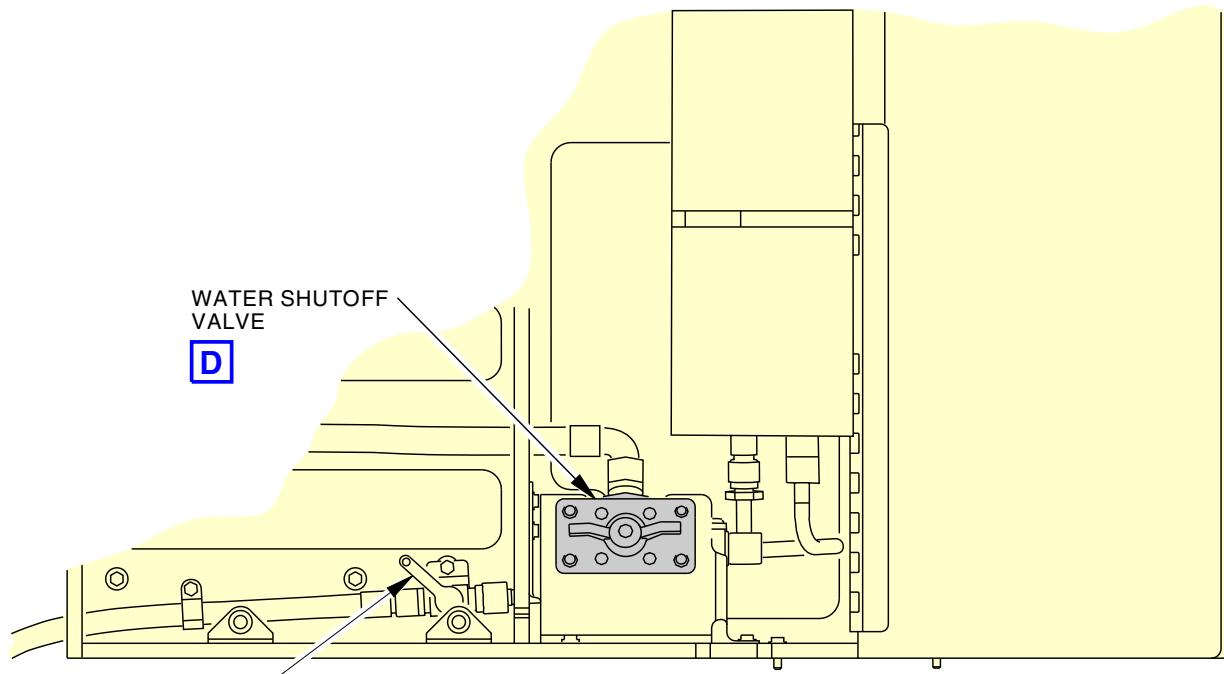
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

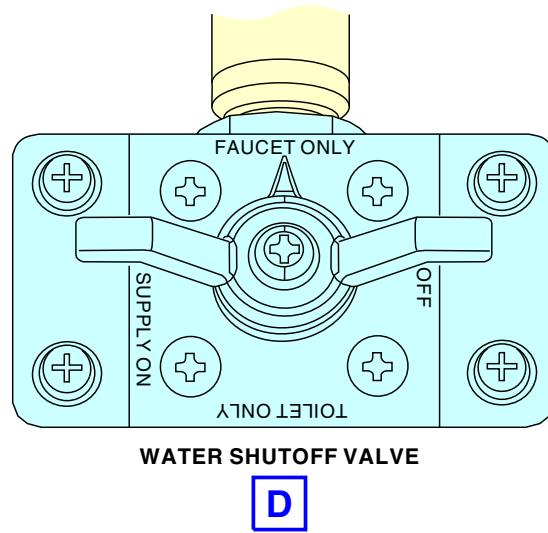
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LOWER VANITY
(SHROUD ASSEMBLY AND DOOR ASSEMBLY ARE NOT SHOWN)



WATER SHUTOFF VALVE

D

2408629 S0000556653_V1

Drain Valve Location
Figure 303/12-14-01-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM 465-999

12-14-01

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HYDRAULIC BRAKE ACCUMULATOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A check of the brake accumulator precharge pressure
 - (2) Servicing the brake accumulator if it has an incorrect precharge pressure.

TASK 12-15-11-610-801

2. Check of the Brake Accumulator Pre-charge Pressure

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
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-931	Thermometer - Hand Held, -112 to 1400 degree F (-80 to 760 degree C) Range Part #: HH911T Supplier: 29907 Opt Part #: HH-26J Supplier: 29907
STD-1179	Tester - Pyrometer

C. Location Zones

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

D. Access Panels

Number	Name/Location
194DR	Aft Wing To Body Fairing Panel

E. Check of the Brake Accumulator Pre-charge Pressure

SUBTASK 12-15-11-480-001



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.

- (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.

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SUBTASK 12-15-11-480-002

- (2) Make sure that the tires have chocks installed around them (PAGEBLOCK 10-11-05/201).

SUBTASK 12-15-11-860-001

- (3) Release the parking brake.

SUBTASK 12-15-11-860-002

- (4) For hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 12-15-11-870-001

- (5) Slowly operate the Captain's or First Officer's left and right brake pedals to the stop for a minimum of 10 times.

NOTE: This may take 15 or more brake applications (brake application: holding brakes for 1 second depressed and 1 second released).

NOTE: This will release the hydraulic pressure at the accumulator until only the gas pre-charge pressure remains.

NOTE: The brakes will go soft, and they will slowly spring back after the accumulator is depleted of hydraulic fluid pressure.

SUBTASK 12-15-11-870-003

- (6) Operate the brake pedal an additional 10 times.

SUBTASK 12-15-11-870-004

- (7) Make sure that there is no further pressure decrease on the gauge in the flight deck.

NOTE: This step will make sure that the accumulator is fully depleted of hydraulic fluid pressure.

SUBTASK 12-15-11-010-001

- (8) Open this access panel:

Number Name/Location

194DR Aft Wing To Body Fairing Panel

SUBTASK 12-15-11-860-003

- (9) The accumulator body temperature must be within 5 degrees C (9 degrees F) of ambient temperature across the entire length.

- (a) Measure the surface temperature using a pyrometer, STD-1179 or thermometer, COM-931.

NOTE: This step is required as removing hydraulic pressure will allow the accumulator pre-charge gas to expand and chill the gas inside of the accumulator.

- 1) Make sure that the accumulator surface temperature is uniform across the entire length.

NOTE: It may require 10 minutes or more for each end of the accumulator to reach a steady state temperature.

NOTE: Air may be blown on the accumulator to decrease the time required to reach a steady state temperature.

SUBTASK 12-15-11-610-001

- (10) Do the steps that follow to do a check of the accumulator pre-charge pressure:

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- (a) Use the charging instructions placard [105] to find the correct accumulator pressure for the current ambient temperature of the airplane.

NOTE: The charging instructions placard is located next to the brake accumulator pressure gauge.

- (b) Make sure that the pressure that shows on the brake accumulator pressure gauge [104] is within 50 psi (345 kPa) of the pressure you obtained from the graph on the charging instructions placard [105].
- (c) If the pressure shown on the brake accumulator pressure gauge [104] is not in the correct pressure range of the charging instructions placard [105], do this task: Hydraulic Brake Accumulator Servicing, TASK 12-15-11-420-801.

SUBTASK 12-15-11-410-002

- (11) Close this access panel:

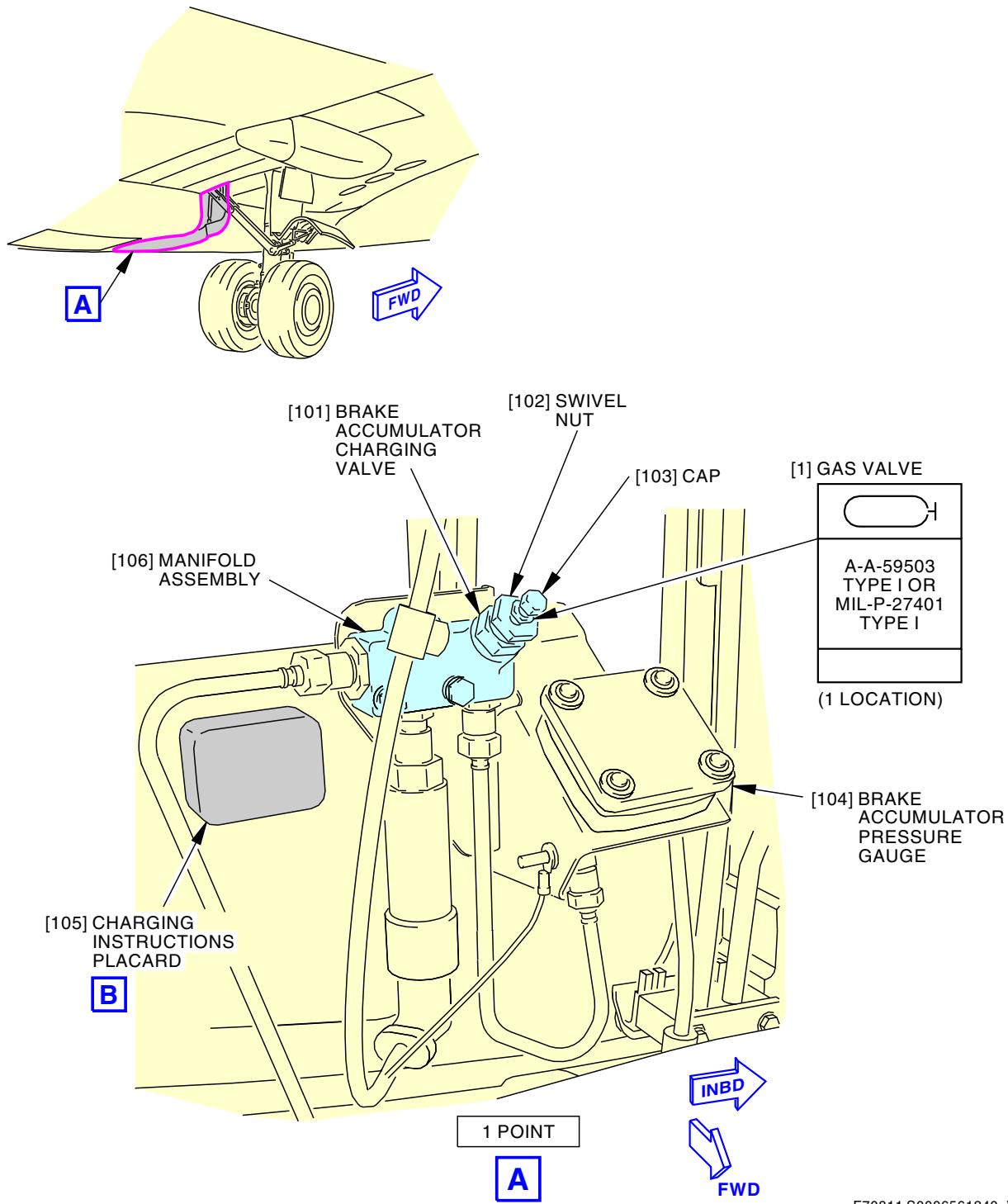
Number Name/Location

194DR Aft Wing To Body Fairing Panel

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-15-11



F70811 S0006561240_V2

Hydraulic Brake Accumulator Servicing

Figure 301/12-15-11-990-801 (Sheet 1 of 2)

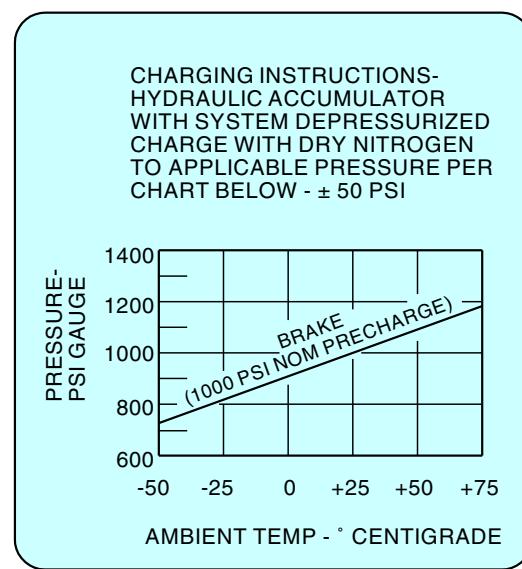
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CHARGING INSTRUCTIONS PLACARD

B

F70966 S0006561241_V3

Hydraulic Brake Accumulator Servicing
Figure 301/12-15-11-990-801 (Sheet 2 of 2)

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TASK 12-15-11-420-801

3. Hydraulic Brake Accumulator Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure supplies instructions to service the hydraulic brake accumulator.
 - (a) Charge the brake accumulator with nitrogen.
 - (b) Use the charging instructions placard [105] adjacent to the brake accumulator pressure gauge [104] to find the correct accumulator charge pressure for a given temperature (Figure 301).
 - (c) Use the brake accumulator pressure gauge [104] adjacent to the brake accumulator charging valve [101] for indication of accumulator nitrogen gas pressure.
 - (d) The brake accumulator charging valve [101] is located on the aft wall of the right wheel well.

NOTE: The brake accumulator is located behind the access panel, aft of the right wheel well.

B. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (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-931	Thermometer - Hand Held, -112 to 1400 degree F (-80 to 760 degree C) Range Part #: HH911T Supplier: 29907 Opt Part #: HH-26J Supplier: 29907
COM-932	Thermometer - Digital/Infrared (Type J, K, T or equivalency meets task requirements) Part #: 51 2B Supplier: 89536 Part #: 62 MAX Supplier: 89536 Part #: HH911T Supplier: 29907 Opt Part #: 51 SERIES II Supplier: 89536 Opt Part #: DHSA24 Supplier: 08086 Opt Part #: HH-21A Supplier: 29907
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1179	Tester - Pyrometer

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D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
104	Brake accumulator pressure gauge	32-41-51-06-105	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420
		32-41-51-07-035	LOM 422-434, 437-447, 450-999

F. Location Zones

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

G. Access Panels

Number	Name/Location
194DR	Aft Wing To Body Fairing Panel

H. Hydraulic Brake Accumulator Servicing

SUBTASK 12-15-11-480-003



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL 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 12-15-11-480-004

- (2) Make sure that the tires have chocks installed around them (PAGEBLOCK 10-11-05/201).

SUBTASK 12-15-11-860-012

- (3) Release the parking brake.

SUBTASK 12-15-11-860-013

- (4) For the hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 12-15-11-870-002

- (5) Slowly operate the Captain's or First Officer's left and right brake pedals to the stop for a minimum of 10 times.

NOTE: This may take 15 or more brake applications (brake application: holding brakes for 1 second depressed and 1 second released).

NOTE: This will release the hydraulic pressure at the accumulator until only the gas pre-charge pressure remains.

NOTE: The brakes will go soft, and they will slowly spring back after the accumulator is depleted of hydraulic fluid pressure.



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SUBTASK 12-15-11-870-005

- (6) Operate the brake pedal an additional 10 times.

SUBTASK 12-15-11-870-006

- (7) Make sure that there is no further pressure decrease on the gauge in the flight deck.

NOTE: This step will make sure that the accumulator is fully depleted of hydraulic fluid pressure.

SUBTASK 12-15-11-010-002

- (8) Open this access panel:

Number Name/Location

194DR Aft Wing To Body Fairing Panel

SUBTASK 12-15-11-860-014

- (9) The accumulator body temperature must be within 5 degrees C (9 degrees F) of ambient temperature across the entire length.

NOTE: This step is required as removing hydraulic pressure will allow the accumulator pre-charge gas to expand and chill the gas inside of the accumulator.

- (a) Measure the surface temperature using a pyrometer, STD-1179, thermometer, COM-931, or digital thermometer, COM-932.

- 1) Make sure that the accumulator surface temperature is uniform across the entire length.

NOTE: It may require 10 minutes or more for each end of the accumulator to reach a steady state temperature.

NOTE: Air may be blown on the accumulator to decrease the time required to reach a steady state temperature.

SUBTASK 12-15-11-780-002

- (10) Examine the brake accumulator pressure on the brake accumulator pressure gauge [104].

- (a) Use the charging instructions placard [105] to find the correct accumulator pressure for the current ambient temperature of the airplane.

NOTE: The charging instructions placard is located next to the brake accumulator pressure gauge.

- (b) Make sure that the pressure that shows on the brake accumulator pressure gauge [104] is within 50 psi (345 kPa) of the pressure you obtained from the graph on the charging instructions placard [105].

- (c) If the pressure shown on the brake accumulator pressure gauge [104] is not in the correct pressure range of the charging instructions placard [105] do the subsequent steps.

SUBTASK 12-15-11-610-002

- (11) Do these steps to charge the brake accumulator:

- (a) Remove the cap [103] from the brake accumulator charging valve [101].

- (b) Attach a source of nitrogen, G00018, to the inflation tool, SPL-1521.

- (c) Install the inflation tool, SPL-1521, on the brake accumulator charging valve [101] (Table 301).

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WARNING

DO NOT LOOSEN THE BODY OF THE CHARGING VALVE ON THE HYDRAULIC BRAKE ACCUMULATOR. THE PRESSURE IN THE BRAKE ACCUMULATOR CAN QUICKLY PUSH THE CHARGING VALVE OFF THE MANIFOLD ASSEMBLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) Turn the outer swivel nut [102] of the brake accumulator charging valve [101] one turn counterclockwise.
- (e) Pressurize the brake accumulator to the correct pressure shown on the charging instructions placard [105] next to the brake accumulator pressure gauge [104].
NOTE: Use the brake accumulator pressure gauge for indication of the brake accumulator pressure.
NOTE: The accumulator body temperature must be within 5 degrees C (9 degrees F) across the entire length.
- (f) Tighten the outer swivel nut [102] of the brake accumulator charging valve clockwise to 60 ± 10 in-lb (7 ± 1 N·m).

Table 301/12-15-11-993-802 Main Landing Gear Brake Accumulator Servicing (Fig. 301)

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
1	Gas Valve	A-A-59503 Type I, or MIL-P-27401 Type I	Charge	1

- (g) Slowly operate the Captain's or First Officer's left and right brake pedals to the stop for a minimum of 10 times.
NOTE: This may take 15 or more brake applications (brake application: holding brakes for 1 second depressed and 1 second released).
NOTE: This will release the hydraulic pressure at the accumulator until only the gas pre-charge pressure remains.
NOTE: The brakes will go soft, and they will slowly spring back after the accumulator is depleted of hydraulic fluid pressure.
- (h) Operate the brake pedal an additional 10 times.
- (i) Make sure that there is no further pressure decrease on the gauge in the flight deck.
NOTE: This step will make sure that the accumulator is fully depleted of hydraulic fluid pressure.
- (j) The accumulator body temperature must be within 5 degrees C (9 degrees F) of ambient temperature across the entire length.
NOTE: This step is required as removing hydraulic pressure will allow the accumulator pre-charge gas to expand and chill the gas inside of the accumulator.
 - 1) Measure the surface temperature using a pyrometer, STD-1179, thermometer, COM-931, or digital thermometer, COM-932.

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- a) Make sure that the accumulator surface temperature is uniform across the entire length.

NOTE: It may require 10 minutes or more for each end of the accumulator to reach a steady state temperature.

NOTE: Air may be blown on the accumulator to decrease the time required to reach a steady state temperature.

- (k) Make sure that the pressure that shows on the brake accumulator pressure gauge [104] is within 50 psi (345 kPa) of the pressure, that was obtained from the graph on the charging instructions placard [105]. If not, repeat steps (c) through (h) until the pre-charge pressure stabilizes within charging instructions placard [105] requirements.

SUBTASK 12-15-11-610-003

- (12) Do these steps to make sure that the brake accumulator pressure does not decrease.

- (a) To pressurize the hydraulic system B to 3000 psi (20,684 kPa), do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

- (b) Make sure that the brake accumulator pressure gauge [104] reads 3000 ± 150 psi ($20,684 \pm 1034$ kPa).

- 1) If the Engine Driven Pump (EDP) or the Electric Motor-Driven Pump (EMDP) are used to pressurize the hydraulic system B, make sure that the brake accumulator pressure gauge [104] reads within 150 psi (1034 kPa) of the hydraulic system B pressure.

- (c) For the hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

- (d) Slowly operate the Captain's or First Officer's left and right brake pedals to the stop for a minimum of 10 times.

NOTE: This may take 15 or more brake applications (brake application: holding brakes for 1 second depressed and 1 second released).

NOTE: This will release the hydraulic pressure at the accumulator until only the gas pre-charge pressure remains.

NOTE: The brakes will go soft, and they will slowly spring back after the accumulator is depleted of hydraulic fluid pressure.

- (e) Operate the brake pedal an additional 10 times.

- (f) Make sure that there is no further pressure decrease on the gauge in the flight deck.

NOTE: This step will make sure that the accumulator is fully depleted of hydraulic fluid pressure.

- (g) The accumulator body temperature must be within 5 degrees C (9 degrees F) of ambient temperature across the entire length.

NOTE: This step is required as removing hydraulic pressure will allow the accumulator pre-charge gas to expand and chill the gas inside of the accumulator.

- 1) Measure the surface temperature using a pyrometer, STD-1179, thermometer, COM-931, or digital thermometer, COM-932.

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- a) Make sure that the accumulator surface temperature is uniform across the entire length.

NOTE: It may require 10 minutes or more for each end of the accumulator to reach a steady state temperature.

NOTE: Air may be blown on the accumulator to decrease the time required to reach a steady state temperature.

- (h) Make sure that the pressure that shows on the brake accumulator pressure gauge [104] is within 50 psi (345 kPa) of the pressure you obtained from the graph on the charging instructions placard [105].

NOTE: The normal accumulator pre-charge pressure is 1000 psi (6895 kPa) at 77°F (25°C).

SUBTASK 12-15-11-610-004

- (13) Remove the inflation tool, SPL-1521, from the brake accumulator charging valve [101].
(a) Disconnect the source of nitrogen, G00018, from the inflation tool, SPL-1521.

SUBTASK 12-15-11-610-005

- (14) Install the cap [103] on the brake accumulator charging valve [101].

SUBTASK 12-15-11-790-001

- (15) If the brake accumulator pressure was less than the minimum service pressure before the accumulator servicing, do the steps that follow:

NOTE: The minimum pressure can be found on the graph of ambient temperature and pressure on the charging instructions placard.

- (a) Use a soap solution to make sure that there are no gas leaks from these components:
1) The gas pressure tube connection to the brake accumulator.
2) The gas pressure tube connections to the manifold assembly [106].
3) The gas pressure tube connections to the brake accumulator pressure gauge [104].
4) The brake accumulator charging valve [101].
5) The brake accumulator pressure gauge [104] dial face and gauge body.

SUBTASK 12-15-11-410-003

- (16) Close this access panel:

Number Name/Location

194DR Aft Wing To Body Fairing Panel

———— END OF TASK ————

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OXYGEN - SERVICING

1. General

- A. This procedure contains these tasks:
 - (1) Crew Oxygen Cylinder Replacement
 - (2) Crew Oxygen Cylinder Dispatch Pressure Check.

TASK 12-15-21-600-801

2. Crew Oxygen Cylinder Replacement

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Servicing of the crew oxygen system is by the replacement of the crew oxygen cylinder installed in the forward cargo bay.
- (2) Servicing of the passenger oxygen system is by the replacement of the chemical generators which are installed in the service units (Passenger Service Unit (PSU)s, Attendant Service Unit (ASU)s, and Lavatory Service Unit (LSU)s).
- (3) Servicing of the portable oxygen cylinder is by the replacement of the portable oxygen cylinder with full portable oxygen cylinder.
- (4) Use steel or composite oxygen cylinder on the same cylinder support structure.
 - (a) Do these steps only if there was a replacement between a steel and composite oxygen cylinder.

NOTE: The shutoff valve on the 801307-00 steel cylinder is fully open at approximately 6.5 revolutions. The shutoff valve on the B42365-1 composite cylinder is fully open at approximately 4 revolutions. The shutoff valve on the 806835-01 composite cylinder is fully open at approximately 6.5 revolutions.

NOTE: The replacement between the steel and composite oxygen cylinders will require a weight and balance change record.

- 1) Do a weight and balance change record for the aircraft.
- (b) For replacement between cylinders of the similar material and weight, no additional steps are needed.
- (5) Oxygen Requirements
 - (a) Oxygen of specification MIL-0-27210 Type 1 is recommended.
 - (b) The oxygen must contain a minimum of 99.5% oxygen by volume.
 - (c) The oxygen must be free from all poisonous contamination to the maximum possible level.
 - (d) Use only aviation oxygen that you can breathe.
 - (e) Oxygen that is not aviation grade can be satisfactory for you to breathe, but can contain too much water.
 - 1) Too much water in the oxygen system can freeze. Blockage in oxygen lines can cause problems with the operation of oxygen system components.
 - 2) The moisture contents must not be more than 0.02 milligrams of water vapor for each liter of gas at a temperature of 70°F (21°C) and a pressure of 30 in. (760 mm) of mercury.

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

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3) Refer to SAE (AS 1065A) for the permitted moisture quantity.

B. References

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
35-00-00-420-801	Installation of Caps on Open Oxygen Lines (P/B 201)
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)
35-12-00-040-801	Crew Oxygen System - Deactivation (P/B 201)
35-12-00-440-801	Crew Oxygen System - Activation (P/B 201)
35-12-00-710-802	Crew Oxygen System Pressure Decay Leak Check (P/B 601)
35-12-11-000-801	Regulator/Transducer Assembly Removal (P/B 401)
35-12-11-400-801	Regulator/Transducer Assembly Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50063	Grease - Perfluoropolyether, fuel and oxygen resistant - Krytox 240AC	MIL-PRF- 27617 Type III

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Cylinder	35-12-52-01A-050	LOM 445-447
		35-12-52-01A-055	LOM 445-447
		35-12-52-01A-060	LOM 422-424
		35-12-52-01A-065	LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442
		35-12-52-01A-400	LOM 426, 430, 431, 445-447
		35-12-52-01A-460	LOM 445-447
		35-12-52-01B-030	LOM 451-999
		35-12-52-01B-200	LOM 451-999
		35-12-52-01B-234C	LOM 451-999
		35-12-00-02-078	LOM 402, 404, 406, 407
12	Packing	35-12-52-05-095	LOM 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

E. Location Zones

Zone	Area
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

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F. Prepare for the Removal of the Crew Oxygen Cylinder

SUBTASK 12-15-21-910-011

- (1) Make sure that you read and obey the safety precautions and instructions for the oxygen system before you do the servicing (TASK 35-00-00-910-801).

SUBTASK 12-15-21-860-064

- (2) Make sure that the airplane is grounded correctly (TASK 20-40-11-910-801).

SUBTASK 12-15-21-840-011

- (3) Make sure that these items are clean:

- (a) White gloves
- (b) Clothes
- (c) Tools
- (d) Oxygen cylinder
- (e) Other items that service the oxygen system.

SUBTASK 12-15-21-840-012

- (4) Make sure that all materials are free from contamination.

G. Crew Oxygen Cylinder Removal

SUBTASK 12-15-21-040-016

- (1) Do this task: Crew Oxygen System - Deactivation, TASK 35-12-00-040-801.

SUBTASK 12-15-21-020-046

- (2) Do this task: Regulator/Transducer Assembly Removal, TASK 35-12-11-000-801.

SUBTASK 12-15-21-480-012



WARNING

USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (3) If the installation of the regulator, transducer and coupling assembly [7] will not occur in five minutes, install caps on open oxygen lines (TASK 35-00-00-420-801).

NOTE: Oxygen clean fittings come from a sealed container with a label for the oxygen system. Make sure that only oxygen clean fittings are used. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs that must be as clean as the installation connections.

SUBTASK 12-15-21-020-047

- (4) Disconnect the overboard discharge line [3] from the oxygen cylinder [4].

LOM 451-457, 461-463 PRE SB 737-35-1162; AIRPLANES WITH CYLINDER STRAP

SUBTASK 12-15-21-020-048

- (5) Do these steps to remove the oxygen cylinder [4]:

- (a) Remove the nuts [6] from the T-bolts [10] on the band strap clamps [13].
 - 1) Keep the nuts [6] in a safe area for installation.
- (b) Open the band strap clamps [13].
- (c) Move the oxygen cylinder [4] out from the oxygen cylinder rack [9].

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

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LOM 451-457, 461-463 PRE SB 737-35-1162; AIRPLANES WITH CYLINDER STRAP (Continued)

- (d) Remove the oxygen cylinder [4] from the airplane.
 - 1) Put the cap for the oxygen cylinder [4] on the outlet port.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447; AIRPLANES WITHOUT CYLINDER STRAP OR KNULED NUT

SUBTASK 12-15-21-020-042

- (6) Do these steps to remove the oxygen cylinder [4]:
 - (a) Remove the nut [6] from the T-bolt [10].
 - (b) Remove the aft cylinder ring [5].
 - 1) Keep the nut [6] and aft cylinder ring [5] in a safe area for installation.
 - (c) Move the oxygen cylinder [4] out from the oxygen cylinder rack [9].
 - (d) Remove the oxygen cylinder [4] from the airplane.
 - 1) Put the cap for the oxygen cylinder [4] on the outlet port.

LOM 458-460, 464-999; LOM 451-457, 461-463 POST SB 737-35-1162; AIRPLANES WITHOUT CYLINDER STRAP, WITH KNULED NUT

SUBTASK 12-15-21-020-049

- (7) Do these steps to remove the oxygen cylinder [4]:
 - (a) Remove the knurled nut [6], washer [18], and washer [19] from the T-bolt [10].
 - (b) Remove the aft cylinder ring [5].
 - 1) Keep the knurled nut [6] and aft cylinder ring [5] in a safe area for installation.
 - (c) Move the oxygen cylinder [4] out from the oxygen cylinder rack [9].
 - (d) Remove the oxygen cylinder [4] from the airplane.
 - 1) Put the cap for the oxygen cylinder [4] on the outlet port.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

SUBTASK 12-15-21-020-014

- (8) Remove the union [11] from the shutoff valve assembly.

NOTE: It is not necessary to remove the union if the oxygen cylinder will be installed.

- (a) Keep the union [11].

NOTE: The union will be used to install the oxygen cylinder.

SUBTASK 12-15-21-020-036

- (9) Remove the packing [12] from the union [11].

EFFECTIVITY
**LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999**

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SUBTASK 12-15-21-480-013



WARNING

USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (10) If the installation of the oxygen cylinder [4] will not occur in five minutes, install caps on the open oxygen lines (TASK 35-00-00-420-801).

NOTE: Oxygen clean fittings come from a sealed container with a label for the oxygen system installation. Make sure that only oxygen clean fittings are used. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs that must be as clean as the installation connections.

H. Crew Oxygen Cylinder Installation

SUBTASK 12-15-21-210-045

- (1) Examine the hydrostatic test date on the oxygen cylinder [4].

- (a) Make sure that the hydrostatic test date obeys the regulatory authority.

NOTE: The hydrostatic test date must be in the approved service life limit. The national regulatory authorities, cylinder manufacturer, and/or airline set the service life of the hydrostatic test.

SUBTASK 12-15-21-860-065

- (2) Do these steps to examine the replacement oxygen cylinder [4]:

- (a) Make sure that the oxygen cylinder [4] is fully serviced.

- (b) Make sure that the oxygen cylinder [4] is free from contamination.

LOM 451-457, 461-463 PRE SB 737-35-1162; AIRPLANES WITH CYLINDER STRAP

SUBTASK 12-15-21-860-066



CAUTION

BEFORE YOU INSTALL THE OXYGEN CYLINDER, MAKE SURE THAT THE CORRECT BAND CLAMPS ARE INSTALLED. INCORRECT BAND CLAMPS CAN CAUSE A LOOSE OXYGEN CYLINDER INSTALLATION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Make sure that the correct band strap clamps [13] are installed.

- (a) If it is necessary, replace the band strap clamps [13], as follows:

- 1) Remove the pads from the band strap clamps [13].
- 2) Remove the band strap clamps [13] from the oxygen cylinder rack [9] mounts.
- 3) Install the correct band strap clamps [13] in the oxygen cylinder rack [9] mounts with the T-bolts [10] positioned upright and inboard.
- 4) Install the pads on the band strap clamps [13].
 - a) Position the forward pad [14], aft pad [15], and outboard pad [16] as shown.
NOTE: Each pad is a different size.
 - b) Install the pads on the band strap clamps [13] with the open side of the pads outboard of the band strap clamps [13].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

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SUBTASK 12-15-21-860-067

- (4) Do these steps to prepare the oxygen cylinder [4] for the installation:
- Install the new packing [12] on the union [11].
 - Install the union [11] on the shutoff valve assembly of the oxygen cylinder [4].
 - Tighten the union [11] to 180.5 in-lb (20.4 N·m) - 199.5 in-lb (22.5 N·m).
 - Remove the lockwire or cotter pin(s) that hold the cap on the oxygen cylinder [4].
 - Slowly loosen the cap from the oxygen cylinder [4].
 - Bleed off the remaining gas before you fully remove the cap.
 - Remove the cap.

SUBTASK 12-15-21-420-020



USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (5) Do these steps to install the oxygen cylinder [4]:

NOTE: Oxygen clean fittings come from a sealed container with a label for the oxygen system installation. Make sure that only oxygen clean fittings are used. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs that must be as clean as the installation connections.

- Go to the forward cargo compartment with the full oxygen cylinder [4].
- Make sure that the nylon pads are installed on the aft cylinder ring [5] (View F, Figure 301).
- Remove the caps and plugs from the overboard discharge line [3] and crew oxygen supply line [2].
- Put the replacement oxygen cylinder [4] on the oxygen cylinder rack [9].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999; ALL AIRPLANES WITHOUT CYLINDER STRAPS

- Push the full oxygen cylinder [4] forward until it is fully engaged in the forward cylinder ring [1].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-431, 433, 434, 437-442, 445-447, 451-999; ALL AIRPLANES WITH CYLINDER STRAPS

- Push the full oxygen cylinder [4] forward until it is fully engaged against the end stop of the oxygen cylinder rack [9].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

- Align the full oxygen cylinder [4] with the overboard discharge line [3].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999; ALL AIRPLANES WITHOUT CYLINDER STRAPS

- Lubricate the threads of the T-bolt [10] with either Christo-lube MCG111 grease, D50011, or Krytox 240AC perfluoropolyether grease, D50063.

EFFECTIVITY

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

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LOM 451-457, 461-463 PRE SB 737-35-1162; AIRPLANES WITH CYLINDER STRAP

- (i) Do these steps to secure the oxygen cylinder [4] in its installed position:
 - 1) Close the band strap clamps [13].
 - a) Apply Christo-lube MCG111 grease, D50011, or Krytox 240AC perfluoropolyether grease, D50063, to the strap T-bolts [10].
 - b) Install the nuts [6] on the T-bolts [10] and tighten until the band strap clamps [13] contact the oxygen cylinder [4].
 - 2) Make sure that the oxygen cylinder [4] is against the end stop.
 - a) Tighten the nuts [6] of the T-bolts [10].
 - 3) Try to move the oxygen cylinder [4] forward, then aft.
 - a) If the oxygen cylinder [4] moves, continue to tighten the nuts [6] of the T-bolts [10].
 - b) Make sure that one or more threads of the T-bolt [10] extend through the nut [6].

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447; AIRPLANES WITHOUT CYLINDER STRAP OR KNULED NUT

- (j) Push and hold the oxygen cylinder [4] against the forward cylinder ring [1].
 - 1) Put the aft cylinder ring [5] in its installed position.
 - 2) Continue to hold the oxygen cylinder [4] against the forward cylinder ring [1].



YOU MUST NOT OVERTIGHTEN THE NUT. IF YOU DO NOT OBEY, THIS CAN CAUSE AFT CYLINDER RING DISTORTION.

CAUTION

- a) Install the T-bolt [10] and nut [6] to the aft cylinder ring [5].
- b) Make sure that the end of the trunnion [21] is installed in the same direction as the end of the T-bolt [10] (View D, Figure 301).
- 3) Try to move the oxygen cylinder [4] forward, then aft.
 - a) If the oxygen cylinder [4] moves, continue to tighten the nut [6] of the T-bolt [10].
 - <1> Tighten the nut [6] until the aft cylinder ring [5] is in firm contact with the oxygen cylinder.
 - <2> Reseat oxygen cylinder [4] and continue to tighten the nut [6] until the oxygen cylinder [4] is firmly seated in the oxygen cylinder rack [9].
 - b) Make sure that one or more threads of the T-bolt [10] extend through the nut [6].
 - c) Make sure that the T-bolt [10] holds the oxygen cylinder [4] tightly to prevent all forward or aft movement.

LOM 458-460, 464-999; LOM 451-457, 461-463 POST SB 737-35-1162; AIRPLANES WITHOUT CYLINDER STRAP, WITH KNULED NUT

- (k) Push and hold the oxygen cylinder [4] against the forward cylinder ring [1].
 - 1) Put the aft cylinder ring [5] in its installed position.
 - 2) Continue to hold the oxygen cylinder [4] against the forward cylinder ring [1].

EFFECTIVITY
**LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
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LOM 458-460, 464-999; LOM 451-457, 461-463 POST SB 737-35-1162; AIRPLANES WITHOUT CYLINDER STRAP, WITH KNURLED NUT (Continued)

- a) Install the T-bolt [10], washer [18], washer [19], and knurled nut [6] to the aft cylinder ring [5].
- b) Make sure that the end of the trunnion [21] is installed in the same direction as the end of the T-bolt [10] (View E, Figure 301).
- 3) Try to move the oxygen cylinder [4] forward, then aft.
 - a) If the oxygen cylinder [4] moves, continue to tighten the knurled nut [6] of the T-bolt [10].



DO NOT TIGHTEN THE KNUURL NUT TOO TIGHT. THIS CAN CAUSE THE AFT CYLINDER RING TO TWIST. IF YOU DO NOT OBEY INSTRUCTIONS, DAMAGE TO EQUIPMENT CAN OCCUR.

- b) Make sure that one or more threads of the T-bolt [10] extend through the knurled nut [6].
- c) Make sure that the T-bolt [10] holds the oxygen cylinder [4] tightly to prevent all forward or aft movement.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

- (I) Connect the overboard discharge line [3] to the full oxygen cylinder [4].

SUBTASK 12-15-21-410-022

- (6) Do this task: Regulator/Transducer Assembly Installation, TASK 35-12-11-400-801.

NOTE: This task does a leak check of the connections and an electrical check of the oxygen pressure indication.

NOTE: The shutoff valve on the 801307-00 steel cylinder is fully open at approximately 6.5 revolutions. The shutoff valve on the B42365-1 composite cylinder is fully open at approximately 4 revolutions. The shutoff valve on the 806835-01 composite cylinder is fully open at approximately 6.5 revolutions.

NOTE: The force necessary to open the valves on composite cylinder can increase before the valves are fully open.

SUBTASK 12-15-21-210-043

- (7) Make sure that the cap for the oxygen cylinder [4] is attached to the regulator to prevent damage to equipment.

SUBTASK 12-15-21-410-013

- (8) Install the access panel in the forward cargo compartment (Figure 301).

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-425, 427, 428, 432-434, 437-442, 445-447, 451-999

I. System Operational Check (WITH EROS MF10/MF20 and ORONASAL MC10 MASKS)

SUBTASK 12-15-21-860-048

- (1) If it is necessary, supply electrical power (TASK 24-22-00-860-811).

SUBTASK 12-15-21-440-013

- (2) Do this task: Crew Oxygen System - Activation, TASK 35-12-00-440-801.

SUBTASK 12-15-21-010-010

- (3) Get access to the captain or the first officer stowage box (Figure 302).

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-425, 427, 428, 432-434, 437-442, 445-447, 451-999
(Continued)

SUBTASK 12-15-21-710-002

- (4) Push and hold the TEST/RESET LEVER of the mask stowage box to the TEST/RESET position.
 - (a) Make sure that the flow indicator of the oxygen stowage box shows a yellow flow indication.
 - (b) Make sure that you hear the release of gas.
 - (c) Make sure that the flow indicator goes back to the zero flow indication (black).

NOTE: After the mask is inflated, the flow indicator will show that there is no flow.

SUBTASK 12-15-21-710-003

- (5) Continue to hold the TEST/RESET LEVER of the mask stowage box to the TEST/RESET position.
 - (a) Push and hold the EMERGENCY OXYGEN SELECTOR KNOB of the mask regulator for 5 seconds.
 - (b) Make sure that the FLOW INDICATOR of the oxygen stowage box shows a yellow flow indication.
 - (c) Make sure that the pressure on the pressure indicator, on the P5-14 panel, does not decrease more than 100 psig (689 kPa).

NOTE: If the pressure decreases more than 100 psig (689 kPa), or it increases slowly, this shows that the supply is not sufficient.

 - 1) If the pressure decreases more than 100 psig (689 kPa) or if it increases slowly, do these steps:
 - a) Make sure that the oxygen cylinder valve is fully open.
 - b) Do the steps again.
 - c) If the condition continues, do this task: Crew Oxygen System Pressure Decay Leak Check, TASK 35-12-00-710-802.
 - (d) Make sure that you can hear the flow of oxygen.
 - (e) Release the EMERGENCY OXYGEN SELECTOR KNOB.
 - 1) Make sure that the flow indicator of the stowage box shows a zero flow indication (black).
 - (f) Release the TEST/RESET LEVER of the mask stowage box.
 - 1) Make sure that the TEST/RESET LEVER goes to its usual position.

SUBTASK 12-15-21-710-004

- (6) Open the left door on the mask stowage box.

NOTE: This step will open the shutoff valve.

- (a) Momentarily push the EMERGENCY OXYGEN SELECTOR KNOB of the mask regulator.
 - 1) Make sure that the FLOW INDICATOR of the oxygen stowage box shows a yellow flow indication.
 - 2) Close the left door on the mask stowage box.
 - 3) Make sure that the oxygen on FLAG of the stowage box shows.

SUBTASK 12-15-21-860-029

- (7) Make sure that the DILUTION CONTROL LEVER is set to the 100% position.

EFFECTIVITY
**LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999**

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AIRCRAFT MAINTENANCE MANUAL

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-425, 427, 428, 432-434, 437-442, 445-447, 451-999
(Continued)

SUBTASK 12-15-21-440-009

- (8) Push the TEST/RESET LEVER again to reset the shutoff valve of the mask stowage box.
 - (a) Make sure that the oxygen on FLAG of the stowage box does not show.

LOM 426, 429-431

J. System Operational Check (WITH B/E AEROSPACE MASKS)

SUBTASK 12-15-21-860-062

- (1) If it is necessary, supply electrical power (TASK 24-22-00-860-811).

SUBTASK 12-15-21-440-015

- (2) Do this task: Crew Oxygen System - Activation, TASK 35-12-00-440-801.

SUBTASK 12-15-21-010-012

- (3) Get access to the captains or the first officers stowage box (Figure 302).

SUBTASK 12-15-21-710-001

- (4) Push and hold the TEST/RESET BUTTON of the mask stowage box for 5 seconds.
 - (a) At the same time, turn the DILUTION CONTROL KNOB of the mask REGULATOR to the EMER mode.
 - (b) Make sure that the FLOW INDICATOR shows the yellow starburst symbol in the indicator window.
 - (c) Make sure that the oxygen on FLAG in the door of the stowage box shows ON.
 - (d) Make sure that you hear the flow of oxygen.
 - (e) Make sure that the pressure on the oxygen pressure indicator of the P5-14 panel does not decrease more than 100 psig (689 kPa).

NOTE: If the pressure decreases more than 100 psig (689 kPa), or it increases slowly, this shows that the supply is not sufficient.

- 1) If the pressure decreases more than 100 psig (689 kPa) or if it increases slowly, do these steps:
 - a) Make sure that the crew oxygen cylinder [4] valve is fully open. Then do the system operational check steps again.
 - b) If the condition continues, then do this task:
Crew Oxygen System Pressure Decay Leak Check, TASK 35-12-00-710-802.

SUBTASK 12-15-21-710-010

- (5) Open the two doors of the mask stowage box, then close the two doors.

- (a) Push the TEST/RESET BUTTON again.

NOTE: This sets the shutoff valve of the mask stowage box to closed.

- 1) Make sure that the FLOW INDICATOR does not show the yellow starburst.
 - 2) Make sure that the oxygen on FLAG of the left door does not show.

SUBTASK 12-15-21-860-034

- (6) Turn the DILUTION CONTROL KNOB to the 100% Oxygen Position.

EFFECTIVITY
**LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999**

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LOM 426, 429-431 (Continued)

SUBTASK 12-15-21-700-002

- (7) If it is necessary, do the test again for the other crew oxygen masks.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-442, 445-447, 451-999

———— END OF TASK ————

— EFFECTIVITY —
**LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999**

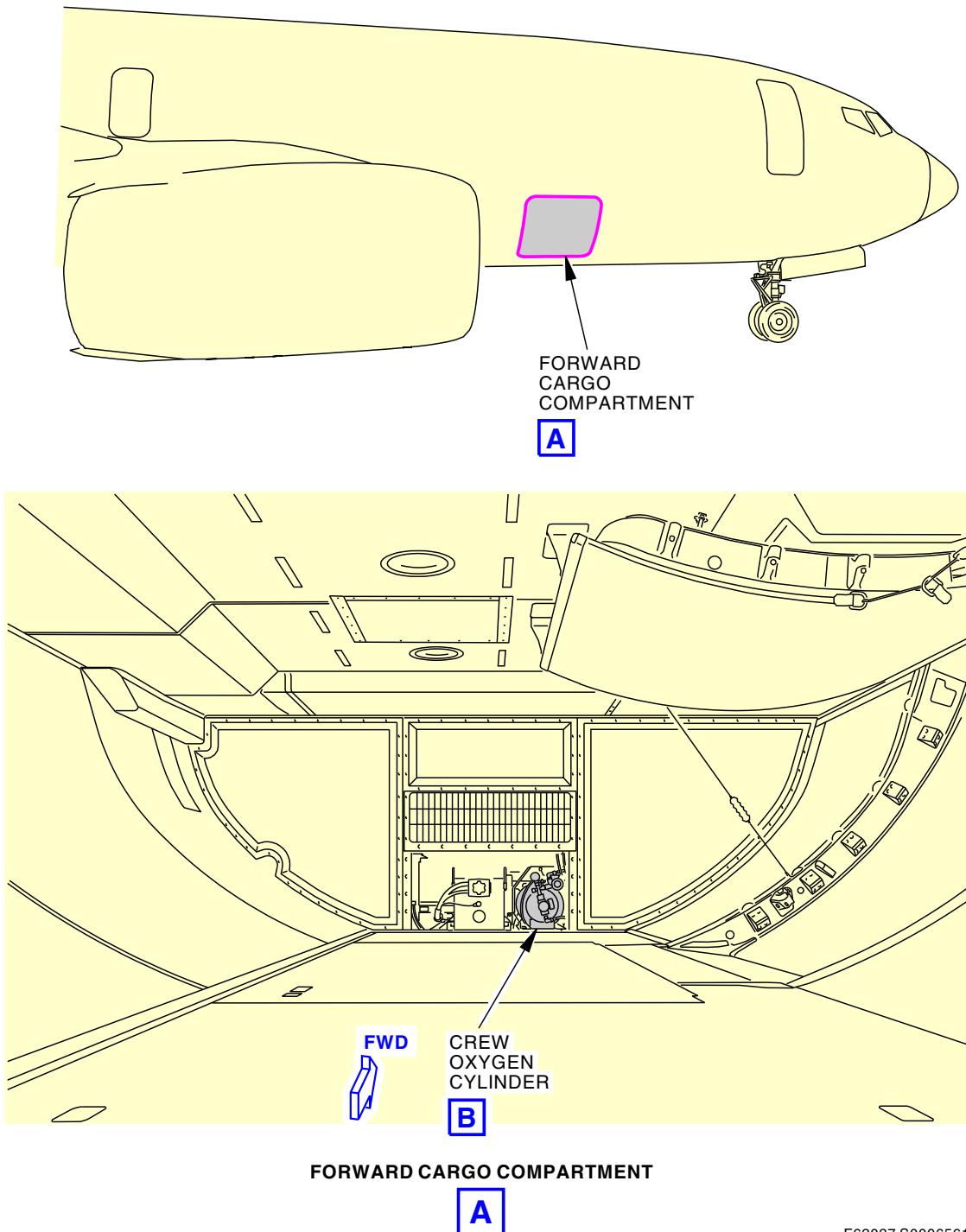
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F62027 S0006561253_V2

Oxygen System Servicing
Figure 301/12-15-21-990-817 (Sheet 1 of 6)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

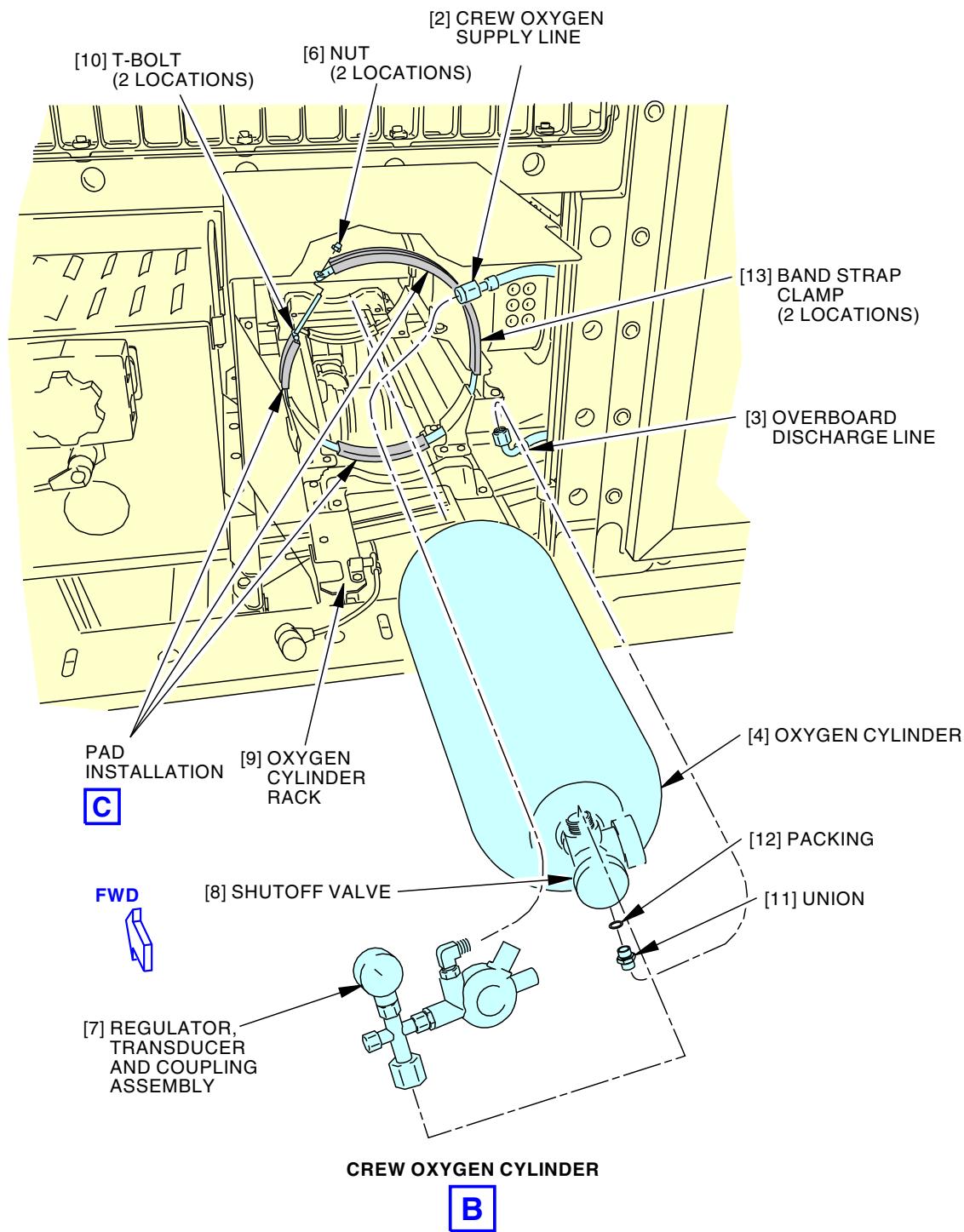
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2392094 S0000549363_V4

Oxygen System Servicing
Figure 301/12-15-21-990-817 (Sheet 2 of 6)

EFFECTIVITY
 LOM 451-457, 461-463 PRE SB 737-35-1162;
 AIRPLANES WITH CYLINDER STRAP

12-15-21

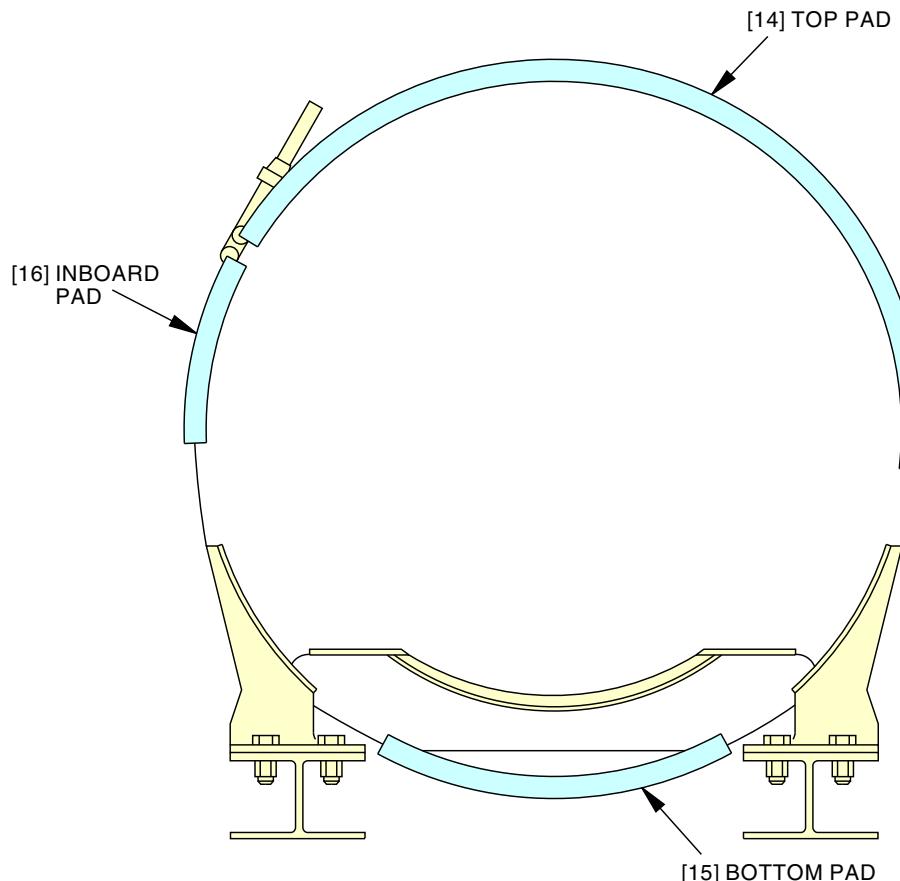
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PAD INSTALLATION
(VIEW IN THE FORWARD DIRECTION)

C

2403011 S0000555931_V1

Oxygen System Servicing
Figure 301/12-15-21-990-817 (Sheet 3 of 6)

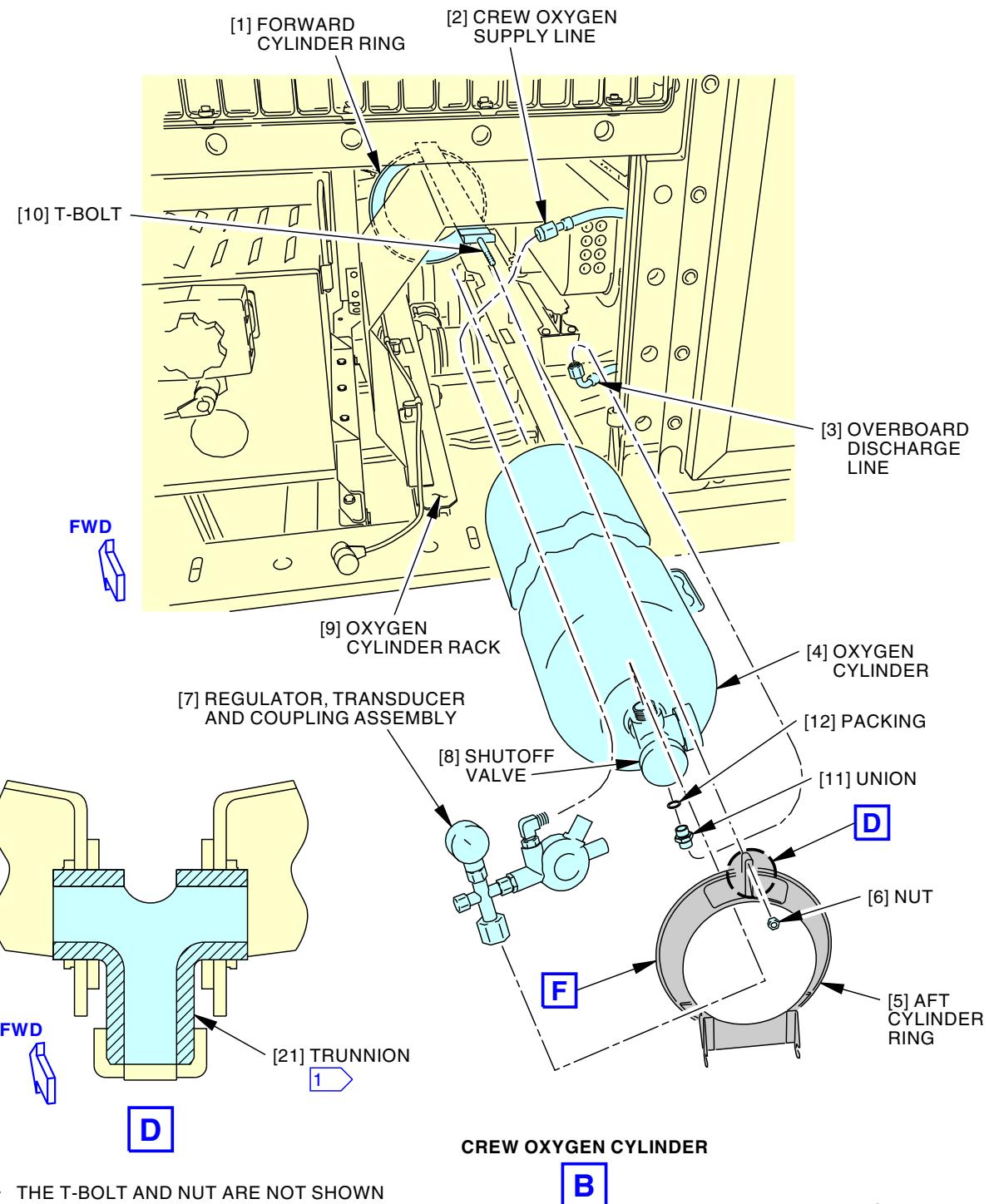
EFFECTIVITY
LOM 451-457, 461-463 PRE SB 737-35-1162;
AIRPLANES WITH CYLINDER STRAP

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2930395 S0000704722_V4

Oxygen System Servicing

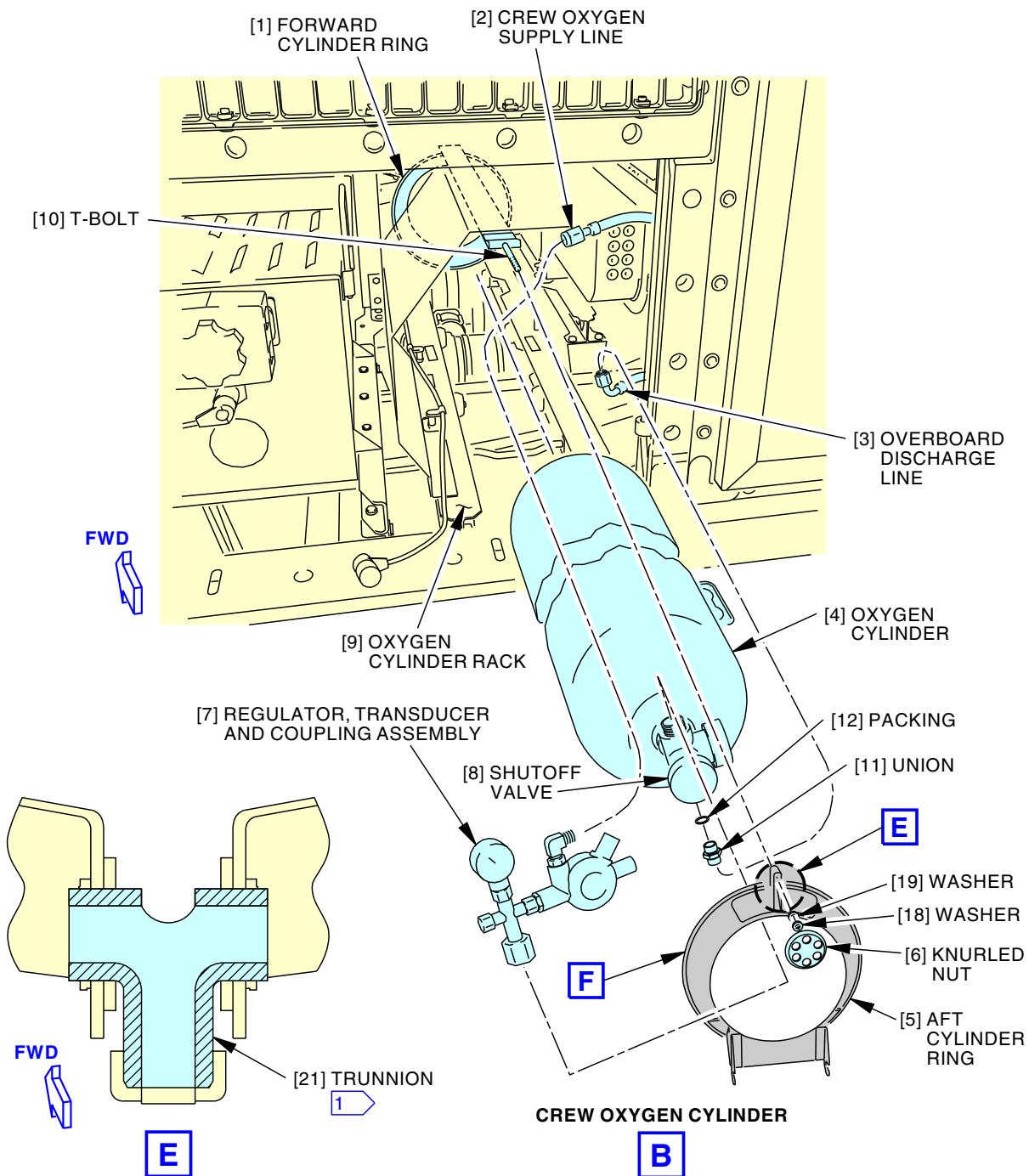
Figure 301/12-15-21-990-817 (Sheet 4 of 6)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447; AIRPLANES WITHOUT
CYLINDER STRAP OR KNULED NUT

12-15-21

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1 THE T-BOLT AND NUT ARE NOT SHOWN

F62026 S0006561254_V8

Oxygen System Servicing

Figure 301/12-15-21-990-817 (Sheet 5 of 6)

EFFECTIVITY
LOM 458-460, 464-999; LOM 451-457, 461-463 POST
SB 737-35-1162; AIRPLANES WITHOUT CYLINDER
STRAP, WITH KNULED NUT

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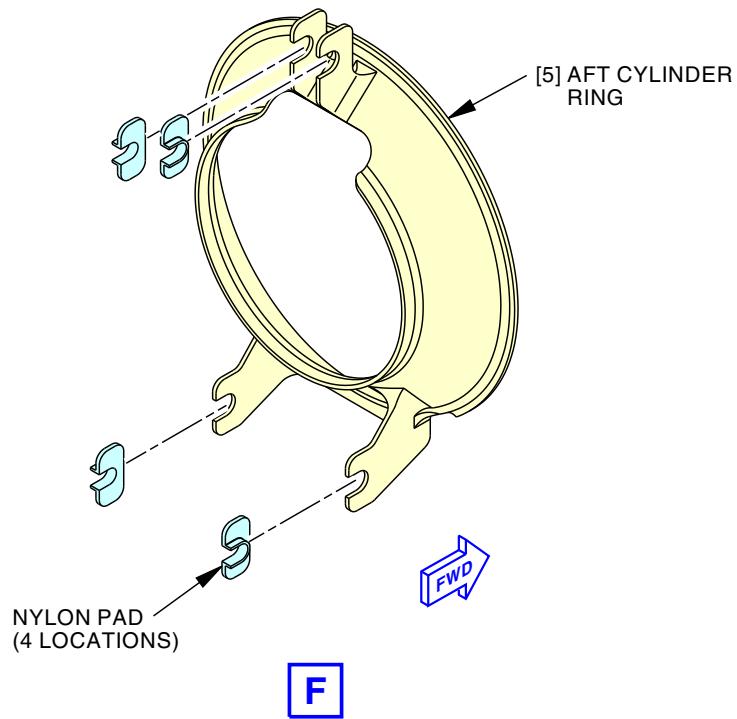
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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3066534 S0000828085_V1

Oxygen System Servicing
Figure 301/12-15-21-990-817 (Sheet 6 of 6)

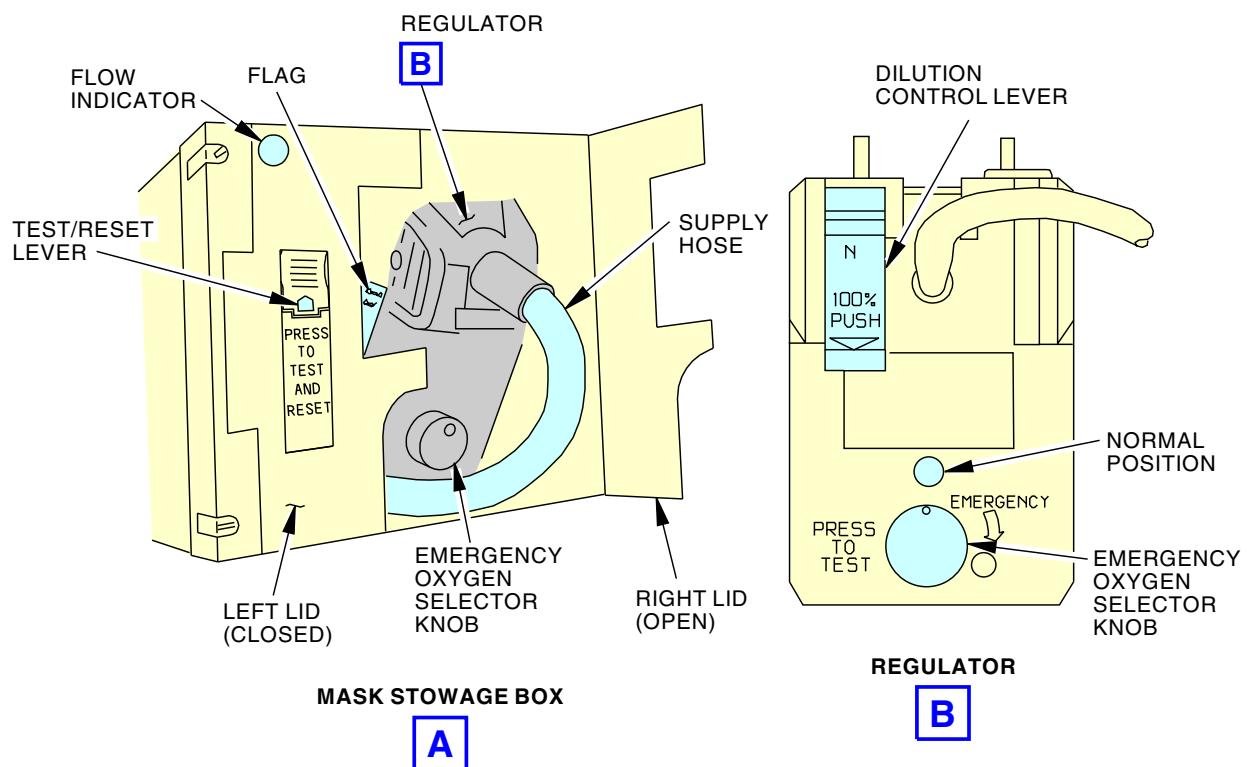
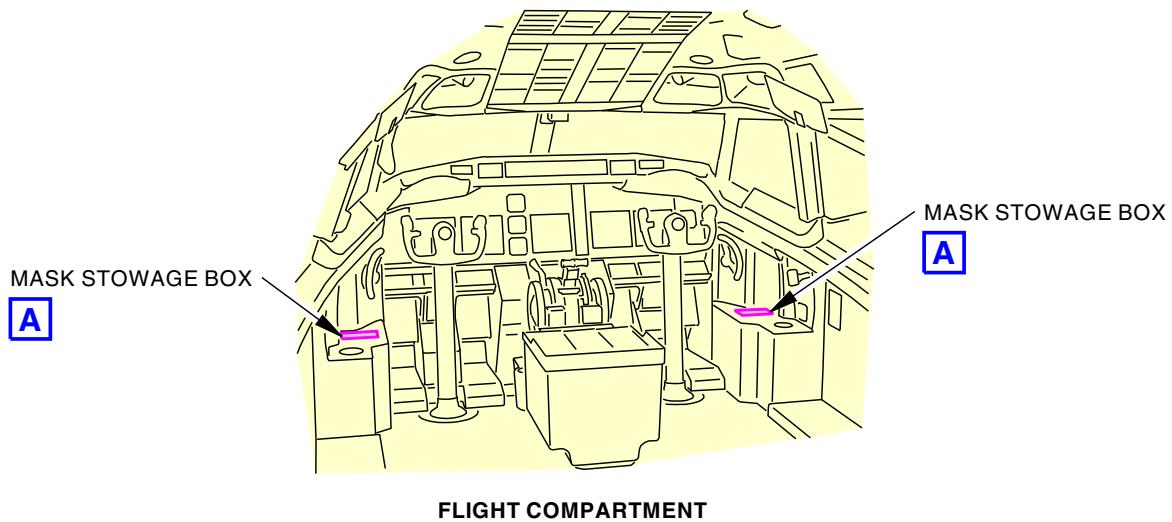
EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 458-460, 464-999; LOM
451-457, 461-463 POST SB 737-35-1162

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J38613 S0000171833_V3

Oxygen System Operational Check
Figure 302/12-15-21-990-804 (Sheet 1 of 3)

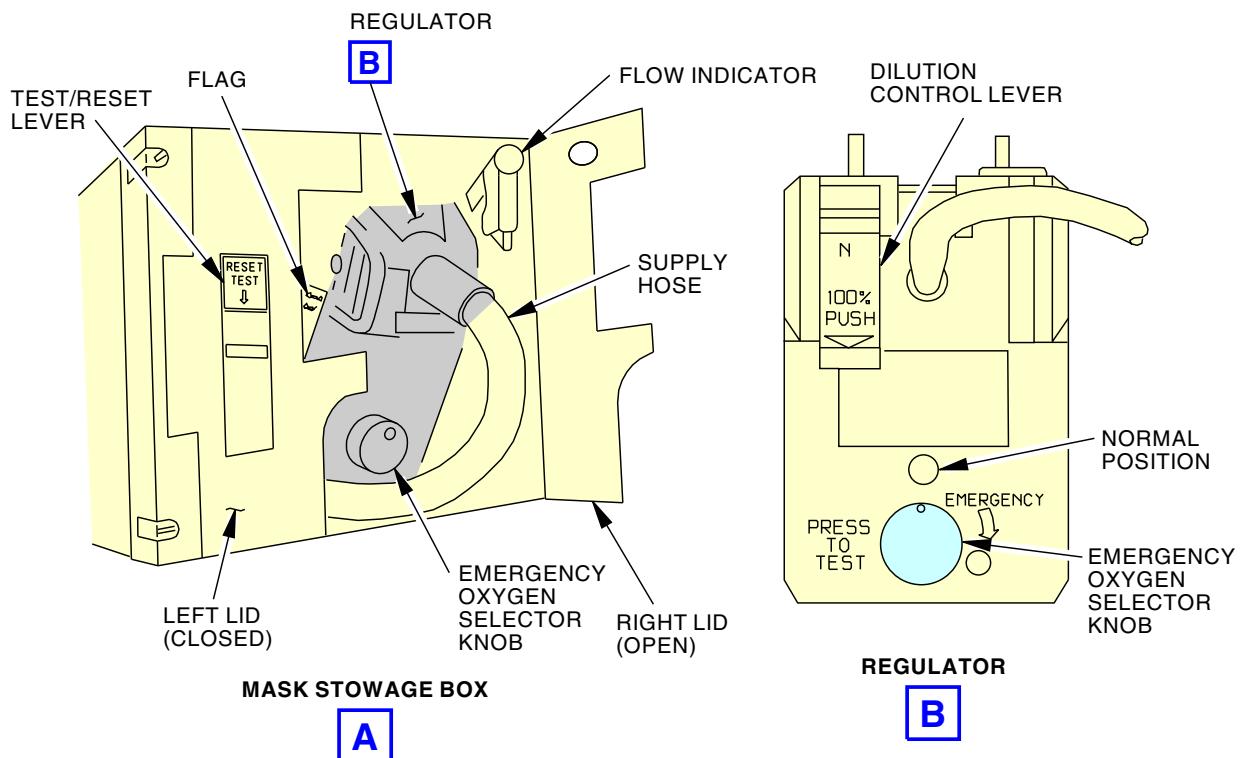
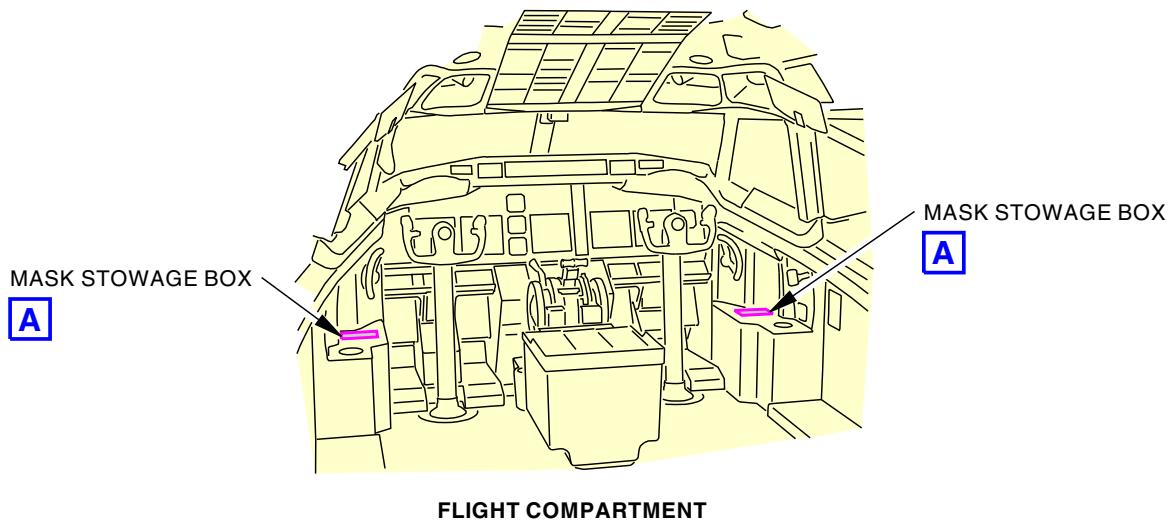
EFFECTIVITY
LOM 411, 422, 425, 427, 428, 433, 434, 440, 442,
445-447, 451-463, 465-999

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2435804 S0000564378_V1

Oxygen System Operational Check
Figure 302/12-15-21-990-804 (Sheet 2 of 3)

EFFECTIVITY
 LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424,
 432, 437-439, 441, 464

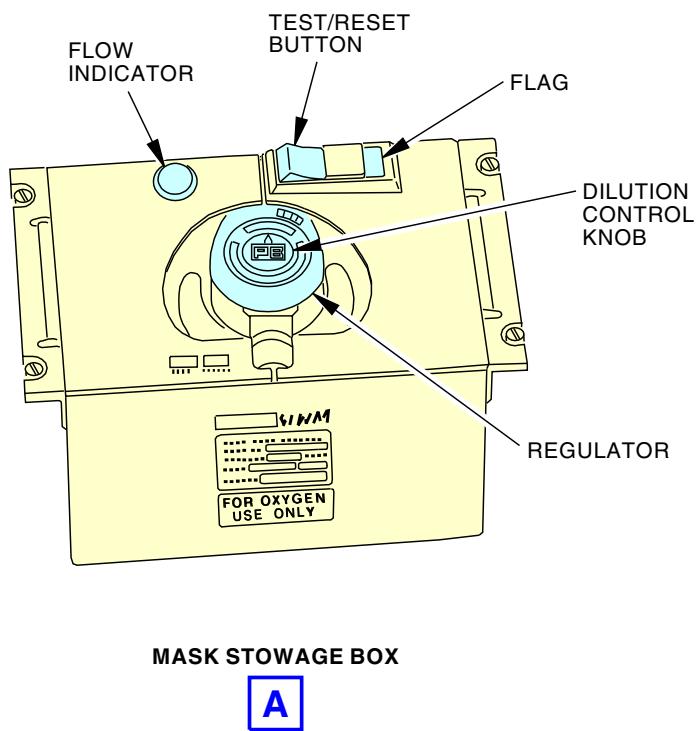
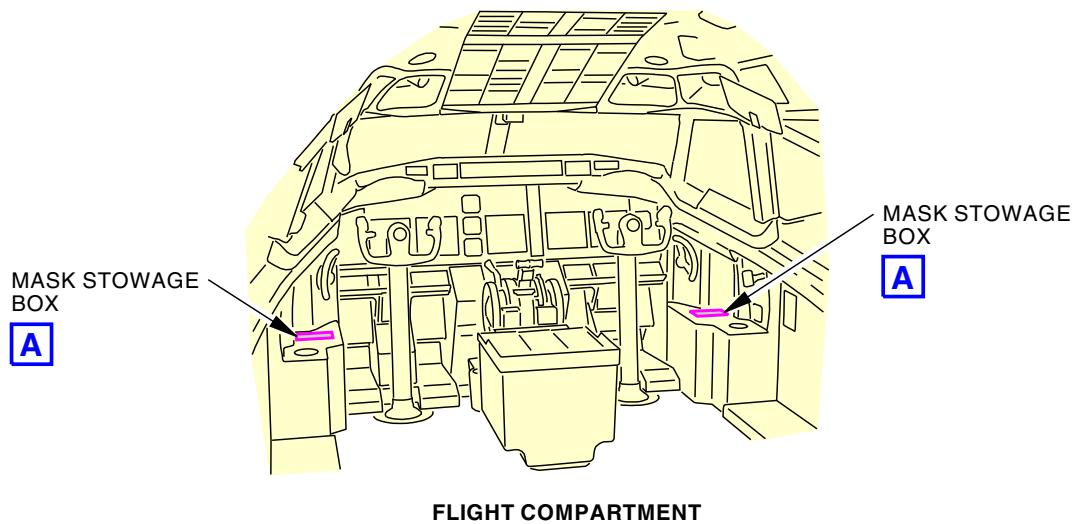
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J42613 S0000171834_V3

Oxygen System Operational Check
Figure 302/12-15-21-990-804 (Sheet 3 of 3)

EFFECTIVITY
LOM 426, 429-431

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TASK 12-15-21-210-801

3. Crew Oxygen Cylinder Dispatch Pressure Check

A. References

Reference	Title
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 12-15-21-910-012

- (1) To read and obey the safety precautions and general instructions for the oxygen system before you do the maintenance, do this task: Oxygen System General Maintenance Practices, TASK 35-00-00-910-801.

SUBTASK 12-15-21-210-044

- (2) Make sure the pressure shown on the pressure gage is above the minimum pressure necessary for dispatch.

NOTE: Contact dispatch or your flight operations organization for minimum dispatch pressure.

———— END OF TASK ————

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 451-999

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OXYGEN - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contain these tasks:
 - (1) Remote Fill Panel Servicing
 - (2) Crew Oxygen Cylinder Replacement
 - (3) Crew Oxygen Cylinder Dispatch Pressure Check.
- C. There are two ways to service the crew oxygen system.
 - (1) The first method refills the depleted crew oxygen cylinder from an external oxygen source by way of the remote fill panel, which is located in the electrical and electronics compartment.
 - (2) The second method replaces the crew oxygen cylinder installed in the forward cargo bay.
- D. The passenger oxygen system is serviced by the replacement of the chemical generators, which are installed behind their respective service units (PSUs, ASUs and LSUs).
- E. The portable oxygen system is serviced by the replacement of the portable oxygen cylinders with fully-serviced portable oxygen cylinders.
- F. Steel oxygen cylinder and composite oxygen cylinder may be used interchangeably on the same cylinder support structure.
- G. Oxygen Requirements
 - (1) Oxygen that you use for the airplane oxygen system must have these properties:
 - (a) Oxygen of specification MIL-0-27210 Type 1, is recommended.
 - (b) The oxygen must contain a minimum of 99.5% oxygen by volume.
 - (c) The oxygen must be free from all poisonous contamination to the maximum possible level.
 - (d) Use only aviation grade oxygen that you can breathe.
 - (e) Oxygen other than aviation grade can be satisfactory for you to breathe, but can contain too much water.
 - 1) Too much water in the oxygen system can freeze and cause blockage in oxygen lines and cause problems with the operation of oxygen system regulators and valves.
 - 2) The moisture content must not be more than 0.005 milligrams of water vapor for each liter of gas at a temperature of 70°F (21°C) and a pressure of 760 millimeters of mercury.
 - 3) Refer to SAE (AS 1065) for the permitted moisture quantity.

TASK 12-15-21-610-801-002

2. Remote Fill Panel Servicing

(Figure 301, Figure 302)

A. References

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)

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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-1543	Cart - Oxygen Bottle (Less Bottles) Part #: 1900.06 Supplier: 1777B Part #: 1900.07 Supplier: 1777B Part #: 20-4505-7000 Supplier: 59603 Part #: 7090-011 Supplier: 00994 Part #: NBOT Supplier: D2029 Opt Part #: 7090-010 Supplier: 00994 Opt Part #: 9761-010 Supplier: 00994
COM-20103	Oxygen Adapter - Fill, Transfer Part #: 173784 Supplier: 16827 Part #: K-2717 Supplier: 59603 Part #: O2N2FP0039 Supplier: \$1340 Opt Part #: PC-1006 (3/8-24 UNF-2B) Supplier: 59603
SPL-1934	Equipment - Test, Pressure Leak, Crew Oxygen System Part #: C35001-37 Supplier: 81205 Opt Part #: C35001-1 Supplier: 81205
STD-1441	Cart - Oxygen

C. Consumable Materials

Reference	Description	Specification
G00019	Oxygen - Aviator's Breathing, Liquid And Gas	MIL-PRF-27210 (Supersedes MIL-O-27210)

D. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare to Service the Crew Oxygen Cylinder

SUBTASK 12-15-21-860-007-002

- (1) Make sure that the airplane is grounded correctly, do this task: Static Grounding, TASK 20-40-11-910-801.

SUBTASK 12-15-21-910-002-002



MAKE SURE THE AIRPLANE REMOTE FILL PORT, CAP, YOUR HANDS, AND TOOLS ARE CLEAN AND DRY (DO NOT HAVE OIL OR GREASE ON THEM). IF DIRT, OIL OR GREASE OR ANY OTHER CONTAMINATION MIXES WITH THE OXYGEN, IT COULD CAUSE AN IGNITION OF THE OXYGEN. ALSO MAKE SURE THAT THE AIRPLANE AND FILL CART ARE ELECTRICALLY GROUNDED. IF EITHER OF THESE CONDITIONS ARE NOT FOLLOWED, IT COULD CAUSE INJURY TO PERSONS OR DAMAGE TO THE AIRPLANE.

- (2) Read and obey the safety precautions and general instructions before you do the maintenance (TASK 35-00-00-910-801).

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SUBTASK 12-15-21-210-001-002

- (3) Make sure that the oxygen cylinders on the oxygen cart, STD-1441, oxygen cart, COM-1543, or the equivalent oxygen service equipment uses oxygen, G00019, that is permitted for airplane use.

SUBTASK 12-15-21-210-002-002

- (4) Make sure that the adapter, COM-20103, and supply hose is clean.

SUBTASK 12-15-21-610-001-002

- (5) Set the outlet pressure of the pressure regulator valve of the oxygen service equipment to 125 ± 25 psig (862 ± 173 kPa).

SUBTASK 12-15-21-610-002-002

- (6) Slowly open the shutoff valve on the oxygen service equipment to bleed any contaminants out of the supply hose.

SUBTASK 12-15-21-420-003-002

- (7) Close the shutoff valve on the oxygen service equipment.

SUBTASK 12-15-21-530-001-002

- (8) Put a cap on the adapter, COM-20103, that is on the end of the supply hose, to keep contaminants out.

SUBTASK 12-15-21-010-002-002

- (9) Open this access panel to get access to the remote fill panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 12-15-21-010-003-002

- (10) Open the remote fill panel door.

SUBTASK 12-15-21-210-003-002

- (11) Before the crew oxygen cylinder servicing, record the pressure value that is shown on pressure indicator for the crew oxygen system in the control cabin.

- (a) Make sure that the pressure of the crew oxygen system is not less than 5 psig (34.5 kPa).

- 1) If the oxygen cylinder pressure is 5 psig (34.5 kPa) or more, continue the procedure.

- 2) If the oxygen cylinder pressure is less than 5 psig (34.5 kPa), do not fill the crew oxygen cylinder.

- a) Replace the cylinder with a fully charged cylinder (TASK 12-15-21-600-803-002).

NOTE: The replaced oxygen cylinder must be sent to an approved oxygen repair and overhaul facility. This is done to make sure that moisture has not gone into the oxygen cylinder.



USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- 3) OPTIONAL PROCEDURE:

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If the pressure that shows on the indicator of the crew oxygen system is less than 5 psig (34.5 kPa), do these steps:

NOTE: If the pressure of the cylinder is very low, it can possibly not show on the indicators of the crew oxygen system. This optional procedure gives one more check of the oxygen cylinder pressure before you replace the cylinder.

- a) Make sure that you use only oxygen clean fittings.

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean.

- b) If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts.

NOTE: This also applies to tube caps or plugs which must be as clean as the installation connections.

- c) Close the shutoff valve of the oxygen cylinder (View B, Figure 302).

- d) Disconnect the remote fill line from the regulator, transducer and coupling assembly of the oxygen cylinder.

- e) Connect the pressure gage of the test equipment, SPL-1934, to the regulator, transducer and coupling assembly of the oxygen cylinder.

- f) Open the shutoff valve of the oxygen cylinder.

- g) If the pressure of the crew oxygen cylinder is less than 5 psig (34.5 kPa), the crew oxygen cylinder is not serviceable.

<1> Do this task: Crew Oxygen Cylinder Replacement,
TASK 12-15-21-600-803-002.

- h) If the pressure of the crew oxygen cylinder is 5 psig (34.5 kPa) or more, the crew oxygen cylinder is serviceable. Continue the procedure.

- i) Close the shutoff valve of the oxygen cylinder.

- j) Disconnect the pressure gage of the test equipment, SPL-1934, from the regulator, transducer and coupling assembly of the oxygen cylinder.

- k) Connect the remote fill line to the regulator, transducer and coupling assembly of the oxygen cylinder (View B, Figure 302).

- l) Open the shutoff valve of the crew oxygen cylinder
(TASK 12-15-21-600-803-002).

- m) Continue the remote fill panel servicing procedure.

G. Service the Crew Oxygen Cylinder

SUBTASK 12-15-21-860-009-002

- (1) Make sure that the shutoff valve on the crew oxygen cylinder is open.

SUBTASK 12-15-21-210-004-002

- (2) Make sure that the remote fill panel is clean.

SUBTASK 12-15-21-860-010-002



YOU MUST REMOVE THE PRESSURE CAP SLOWLY. YOU MUST BLEED THE REMAINING PRESSURE OR THE CAP CAN COME OFF WITH A LARGE FORCE. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Slowly remove the pressure cap on the remote fill port.

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SUBTASK 12-15-21-860-011-002

- (4) Bleed off the remaining pressure in the line before you fully remove the pressure cap.

SUBTASK 12-15-21-210-005-002

- (5) Make sure that the remote fill port fitting is clean and free of contamination.

SUBTASK 12-15-21-020-004-002



WARNING

YOU MUST NOT USE LUBRICANTS OR GASKETS WHEN YOU MAKE THE SUPPLY HOSE CONNECTIONS. A FIRE OR EXPLOSION CAN OCCUR WHEN OXYGEN IS EXPOSED TO AN IGNITION SOURCE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Remove the cap from the adapter, COM-20103.

SUBTASK 12-15-21-480-003-002

- (7) Connect the adapter, COM-20103, to the remote fill port.

NOTE: The filler port end fitting is a cone-type connection with a 0.375–24 UNF-3A thread - refer to AND10089–3, or A 0.625–24 UNF 3A thread - refer to AND10089–5.

SUBTASK 12-15-21-480-004-002

- (8) Connect the supply hose to the adapter, COM-20103.

SUBTASK 12-15-21-210-006-002

- (9) Find the pressure indicator on the remote fill panel and make a note of the system pressure.

SUBTASK 12-15-21-610-003-002

- (10) Set the pressure compensator dial on the remote fill panel to this pressure.

SUBTASK 12-15-21-210-007-002

- (11) Find the temperature of the area near the crew oxygen cylinder.

SUBTASK 12-15-21-610-004-002

- (12) Set the temperature compensator dial on the remote fill panel to the temperature of the cylinder area.

SUBTASK 12-15-21-610-005-002

- (13) Set the pressure regulator valve of the oxygen service equipment to supply an outlet pressure of not more than 150 psig (1034 kPa).

SUBTASK 12-15-21-780-001-002

- (14) Slowly open the supply shutoff valve on the oxygen service equipment to its full open position.

SUBTASK 12-15-21-790-001-002

- (15) Make sure that there is no oxygen leakage from the connections.

SUBTASK 12-15-21-820-001-002

- (16) Adjust the pressure regulator valve of the oxygen service equipment by the steps that follow:

(a) Adjust the pressure regulator valve of the oxygen service equipment to the same pressure that shows on the remote fill panel gage.

(b) Slowly adjust the pressure regulator valve of the oxygen service equipment to 250 psig (1724 kPa) more than the system pressure that shows on the remote fill panel gage.

EFFECTIVITY
LOM 443, 444, 450

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SUBTASK 12-15-21-820-002-002



CAUTION

DO NOT PERMIT THE CYLINDER PRESSURE TO BE MORE THAN 2300 PSI
(15,858 KPA). DAMAGE TO EQUIPMENT CAN OCCUR.

- (17) After the automatic shutoff occurs at the necessary pressure, do the steps that follow:
 - (a) Close the shutoff valve on the oxygen service equipment.
 - (b) Set the pressure regulator valve of the oxygen service equipment to zero.

SUBTASK 12-15-21-870-002-002



WARNING

YOU MUST OPEN THE CONNECTIONS SLOWLY, AND BLEED OFF THE REMAINING PRESSURE. IF YOU REMOVE THE CONNECTIONS TOO QUICKLY THE OXYGEN PRESSURE CAN RELEASE WITH A LARGE FORCE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (18) Slowly loosen the adapter, COM-20103, to bleed the remaining pressure.

SUBTASK 12-15-21-020-005-002



CAUTION

DO NOT PERMIT THE SUPPLY HOSE ADAPTER FITTING TO TOUCH THE GROUND OR OTHER DIRTY SURFACE. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (19) Disconnect the adapter, COM-20103, from the remote fill port fitting.

SUBTASK 12-15-21-530-002-002

- (20) Put a cap on the adapter supply hose.

SUBTASK 12-15-21-530-003-002

- (21) Put the supply hose in storage.

SUBTASK 12-15-21-280-001-002

- (22) Install the pressure cap on the remote fill port.

NOTE: A loose pressure cap on the remote fill port can permit slow leakage and decrease the quantity of oxygen in the crew oxygen cylinder.

- (a) Tighten the cap to 100 ± 5 in-lb (11.3 ± 0.6 N·m).

SUBTASK 12-15-21-410-002-002

- (23) Close and latch the door of the remote fill panel.

SUBTASK 12-15-21-410-003-002

- (24) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

———— END OF TASK ————

EFFECTIVITY
LOM 443, 444, 450

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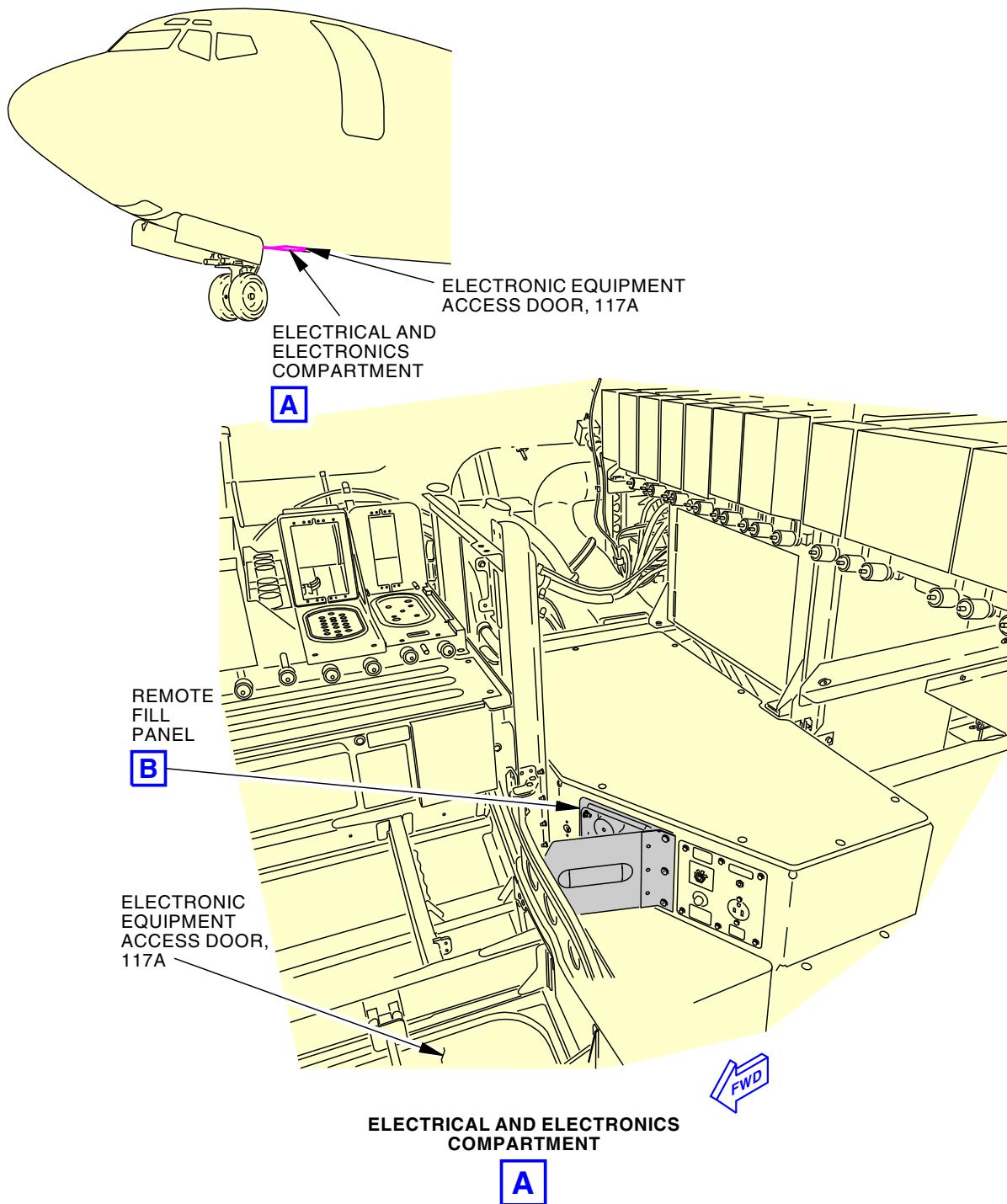
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Remote Fill Panel Servicing
Figure 301/12-15-21-990-802-002 (Sheet 1 of 2)

EFFECTIVITY
LOM 443, 444, 450

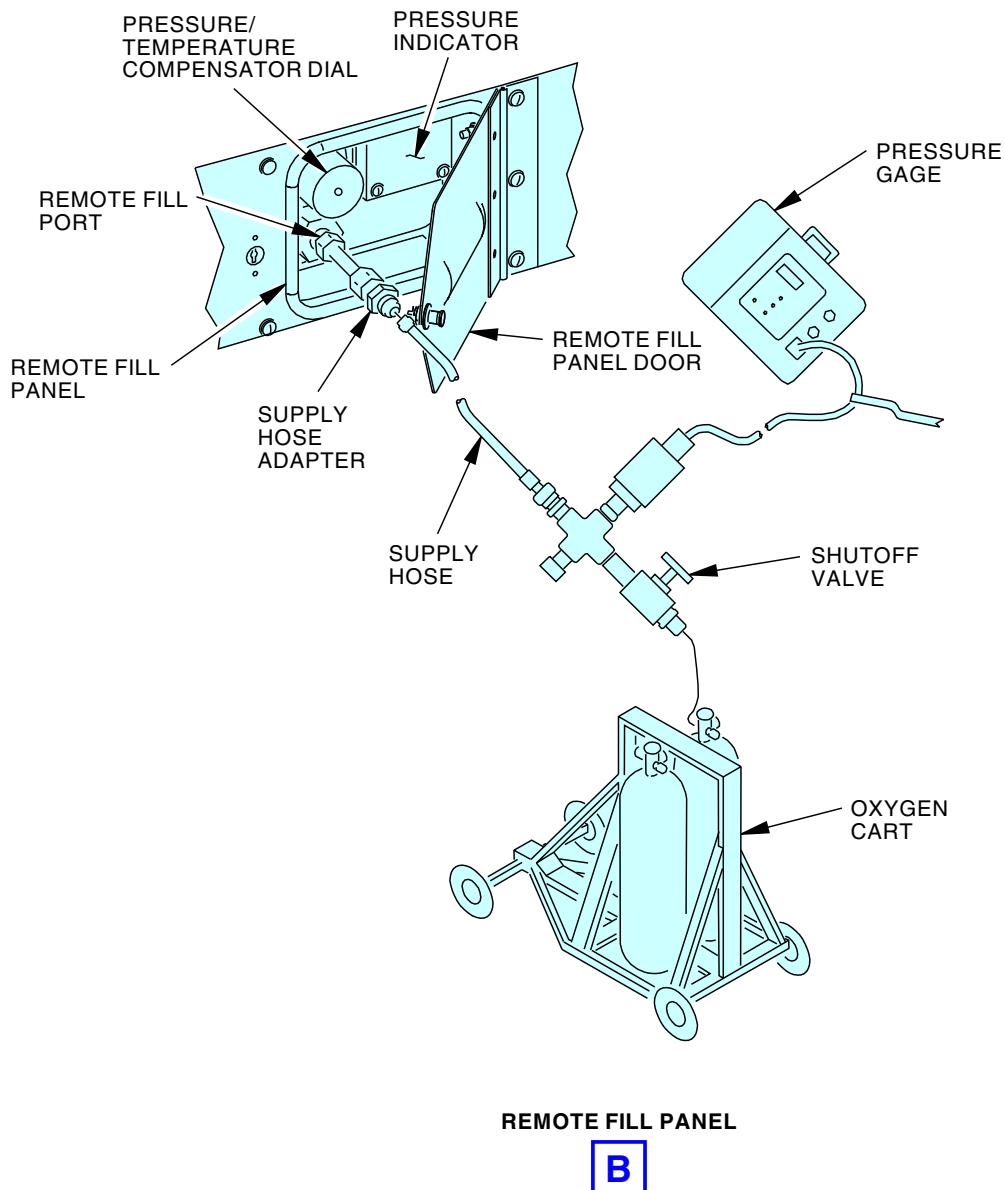
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G89978 S0006561261_V2

Remote Fill Panel Servicing
Figure 301/12-15-21-990-802-002 (Sheet 2 of 2)

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TASK 12-15-21-600-803-002

3. Crew Oxygen Cylinder Replacement

(Figure 302)

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)
20-40-11-910-801	Static Grounding (P/B 201)
25-52-16-000-801	Forward Cargo Compartment Forward Bulkhead Liner - Removal (P/B 401)
25-52-16-400-801	Forward Cargo Compartment Forward Bulkhead Liner - Installation (P/B 401)
35-00-00-420-801	Installation of Caps on Open Oxygen Lines (P/B 201)
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)
35-12-00-800-801	Bleed the Crew Oxygen System Prior to System Maintenance or Repair (P/B 201)
35-12-11-000-801	Regulator/Transducer Assembly Removal (P/B 401)
35-12-11-400-801	Regulator/Transducer Assembly Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50063	Grease - Perfluoropolyether, fuel and oxygen resistant - Krytox 240AC	MIL-PRF- 27617 Type III
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Oxygen cylinder assembly	35-12-52-01A-065	LOM 443, 444
		35-12-52-01B-030	LOM 450
		35-12-52-01B-200	LOM 450
12	Packing	35-12-52-05-095	LOM 443, 444, 450

D. Location Zones

Zone	Area
122	Forward Cargo Compartment - Right

E. Access Panels

Number	Name/Location
121LW	PANEL ASSY - FORWARD CARGO COMPARTMENT FWD BULKHEAD FAN COVER

EFFECTIVITY
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F. Prepare for the Removal of the Crew Oxygen Cylinder

SUBTASK 12-15-21-910-004-002

- (1) Read and obey the safety precautions and general instructions for the oxygen system before you do the servicing (TASK 35-00-00-910-801).

SUBTASK 12-15-21-860-018-002

- (2) Make sure that the airplane is grounded correctly, do this task: Static Grounding, TASK 20-40-11-910-801.

SUBTASK 12-15-21-010-023-002

- (3) Remove this access panel (TASK 25-52-16-000-801):

- (a) FWD bulkhead liner:

Number Name/Location

121LW	PANEL ASSY - FORWARD CARGO COMPARTMENT FWD BULKHEAD FAN COVER
-------	--

SUBTASK 12-15-21-020-044-002

- (4) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
F	7	C00156	OXYGEN IND

SUBTASK 12-15-21-840-010-002

- (5) Make sure that these items are clean:

- (a) White gloves used to service oxygen system components
 - (b) Clothes
 - (c) Tools
 - (d) oxygen cylinder assembly [4]
 - (e) Other items used to service the oxygen system.

SUBTASK 12-15-21-840-006-002

- (6) Make sure that all materials are free from contamination.

G. Remove the Crew Oxygen Cylinder

SUBTASK 12-15-21-870-004-002

- (1) Do this task: Bleed the Crew Oxygen System Prior to System Maintenance or Repair, TASK 35-12-00-800-801.

SUBTASK 12-15-21-020-010-002

- (2) Remove the regulator, transducer and coupling assembly [7]. Do this task: Regulator/Transducer Assembly Removal, TASK 35-12-11-000-801.

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SUBTASK 12-15-21-480-007-002



WARNING

USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (3) If the installation of the regulator, transducer and coupling assembly [7] will not occur in five minutes, do this task: Installation of Caps on Open Oxygen Lines, TASK 35-00-00-420-801.

NOTE: Oxygen clean fittings come from a sealed container with a label for the oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

SUBTASK 12-15-21-020-011-002

- (4) Disconnect the overboard discharge line [3] from the oxygen cylinder assembly [4].

SUBTASK 12-15-21-020-045-002

- (5) Remove the union [11] of the overboard discharge line [3] from the shutoff valve [8] of the oxygen cylinder assembly [4].
- Remove the packing [12] from the union [11], then discard the packing [12].
 - Keep the union [11]. You will use this part to install the oxygen cylinder assembly [4].

LOM 443, 444, 450; ALL AIRPLANES WITHOUT CYLINDER STRAPS

SUBTASK 12-15-21-020-013-002

- (6) Do these steps to remove the oxygen cylinder assembly [4].
- Remove the nut [6] from the T-bolt [10].
 - Remove the aft cylinder ring [5].
- NOTE: Keep the nut [6] and aft cylinder ring [5] at a safe position for installation when necessary.
- Move the oxygen cylinder assembly [4] out from the oxygen cylinder rack [9].
 - Remove the oxygen cylinder assembly [4] from the airplane.
- Put the protective cap for the oxygen cylinder assembly [4] on the outlet port.

LOM 443, 444, 450; ALL AIRPLANES WITH CYLINDER STRAPS

SUBTASK 12-15-21-020-027-002

- (7) Do these steps to remove the oxygen cylinder assembly [4].
- Remove the nuts [6] from the T-bolts [10] on the band strap clamps [14].
- NOTE: Keep the nuts [6] in a safe area for installation.
- Open the band strap clamps [14].
 - Move the oxygen cylinder assembly [4] out from the oxygen cylinder rack [9].
 - Remove the oxygen cylinder assembly [4] from the airplane.
- Put the protective cap for the oxygen cylinder assembly [4] on the outlet port.

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SUBTASK 12-15-21-480-008-002

- (8) If the installation of the oxygen cylinder assembly [4] will not occur in less than five minutes, do this task: Installation of Caps on Open Oxygen Lines, TASK 35-00-00-420-801.

H. Install the Crew Oxygen Cylinder

(Figure 302)

SUBTASK 12-15-21-210-042-002

- (1) Make sure that the hydrostatic test date is on the replacement oxygen cylinder assembly [4].

- (a) Make sure that the hydrostatic test date agrees with local rules.

NOTE: The hydrostatic test date must be in the approved service life limit. The service life of the hydrostatic test is established by national regulatory authorities, the cylinder manufacturer, and/or the airline.

SUBTASK 12-15-21-860-021-002

- (2) Do these steps to make sure that the replacement oxygen cylinder assembly [4] obeys the requirements.

- (a) Make sure that the replacement oxygen cylinder assembly [4] is fully serviced.

- (b) Make sure that the replacement oxygen cylinder assembly [4] is free from contamination.

SUBTASK 12-15-21-860-022-002

- (3) Do these steps to prepare the replacement oxygen cylinder assembly [4] for the installation:

- (a) Remove the lockwire or cotter pin(s) that hold the protective cap on the replacement oxygen cylinder assembly [4].

- (b) Slowly loosen the protective cap from the replacement oxygen cylinder assembly [4].

- (c) Bleed off the remaining gas before you fully remove the protective cap.

- (d) Remove the protective cap.

- (e) Install the new packing [12] on the union [11].

- (f) Install the union [11] on the shutoff valve [8].

- 1) Tighten the union [11] to 180.5 in-lb (20.4 N·m) - 199.5 in-lb (22.5 N·m).

LOM 443, 444, 450; ALL AIRPLANES WITH CYLINDER STRAPS

SUBTASK 12-15-21-860-051-002



BEFORE YOU INSTALL THE OXYGEN CYLINDER, MAKE SURE THAT THE CORRECT BAND CLAMPS ARE INSTALLED. INCORRECT BAND CLAMPS CAN CAUSE A LOOSE OXYGEN CYLINDER INSTALLATION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Make sure that the correct band strap clamps [14] are installed.

NOTE: The oxygen cylinder assembly [4] P/N 806835-01 or P/N 801307-00 requires band strap clamps [14] P/N BACC10FY094SE. The oxygen cylinder assembly [4] B42365-1 requires band strap clamps [14] P/N BACC10FY095SE.

- (a) If it is necessary to replace the band strap clamps [14], do these steps:

- 1) Remove the pads from the band strap clamps [14].

- 2) Remove band strap clamps [14] from the oxygen cylinder rack [9] mounts.

- 3) Install the correct band strap clamps [14] in the oxygen cylinder rack [9] mounts with the T-bolts [10] positioned upright and inboard.

- 4) Install the pads on the band strap clamps [14].

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LOM 443, 444, 450; ALL AIRPLANES WITH CYLINDER STRAPS (Continued)

- a) Position the top pad [15], bottom pad [16], inboard pad [17] as shown.
NOTE: Each pad is a different size.
- b) Install the pads on the band strap clamp [14] with the open side of the pads outboard of the band strap clamps [14].

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SUBTASK 12-15-21-420-006-002

- (5) Do these steps to install the replacement oxygen cylinder assembly [4]:
 - (a) Go to the forward cargo compartment with the replacement oxygen cylinder assembly [4].
 - (b) Remove the protective caps and plugs from the overboard discharge line [3] and crew oxygen supply line [2].



USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM.
IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (c) Put the replacement oxygen cylinder assembly [4] on the oxygen cylinder rack [9].

LOM 443, 444, 450; ALL AIRPLANES WITHOUT CYLINDER STRAPS

- (d) Push the replacement oxygen cylinder assembly [4] forward until it is fully engaged in the forward cylinder ring [1].

LOM 443, 444, 450; ALL AIRPLANES WITH CYLINDER STRAPS

- (e) Push the replacement oxygen cylinder assembly [4] forward until it is fully engaged against the end stop of the oxygen cylinder rack [9].

LOM 443, 444, 450; ALL AIRPLANES WITHOUT CYLINDER STRAPS

- (f) Push and hold the oxygen cylinder assembly [4] against the forward cylinder ring [1].
 - 1) Put the aft cylinder ring [5] in its installed position.
 - 2) Continue to hold the oxygen cylinder assembly [4] against the forward cylinder ring [1].
 - 3) Install the T-bolt [10] and the nut [6] to the aft cylinder ring [5].
 - a) Make sure that the end of the trunnion [18] is installed in the same direction as the end of the T-bolt [10] (View D, Figure 302).
 - 4) Try to move the oxygen cylinder assembly [4] forward, then aft.
 - a) If the oxygen cylinder assembly [4] moves, then continue to tighten the nut [6] of the T-bolt [10].
 - b) Make sure that one or more threads of the T-bolt [10] extend through the nut [6].
<1> Do not tighten the nut [6] too tight.
NOTE: This can cause the aft cylinder ring [5] to twist.

- c) Make sure that the T-bolt [10] holds the oxygen cylinder assembly [4] tightly to prevent all forward or aft movement.

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LOM 443, 444, 450; ALL AIRPLANES WITH CYLINDER STRAPS

- (g) Do these steps to secure the oxygen cylinder assembly [4] in its installed position.
 - 1) Close the band strap clamps [14].
 - a) Apply Christo-lube MCG111 grease, D50011, or Krytox 240AC perfluoropolyether grease, D50063, to the strap T-bolts [10].
 - b) Install the nuts [6] on the T-bolts [10] and tighten until the band strap clamps [14] contact the oxygen cylinder assembly [4].
 - 2) Make sure that the oxygen cylinder assembly [4] is against the end stop, then continue to tighten the nuts [6] of the T-bolts [10].
 - 3) Try to move the oxygen cylinder assembly [4] forward, then aft.
 - a) If the oxygen cylinder assembly [4] moves, then continue to tighten the nuts [6] of the T-bolts [10].
 - b) Make sure that one or more threads of the T-bolts [10] extend through the nut.

LOM 443, 444, 450

- (h) Align the replacement oxygen cylinder assembly [4] with the overboard discharge line [3].
- (i) Connect the overboard discharge line [3] to the replacement oxygen cylinder assembly [4].

SUBTASK 12-15-21-410-005-002

- (6) Install the regulator, transducer and coupling assembly [7]. Do this task: Regulator/Transducer Assembly Installation, TASK 35-12-11-400-801.

NOTE: This task does a leak check and an electrical check of the oxygen pressure indication.

SUBTASK 12-15-21-420-018-002

- (7) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	7	C00156	OXYGEN IND

SUBTASK 12-15-21-210-008-002



CAUTION MAKE SURE THAT YOU ATTACH THE CAP FOR THE OXYGEN CYLINDER CORRECTLY TO THE REGULATOR. DAMAGE TO ADJACENT WIRES AND EQUIPMENT CAN OCCUR IF OXYGEN CYLINDER IS NOT ATTACHED CORRECTLY.

- (8) Make sure that the cap for the oxygen cylinder assembly [4] is correctly attached to the regulator.

I. Lockwire the Shutoff Valve

SUBTASK 12-15-21-420-007-002

- (1) When the oxygen system is satisfactory, do these steps to install lockwire on the shutoff valve [8] in the open position:

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CAUTION
DO NOT TIGHTEN THE SHUTOFF VALVE ON EACH OXYGEN CYLINDER
MORE THAN 25 INCH-POUNDS (3 NM). TOO MUCH TORQUE CAN
CAUSE DAMAGE TO THE SHUTOFF VALVE.

- (a) Fully open the shutoff valve [8].

NOTE: The shutoff valve [8] on the steel cylinder is fully open at approximately 6-7 turns.
The shutoff valve [8] on the composite cylinder is fully open at approximately 4-5 turns. The shutoff valve [8] will stop when it is fully open.

- (b) Close the shutoff valve [8] one fourth of a turn.

- (c) Use MS20995NC32 lockwire, G01912, or MS20995CY20 lockwire, G02479, to hold the shutoff valve [8] in the open position.

- 1) Put the lockwire around the regulator, transducer and coupling assembly [7] in a counterclockwise direction.
- 2) Use the double-twist procedure (TASK 20-10-44-400-801).

SUBTASK 12-15-21-410-023-002

- (2) Install this access panel (TASK 25-52-16-400-801):

- (a) FWD bulkhead liner:

Number Name/Location

121LW	PANEL ASSY - FORWARD CARGO COMPARTMENT FWD BULKHEAD FAN COVER
-------	--

———— END OF TASK ————

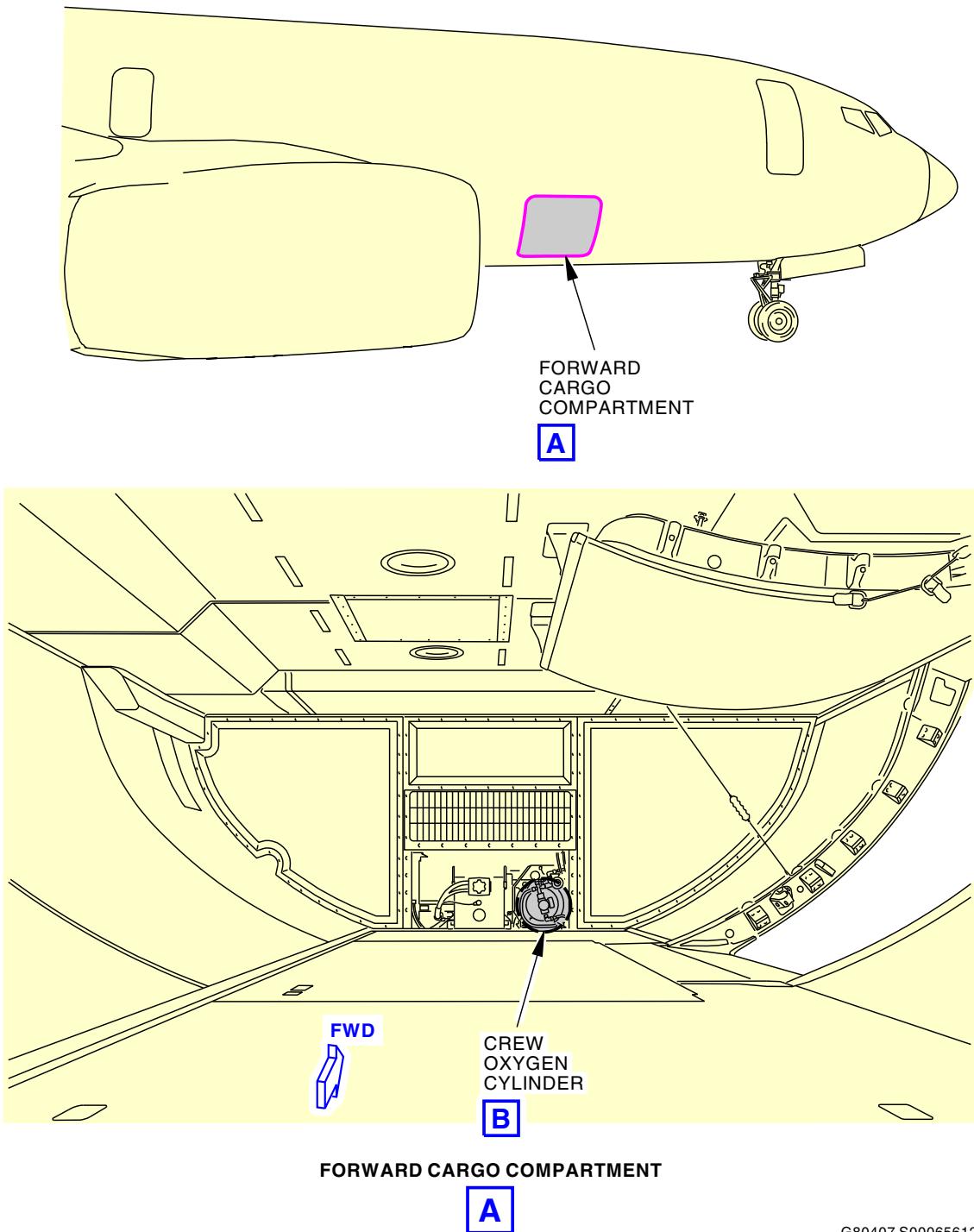
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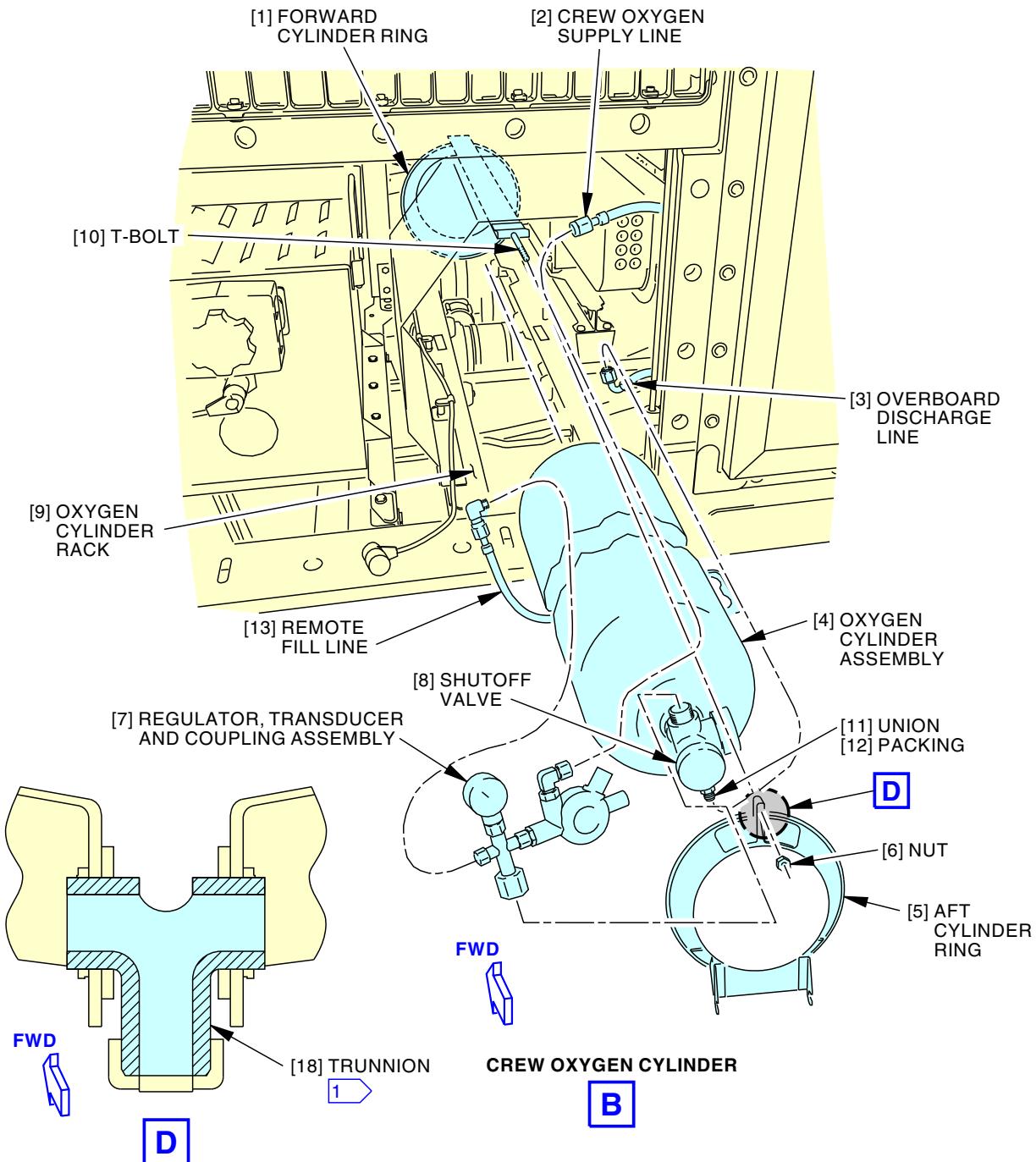
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Crew Oxygen Cylinder Replacement
Figure 302/12-15-21-990-803-002 (Sheet 1 of 4)

EFFECTIVITY
LOM 443, 444, 450

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1 THE T-BOLT AND NUT ARE NOT SHOWN

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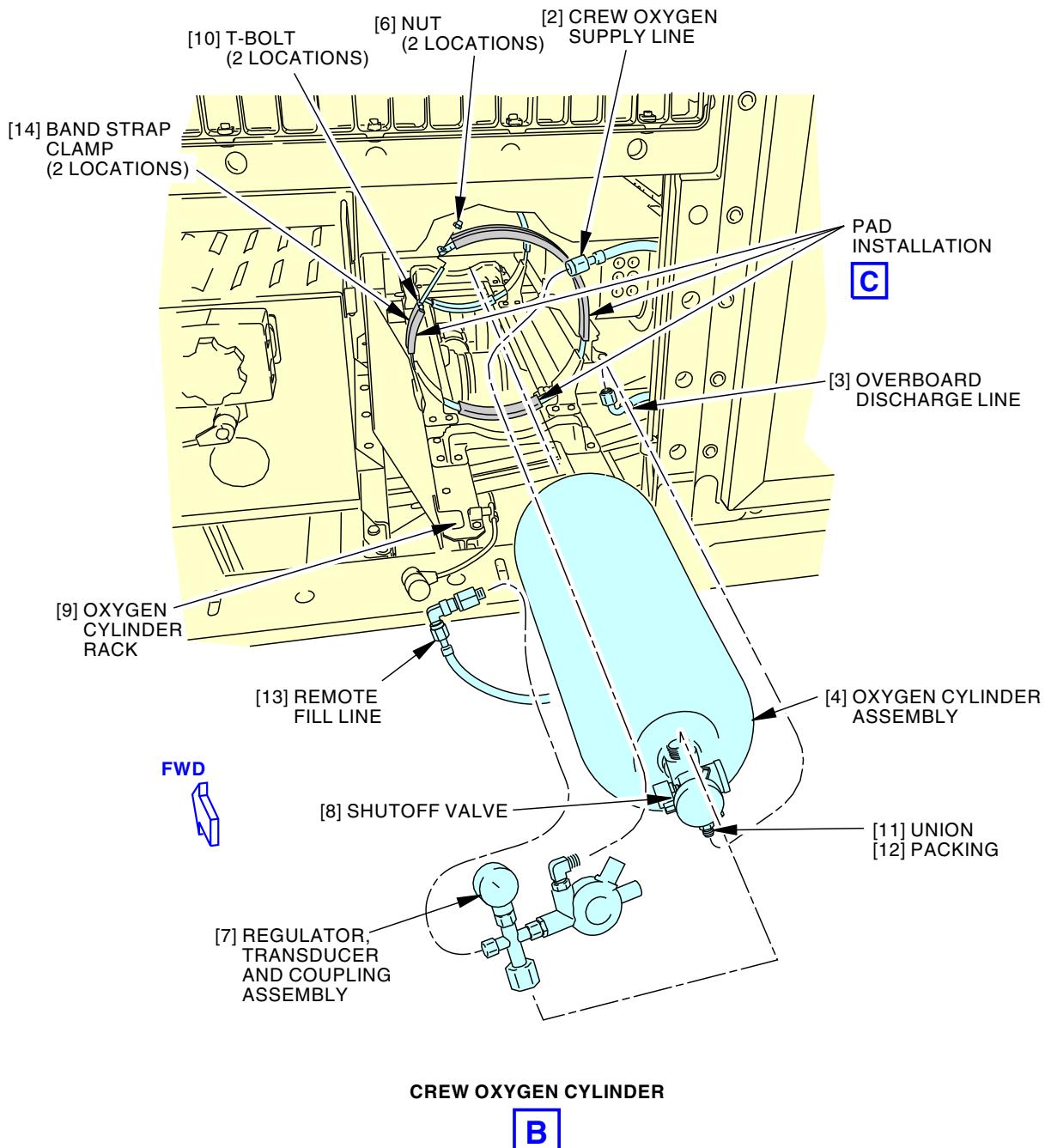
Crew Oxygen Cylinder Replacement
Figure 302/12-15-21-990-803-002 (Sheet 2 of 4)

EFFECTIVITY
**LOM 443, 444, 450; ALL AIRPLANES WITHOUT
 CYLINDER STRAPS**

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2392097 S0000550187_V3

Crew Oxygen Cylinder Replacement
Figure 302/12-15-21-990-803-002 (Sheet 3 of 4)

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LOM 443, 444, 450; ALL AIRPLANES WITH
CYLINDER STRAPS

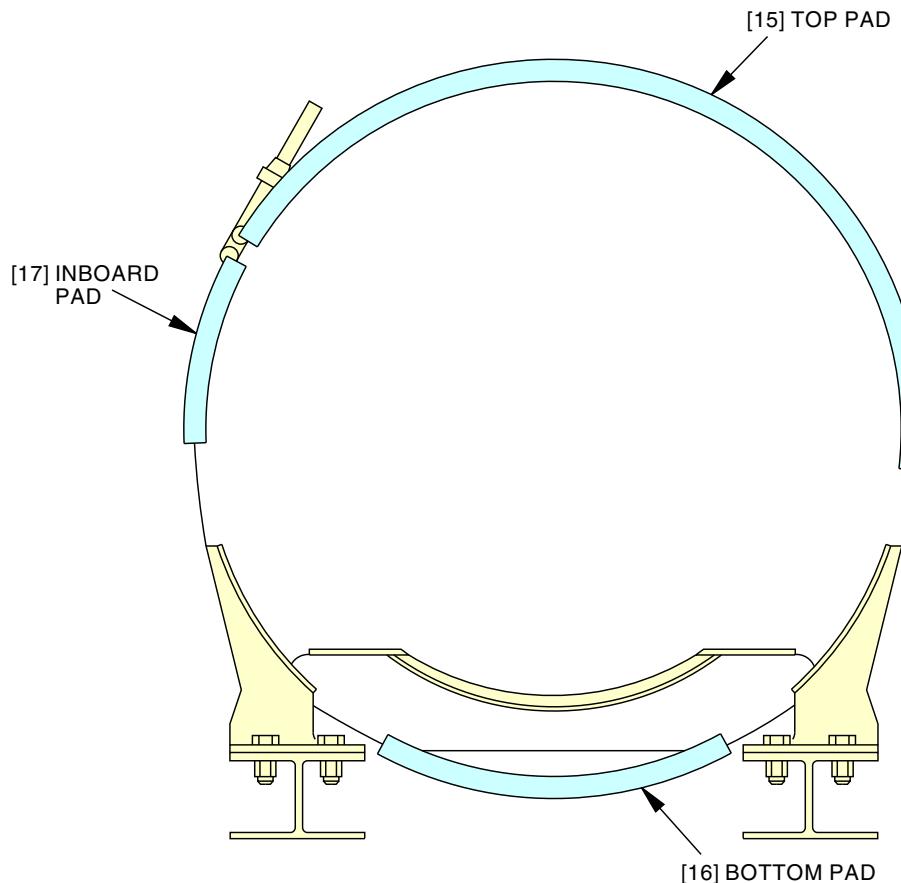
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PAD INSTALLATION
(VIEW IN THE FORWARD DIRECTION)

C

2403028 S0000555932_V1

Crew Oxygen Cylinder Replacement
Figure 302/12-15-21-990-803-002 (Sheet 4 of 4)

EFFECTIVITY
LOM 443, 444, 450; ALL AIRPLANES WITH
CYLINDER STRAPS

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TASK 12-15-21-210-801-002

4. Crew Oxygen Cylinder Dispatch Pressure Check

A. References

Reference	Title
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 12-15-21-910-005-002

- (1) To read and obey the safety precautions and general instructions for the oxygen system before you do the maintenance, do this task: Oxygen System General Maintenance Practices, TASK 35-00-00-910-801.

SUBTASK 12-15-21-210-010-002

- (2) Make sure the pressure shown on the pressure gage is above the minimum pressure necessary for dispatch.

NOTE: Contact dispatch or your flight operations organization for minimum dispatch pressure.

———— END OF TASK ————

EFFECTIVITY
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MAIN LANDING GEAR SHOCK STRUT - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) A check of the fluid levels for the shock strut of the main landing gear.
 - (2) A servicing of the shock strut for the main landing gear, with the airplane on the ground.
 - (3) A servicing of the shock strut for the main landing gear, with the airplane on jacks.

TASK 12-15-31-610-801

2. Main Landing Gear Shock Strut Fluid Check

(Figure 301)

A. General

- (1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut [101] of the main landing gear.
 - (a) To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at two different shock strut extensions. The greater the difference in the shock strut extensions, the more accurate the fluid measurement will be.
 - 1) You can obtain the different shock strut extension one of two ways:
 - a) You can take the shock strut measurements at two different airplane weights, for example, before and after fueling the airplane.
 - b) If the airplane is on jacks, you can use floor jacks or the airplane jacks to compress or extend the shock struts.
 - 2) You should have a minimum difference of 2 in. (51 mm) between the two shock strut extensions to do the check.
 - 3) There are no maximum strut extension allowable difference measurements between the left hand and right hand struts.
 - 4) The extension and pressure measurements for both the left hand and right hand struts must lie within the respective strut servicing bands for proper operation.

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
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

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D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A

E. Location Zones

Zone	Area
734	Left Main Landing Gear
744	Right Main Landing Gear

F. Precautions for the Tail Stand

SUBTASK 12-15-31-840-002

- (1) Obey the tail stand precautions as follows:



**DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED.
WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS
INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.**

- (a) Do not tow the airplane while the tail stand is installed.



**DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL
STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK
STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS
CAN CAUSE DAMAGE TO EQUIPMENT.**

- (b) Do not deflate or service the shock struts while the tail stand is installed.



**DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES
WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE,
THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE
DAMAGE TO EQUIPMENT.**

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



**DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR
IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED.
THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT
FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND
DAMAGE TO EQUIPMENT CAN OCCUR.**

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

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G. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

SUBTASK 12-15-31-480-001



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 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.

H. Examine the Fluid Level of the Shock Strut for the Main Landing Gear



WARNING

KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE AIRPLANE WHEN YOU CHANGE SHOCK STRUT HEIGHT OF THE LANDING GEAR. THIS CHANGE WILL CAUSE THE AIRPLANE ATTITUDE TO MOVE. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

NOTE: To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at different shock strut extensions.

SUBTASK 12-15-31-200-001

- (1) Check the hydraulic fluid level with the airplane at the first shock strut [101] extension (Figure 302):
- Remove the cap [105] and use a inflation tool, SPL-1521 or pressure gauge (0-3000 PSIG), STD-1157 to measure the pressure of the shock strut [101].
NOTE: You must loosen the swivel nut on the gas valve [106] to release the gas from the shock strut [101].
 - Measure the extension of the shock strut [101] (Dimension X) (Figure 301).
 - Compare the extension and pressure you measured with the servicing chart (Figure 302).
 - If the shock strut [101] pressure and the shock strut extension are not on the servicing curve on the servicing chart, do one of the steps that follow:
 - If the extension and pressure you measured are above the servicing curve, deflate the shock strut [101] until they are on the servicing curve.
 - If the extension and pressure you measured are below the servicing curve, use the inflation tool, SPL-1521 to inflate the shock strut [101] with nitrogen, G00018 until they are on the servicing curve (Table 301).

NOTE: If dry nitrogen is not available, you can use air, G02314 as an alternative to inflate the shock strut [101].

Table 301/12-15-31-993-803 Main Landing Gear Shock Strut Servicing

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
2	Gas Valve	BB-N-411 Type I, or MIL-P-27401 Type I, or A-A-59503, Type 1, Grade B, or BB-A-1034 (dry air)	Charge	1

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SUBTASK 12-15-31-200-002

- (2) Check the hydraulic fluid level with the airplane at the second shock strut [101] extension (Figure 302):
 - (a) Measure the pressure and extension of the shock strut [101].
 - (b) Compare the extension and pressure you measured with the servicing chart.
 - (c) If the measured extension and pressure are on the curve in the service chart, the fluid level is correct.
 - (d) If the measured extension and pressure are not on the curve in the service chart, the fluid level is not correct, do this task: Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802.
 - 1) If you cannot service the shock strut [101] immediately, you can add or remove nitrogen until the measured extension and pressure are on the service chart.
- NOTE:** If the amount of fluid in the shock strut [101] is very low, you will not be able to obtain the correct extension and pressure on the servicing chart; you will need to service the shock strut [101] before you dispatch the airplane.

SUBTASK 12-15-31-420-005

- (3) Tighten the swivel nut on the gas valve [106] to 60 in-lb (6.8 N·m) to 84 in-lb (9.5 N·m).
 - (a) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].

SUBTASK 12-15-31-420-006

- (4) Install the cap [105].

———— END OF TASK ————

TASK 12-15-31-610-802

3. **Main Landing Gear Shock Strut Servicing, Airplane on the Ground**
(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives the instructions to do the servicing for the shock strut [101] of the main landing gear.

B. References

Reference	Title
12-15-61-610-801	Landing Gear Shock Strut Fluids (P/B 301)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-11-00-200-801	Main Landing Gear Inspection (P/B 601)
32-11-21-200-801	Main Landing Gear Shock Strut Seal Leakage Check (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.

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Reference	Description
COM-1532	Cart - Servicing, Strut Oil Part #: 1104 Supplier: 30188 Part #: 8774B Supplier: 94861 Part #: 884400B-3 Supplier: 94861 Part #: HM-GT1-C-VS Supplier: 1HV74 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-1 Supplier: 94861 Part #: PF55451-23 Supplier: 94861 Part #: SH001 Supplier: D2029 Opt Part #: 8774 Supplier: 94861 Opt Part #: 8844A Supplier: 94861 Opt Part #: 8844B Supplier: 94861 Opt Part #: HM-GT1-C Supplier: 1HV74
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Oil Drain Valve - Shock Strut, LG Part #: J32108-16 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
108	Packing	32-11-21-03A-035	LOM ALL

F. Location Zones

Zone	Area
734	Left Main Landing Gear
744	Right Main Landing Gear

G. Precautions for the Tail Stand

SUBTASK 12-15-31-840-003

- (1) Obey the tail stand precautions as follows:



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DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED. WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Do not tow the airplane while the tail stand is installed.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (b) Do not deflate or service the shock struts while the tail stand is installed.



DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE, THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE DAMAGE TO EQUIPMENT.

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED. THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

H. Prepare for the Shock Strut Servicing

SUBTASK 12-15-31-800-001



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Do not deflate or service the shock struts while tail stand is installed.

SUBTASK 12-15-31-490-001



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) 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.

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SUBTASK 12-15-31-020-001



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE WING BEFORE YOU DEFLATE THE SHOCK STRUT. WHEN YOU DEFLATE ONE SHOCK STRUT, THE WINGTIP CAN MOVE DOWN. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (3) Deflate the shock strut [101] for the main landing gear:

- (a) Remove the cap [105] for the gas valve [106].



WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the swivel nut on the gas valve [106] a maximum of two turns.

NOTE: Fluid in the shock strut will have bubbles when you release the pressure. Deflate the shock strut slowly to prevent the leakage of the fluid through the gas valve.

- (c) Loosen the swivel nut on the gas valve [106] fully when all of the pressure in the shock strut [101] is released.

NOTE: The shock strut [101] is fully deflated when the dimension "X" is 0.81 in. (20.57 mm) to 1.11 in. (28.19 mm).

SUBTASK 12-15-31-680-001

- (4) If you need to drain oil from the shock strut [101], do these steps:

- (a) Remove the lockwire from the cap [102].

- 1) Discard the lockwire.

- (b) Remove the cap [102] from the oil charging valve assembly [103].

- (c) Remove and discard the packing [108] from the oil charging valve assembly [103].

- (d) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve assembly [103] is opened.

- (e) Install the drain equipment on the oil charging valve assembly [103]:

NOTE: The tool, landing gear shock strut drain valve, SPL-1829, could also be used, but it will take much longer to drain the shock strut.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.

- 2) Insert a small allen wrench in the end of the length of tubing, such that the long end of the allen wrench is flush with the end of the tube and the short end penetrates the wall of the tube.

- 3) Install the tubing on the oil charging valve assembly [103] such that the allen wrench goes into the check valve and holds it open to drain the hydraulic fluid.

- (f) Remove the drain equipment when you have removed all of the shock strut oil.

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I. Shock Strut Servicing

SUBTASK 12-15-31-600-001



USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut with Hydraulic fluid, for usage and alternative fluids (Table 302):

Table 302/12-15-31-993-810 Main Landing Gear Shock Strut Servicing

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
1	Shock Strut	BMS 3-32, Type I, II *[1]	Fill	1
2	Gas Valve	BB-N-411 Type I, or MIL-P-27401 Type I, or A-A-59503, Type 1, Grade B, or BB-A-1034(dry air)	Charge	1

*[1] For usage and alternative fluids, refer to Landing Gear Shock Strut Fluids, TASK 12-15-61-610-801.

- (a) Make sure that the cap [102] for the oil charging valve assembly [103] is removed.
- (b) Make sure that the cap [105] for the gas valve [106] is removed.
- (c) Attach the oil charging line from servicing cart, COM-1532, to the oil charging valve assembly [103].
- (d) Make sure that the swivel nut on the gas valve [106] is fully open.
- (e) Attach a hose to the gas valve [106] with the end of the hose in a drain bucket.



CLEAN THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY IF THE FLUID FALLS ON THE TIRES. THE FLUID CAN CAUSE DETERIORATION OF THE TIRES.

- (f) Fill the shock strut with hydraulic fluid until the hydraulic fluid flows out of the gas valve [106] and into a hydraulic fluid resistant container.
 - 1) Continue to fill the shock strut [101] until the hydraulic fluid which flows into the container is free of bubbles.
- (g) Remove the oil charging line.

SUBTASK 12-15-31-420-002

- (2) Do the steps that follow for the oil charging valve assembly [103]:
 - (a) Install the new packing [108] on the oil charging valve assembly [103].
 - (b) Install the cap [102].
 - (c) Tighten the cap [102] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
 - (d) Install MS20995C32 lockwire, G01048, on the cap [102] using the double twist method.

SUBTASK 12-15-31-020-002

- (3) Remove the hose from the gas valve [106].

SUBTASK 12-15-31-600-002

- (4) Inflate the shock strut [101] for the main landing gear (Table 302):
 - (a) Install the inflation tool, SPL-1521, on the gas valve [106].

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- (b) Inflate the shock strut [101], with nitrogen, G00018, until the dimension "X" is approximately 3.5 in. (88.9 mm) or you reach 1700 psig (11,721 kPa).
- NOTE: If nitrogen is not available, you can use air, G02314, as an alternative to inflate the shock strut [101].
- (c) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
- (d) Inflate or deflate the shock strut [101] until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart.
- NOTE: Dimension "X" and the pressure must be within the servicing curve for a correctly serviced shock strut.

SUBTASK 12-15-31-420-007

- (5) Tighten the gas valve [106]:

- (a) Tighten the swivel nut on the gas valve [106] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).

SUBTASK 12-15-31-020-003

- (6) Remove the inflation tool, SPL-1521, from the gas valve [106].

SUBTASK 12-15-31-610-023

- (7) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].

SUBTASK 12-15-31-420-003

- (8) Install the cap [105].

SUBTASK 12-15-31-020-004

- (9) Five to ten in-service landings after a complete oil and nitrogen servicing, do the steps that follow to check the pressure of the shock strut:

NOTE: The shock strut fluid can absorb nitrogen after a complete servicing, reducing the shock strut "X" dimension.

- (a) Check the pressure of the shock strut [101]:

- 1) Remove the cap [105] for the gas valve [106].

- (b) Loosen the swivel nut.

- 1) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].

- 2) Make sure that the pressure you measure is still correct for the extension of the shock strut [101] (Figure 302).

- (c) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the main landing gear (Table 302):

- 1) Install the inflation tool, SPL-1521, on the gas valve [106].

- 2) Inflate the shock strut [101] with nitrogen, G00018 until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).

- (d) Tighten the swivel nut on the gas valve [106] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).

- (e) Remove the inflation tool, SPL-1521, from the gas valve [106].

- (f) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].

- (g) Install the cap [105].

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SUBTASK 12-15-31-210-001

- (10) If necessary, do a general visual inspection of the oil changing valve [104] for leaks
(TASK 32-11-21-200-801, TASK 32-11-00-200-801).

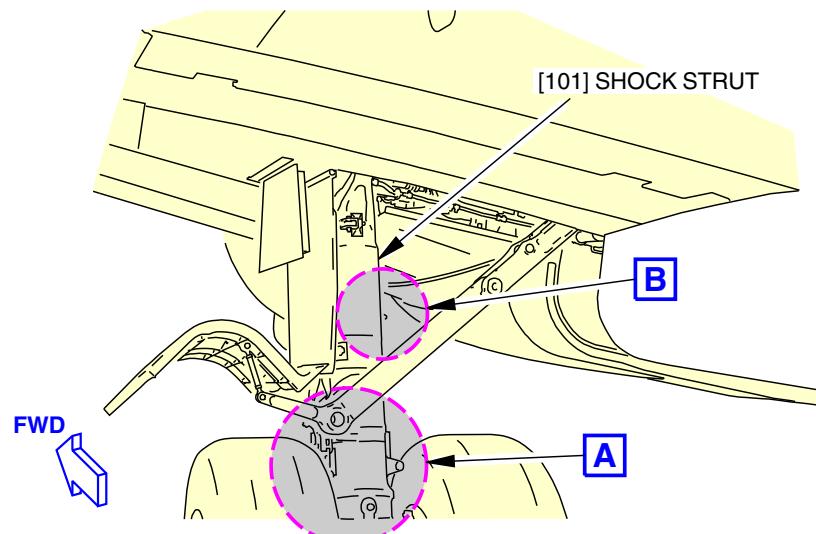
———— END OF TASK ————

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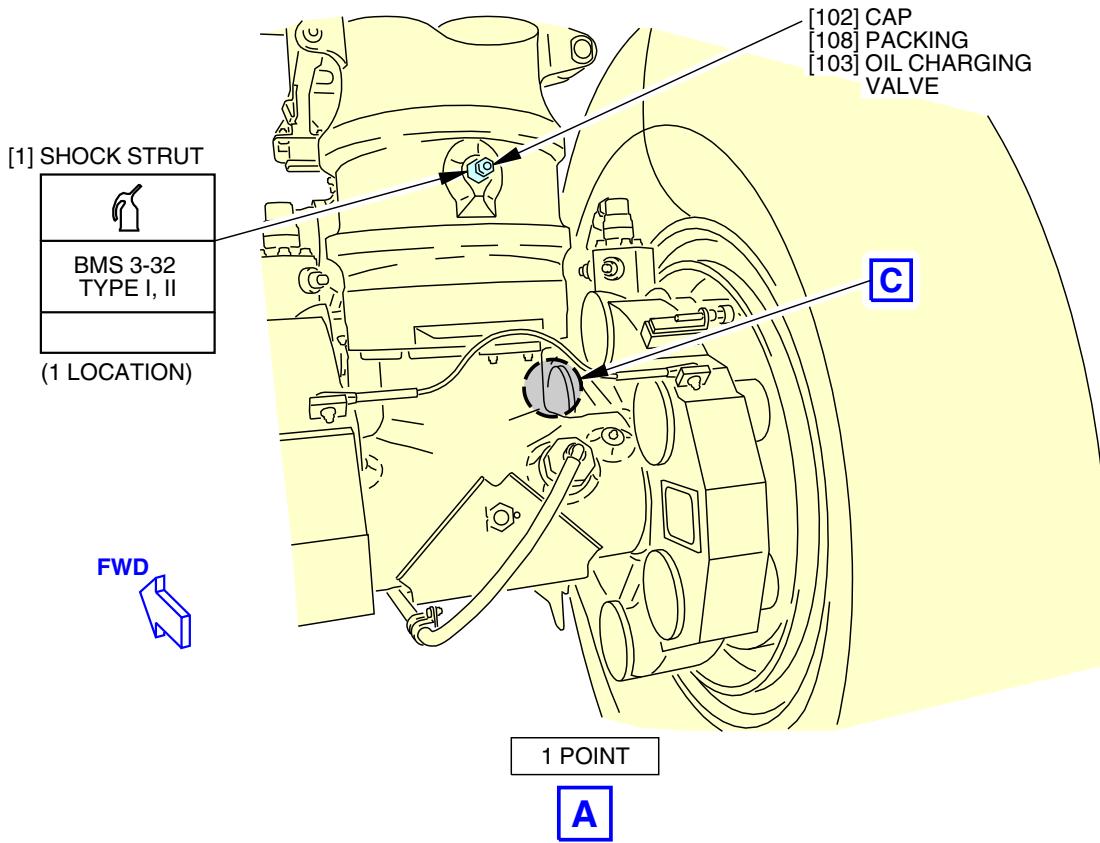
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(LEFT MAIN LANDING GEAR IS SHOWN, RIGHT MAIN LANDING GEAR IS EQUIVALENT)



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Main Landing Gear Shock Strut Servicing
Figure 301/12-15-31-990-801 (Sheet 1 of 3)

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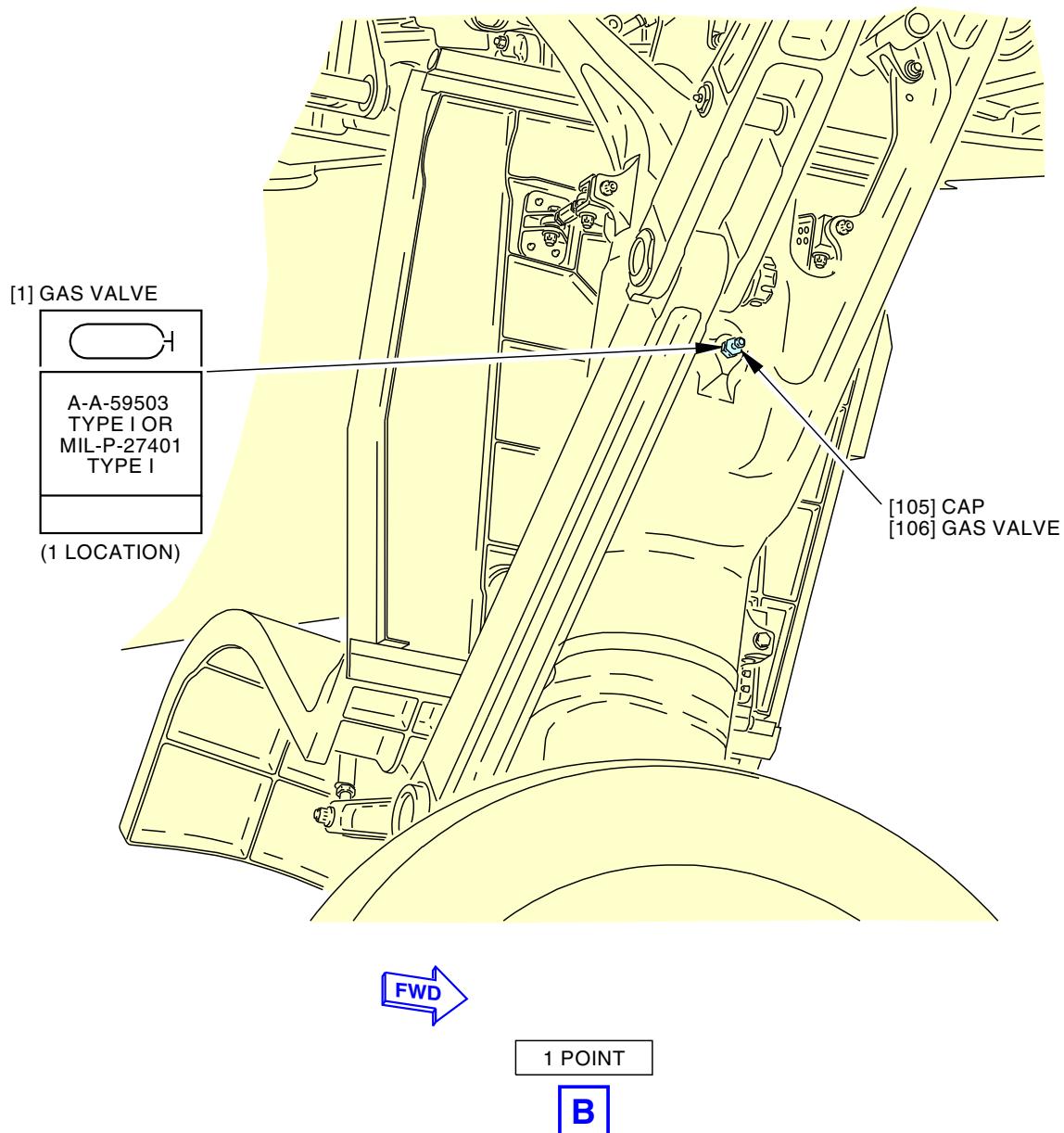
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Main Landing Gear Shock Strut Servicing
Figure 301/12-15-31-990-801 (Sheet 2 of 3)

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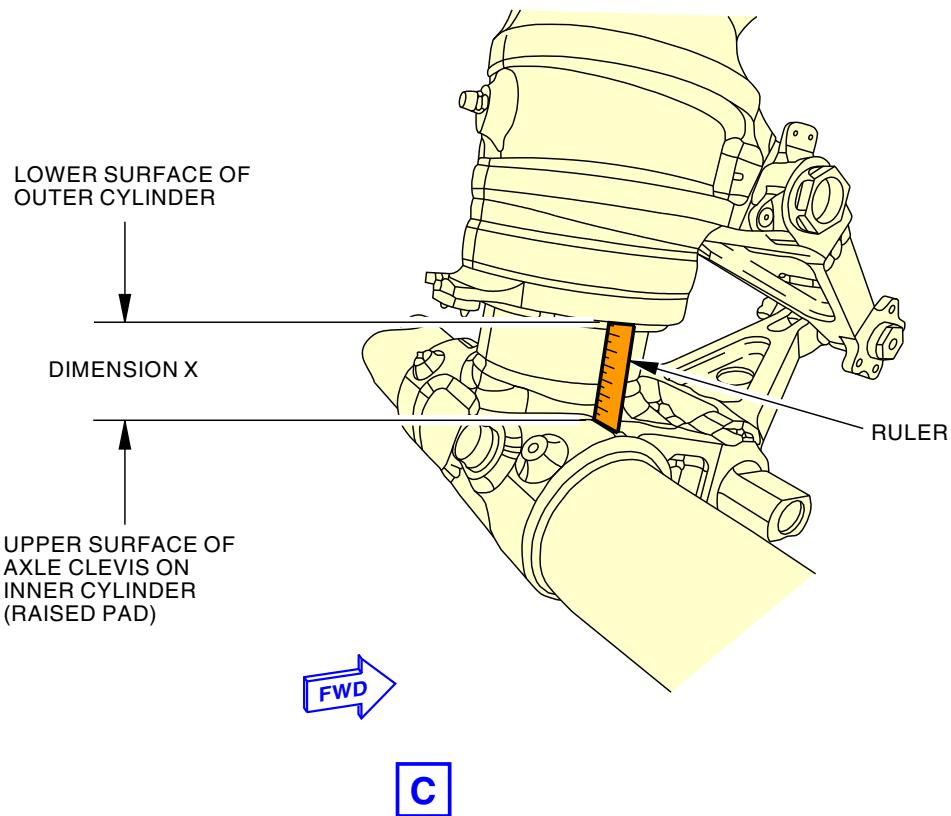
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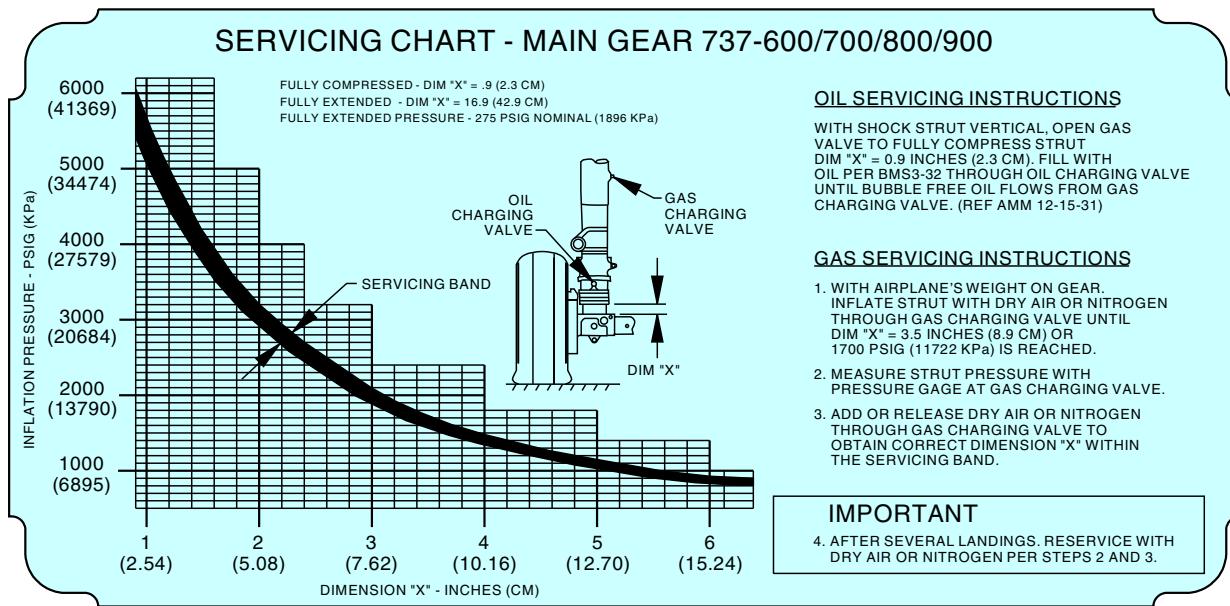
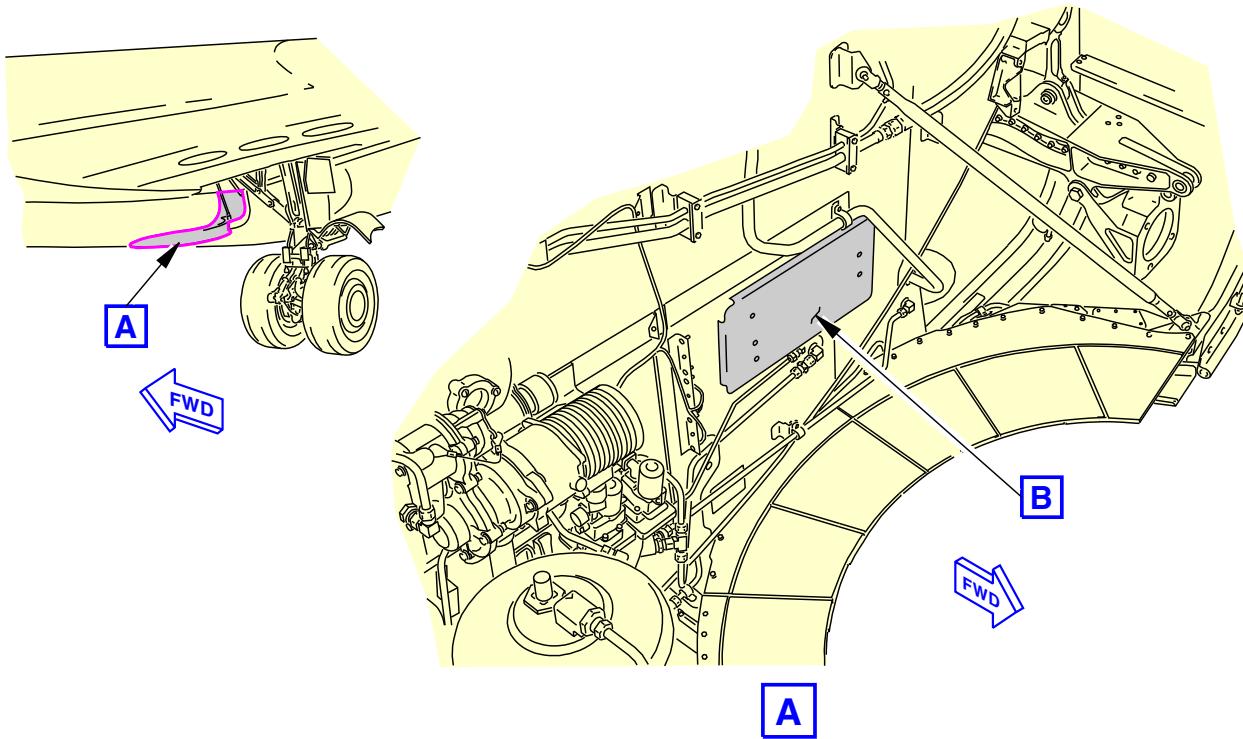
Main Landing Gear Shock Strut Servicing
Figure 301/12-15-31-990-801 (Sheet 3 of 3)

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**Main Landing Gear Shock Strut Servicing Chart
Figure 302/12-15-31-990-802**

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TASK 12-15-31-610-805

4. Main Landing Gear Strut Servicing, Airplane on Jacks

(Figure 301, Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives the instructions to do the servicing for the shock strut of the main landing gear.

B. References

Reference	Title
12-15-61-610-801	Landing Gear Shock Strut Fluids (P/B 301)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-11-00-200-801	Main Landing Gear Inspection (P/B 601)
32-11-21-200-801	Main Landing Gear Shock Strut Seal Leakage Check (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
COM-1532	Cart - Servicing, Strut Oil Part #: 1104 Supplier: 30188 Part #: 8774B Supplier: 94861 Part #: 884400B-3 Supplier: 94861 Part #: HM-GT1-C-VS Supplier: 1HV74 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-1 Supplier: 94861 Part #: PF55451-23 Supplier: 94861 Part #: SH001 Supplier: D2029 Opt Part #: 8774 Supplier: 94861 Opt Part #: 8844A Supplier: 94861 Opt Part #: 8844B Supplier: 94861 Opt Part #: HM-GT1-C Supplier: 1HV74
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Oil Drain Valve - Shock Strut, LG Part #: J32108-16 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)
STD-6620	Jack - Automotive Type, One Ton Minimum Rated Load

D. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II

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(Continued)

Reference	Description	Specification
D50022	Fluid - Landing Gear Shock Strut (Specifically For Preservation)	BMS3-32 Type I
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
108	Packing	32-11-21-03A-035	LOM ALL

F. Location Zones

Zone	Area
734	Left Main Landing Gear
744	Right Main Landing Gear

G. Precautions for the Tail Stand

SUBTASK 12-15-31-840-001

- (1) Obey the tail stand precautions as follows:



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED. WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Do not tow the airplane while the tail stand is installed.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (b) Do not deflate or service the shock struts while the tail stand is installed.



DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE, THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE DAMAGE TO EQUIPMENT.

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED. THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

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H. Prepare for the Shock Strut Servicing

SUBTASK 12-15-31-610-022



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 12-15-31-610-008

NOTE: If it is possible, deflate the shock strut while the airplane is on the ground. Restraine the inner cylinder in the fully compressed position, when the airplane is jacked.



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE WING BEFORE YOU DEFLATE THE SHOCK STRUT. WHEN YOU DEFLATE ONE SHOCK STRUT, THE WINGTIP CAN MOVE DOWN. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (2) Deflate the shock strut [101] for the main landing gear:
 - (a) Remove the cap [105] for the gas valve [106].



WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the swivel nut [107] on the gas valve [106] a maximum of two turns.
NOTE: Fluid in the shock strut will have bubbles when the pressure is released. Deflate the shock strut slowly to prevent the leakage of the fluid through the gas valve.
- (c) If the shock strut [101] was not deflated while the airplane was on the ground, do this step:
 - 1) Use an automotive type jack, STD-6620, and lift the inner cylinder slowly up until the shock strut [101] is in the fully compressed position.
- (d) Loosen the swivel nut [107] on the gas valve [106] fully when all of the pressure in the shock strut [101] is released.
NOTE: The shock strut is fully deflated when the dimension "X" is 0.81 in. (20.57 mm) - 1.11 in. (28.19 mm).

SUBTASK 12-15-31-610-009

- (3) To drain the oil from the shock strut [101], do these steps:

- (a) Remove the lockwire from the cap [102].
 - 1) Discard the lockwire.
- (b) Remove the cap [102] from the oil charging valve assembly [103].
- (c) Remove and discard the packing [108] from the oil charging valve assembly [103].
- (d) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve assembly [103] is opened.

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- (e) Install the drain equipment on the oil charging valve assembly [103]:

NOTE: The landing gear shock strut drain valve, SPL-1829, can also be used. It will take much longer to drain the shock strut.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.
- 2) Insert a small allen wrench in the end of the length of tubing.

NOTE: The long end of the allen wrench should be flush with the end of the tube and the short end should penetrate the wall of the tube.

- 3) Install the tubing on the oil charging valve assembly [103].

NOTE: The allen wrench should go into the check valve and hold it open to drain the hydraulic fluid.

- (f) Remove the drain equipment when all of the shock strut oil is removed.

I. Shock Strut Servicing

SUBTASK 12-15-31-610-010



CAUTION

USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut [101] with hydraulic fluid (Table 302):

- (a) To use hydraulic fluid and alternative fluids, do this task: Landing Gear Shock Strut Fluids, TASK 12-15-61-610-801.

- (b) Make sure that the shock strut [101] is in the fully compressed position when adding hydraulic fluid.

NOTE: The shock strut is fully compressed when the dimension "X" is 0.81 in.
(20.57 mm) - 1.11 in. (28.19 mm).

- (c) Make sure that the cap [102] for the oil charging valve assembly [103] is removed.

- (d) Make sure that the cap [105] for the gas valve [106] is removed.

- (e) Attach the oil charging line from the servicing cart, COM-1532, to the oil charging valve assembly [103].

- (f) Make sure that the swivel nut [107] on the gas valve [106] is fully open.

- (g) Attach a hose to the gas valve [106] with the end of the hose in a drain bucket.



CAUTION

CLEAN THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY IF THE FLUID FALLS ON THE TIRES. THE FLUID CAN CAUSE DETERIORATION OF THE TIRES.

- (h) Fill the shock strut [101] with fluid, D00467 (preferred), or fluid, D50022 (optional), until the hydraulic fluid flows out of the gas valve [106] and into a hydraulic fluid resistant container.

- 1) Continue to fill the shock strut [101] until the hydraulic fluid which flows into the container is free of bubbles.

- (i) Remove the oil charging line.

SUBTASK 12-15-31-610-011

- (2) Do the steps that follow for the oil charging valve assembly [103].

- (a) Install the new packing [108] on the oil charging valve assembly [103].

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- (b) Install the cap [102] on the oil charging valve assembly [103].
- (c) Tighten the cap [102] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
- (d) Install MS20995C32 lockwire, G01048, on the cap [102].
 - 1) Use the double twist method to twist MS20995C32 lockwire, G01048.

SUBTASK 12-15-31-610-012

- (3) Remove the hose from the gas valve [106].

SUBTASK 12-15-31-610-013

- (4) Remove the automotive type jack, STD-6620, from the inner cylinder.
 - (a) Make sure that the inner cylinder is not restrained.

SUBTASK 12-15-31-610-021

- (5) Inflate the shock strut [101] for the main landing gear (Table 302):

- (a) Install the inflation tool, SPL-1521, on the gas valve [106].
- (b) Inflate the shock strut [101] with nitrogen, G00018, until the dimension "X" is approximately 16.9 in. (42.9 cm) and reach 275 psig (1896 kPa).

NOTE: If nitrogen is not available, use air, G02314, as an alternative to inflate the shock strut.
- (c) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
- (d) Inflate or deflate the shock strut [101] until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart.

NOTE: Dimension "X" and the pressure must be on the servicing curve for a correctly serviced shock strut.

SUBTASK 12-15-31-610-014

- (6) Tighten the gas valve [106]:

- (a) Tighten the swivel nut [107] on the gas valve [106] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).

SUBTASK 12-15-31-610-015

- (7) Remove the inflation tool, SPL-1521, from the gas valve [106].

- (a) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].

SUBTASK 12-15-31-610-016

- (8) Install the cap [105].

SUBTASK 12-15-31-610-018

- (9) With the airplane on the ground, do these steps:

- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [105] for the gas valve [106].
 - (b) Loosen the swivel nut [107] on the gas valve [106].
 - 1) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 2) Make sure that the pressure is still correct for the extension of the shock strut [101] (Figure 302).
 - (c) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the main landing gear (Table 302):

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- 1) Install the inflation tool, SPL-1521, on the gas valve [106].
- 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).
- (d) Tighten the swivel nut [107] on the gas valve [106] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
- (e) Remove the inflation tool, SPL-1521, from the gas valve [106].
- (f) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].
- (g) Install the cap [105].

SUBTASK 12-15-31-610-017

- (10) Five to ten in-service landings after a complete oil and nitrogen servicing, check the pressure of the shock strut [101]:

NOTE: The shock strut fluid can absorb nitrogen after a complete servicing, reducing the shock strut "X" dimension.

- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [105] for the gas valve [106].
- (b) Loosen the swivel nut [107] on the gas valve [106].
 - 1) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 2) Make sure that the pressure is still correct for the extension of the shock strut [101] (Figure 302).
- (c) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the main landing gear (Table 302).
 - 1) Install the inflation tool, SPL-1521, on the gas valve [106].
 - 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).
- (d) Tighten the swivel nut [107] on the gas valve [106] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
- (e) Remove the inflation tool, SPL-1521, from the gas valve [106].
- (f) Use a soap solution to make sure that there are no gas leaks from the gas valve [106].
- (g) Install the cap [105].

SUBTASK 12-15-31-210-002

- (11) If necessary, do a general visual inspection of the oil changing valve [104] for leaks (TASK 32-11-21-200-801, TASK 32-11-00-200-801).

———— END OF TASK ————

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NOSE LANDING GEAR SHOCK STRUT - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) Nose landing Gear Shock Strut Fluid Check
 - (2) Nose Landing Gear Shock Strut Servicing, Airplane on the Ground.
 - (3) Nose Landing Gear Shock Strut Servicing, Airplane on Jacks.

TASK 12-15-41-610-801

2. Nose Landing Gear Shock Strut Fluid Check

(Figure 301, Figure 302)

A. General

- (1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut [101] of the nose landing gear.
 - (a) To do a check of the fluid level, you must measure the pressure and the extension of the shock strut [101] twice, at two different strut extensions. The greater the difference in the shock strut [101] extensions, the more accurate the fluid measurement will be.
 - 1) You can obtain the different shock strut [101] extension one of two ways:
 - a) You can take the shock strut [101] measurements at two different airplane weights, for example, before and after fueling the airplane.
 - b) If the airplane is on jacks, you can use floor jacks or the airplane jacks to compress or extend the shock strut [101].
 - 2) You should have a difference of 2 in. (51 mm) - 4 in. (102 mm) between the two shock strut extensions to do the check.

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
SPL-1521	Strut Inflation Tool - Landing Gear <ul style="list-style-type: none">Part #: F70200-35 Supplier: 81205Opt Part #: F70200-1 Supplier: 81205Opt Part #: F70200-14 Supplier: 81205Opt Part #: F70200-17 Supplier: 81205Opt Part #: F70200-18 Supplier: 81205
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

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Reference	Description	Specification
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A

E. Location Zones

Zone	Area
713	Nose Landing Gear

F. Precautions for the Tail Stand

SUBTASK 12-15-41-840-002

- (1) Obey the tail stand precautions as follows:



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED.
WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS
INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Do not tow the airplane while the tail stand is installed.



CAUTION

DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL
STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK
STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS
CAN CAUSE DAMAGE TO EQUIPMENT.

- (b) Do not deflate or service the shock struts while the tail stand is installed.



CAUTION

DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES
WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE,
THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE
DAMAGE TO EQUIPMENT.

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



WARNING

DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR
IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED.
THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT
FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND
DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

G. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

SUBTASK 12-15-41-480-001



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 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.

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H. Examine the Fluid Level of the Shock Strut for the Nose Landing Gear



WARNING

KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE AIRPLANE WHEN YOU CHANGE SHOCK STRUT HEIGHT OF THE LANDING GEAR. THIS CHANGE WILL CAUSE THE AIRPLANE ATTITUDE TO MOVE. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

NOTE: To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at different shock strut extensions.

SUBTASK 12-15-41-200-001

- (1) Check the hydraulic fluid level with the airplane at the first shock strut [101] extension:
 - (a) Remove the gas valve cap [102] and use a inflation tool, SPL-1521 or pressure gauge (0-3000 PSIG), STD-1157 to measure the pressure of the shock strut [101].
 - (b) Measure the extension of the shock strut [101] (Dimension X, Figure 301).
 - (c) Compare the extension and pressure you measured with the servicing chart (Figure 302).
 - (d) If the shock strut pressure and the shock strut extension are not on the servicing curve on the servicing chart, do one of these steps:
 - 1) If the extension and pressure you measured are above the servicing curve, deflate the shock strut [101] until they are on the servicing curve.
NOTE: You must loosen the swivel nut [104] to release the gas from the shock strut [101].
 - 2) If the extension and pressure you measured are below the servicing curve, use the inflation tool, SPL-1521, to inflate the shock strut [101] with nitrogen, G00018, until they are on the servicing curve (Figure 302).
NOTE: If dry nitrogen is not available, you can use air, G02314 as an alternative to inflate the shock strut [101].

SUBTASK 12-15-41-200-002

- (2) Check the hydraulic fluid level with the airplane at the second shock strut [101] extension (Figure 302):
 - (a) Measure the pressure and extension of the shock strut [101].
 - (b) Compare the extension and pressure you measured with the servicing chart.
 - (c) If the measured extension and pressure are on the curve in the service chart, the fluid level is correct.
 - (d) If the measured extension and pressure are not on the curve in the service chart, the fluid level is not correct, do this task: Nose Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-41-610-802.
 - 1) If you cannot service the shock strut [101] immediately, you can add or remove nitrogen until the measured extension and pressure are on the service chart.
NOTE: If the amount of fluid in the shock strut [101] is low, you will not be able to obtain the correct extension and pressure on the servicing chart; you will need to service the shock strut [101] before you dispatch the airplane.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-41-420-001

- (1) Tighten the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.78 N·m) - 84 in-lb (9.49 N·m).

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- (b) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].
- (c) Install the gas valve cap [102].

Table 301/12-15-41-993-801 Nose Landing Gear Shock Strut Servicing

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
1	Gas Valve	BB-N-411 Type I, or MIL-P-27401 Type I or BB-A-1034 (dry air)	Charge	1

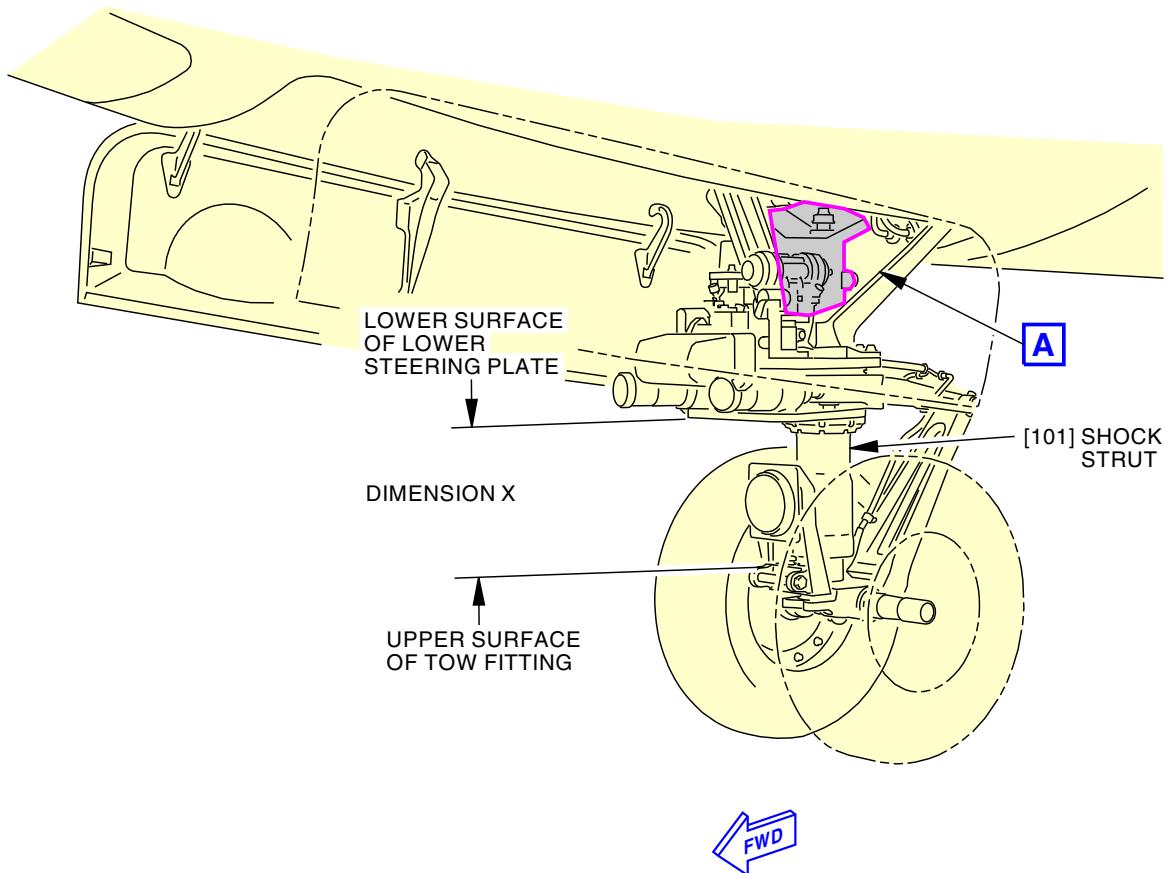
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F84511 S0006561297_V3

Nose Landing Gear Shock Strut Servicing
Figure 301/12-15-41-990-801 (Sheet 1 of 2)

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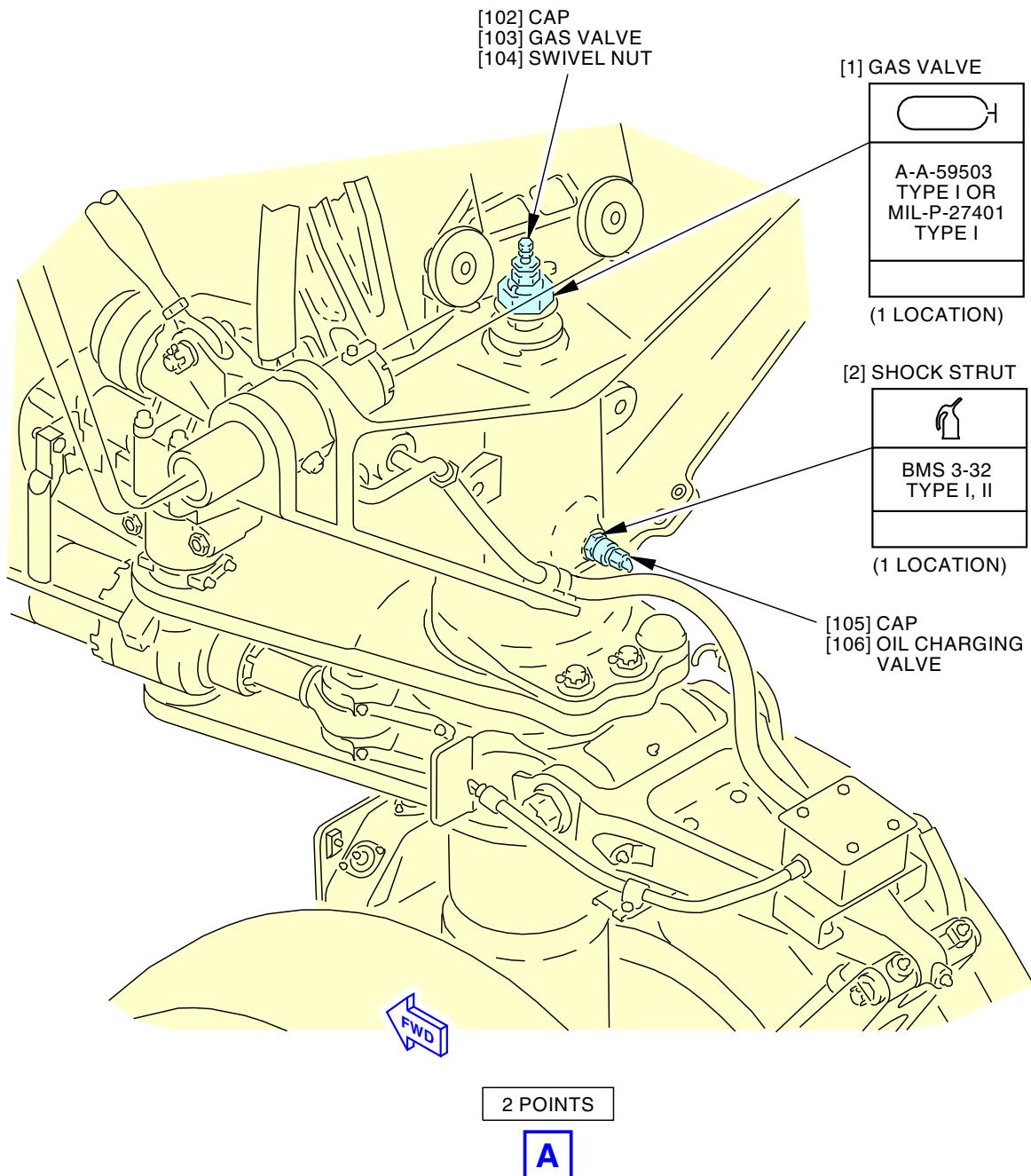
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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F84524 S0006561298_V2

Nose Landing Gear Shock Strut Servicing
Figure 301/12-15-41-990-801 (Sheet 2 of 2)

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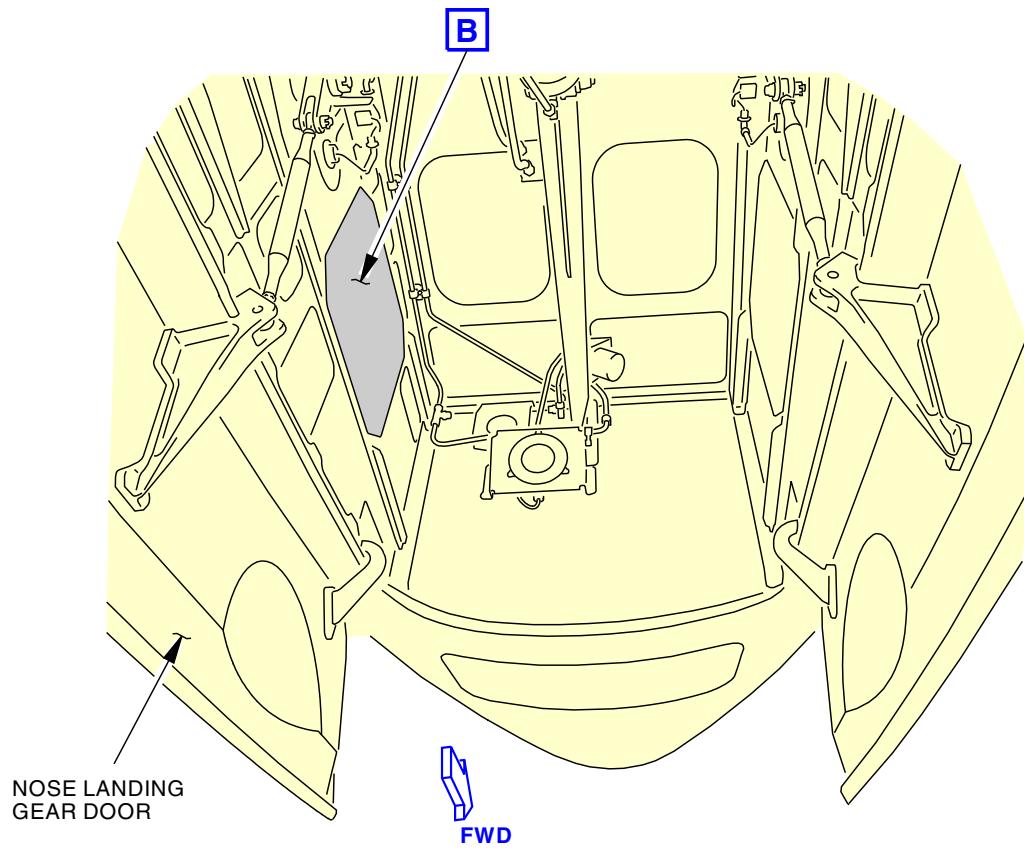
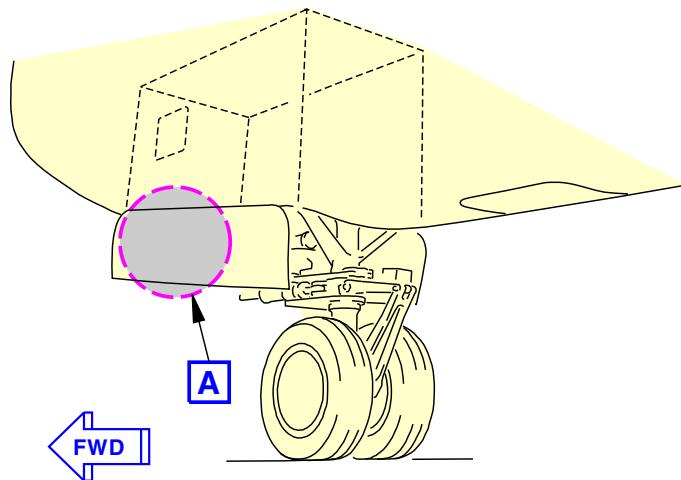
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Nose Landing Gear Shock Strut Servicing Chart
Figure 302/12-15-41-990-802 (Sheet 1 of 2)

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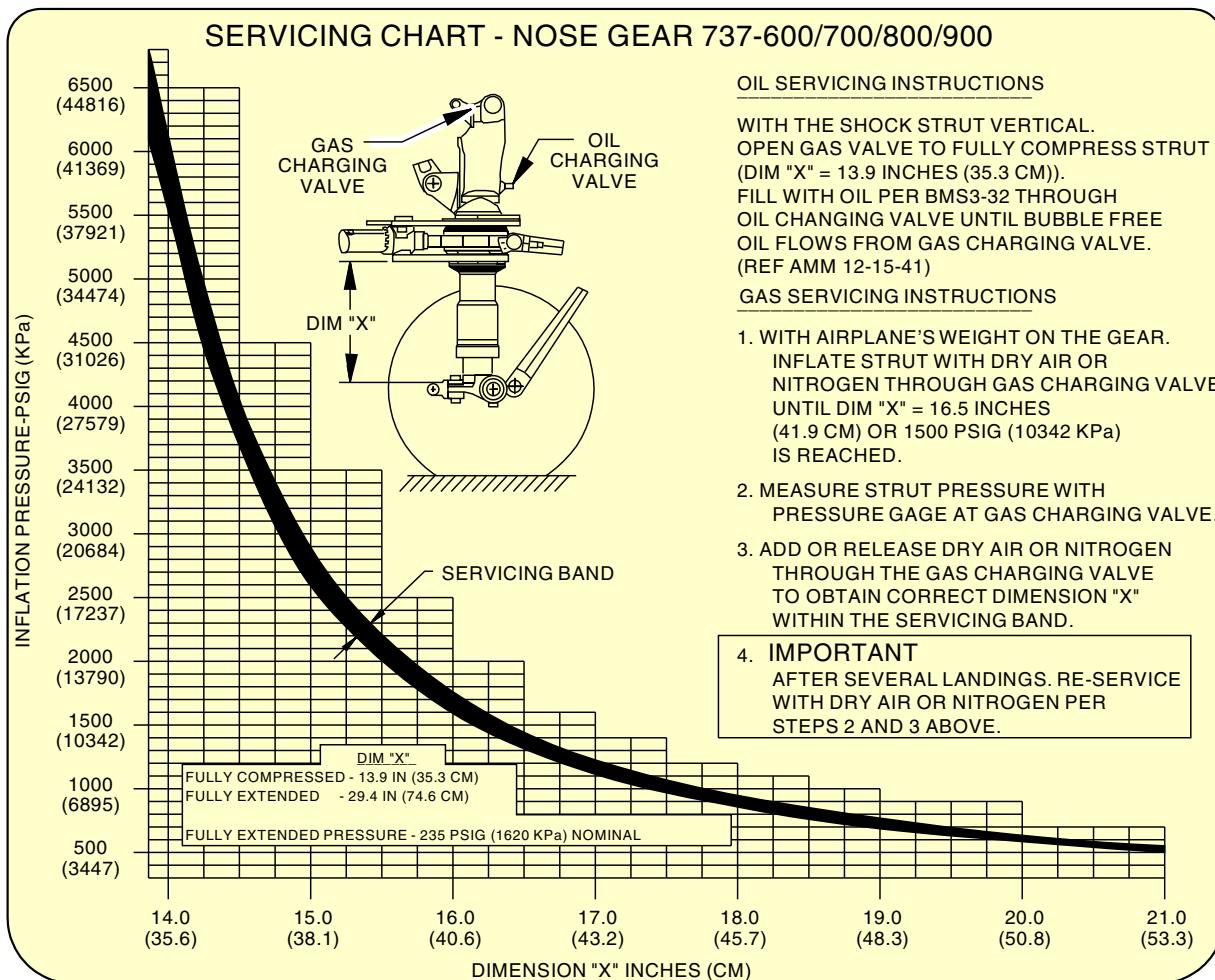
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EXAMPLE

B

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Nose Landing Gear Shock Strut Servicing Chart
Figure 302/12-15-41-990-802 (Sheet 2 of 2)

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TASK 12-15-41-610-802

3. Nose Landing Gear Shock Strut Servicing, Airplane on the Ground

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task supplies instructions for the servicing of the shock strut of the nose landing gear.
- (2) The airplane weight must be on the nose landing gear to service the shock strut.

B. References

Reference	Title
12-15-61-610-801	Landing Gear Shock Strut Fluids (P/B 301)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-11-00-200-801	Main Landing Gear Inspection (P/B 601)
32-11-21-200-801	Main Landing Gear Shock Strut Seal Leakage Check (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
COM-1532	Cart - Servicing, Strut Oil Part #: 1104 Supplier: 30188 Part #: 8774B Supplier: 94861 Part #: 884400B-3 Supplier: 94861 Part #: HM-GT1-C-VS Supplier: 1HV74 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-1 Supplier: 94861 Part #: PF55451-23 Supplier: 94861 Part #: SH001 Supplier: D2029 Opt Part #: 8774 Supplier: 94861 Opt Part #: 8844A Supplier: 94861 Opt Part #: 8844B Supplier: 94861 Opt Part #: HM-GT1-C Supplier: 1HV74
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Oil Drain Valve - Shock Strut, LG Part #: J32108-16 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
STD-1103	Hose - Flexible, 5/8 Inch ID, Oil or Hydraulic Fluid Resistant, 6 foot
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

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D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567

E. Location Zones

Zone	Area
713	Nose Landing Gear

F. Precautions for the Tail Stand

SUBTASK 12-15-41-840-003

- (1) Obey the tail stand precautions as follows:



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED.
WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS
INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Do not tow the airplane while the tail stand is installed.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL
STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK
STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS
CAN CAUSE DAMAGE TO EQUIPMENT.

- (b) Do not deflate or service the shock struts while the tail stand is installed.



DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES
WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE,
THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE
DAMAGE TO EQUIPMENT.

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR
IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED.
THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT
FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND
DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

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G. Prepare to Service the Shock Strut

SUBTASK 12-15-41-800-002



CAUTION

DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Do not deflate or service the shock strut [101] while the tail stand is installed.

SUBTASK 12-15-41-490-001



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.

- (2) 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 12-15-41-020-001



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE NOSE BEFORE YOU DEFLATE THE SHOCK STRUT. WHEN YOU DEFLATE THE SHOCK STRUT, THE NOSE CAN MOVE DOWN. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.



CAUTION

MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE YOU LOWER THE AIRPLANE. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (3) Deflate the shock strut [101] for the nose landing gear:

- (a) Remove the cap [102] for the gas valve [103] which is on the top of the shock strut [101].



WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the gas valve swivel nut [104] a maximum of two turns.

NOTE: Fluid in the shock strut will have bubbles when you release the pressure. Deflate the shock strut slowly to prevent the leakage of the fluid through the gas valve.

- (c) Loosen the gas valve swivel nut [104] fully when all of the pressure in the shock strut [101] is released.

NOTE: The shock strut is fully deflated when the dimension "X" is 13.9 in. (353.1 mm).

SUBTASK 12-15-41-680-001

- (4) If you need to drain the oil from the shock strut [101], do these steps:

- (a) Remove the lockwire from the oil charging valve [106].

- (b) Remove the cap [105] from the oil charging valve [106].

- (c) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve [106] is opened.

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- (d) Install the drain equipment on the oil charging valve [106]:

NOTE: The tool, landing gear shock strut drain valve, SPL-1829, could also be used.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.
- 2) Insert a small allen wrench in the end of the length of tubing, such that the long end of the allen wrench is flush with the end of the tube and the short end penetrates the wall of the tube.
- 3) Install the tubing on the oil charging valve [106] such that the allen wrench goes into the check valve and holds it open to drain the hydraulic fluid.

- (e) Remove the drain equipment when you have removed all of the shock strut oil.

NOTE: 8 fl-oz (250 ml) - 14 fl-oz (425 ml) of fluid will drain out of the strut. More fluid is in the strut below the oil charging valve.

H. Service the Shock Strut

SUBTASK 12-15-41-600-001



CAUTION

USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut with hydraulic fluid, for usage and alternative fluids, refer to TASK 12-15-61-610-801 (Table 302).

Table 302/12-15-41-993-809 Nose Landing Gear Shock Strut Servicing

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
1	Gas Valve	BB-N-411 Type I, or MIL-P-27401 Type I	Charge	1
2	Shock Strut	BMS 3-32 Type I,II ^[1]	Fill	1

*[1] For usage and alternative fluids, refer to (Landing Gear Shock Strut Fluids, TASK 12-15-61-610-801).

- (a) Make sure that the cap [105] for the oil charging valve [106] is removed.
- (b) Attach the oil charging line from servicing cart, COM-1532, to the oil charging valve [106].
- (c) Make sure that the cap [102] for the gas valve [103] is removed.
- (d) Make sure that the gas valve swivel nut [104] is fully open.
- (e) Attach a oil resistant hose, STD-1103, to the gas valve [103] with the end of the hose in a container.



CAUTION

CLEAN THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY IF THE FLUID FALLS ON THE TIRES. THE FLUID CAN CAUSE DETERIORATION OF THE TIRES.

- (f) Fill the shock strut [101] with hydraulic fluid until the hydraulic fluid flows out of the gas valve [103] and into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.
 - 1) Continue to fill the shock strut [101] until the hydraulic fluid which flows into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, is free of bubbles.
- (g) Remove the oil charging line.

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SUBTASK 12-15-41-420-002

- (2) Do the steps that follow for the oil charging valve [106]:
 - (a) Install the cap [105].
 - (b) Tighten the cap [105] to 50.0 in-lb (5.6 N·m) – 70.0 in-lb (7.9 N·m).
 - (c) Use the double twist method to install MS20995C32 lockwire, G01048, on the oil charging valve [106].

SUBTASK 12-15-41-020-002

- (3) Remove the hose from the gas valve [103].

SUBTASK 12-15-41-600-002

- (4) Inflate the shock strut [101] for the nose landing gear (Table 302):
 - (a) Install the inflation tool, SPL-1521, on the gas valve [103].
 - (b) Inflate the shock strut [101] with nitrogen, G00018, until dimension "X" is approximately 16.5 in. (419.1 mm) or you reach 1500 psig (10,342 kPa) (Figure 302).

NOTE: If dry nitrogen is not available, you can use air, G02314 as an alternative to inflate the shock strut.
 - (c) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - (d) Inflate or deflate the shock strut [101] until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart.

NOTE: Dimension "X" and the pressure must be on the servicing curve for a correctly serviced shock strut.

SUBTASK 12-15-41-420-004

- (5) Tighten the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.78 N·m) – 84 in-lb (9.49 N·m).

SUBTASK 12-15-41-020-003

- (6) Remove the inflation tool, SPL-1521, from the gas valve [103].

SUBTASK 12-15-41-200-003

- (7) Use a leak detector, G50135, to make sure that there are no gas leaks from the gas valve [103].
 - (a) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].

SUBTASK 12-15-41-420-003

- (8) Install the gas valve cap [102].

SUBTASK 12-15-41-020-004

- (9) Five to ten in-service landings after a complete oil and nitrogen servicing, do the steps that follow to check the pressure of the shock strut [101]:

NOTE: The shock strut fluid can absorb nitrogen after a complete servicing, reducing the shock strut dimension "X".

- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [102] for the gas valve [103].
 - 2) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 3) Loosen swivel nut [104].

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- 4) Make sure that the pressure you measure is still correct for the extension of the shock strut [101] (Figure 302).
- (b) If the shock strut [101] does not have enough pressure, Inflate the shock strut [101] for the nose landing gear (Table 302):
 - 1) Install the inflation tool, SPL-1521, on the gas valve [103].
 - 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).
- (c) Tighten the swivel nut [104] to 60 in-lb (6.78 N·m) - 84 in-lb (9.49 N·m).
- (d) Remove the inflation tool, SPL-1521, from the gas valve [103].
- (e) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].
- (f) Install the gas valve cap [102].

SUBTASK 12-15-41-210-001

- (10) If necessary, do a general visual inspection of the oil charging valve [106] for leaks (TASK 32-11-21-200-801, TASK 32-11-00-200-801).

———— END OF TASK ————

TASK 12-15-41-610-805

4. Nose Landing Gear Shock Strut Servicing, Airplane on Jacks

(Figure 301, Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives the instructions for the servicing of the shock strut of the nose landing gear.

B. References

Reference	Title
12-15-61-610-801	Landing Gear Shock Strut Fluids (P/B 301)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-11-00-200-801	Main Landing Gear Inspection (P/B 601)
32-11-21-200-801	Main Landing Gear Shock Strut Seal Leakage Check (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.

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Reference	Description
COM-1532	Cart - Servicing, Strut Oil Part #: 1104 Supplier: 30188 Part #: 8774B Supplier: 94861 Part #: 884400B-3 Supplier: 94861 Part #: HM-GT1-C-VS Supplier: 1HV74 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-1 Supplier: 94861 Part #: PF55451-23 Supplier: 94861 Part #: SH001 Supplier: D2029 Opt Part #: 8774 Supplier: 94861 Opt Part #: 8844A Supplier: 94861 Opt Part #: 8844B Supplier: 94861 Opt Part #: HM-GT1-C Supplier: 1HV74
SPL-1521	Strut Inflation Tool - Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-1 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-17 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Oil Drain Valve - Shock Strut, LG Part #: J32108-16 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
STD-1103	Hose - Flexible, 5/8 Inch ID, Oil or Hydraulic Fluid Resistant, 6 foot
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)
STD-6620	Jack - Automotive Type, One Ton Minimum Rated Load

D. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A
G02314	Air - Compressed, Breathing	BB-A-1034 Source I Grade A

E. Location Zones

Zone	Area
713	Nose Landing Gear

F. Precautions for the Tail Stand

SUBTASK 12-15-41-840-001

- (1) Obey the tail stand precautions as follows:



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED.
 WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS
 INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Do not tow the airplane while the tail stand is installed.

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DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (b) Do not deflate or service the shock struts while the tail stand is installed.



DO NOT JACK THE AIRPLANE AT THE MAIN JACK POINTS OR AXLES WHILE THE TAIL STAND IS INSTALLED. IF YOU JACK THE AIRPLANE, THE LOAD ON THE TAIL STAND CAN BE TOO HIGH WHICH CAN CAUSE DAMAGE TO EQUIPMENT.

- (c) Do not jack the airplane at the main jack points or axles while the tail stand is installed.



DO NOT DO THE SERVICING PROCEDURE FOR THE LANDING GEAR IF THE MOORING OR SHORING TIE-DOWN EQUIPMENT IS INSTALLED. THE TIE-DOWN EQUIPMENT WILL NOT LET THE SHOCK STRUT FREELY EXPAND. IF YOU DO NOT OBEY, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (d) Do not do the servicing procedure for the landing gear if the mooring or shoring tie-down equipment is installed.

G. Prepare to Service the Shock Strut

SUBTASK 12-15-41-610-022



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 12-15-41-610-008

NOTE: If it is possible, the shock strut should be deflated while the airplane is on the ground and restrained, in the fully compressed condition, while the airplane is jacked.



MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE NOSE BEFORE YOU DEFLATE THE SHOCK STRUT. WHEN YOU DEFLATE THE SHOCK STRUT, THE NOSE CAN MOVE DOWN. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.



MAKE SURE THE AREA BELOW THE AIRPLANE IS CLEAR OF ALL EQUIPMENT BEFORE YOU LOWER THE AIRPLANE. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (2) Deflate the shock strut [101] for the nose landing gear:

- (a) Remove the cap [102] from the gas valve [103] that is on the top of the shock strut [101].

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WARNING
DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the swivel nut [104] a maximum of two turns.

NOTE: Fluid in the shock strut will have bubbles when the pressure is released. Deflate the shock strut slowly to prevent the leakage of the fluid through the gas valve.

- (c) Use an automotive type jack, STD-6620, to slowly lift the inner cylinder to the fully compressed position.

- (d) Loosen the swivel nut [104] fully when all of the pressure in the shock strut [101] is released.

NOTE: The shock strut is fully deflated when the dimension "X" is 13.9 in. (353.1 mm).

SUBTASK 12-15-41-610-009

- (3) To drain the oil from the shock strut [101], do these steps:

- (a) Remove the cap [105] from the oil charging valve [106].

- (b) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve [106] is opened.

- (c) Install the drain equipment on the oil charging valve [106]:

NOTE: The landing gear shock strut drain valve, SPL-1829, can also be used. It will take much longer to drain the shock strut.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.

- 2) Insert a small allen wrench in the end of the length of tubing.

NOTE: The long end of the allen wrench should be flush with the end of the tube and the short end should penetrate the wall of the tube.

- 3) Install the tubing on the oil charging valve [106].

NOTE: The allen wrench should go into the check valve and hold it open to drain the hydraulic fluid.

- (d) Remove the drain equipment when all of the shock strut oil is removed.

NOTE: About 8 fl-oz (250 ml) - 14 fl-oz (425 ml) of fluid will drain out of the strut. More fluid is in the strut below the oil charging valve.

H. Service the Shock Strut

SUBTASK 12-15-41-610-010



CAUTION
USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut [101] with hydraulic fluid (Table 302).

- (a) To use hydraulic fluid and alternative fluids, do this task: Landing Gear Shock Strut Fluids, TASK 12-15-61-610-801.

- (b) Make sure that the shock strut [101] is in the fully compressed position while filling with hydraulic fluid.

- (c) Make sure that the cap [105] for the oil charging valve [106] is removed.

- (d) Attach the oil charging line from servicing cart, COM-1532, to the oil charging valve [106].

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- (e) Make sure that the cap [102] for the gas valve [103] is removed.
- (f) Make sure that the gas valve swivel nut [104] is fully open.
- (g) Attach a oil resistant hose, STD-1103, to the gas valve [103] with the end of the hose in a container.



CAUTION
CLEAN THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY IF THE FLUID FALLS ON THE TIRES. THE FLUID CAN CAUSE DETERIORATION OF THE TIRES.

- (h) Fill the shock strut [101] with fluid, D00467, until the hydraulic fluid flows out of the gas valve [103] and into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.
 - 1) Continue to fill the shock strut [101] until the hydraulic fluid that flows into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, is free of bubbles.
- (i) Remove the oil charging line.

SUBTASK 12-15-41-610-011

- (2) For the oil charging valve [106], do these steps:
 - (a) Install the cap [105].
 - (b) Tighten the cap [105] to 50.0 in-lb (5.6 N·m) - 70.0 in-lb (7.9 N·m).

SUBTASK 12-15-41-610-012

- (3) Remove the hose from the gas valve [103].

SUBTASK 12-15-41-610-013

- (4) Prior to inflating the shock strut [101] remove any restraints and automotive type jack, STD-6620, from below the inner cylinder.

SUBTASK 12-15-41-610-021

- (5) Inflate the shock strut [101] for the nose landing gear (Table 302):
 - (a) Install the inflation tool, SPL-1521, on the gas valve [103].
 - (b) Inflate the shock strut [101] with nitrogen, G00018, until dimension "X" is approximately 29.4 in. (746.8 mm) and reach 235 psig (1620 kPa) (Figure 302).
NOTE: If dry nitrogen is not available, use air, G02314, as an alternative to inflate the shock strut.
 - (c) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - (d) Inflate or deflate the shock strut [101] until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart.
NOTE: Dimension "X" and pressure must be on the servicing curve for a correctly serviced shock strut.

SUBTASK 12-15-41-610-014

- (6) Tighten the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).

SUBTASK 12-15-41-610-015

- (7) Remove the inflation tool, SPL-1521, from the gas valve [103].
 - (a) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].

SUBTASK 12-15-41-610-016

- (8) Install the cap [102].

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SUBTASK 12-15-41-610-018

- (9) With the airplane on the ground, do these steps:
- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [102] from the gas valve [103].
 - (b) Loosen the swivel nut [104] on the gas valve [103].
 - 1) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 2) Make sure that the pressure is still correct for the extension of the shock strut [101] (Figure 302).
 - (c) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the nose landing gear (Table 302):
 - 1) Install the inflation tool, SPL-1521, on the gas valve [103].
 - 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).
 - (d) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
 - (e) Remove the inflation tool, SPL-1521, from the gas valve [103].
 - (f) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].
 - (g) Install the cap [102].

SUBTASK 12-15-41-610-019

- (10) Five to ten in-service landings after a complete oil and nitrogen servicing, check the pressure of the shock strut [101]:

NOTE: The shock strut fluid can absorb nitrogen after a complete servicing, reducing the shock strut dimension "X".

- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [102] from the gas valve [103].
 - 2) Use a inflation tool, SPL-1521, or pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 3) Loosen the swivel nut [104].
 - 4) Make sure that the pressure is still correct for the extension of the shock strut [101] (Figure 302).
- (b) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the nose landing gear (Table 302):
 - 1) Install the inflation tool, SPL-1521, on the gas valve [103].
 - 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut [101] extension dimension "X" for the pressure is on the servicing curve on the servicing chart (Figure 302).
- (c) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).
- (d) Remove the inflation tool, SPL-1521, from the gas valve [103].
- (e) Use a soap solution to make sure that there are no gas leaks from the gas valve [103].
- (f) Install the cap [102].

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SUBTASK 12-15-41-210-002

- (11) If necessary, do a general visual inspection of the oil charging valve [106] for leaks
(TASK 32-11-21-200-801, TASK 32-11-00-200-801).

———— END OF TASK ————

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LANDING GEAR TIRE - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Landing Gear Tire Pressure Check
 - (2) Landing Gear Tire Servicing
- C. The nitrogen that you use must have a minimum purity of 99.5 percent.

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- D. Some airplanes have a tire pressure gage installed in the wheels. The tire pressure gage is part of an assembly that includes the gage and the tire fill valve. You can use the gage for walk-around inspections and other fast checks. You must use a separate calibrated gage with an approved dial when you inflate a tire. You must also use a calibrated gage when the tire pressure indication must be very accurate.

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TASK 12-15-51-780-801

2. Landing Gear Tire Pressure Check and Tire Servicing

(Figure 301, Figure 302, Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has instructions for two methods to determine tire pressure.
 - (a) Use standardized pressures for the main gear and nose gear tires (recommended).
 - (b) Use the tire inflation limit charts to determine main gear and nose gear tire pressures (optional).

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-45-11 P/B 401	MAIN LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION
32-45-21 P/B 401	NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - 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
SPL-1527	Inflator - Tire Part #: F70199-52 Supplier: 81205

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(Continued)

Reference	Description
SPL-12301	Sensor - Tire Pressure, Smartstem (TPS), Handheld Reader Part #: KIT83-008-04 Supplier: 81982 Part #: KIT83-008-04E Supplier: 81982 Opt Part #: KIT83-008-02 Supplier: 81982 Opt Part #: KIT83-008-03 Supplier: 81982 Opt Part #: KIT83-008-03E Supplier: 81982
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
713	Nose Landing Gear
734	Left Main Landing Gear
744	Right Main Landing Gear

F. Prepare for the Landing Gear Tire Pressure Check

SUBTASK 12-15-51-480-001



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) 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.

G. Landing Gear Tire Pressure Check Using Standardized Nose and Main Gear Tire Pressures (Recommended)

SUBTASK 12-15-51-600-023

- (1) Make sure that the tires are cool before you measure the tire pressures.

NOTE: Let the tires cool for a minimum of two hours after the airplane has landed.

- (a) If the main landing gear tires and nose gear tires are too hot to check the tire pressures, and there is not enough time to allow the tires to cool before the airplane is dispatched, do this task: Main Landing Gear and Nose Gear Hot Tire Pressure Check, TASK 12-15-51-780-802.

SUBTASK 12-15-51-020-009

- (2) For the nose landing gear tires, remove the cap [102].

SUBTASK 12-15-51-020-010

- (3) For the main landing gear tires, remove the cap [101].



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SUBTASK 12-15-51-600-024



CAUTION

MAKE SURE THAT THE DIRECT READING GAGE IS CORRECTLY CALIBRATED. MAKE SURE THAT IT HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (4) Use the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.

SUBTASK 12-15-51-600-027

- (5) If the combination tire pressure fill valve and tire pressure transmitter is installed in the tire/wheel, use the hand held device tire pressure sensor reader, SPL-12301, to measure the tire pressure.

SUBTASK 12-15-51-610-012

- (6) Do the tire inflation pressure check.
- Let the tires cool for a minimum of two hours after a flight.
 - Do a check of the tire inflation pressure with an accurate gage.
 - Compare the measured pressure to the standardized pressure. Do the maintenance actions specified below:

SUBTASK 12-15-51-610-016



WARNING

USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (7) If the tires require inflation, connect the tire inflator, SPL-1527, to the gas valve [1], gas valve [2] and inflate the tire with nitrogen, G00018, to the correct pressure.

SUBTASK 12-15-51-610-013

- (8) Inflate main and nose gear tires to 205 ± 5 psig (1413 ± 34 kPa) for the 737-600/-700/-800/-900 airplanes but not 737-900ER (Table 301).

Table 301/12-15-51-993-812 Maintenance Actions for Main and Nose Gear Standardized Tire Pressures for 737-600/-700/-800/-900 but Not 737-900ER

Measured Tire Pressure Main and Nose Gear Tires (Tires Cold)	Maintenance Action
Greater than 210 psig	Adjust to correct pressure
Between 200 psig and 210 psig	No action required
Between 195 psig and 199 psig	Inflate the tire to the correct pressure
Between 185 psig and 194 psig	Inflate the tire to the correct pressure. It is recommended to check pressure again in 24 hours. If the tire pressure is found low again, replace the tire. *[1]*[2]
Between 165 psig and 184 psig	Replace wheel and tire assembly. *[1]*[2]
Below 165 psig	Replace the wheel and tire assembly if the pressure cannot be maintained above these limits. If the wheel and tire assembly has turned with the airplane weight on it after the pressure decreased, replace the wheel and tire assembly installed on the opposite side of that axle. *[1]

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- *[1] Send the wheel and the tire assembly for an inspection to find the cause for the low tire pressure. Mark the reason for removal on the tire to aid the inspectors when they examine the tires.
- *[2] CAUTION: Replace the tires that require frequent refills to maintain nominal service pressure. These tires can have tread loss or carcass rupture if you use them for too long. This can cause damage to equipment.

SUBTASK 12-15-51-610-017

- (9) Remove the tire inflator, SPL-1527, from the gas valve [1], gas valve [2].
 - (a) Install the cap [102] for the nose landing gear tires and hand-tighten.
 - (b) Install the cap [101] for the main landing gear tires and hand-tighten.

H. Landing Gear Tire Pressure Check Using the Tire Pressure Limit Charts (Optional)

NOTE: As an option, operators can select a tire pressure from the following variable tire inflation charts. These charts allow a reduced tire pressure if the airplane gross weight is not at the maximum. A reduced tire pressure should only be used if there is a specific reason to do so, such as a runway pressure restriction or to solve unusual tire wear patterns.

SUBTASK 12-15-51-600-001

- (1) Make sure that the tires are cool before you measure the tire pressures.

NOTE: Let the tires cool for a minimum of two hours after the airplane has landed.

- (a) If the main landing gear tires and nose gear tires are too hot to check the tire pressures, and there is not enough time to allow the tires to cool before the airplane is dispatched, do this task: Main Landing Gear and Nose Gear Hot Tire Pressure Check, TASK 12-15-51-780-802.

SUBTASK 12-15-51-020-001

- (2) For the nose landing gear tires, remove the cap [102].

SUBTASK 12-15-51-020-002

- (3) For the main landing gear tires, remove the cap [101].

SUBTASK 12-15-51-600-002



CAUTION

MAKE SURE THAT THE DIRECT READING GAGE IS CORRECTLY CALIBRATED. MAKE SURE THAT IT HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (4) Use the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.

SUBTASK 12-15-51-600-026

- (5) If the combination tire pressure fill valve and tire pressure transmitter is installed in the tire/wheel, use the hand held device tire pressure sensor reader, SPL-12301, to measure the tire pressure.

SUBTASK 12-15-51-600-004

- (6) Check the main landing gear tire and nose gear tire pressures (Figure 302, Figure 303).

NOTE: Use the tire pressure graphs for the main landing gear and nose gear.

NOTE: The inflation pressures that are shown are for cold, loaded tires (i.e. with the airplane resting on the tires). For unloaded tires, decrease the pressure by 4%.

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- (a) For the applicable airplane maximum taxi weight and tire, find the minimum service pressure from the pressure limits chart for the correct airplane model (Figure 302, Figure 303).
- NOTE: The minimum service pressure is the lowest line, for the correct tire size, on the chart.
- NOTE: The maximum taxi weight is the actual maximum taxi weight. Not the certified maximum taxi weight.
- (b) For the tires in use, find the maximum service pressure from the pressure limits chart for the correct airplane model (Figure 302, Figure 303).
- NOTE: The maximum service pressure is the upper line, for the correct tire size, on the chart.
- (c) Select a nominal service tire pressure between the minimum service pressure and the maximum service pressure found above.

SUBTASK 12-15-51-610-001

- (7) Do the tire inflation pressure check.
- (a) Let the tires cool for a minimum of two hours after a flight.
- (b) Do a check of the tire inflation pressure with an accurate gage.
- (c) Compare the measured pressure to the nominal service pressure selected above. Verify that all tires on the same gear are inflated to the selected nominal service pressure +/- 5 psig (+/- 34 kPa) (Figure 302, Figure 303).
- (d) Do these steps for tires which have tire pressures below the selected nominal service pressure:
- 1) If the measured tire pressure is below the selected nominal service pressure by no more than 5%, do these steps:



WARNING USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- a) Connect the tire inflator, SPL-1527 (or equivalent), to the gas valve [1], gas valve [2] and inflate the tire with nitrogen, G00018, to the necessary pressure.
- b) Remove the tire inflator, SPL-1527 (or equivalent), from the gas valve [1], gas valve [2].
- 2) If the measured pressure is between 5% - 10% below the selected nominal service tire pressure, do these steps:



WARNING USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- a) Connect the tire inflator, SPL-1527, to the gas valve [1], gas valve [2] and inflate the tire with nitrogen, G00018, to the selected nominal service pressure.
- b) Remove the tire inflator, SPL-1527, from the gas valve [1], gas valve [2].
- c) Do a check of the tire pressure again after 24 hours.

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- d) If the tire pressure is more than 5% below the selected nominal service pressure again, replace the wheel and tire assembly: MAIN LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-11/401, or NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-21/401.

NOTE: Replace tires that require frequent refills to maintain nominal service pressure. These tires can have tread loss or carcass rupture if you use them for too long. This can cause damage to equipment.

- e) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
- f) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
- 3) If the measured tire pressure is between 10% - 20% below the selected nominal service tire pressure, do these steps:
- a) Replace the wheel and tire assembly: MAIN LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-11/401, or NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-21/401.
- b) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
- c) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
- 4) If the measured tire pressure is more than 20% below the selected nominal service tire pressure, do these steps:
- a) Replace the tire and wheel assembly: MAIN LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-11/401, or NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-21/401.
- b) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
- c) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
- d) If the wheel and tire assembly has turned with the airplane weight on it after the pressure had decreased, replace the wheel and tire assembly installed on the opposite side of that axle.
- e) Mark on the tire that it was on the same axle with a wheel and tire assembly that was replaced because of low tire pressure.
- f) Send the tire for inspection for damage.

SUBTASK 12-15-51-020-003

- (8) If you will not service the tires for the nose landing gear, install and hand-tighten the cap [102].

SUBTASK 12-15-51-020-004

- (9) If you will not service the tires for the main landing gear, install and hand-tighten the cap [101].

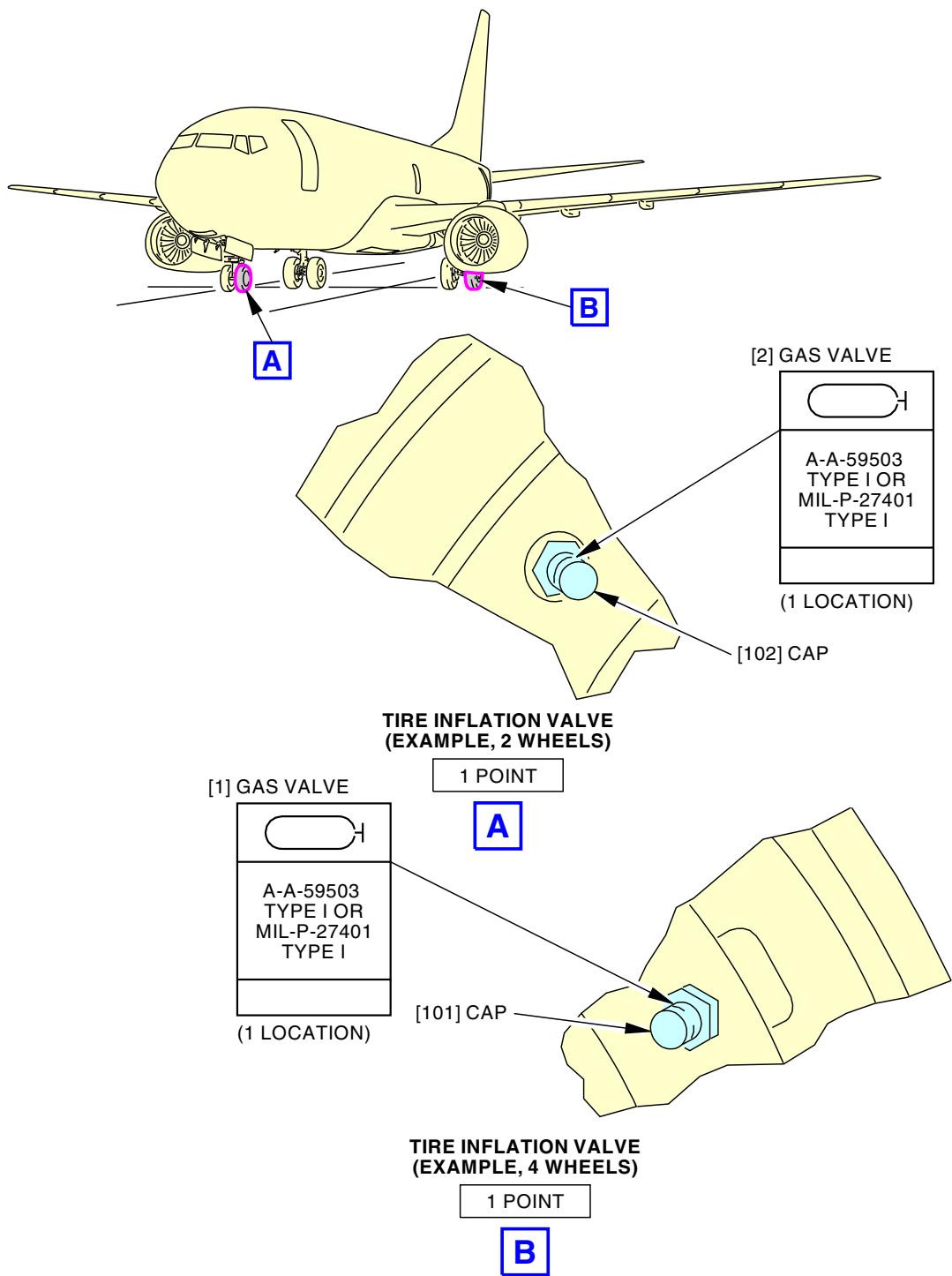
— END OF TASK —

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F73466 S0006561315_V2

Landing Gear Tire Servicing
Figure 301/12-15-51-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-464

12-15-51

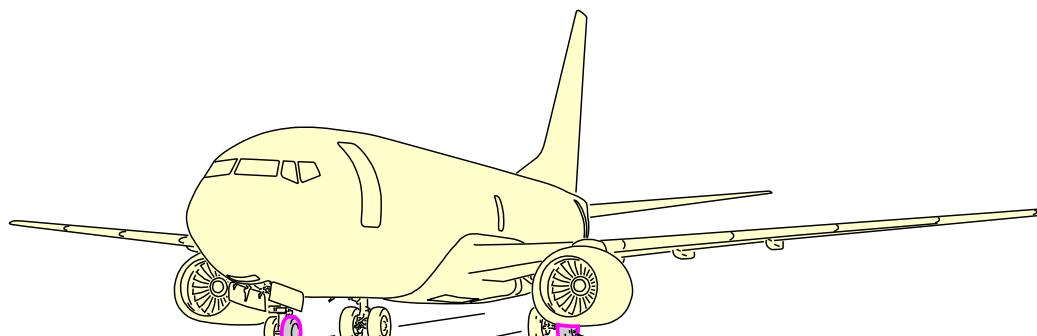
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

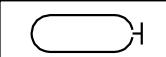
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[2] GAS VALVE



A-A-59503
TYPE I OR
MIL-P-27401
TYPE I

(1 LOCATIONS)

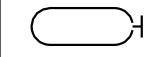
TIRE INFLATION VALVE
(EXAMPLE, 2 WHEELS)

1 POINT

A

[101] CAP

[2] GAS VALVE



A-A-59503
TYPE I OR
MIL-P-27401
TYPE I

(1 LOCATIONS)

TIRE INFLATION VALVE
(EXAMPLE, 4 WHEELS)

1 POINT

B

F73462 S0006561316_V2

Landing Gear Tire Servicing
Figure 301/12-15-51-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM 465-999

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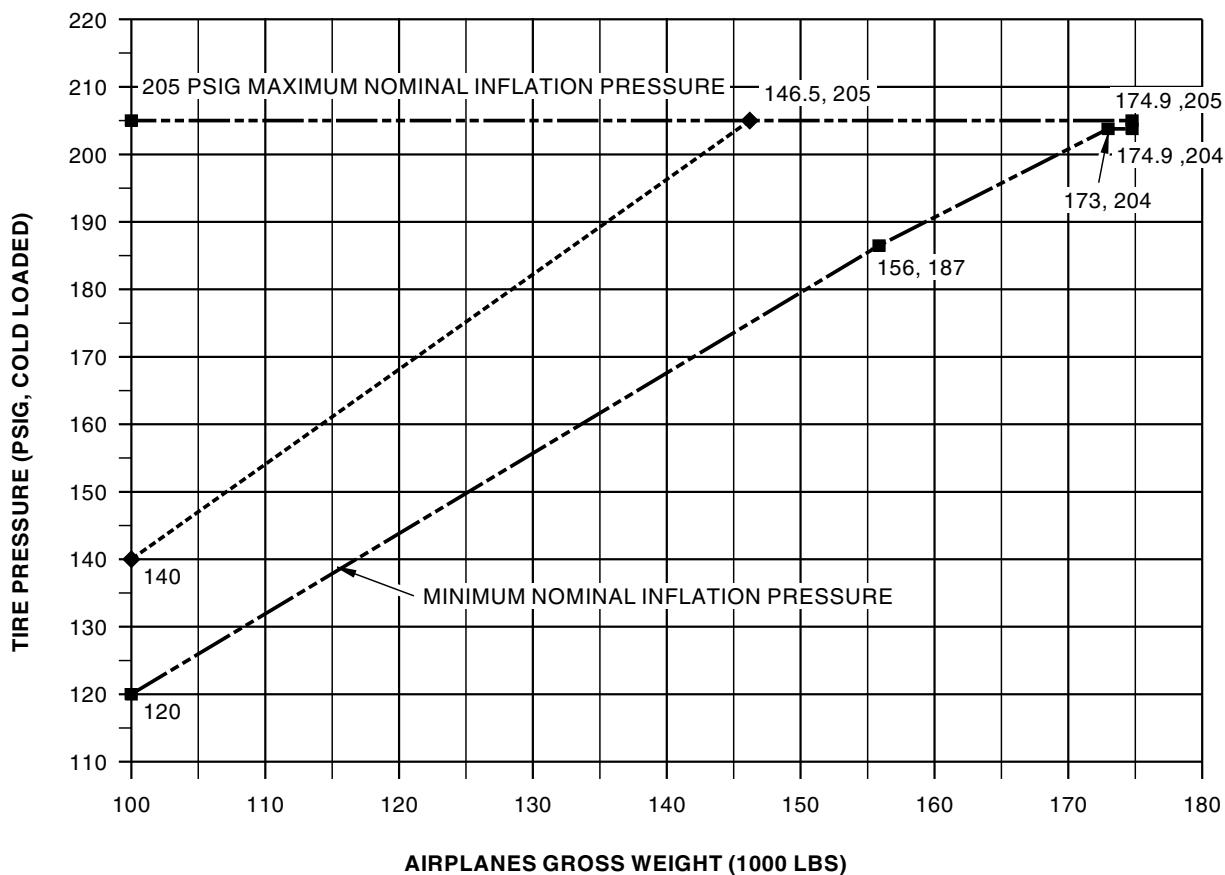
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737-800 MAIN LANDING GEAR TIRE PRESSURE LIMITS

NOTE:

1. INFLATION PRESSURES SHOWN ARE FOR COLD LOADED TIRES (I.E. WITH AIRPLANE RESTING ON TIRES). FOR UNLOADED TIRES, REDUCE PRESSURE BY 4%.
2. FOR THE DESIRED MAXIMUM TAXI WEIGHT, DETERMINE THE MINIMUM SERVICE PRESSURE (SLOPED LINE) FROM THE CHART.
3. DETERMINE THE MAXIMUM SERVICE PRESSURE (HORIZONTAL LINE) FROM THE CHART.
4. SELECT A NOMINAL SERVICE PRESSURE BETWEEN THE MINIMUM AND MAXIMUM.
5. INFLATE ALL TIRES ON THE SAME GEAR TO THE SELECTED NOMINAL PRESSURE ± 5 PSIG.
6. SEE AIRPLANE WEIGHT - CG CURVES FOR STRUCTURAL LIMITS.

LEGEND:

- H44.5x16.5-21/28PR
-◆- H44.5x16.5R21/30PR

G93409 S0006561321_V3

Main Landing Gear Tire Inflation Limits
Figure 302/12-15-51-990-802

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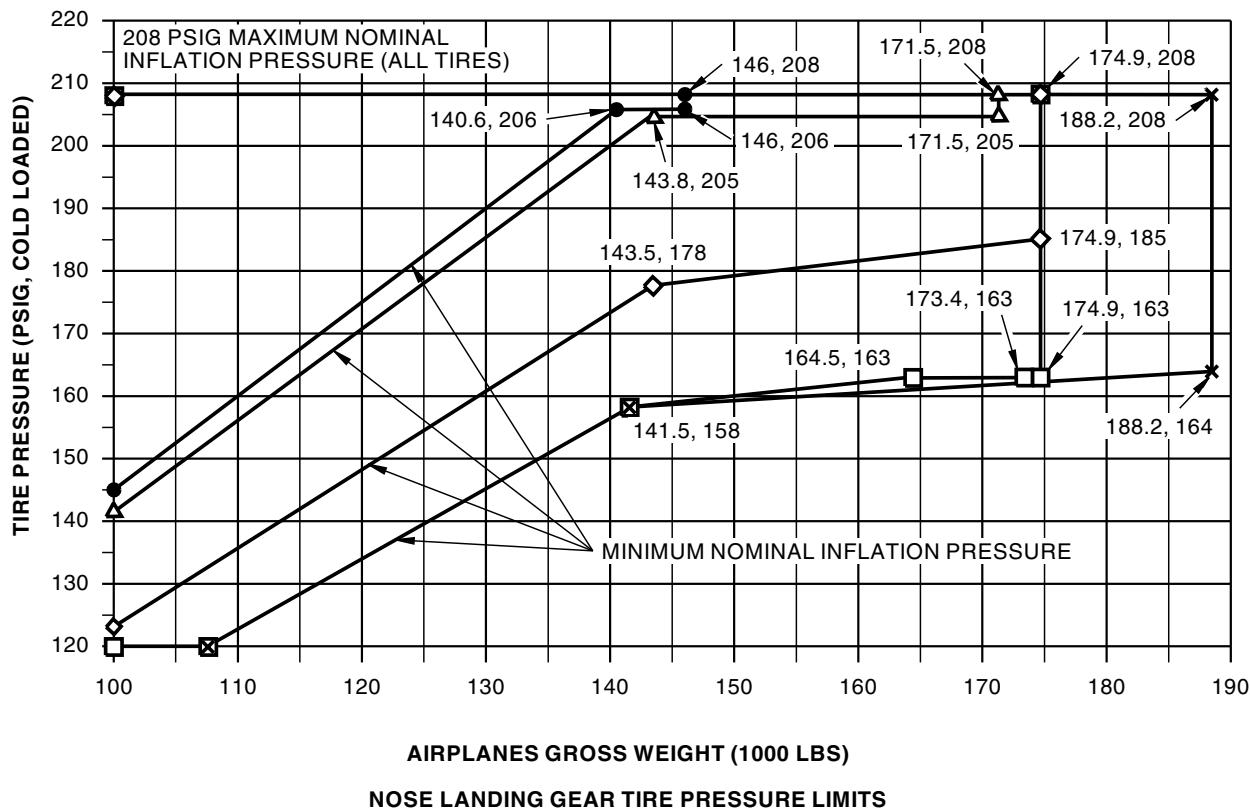
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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NOTE:

1. THIS CHART APPLIES TO 27X7.75-15/12PR BIAS AND 27X7.75R15/12PR RADIAL TIRES, WHEN USED WITH 10-62237-9, -10, OR LATER NOSE WHEELS.
2. INFLATION PRESSURES SHOWN ARE FOR COLD LOADED TIRES (I.E. WITH AIRPLANE RESTING ON TIRES). FOR UNLOADED TIRES, REDUCE PRESSURE BY 4%.
3. FOR THE DESIRED MAXIMUM TAXI WEIGHT, DETERMINE THE MINIMUM SERVICE PRESSURE (SLOPED LINE) FROM THE CHART.
4. DETERMINE THE MAXIMUM SERVICE PRESSURE (HORIZONTAL LINE) FROM THE CHART.
5. SELECT A NOMINAL SERVICE PRESSURE BETWEEN THE MINIMUM AND MAXIMUM.
6. INFLATE ALL TIRES ON THE SAME GEAR TO THE SELECTED NOMINAL PRESSURE ± 5 PSIG.
7. SEE AIRPLANE WEIGHT - CG CURVES FOR STRUCTURAL LIMITS.

LEGEND:

- 737-600
- △ 737-700/700IGW
- ◊ 737-800
- 737-900
- × 737-900ER

G37434 S0006561323_V3

Nose Landing Gear Tire Inflation Limits
Figure 303/12-15-51-990-803



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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 12-15-51-780-802

3. Main Landing Gear and Nose Gear Hot Tire Pressure Check

(Figure 301)

A. General



WARNING

DO NOT GO NEAR WHEEL, BRAKE, OR TIRE EQUIPMENT WHICH ARE SUSPECTED OF BEING OVERHEATED. INJURY TO PERSONS CAN OCCUR.

- (1) If the wheel, brake, or tire equipment is suspected of being overheated, do this task: High Energy Stop, TASK 05-51-07-210-801.
- (2) This task gives a procedure to check tire pressures before a two hour cool down of the tires. Or for pressure checks after the necessary daily pressure check.
- (3) It is recommended that you check the tire pressure after you let the tires cool for a minimum of two hours since the airplane landed.
- (4) If not possible to wait the recommended two hours, for the tires to cool down before the airplane is dispatched, you can use this task as an alternative inspection immediately before the dispatch.

NOTE: The hot tire pressure check is for occasional use only. It is not to be used as a permanent alternative to the more accurate cold tire checks. The more accurate cold tire pressure check should be used as frequently as possible to avoid possible tire service life problems such as tread losses and carcass ruptures.



CAUTION

IF YOU USE A DIRECT READING GAGE TO MEASURE THE TIRE PRESSURES, MAKE SURE IT IS CORRECTLY CALIBRATED AND HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (5) Use a 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.
- (6) If the combination tire pressure fill valve and tire pressure transmitter is installed in the wheel/tire, use the hand held device tire pressure sensor reader, SPL-12301, to measure the tire pressure.

B. References

Reference	Title
05-51-07-210-801	High Energy Stop (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-45-11-000-801	Main Landing Gear Wheel and Tire Assembly Removal (P/B 401)
32-45-21-000-801	Nose Landing Gear Wheel and Tire Assembly - 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.

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Reference	Description
SPL-1527	Inflator - Tire Part #: F70199-52 Supplier: 81205
SPL-12301	Sensor - Tire Pressure, Smartstem (TPS), Handheld Reader Part #: KIT83-008-04 Supplier: 81982 Part #: KIT83-008-04E Supplier: 81982 Opt Part #: KIT83-008-02 Supplier: 81982 Opt Part #: KIT83-008-03 Supplier: 81982 Opt Part #: KIT83-008-03E Supplier: 81982
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
734	Left Main Landing Gear
744	Right Main Landing Gear

F. Prepare for the Hot Tire Pressure Check

SUBTASK 12-15-51-480-003



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 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.

G. Hot Tire Pressure Check

SUBTASK 12-15-51-600-005

- (1) Make sure that all antiskid and autobrake system equipment is serviceable.

NOTE: If there are problems with the antiskid or autobrake systems, your average main landing gear tire pressures can be higher than normal; this could cause you to over-inflate a suspected low pressure tire.

SUBTASK 12-15-51-600-006



CAUTION

MAKE SURE THAT THE DIRECT READING GAGE IS CORRECTLY CALIBRATED. MAKE SURE THAT IT HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (2) If all of the main landing gear tires can be assumed to be at approximately the same temperature, measure all of the main landing gear tire pressures and make a record of the values.
 - (a) Remove the cap [101].



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- (b) Use the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the main landing gear tire pressures.
- (c) If the combination tire pressure fill valve and tire pressure transmitter is installed in the wheel/tire, use the hand held device tire pressure sensor reader, SPL-12301, to measure the tire pressure.

SUBTASK 12-15-51-600-007



CAUTION

DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Use the tire pressure tables for the main landing gear, do this task: Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801, Figure 301, Figure 302, Figure 303, Figure 304.

NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 4%.

- (a) For the applicable airplane maximum taxi weight and tire, find the minimum service pressure.

SUBTASK 12-15-51-610-005

- (4) Make sure that all of the main landing gear tire pressures are above the minimum "cold" specified pressures for the airplane's maximum taxi weight.

- (a) Replace any tire and wheel assembly that is below the minimum cold value.
 - 1) Do this task: Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-11-000-801.
 - 2) Send the wheel and tire assemblies for an inspection to find the cause for the low tire pressures.
 - 3) Mark the reason for the tire removal on each tire to aid the inspectors when they examine the tires.

SUBTASK 12-15-51-610-006



CAUTION

DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) If the pressure of one tire is low, calculate the average of the other three tires.

SUBTASK 12-15-51-610-007

- (6) If the pressure of one tire is 5% - 10% below the average pressure of the other three tires, do these steps:



WARNING

USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (a) Connect the tire inflator, SPL-1527, to the gas valve [1].
- (b) Inflate the tire with nitrogen, G00018, to the average value of the other three tires.
- (c) Remove the tire inflator, SPL-1527, from the gas valve [1].

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SUBTASK 12-15-51-610-008

- (7) If the pressure of one tire is more than 10% below the average of the other three tires, do these steps.
- (a) Replace the tire and wheel assembly.
 - 1) Do this task: Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-11-000-801.
 - 2) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - 3) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.

SUBTASK 12-15-51-780-001

- (8) If the tire pressure of one tire is more than 20% below the average pressure of the other three tires, do these steps:
- (a) Replace the tire and wheel assembly.
 - 1) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - 2) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
 - (b) Replace the wheel and tire assembly installed on the opposite side of that axle.
 - 1) Mark on the tire that it was on the same axle with a wheel and tire assembly that was replaced because of low tire pressure.
 - 2) Send the tire for inspection for damage.

SUBTASK 12-15-51-200-001

- (9) Use the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the nose landing gear tire pressures.

SUBTASK 12-15-51-200-002

- (10) For the applicable airplane maximum taxi weight and tire, find the minimum nose tire service pressure, do this task: Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801, (Figure 303).

SUBTASK 12-15-51-200-003

- (11) Make sure that both of the nose gear tires are above the minimum "cold" specified pressures for the airplane's maximum weight.
- (a) Replace the tire and wheel assemblies if both tires are below the minimum cold value.
 - 1) Do this task: Nose Landing Gear Wheel and Tire Assembly - Removal, TASK 32-45-21-000-801.
 - 2) Send the wheel and tire assemblies for an inspection to find the cause for the low tire pressures.
 - 3) Mark the reason for the tire removal on the tires to aid the inspectors when they examine the tires.
 - (b) If the pressure of one tire is 5% below the minimum cold value, do these steps:
 - 1) Do this task: Nose Landing Gear Wheel and Tire Assembly - Removal, TASK 32-45-21-000-801.
 - 2) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.

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- 3) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.

SUBTASK 12-15-51-600-008



CAUTION

DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (12) If the pressure of one tire is 5% - 10% below the pressure of the other tire, do these steps:
- Inflate the tire to the pressure of the other tire.



WARNING

USE A REGULATED PRESSURE SOURCE TO WHEN YOU SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- Connect the tire inflator, SPL-1527, to the gas valve [2].
- Inflate the tire with nitrogen, G00018, to the value of the other tire.
- Remove the tire inflator, SPL-1527, from the gas valve [2].

SUBTASK 12-15-51-000-001

- (13) If the tire pressure of the one tire is more than 10% below the other tire, do these steps:

- Replace the tire and wheel assembly.
 - Do this task: Nose Landing Gear Wheel and Tire Assembly - Removal, TASK 32-45-21-000-801.
 - Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.

SUBTASK 12-15-51-780-002

- (14) If the tire pressure of one tire is more than 20% below the pressure of the other tire, do these steps:

- Replace the tire and wheel assembly.
 - Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
- Replace the wheel and tire assembly installed on the opposite side of that axle.
 - Mark on the tire that it was on the same axle with a wheel and tire assembly that was replaced because of low tire pressure.
 - Send the tire for inspection for damage.

— END OF TASK —

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TASK 12-15-51-610-802

4. Add Nitrogen or Air to the Tire

(Figure 301, Figure 302, Figure 303)

NOTE: Also see Figure 304.

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) You can add air to the tire when nitrogen is not available, but the oxygen in the air that you add must not be more than 5 percent of the total tire volume.

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
SPL-1527	Inflator - Tire Part #: F70199-52 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
713	Nose Landing Gear
734	Left Main Landing Gear
744	Right Main Landing Gear

F. Procedure

SUBTASK 12-15-51-480-002



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD 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 12-15-51-020-005

- (2) For the nose landing gear tires, remove the cap [102].

SUBTASK 12-15-51-490-001

- (3) Connect the tire inflator, SPL-1527 to the gas valve [2].

SUBTASK 12-15-51-020-006

- (4) For the main landing gear tires, remove the cap [101].

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SUBTASK 12-15-51-490-002

- (5) Connect the tire inflator, SPL-1527 to the gas valve [1].

SUBTASK 12-15-51-610-003

- (6) If you used dry air to inflate the tire, make sure the oxygen content does not exceed 5 percent, do one of the steps that follow:

- (a) Procedure #1, a minimum quantity of dry air:

- 1) Make a record of the quantity of the dry air inflation psig that you added to the tire.
- 2) Make sure the sum of all of the dry air inflations to the tire are not more than 18 psi (124 kPa).
- 3) If the sum of all of the dry air inflations are more than 18 psi (124 kPa), you must deflate the tire and re-inflate with nitrogen, G00018.

NOTE: If you will deflate the tire, raise the axle on jacks to provide clearance between the wheel and tire assembly and the ground to prevent the tire beads from separating from the wheel.

- (b) Procedure #2, the quantity of air determined from a graph:

- 1) Make a record of the quantity of the dry air inflation psi that you added to the tire.
- 2) Determine the amount of dry air that you can add to the tire, using the initial inflation pressure of the tire and (Figure 304).
- 3) Make sure the sum of all of the dry air inflations to the tire are not more than the value that you determined from (Figure 304).
- 4) If the sum of all of the dry air inflations are more than the determined amount, you must deflate the tire and re-inflate with nitrogen, G00018.

NOTE: If you will deflate the tire, raise the axle on jacks to provide clearance between the wheel and tire assembly and the ground to prevent the tire beads from separating from the wheel.

SUBTASK 12-15-51-090-001

- (7) Remove the tire inflator, SPL-1527 from the gas valve [2].

SUBTASK 12-15-51-020-007

- (8) Install the cap [102] for the nose landing gear tires and hand-tighten.

SUBTASK 12-15-51-090-002

- (9) Remove the tire inflator, SPL-1527 from the gas valve [1].

SUBTASK 12-15-51-020-008

- (10) Install the cap [101] for the main landing gear tires and hand-tighten.

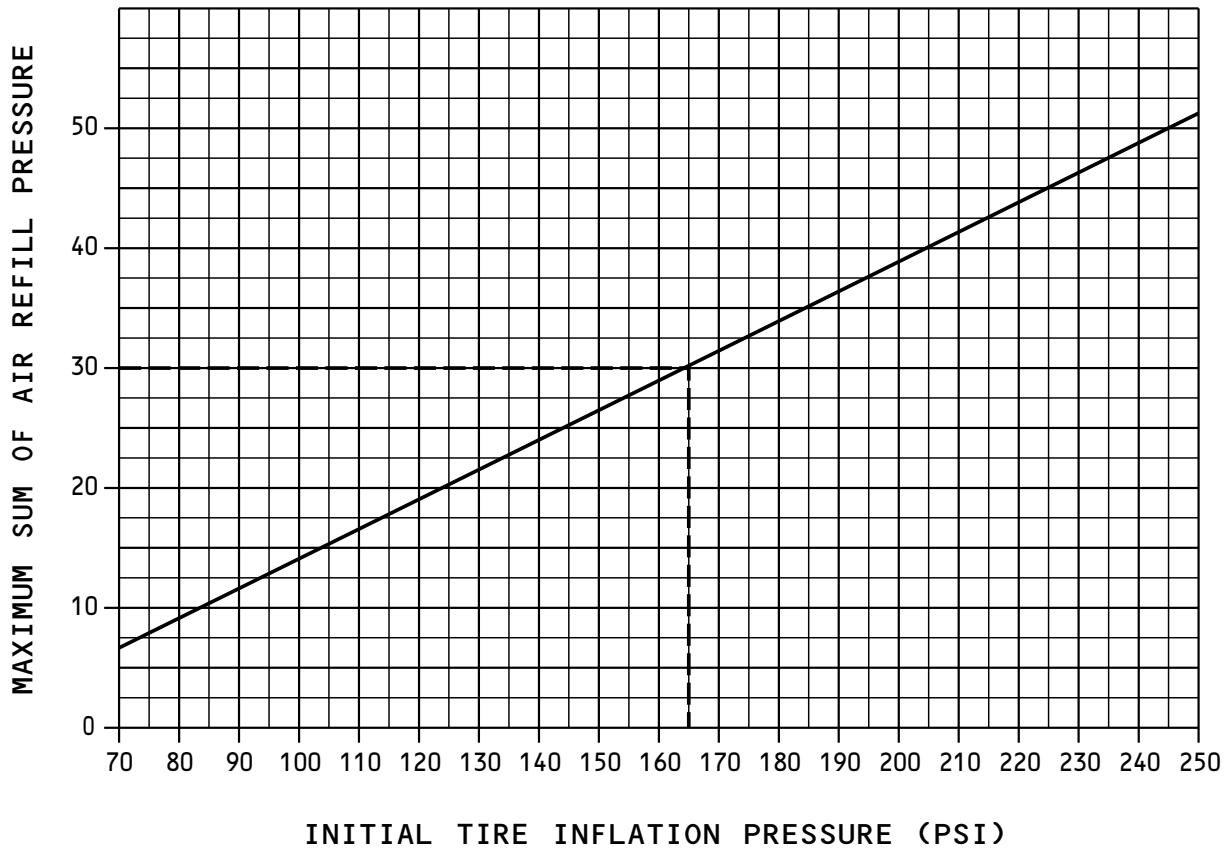
———— END OF TASK ————

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Air Refill Pressure
Figure 304/12-15-51-990-805

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LANDING GEAR SHOCK STRUT FLUID - SERVICING

1. General

- A. This procedure contains a description of the fluids that are used to service the shock strut.

TASK 12-15-61-610-801

2. Landing Gear Shock Strut Fluids

A. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00106	Fluid - Hydraulic, Petroleum Base, For Preservation And Operation	MIL-PRF-6083 (NATO C-635)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00510	Lubricant - Landing Gear Shock Strut Additive - Lubrizol 1395	
D50022	Fluid - Landing Gear Shock Strut (Specifically For Preservation)	BMS3-32 Type I
D50193	Lubricant - Landing Gear Shock Strut Additive - Methyl Oleate	

B. General

SUBTASK 12-15-61-610-001

- (1) All of the fluids that are listed here are compatible. Use any of these fluids to top off the strut even if the strut was originally filled with one of the other fluids.
- (2) It is not necessary to change the seals in the shock strut if you drained the strut and filled it with one of the other fluids.
- (3) It is recommended to use the pre-mixed fluid, fluid, D00467 and fluid, D50022, if it is available. This is more convenient for the operator and will remove the possibility of error that can occur when the operator mixes the fluid, D00106 or fluid, D00070 with a lubricant.
- (4) Use fluid, D50022 to fill the shock strut for the first time when new, or after overhaul. The Type I fluid contains a corrosion inhibitor.
- (5) Use fluid, D00467 and fluid, D50022 at the operator's discretion, for subsequent refills or to top off the strut. These two types of fluid are compatible.
- (6) If the fluid, D00467 and fluid, D50022 are not available, You can use fluid, D00106 or fluid, D00070 without lubricants to top off the strut. Try not to do this too often because the lubricant that is already in the strut will become more diluted. This will make the fluid less effective.
- (7) The shock strut fluid must contain a lubricant to be effective in service. Lubrizol 1395 lubricant, D00510 and methyl oleate, D50193 are heavy duty lubricants. They are added to the fluid to reduce the wear on the parts of the shock strut that move.
- (8) If the fluid, D00467 and fluid, D50022 are not available, and you need to fill an empty shock strut, it is recommended that you pre-mix the fluid, D00106 or fluid, D00070 with the lubricants before you add the fluid to the strut. If this is not possible, you can pre-mix 1 part lubricant with 10 parts (minimum) fluid before you add the lubricant into the shock strut.





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C. Recommended (Pre-Mixed) Shock Strut Fluids

SUBTASK 12-15-61-610-002

- (1) BMS 3-32, Type I - This is MIL-PRF-6083 fluid pre-mixed with 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.
- (2) BMS 3-32, Type II - This is MIL-PRF-5606 fluid pre-mixed with 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.

D. Alternative (Not Pre-Mixed) Shock Strut Fluids

SUBTASK 12-15-61-610-003

- (1) MIL-PRF-6083 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for fluid, D00106 and mixed with 2.4 percent by volume of Lubrizol 1395 lubricant, D00510.

NOTE: Operators can choose to add 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate instead of 2.4 percent by volume of Lubrizol 1395.

- (2) MIL-PRF-5606 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for fluid, D00070 and mixed with 2.4 percent by volume of Lubrizol 1395 lubricant, D00510.

NOTE: Operators can choose to add 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate instead of 2.4 percent by volume of Lubrizol 1395.

E. Shock Strut Fluid Precautions

SUBTASK 12-15-61-610-004

- (1) Do not add undiluted lubrizol directly into the shock strut. If you put undiluted lubrizol into a strut it will collect at the bottom and not mix correctly with the fluid. Undiluted lubrizol can cause the strut seals to expand and become soft, which will reduce the service life of the seals.
- (2) To add lubrizol directly into the shock strut, the lubrizol must be pre-mixed with shock strut fluid. You must mix 1 part of lubrizol with 10 parts (minimum) of shock strut fluid before you put the lubrizol into the shock strut.
- (3) When it is necessary to top off the shock strut with fluid. Do not add small quantities of hydraulic fluid without lubrizol many times. This can decrease the lubricity of the fluid in the strut which can cause damage to the strut.

———— END OF TASK ————

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FLIGHT COMPARTMENT WINDOWS - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Inner window surface - cleaning (Glass Type)
 - (2) Outer window surface - cleaning (Glass Type)
 - (3) Inner window surface - cleaning (Acrylic Type)
 - (4) Outer window surface - cleaning (Acrylic Type)

TASK 12-16-02-100-801

2. Clean the Glass Flight Compartment Windows - Inner Surface

A. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
G00834	Cloth - Lint-free Cotton	
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

B. Location Zones

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

C. Prepare to Clean the Inner Surface of the Flight Compartment Windows

SUBTASK 12-16-02-860-001



THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Make sure that the WINDOW HEAT switches are in the OFF position.

SUBTASK 12-16-02-860-002

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

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
B	1	C00055	ANTI-ICE & RAIN WSHLD WIPER RIGHT
B	3	C00054	ANTI-ICE & RAIN WSHLD WIPER LEFT
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464			
D	1	C00226	WINDOW HEAT CONTROL RIGHT FRONT AC
D	2	C00225	WINDOW HEAT CONTROL LEFT SIDE AC
E	1	C00224	WINDOW HEAT CONTROL LEFT FRONT AC
E	2	C00227	WINDOW HEAT CONTROL RIGHT SIDE AC



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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 (Continued)

F/O Electrical System Panel, P6-11

Row Col Number Name

LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464
B 7 C01650 WINDOW HEAT POWER L3

LOM 402

B 7 C00229 WINDOW HEAT POWER L3, L4 & L5

LOM ALL

B 8 C00393 WINDOW HEAT POWER RIGHT SIDE
B 9 C00228 WINDOW HEAT POWER LEFT FRONT

F/O Electrical System Panel, P6-12

Row Col Number Name

LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464
B 7 C01649 WINDOW HEAT POWER R3

LOM 402

B 7 C00395 WINDOW HEAT POWER R3, R4 & R5

LOM ALL

B 8 C00394 WINDOW HEAT POWER RIGHT FRONT
B 9 C00392 WINDOW HEAT POWER LEFT SIDE

These circuit breakers are inoperative and should remain open:

F/O Electrical System Panel, P6-11

Row Col Number Name

LOM 402 POST SB 737-56-1017
B 7 C00229 WINDOW HEAT POWER L4 & L5 (INOP)

F/O Electrical System Panel, P6-12

Row Col Number Name

B 7 C00395 WINDOW HEAT POWER R4 & R5 (INOP)

LOM ALL

D. Clean the Inner Surface of the Flight Compartment Windows

SUBTASK 12-16-02-160-001



DO NOT USE ABRASIVE CLEANERS, OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC-COATED WINDOWS. THESE CLEANERS WILL REMOVE THE HYDROPHOBIC LAYER.

- (1) For airplanes with hydrophobic coated windows, do the step that follows:

NOTE: Hydrophobic coated windows will be identified with the words HYDROPHOBIC COATED WINDSHIELD next to the window part number.

- (a) Use a lint-free cloth, G00834, to apply a 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, to the inner surface of the window.

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SUBTASK 12-16-02-160-002



CAUTION

DO NOT RUB ACRYLIC WINDOWS WITH A DRY CLOTH. IT CAN CAUSE SCRATCHES. A RUBBED WINDOW IS ELECTROSTATICALLY CHARGED AND WILL ATTRACT DUST AND ABRASIVE PARTICLES.

- (2) For airplanes with non-hydrophobic coated windows, do the step that follows:

- (a) Use a lint-free cloth, G00834, to apply a solution of castile soap, G01989, and water to the inner surface of the window.

NOTE: Hydrophobic coated windows will be identified with the words HYDROPHOBIC COATED WINDSHIELD next to the window part number.

SUBTASK 12-16-02-160-003

- (3) Clean the windows with as light a pressure as possible.

SUBTASK 12-16-02-160-004

- (4) Remove the cleaning solution from the windows with clean water.

SUBTASK 12-16-02-160-005

- (5) Wipe the window dry with a chamois cloth, B00106.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-16-02-860-003

- (1) 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>
B	1	C00055	ANTI-ICE & RAIN WSHLD WIPER RIGHT
B	3	C00054	ANTI-ICE & RAIN WSHLD WIPER LEFT
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464			
D	1	C00226	WINDOW HEAT CONTROL RIGHT FRONT AC
D	2	C00225	WINDOW HEAT CONTROL LEFT SIDE AC
E	1	C00224	WINDOW HEAT CONTROL LEFT FRONT AC
E	2	C00227	WINDOW HEAT CONTROL RIGHT SIDE AC

F/O Electrical System Panel, P6-11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464			
B	7	C01650	WINDOW HEAT POWER L3
LOM 402			
B	7	C00229	WINDOW HEAT POWER L3, L4 & L5
LOM ALL			
B	8	C00393	WINDOW HEAT POWER RIGHT SIDE
B	9	C00228	WINDOW HEAT POWER LEFT FRONT

F/O Electrical System Panel, P6-12

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464			
B	7	C01649	WINDOW HEAT POWER R3



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LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464 (Continued)

(Continued)

F/O Electrical System Panel, P6-12

Row Col Number Name

LOM 402

B 7 C00395 WINDOW HEAT POWER R3, R4 & R5

LOM ALL

B 8 C00394 WINDOW HEAT POWER RIGHT FRONT

B 9 C00392 WINDOW HEAT POWER LEFT SIDE

These circuit breakers are inoperative and should remain open:

F/O Electrical System Panel, P6-11

Row Col Number Name

LOM 402 POST SB 737-56-1017

B 7 C00229 WINDOW HEAT POWER L4 & L5 (INOP)

F/O Electrical System Panel, P6-12

Row Col Number Name

B 7 C00395 WINDOW HEAT POWER R4 & R5 (INOP)

LOM ALL

———— END OF TASK ————

TASK 12-16-02-100-802

3. Clean the Glass Flight Compartment Windows - Outer Surface

A. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
G00834	Cloth - Lint-free Cotton	
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

B. Location Zones

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

C. Prepare to clean the Outer Surface of the Flight Compartment Windows

SUBTASK 12-16-02-860-010



THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Make sure that the WINDOW HEAT switches are in the OFF position.

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D. Clean the Outer Surface of the Flight Compartment Windows

SUBTASK 12-16-02-160-009



CAUTION

DO NOT USE ABRASIVE CLEANERS, OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC-COATED WINDOWS. THESE CLEANERS WILL REMOVE THE HYDROPHOBIC LAYER.

- (1) For airplanes with hydrophobic coated windows, do the steps that follow:

- (a) Use a lint-free cloth, G00834, to apply a 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, to the outer surface of the window.

SUBTASK 12-16-02-160-024



CAUTION

DO NOT RUB ACRYLIC WINDOWS WITH A DRY CLOTH. IT CAN CAUSE SCRATCHES. A RUBBED WINDOW IS ELECTROSTATICALLY CHARGED AND WILL ATTRACT DUST AND ABRASIVE PARTICLES.

- (2) For airplanes with non-hydrophobic coated windows, do the steps that follow:

- (a) Use a lint-free cloth, G00834, to apply a solution of castile soap, G01989, and water to the outer surface of the window.

SUBTASK 12-16-02-160-025

- (3) Clean the windows with as light a pressure as possible.

SUBTASK 12-16-02-160-026

- (4) Remove the cleaning solution from the windows with clean water.

SUBTASK 12-16-02-160-027

- (5) Wipe the window dry with a clean, chamois cloth, B00106.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-16-02-860-011

- (1) If necessary, set the WINDOW HEAT switches to the ON position.

———— END OF TASK ————

TASK 12-16-02-100-803

4. Clean the Acrylic Flight Compartment Windows - Inner Surface

A. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
G00834	Cloth - Lint-free Cotton	
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

B. Location Zones

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

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C. Prepare to Clean the Inner Surface of the Flight Compartment Windows

SUBTASK 12-16-02-860-012



THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Make sure that the WINDOW HEAT switches are in the OFF position.

SUBTASK 12-16-02-860-013

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00055	ANTI-ICE & RAIN WSHLD WIPER RIGHT
B	3	C00054	ANTI-ICE & RAIN WSHLD WIPER LEFT
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464			
D	1	C00226	WINDOW HEAT CONTROL RIGHT FRONT AC
D	2	C00225	WINDOW HEAT CONTROL LEFT SIDE AC
E	1	C00224	WINDOW HEAT CONTROL LEFT FRONT AC
E	2	C00227	WINDOW HEAT CONTROL RIGHT SIDE AC

F/O Electrical System Panel, P6-11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464			
B	7	C01650	WINDOW HEAT POWER L3
LOM 402			
B	7	C00229	WINDOW HEAT POWER L3, L4 & L5
LOM ALL			
B	8	C00393	WINDOW HEAT POWER RIGHT SIDE
B	9	C00228	WINDOW HEAT POWER LEFT FRONT

F/O Electrical System Panel, P6-12

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464			
B	7	C01649	WINDOW HEAT POWER R3
LOM 402			
B	7	C00395	WINDOW HEAT POWER R3, R4 & R5
LOM ALL			
B	8	C00394	WINDOW HEAT POWER RIGHT FRONT
B	9	C00392	WINDOW HEAT POWER LEFT SIDE

These circuit breakers are inoperative and should remain open:

F/O Electrical System Panel, P6-11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
LOM 402 POST SB 737-56-1017			
B	7	C00229	WINDOW HEAT POWER L4 & L5 (INOP)

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LOM 402 POST SB 737-56-1017 (Continued)

F/O Electrical System Panel, P6-12

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C00395	WINDOW HEAT POWER R4 & R5 (INOP)

LOM ALL

D. Clean the Inner Surface of the Flight Compartment Windows

SUBTASK 12-16-02-160-029



CAUTION DO NOT USE ABRASIVE CLEANERS, OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC-COATED WINDOWS. THESE CLEANERS WILL REMOVE THE HYDROPHOBIC LAYER.

- (1) For airplanes with hydrophobic coated windows, do the step that follows:

- (a) Use a lint-free cloth, G00834, to apply a 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, to the inner surface of the window.

SUBTASK 12-16-02-160-014



CAUTION DO NOT RUB ACRYLIC WINDOWS WITH A DRY CLOTH. IT CAN CAUSE SCRATCHES. A RUBBED WINDOW IS ELECTROSTATICALLY CHARGED AND WILL ATTRACT DUST AND ABRASIVE PARTICLES.

- (2) For airplanes with non-hydrophobic coated windows, do the step that follows:

- (a) Use a lint-free cloth, G00834, to apply a solution of castile soap, G01989, and water to the inner surface of the window.

SUBTASK 12-16-02-160-015

- (3) Clean the window surface with your bare hand only.

NOTE: Your bare hand can detect dirt before it can scratch the window.

SUBTASK 12-16-02-160-016

- (4) Dry the window with a clean damp chamois cloth, B00106.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-16-02-860-014

- (1) 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>
B	1	C00055	ANTI-ICE & RAIN WSHLD WIPER RIGHT
B	3	C00054	ANTI-ICE & RAIN WSHLD WIPER LEFT

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464

D	1	C00226	WINDOW HEAT CONTROL RIGHT FRONT AC
D	2	C00225	WINDOW HEAT CONTROL LEFT SIDE AC
E	1	C00224	WINDOW HEAT CONTROL LEFT FRONT AC
E	2	C00227	WINDOW HEAT CONTROL RIGHT SIDE AC

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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 (Continued)

F/O Electrical System Panel, P6-11

Row Col Number Name

LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464
B 7 C01650 WINDOW HEAT POWER L3

LOM 402

B 7 C00229 WINDOW HEAT POWER L3, L4 & L5

LOM ALL

B 8 C00393 WINDOW HEAT POWER RIGHT SIDE
B 9 C00228 WINDOW HEAT POWER LEFT FRONT

F/O Electrical System Panel, P6-12

Row Col Number Name

LOM 404, 411, 412, 415, 423, 424, 427, 428, 439, 441, 464
B 7 C01649 WINDOW HEAT POWER R3

LOM 402

B 7 C00395 WINDOW HEAT POWER R3, R4 & R5

LOM ALL

B 8 C00394 WINDOW HEAT POWER RIGHT FRONT
B 9 C00392 WINDOW HEAT POWER LEFT SIDE

These circuit breakers are inoperative and should remain open:

F/O Electrical System Panel, P6-11

Row Col Number Name

LOM 402 POST SB 737-56-1017
B 7 C00229 WINDOW HEAT POWER L4 & L5 (INOP)

F/O Electrical System Panel, P6-12

Row Col Number Name

B 7 C00395 WINDOW HEAT POWER R4 & R5 (INOP)

LOM ALL

SUBTASK 12-16-02-860-015

- (2) Make sure that the WINDOW HEAT switches are in the ON position.

———— END OF TASK ————

TASK 12-16-02-100-804

5. Clean the Acrylic Flight Compartment Windows - Outer Surface

A. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
G00834	Cloth - Lint-free Cotton	
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

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B. Location Zones

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

C. Prepare to Clean the Outer Surface of the Flight Compartment Windows

SUBTASK 12-16-02-860-016



WARNING

THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Make sure that the WINDOW HEAT switches are in the OFF position.

D. Clean the Outer Surface of the Flight Compartment Windows

SUBTASK 12-16-02-160-030



CAUTION

DO NOT USE ABRASIVE CLEANERS, OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC-COATED WINDOWS. THESE CLEANERS WILL REMOVE THE HYDROPHOBIC LAYER.

- (1) For airplanes with hydrophobic coated windows, do the step that follows:

- (a) Use a lint-free cloth, G00834, to apply a 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, to the outer surface of the window.

SUBTASK 12-16-02-160-017



CAUTION

DO NOT RUB ACRYLIC WINDOWS WITH A DRY CLOTH. IT CAN CAUSE SCRATCHES. A RUBBED WINDOW IS ELECTROSTATICALLY CHARGED AND WILL ATTRACT DUST AND ABRASIVE PARTICLES.

- (2) For airplanes with non-hydrophobic coated windows, do the step that follows:

- (a) Use a lint-free cloth, G00834, to apply a solution of castile soap, G01989, and water to the outer surface of the window.

SUBTASK 12-16-02-160-018

- (3) Clean the window surface with your bare hand only.

NOTE: Your bare hand can detect dirt before it can scratch the window.

SUBTASK 12-16-02-160-019

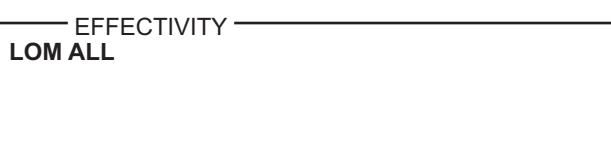
- (4) Dry the window with a clean damp chamois cloth, B00106, or optional lint-free cloth, G00834.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-16-02-160-020

- (1) Make sure that the WINDOW HEAT switches are in the ON position.

———— END OF TASK ————



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PASSENGER COMPARTMENT WINDOWS - SERVICING

1. General

- A. This procedure has these tasks for passenger compartment windows, window plugs and door windows:
 - (1) Clean the passenger compartment windows.
 - (2) Apply antistatic solution to the passenger windows (optional).

TASK 12-16-03-100-801

2. Clean The Passenger Compartment Windows

A. References

Reference	Title
56-21-00-000-801	Removal of a Passenger Cabin Window (P/B 401)
56-21-00-400-801	Passenger Cabin Window Installation (P/B 401)
56-31-00-000-801	Remove the Door-Mounted Windows (P/B 401)
56-31-00-400-801	Install the Door-Mounted Windows (P/B 401)

B. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
G01989	Soap - Castile (Vegetable Oil Based)	

C. Location Zones

Zone	Area
220	Subzone - Passenger Compartment - Body Station 259.50 to 360.00
230	Subzone - Passenger Compartment - Body Station 360.00 to 663.75
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00
831	Forward Entry Door
832	Left Forward Emergency Exit
834	Left Aft Entry Door
841	Forward Galley Service Door
842	Right Forward Emergency Exit
844	Aft Galley Service Door

D. Clean the Passenger Compartment Windows

SUBTASK 12-16-03-020-001

- (1) Do one of the steps as necessary that follows:
 - (a) Do this task: Removal of a Passenger Cabin Window, TASK 56-21-00-000-801.
 - (b) Do this task: Remove the Door-Mounted Windows, TASK 56-31-00-000-801.

SUBTASK 12-16-03-160-001



DO NOT RUB THE SURFACE WITH DRY CLOTH. THIS CAUSES SCRATCHES AND CAN CAUSE AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

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(CAUTION PRECEDES)



CAUTION

DO NOT MOVE THE HEAT SENSOR WIRES WHEN YOU CLEAN THE INNER SURFACE. IF YOU MOVE THE WIRES, IT CAN CAUSE THE ELECTRICAL CONNECTORS TO BECOME LOOSE. IF THE CONNECTORS ARE LOOSE, THEY CAN BECOME TOO HOT AND CAUSE DAMAGE TO THE EQUIPMENT.

- (2) Clean the inner and outer surfaces of the middle and outer window panes with a mixture of lukewarm water and castile soap, G01989.

SUBTASK 12-16-03-100-001

- (3) Rinse the window panes with clean water.

SUBTASK 12-16-03-100-002

- (4) Dry the window panes with a chamois cloth, B00106.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-16-03-600-001

- (1) Apply antistatic solution to the passenger windows (optional) (TASK 12-16-03-600-801).

SUBTASK 12-16-03-420-002

- (2) If it is necessary, do one of the following steps:

- (a) Do this task: Passenger Cabin Window Installation, TASK 56-21-00-400-801.
(b) Do this task: Install the Door-Mounted Windows, TASK 56-31-00-400-801.

————— END OF TASK ————

TASK 12-16-03-600-801

3. Apply Antistatic Solution to the Passenger Compartment Windows

A. General

- (1) The application of antistatic solution is an optional procedure.

B. References

Reference	Title
56-21-00-400-801	Passenger Cabin Window Installation (P/B 401)
56-31-00-400-801	Install the Door-Mounted Windows (P/B 401)

C. 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)
G00073	Agent - Anti-Static (Harry Miller Corporation - Activol 1390-M)	

D. Location Zones

Zone	Area
220	Subzone - Passenger Compartment - Body Station 259.50 to 360.00
230	Subzone - Passenger Compartment - Body Station 360.00 to 663.75
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00
831	Forward Entry Door
832	Left Forward Emergency Exit

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(Continued)

Zone	Area
834	Left Aft Entry Door
841	Forward Galley Service Door
842	Right Forward Emergency Exit
844	Aft Galley Service Door

E. Prepare for the Procedure

SUBTASK 12-16-03-100-003

- (1) Do this task: Clean The Passenger Compartment Windows, TASK 12-16-03-100-801.
 - (a) Do not install the windows at this time.

F. Apply Antistatic Solution to the Passenger Compartment Windows

SUBTASK 12-16-03-620-001

- (1) Apply the antistatic solution to the window as follows:
 - (a) Mix 10 parts of antistatic Activol 1390-M agent, G00073 with 120 parts of water by weight.
 - (b) Soak a boiled piece of cotton wiper, G00034 with the antistatic solution.
 - (c) Apply the antistatic solution to the inner surface of the outer pane and the inner and outer surfaces of the middle pane.
 - (d) Let the window surfaces dry.
NOTE: Do not wet the window surfaces after polishing the windows or it can dissolve the antistatic solution.
 - (e) Polish the window with a dry piece of boiled cotton wiper, G00034.
NOTE: Use brisk straight motions of your hand and maintain as light a pressure as possible.

G. Put The Airplane Back to Its Usual Condition

SUBTASK 12-16-03-420-001

- (1) Do one of the steps that follow:
 - (a) Do this task: Passenger Cabin Window Installation, TASK 56-21-00-400-801.
 - (b) Do this task: Install the Door-Mounted Windows, TASK 56-31-00-400-801.

———— END OF TASK ————





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WASTE TANK - SERVICING

1. General

- A. This procedure has the this task:
- (1) waste tank - servicing

TASK 12-17-01-610-801

2. Waste Tank Servicing

(Figure 301)

A. General

- (1) After you drain the waste tank, you must flush the waste tank, then add a chemical precharge.

B. References

Reference	Title
12-14-01-600-802	Potable Water Tank - Fill (P/B 301)
38-32-00-910-801	Standard Practices for Work with the Toilet Waste and Equipment (P/B 201)
38-42-00-800-802	Potable Water System - Activation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1142	Equipment - Waste System Servicing

D. Consumable Materials

Reference	Description	Specification
B00490	Chemical, Toilet Flushing Deodorant	AMS 1476

E. Location Zones

Zone	Area
144	Area Below Aft Cargo Compartment - Right

F. Access Panels

Number	Name/Location
145AL	Waste Service Door

G. Drain and Flush the Waste Tank

SUBTASK 12-17-01-910-001

- (1) Do this task: Standard Practices for Work with the Toilet Waste and Equipment, TASK 38-32-00-910-801.

SUBTASK 12-17-01-010-001

- (2) Open this access panel:

Number	Name/Location
145AL	Waste Service Door

SUBTASK 12-17-01-860-001

- (3) Open the cap on the service panel drain valve assembly.

SUBTASK 12-17-01-480-001

- (4) Connect the waste drain hose from the toilet service waste system servicing equipment, STD-1142 to the service panel drain valve assembly.

NOTE: The toilet service line pressure should not exceed 8.8 PSID.

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SUBTASK 12-17-01-860-002

- (5) Push the PUSH-TO-OPEN lever on the service panel drain valve assembly.

SUBTASK 12-17-01-680-001

- (6) Drain the waste tank.

- (a) Pull a handle to open the waste drain ball valve.

NOTE: While the tank drains, feel the waste drain hose to make sure the liquid flows.

H. Flush the Waste Tank

SUBTASK 12-17-01-860-004

- (1) Open the cap on the rinse fitting assembly.

SUBTASK 12-17-01-480-002

- (2) Connect a rinse water hose from the toilet service waste system servicing equipment, STD-1142 to the rinse fitting assembly.

- (a) Make sure that the water pressure is a minimum of 30 psig (207 kPa).

NOTE: The recommended rinse water pressure is from 30 psig (207 kPa) to 50 psig (345 kPa). If the water pressure is less than 30 psig (207 kPa), the waste tank will not get clean.

- (b) The maximum water pressure measured at the rinse nozzle is 80 psig (552 kPa).

SUBTASK 12-17-01-170-001

- (3) Flush the waste tank.

- (a) Flush the waste tank with 10 gal (38 l) - 50 gal (189 l) of water.

NOTE: While you flush the tank, feel the waste drain hose to make sure the liquid flows.
Use a minimum of 10 gal (38 l) of fluid to flush the waste tank.

SUBTASK 12-17-01-680-002

- (4) Make sure the liquid drains fully.

SUBTASK 12-17-01-860-005

- (5) At the service panel, push the handle to close the waste drain ball valve.

I. Add the precharge chemical to the waste tank.

SUBTASK 12-17-01-610-001



WARNING

YOU MUST OBEY THE MANUFACTURER'S INSTRUCTIONS WHEN YOU USE THE PRECHARGE CHEMICAL. THE PRECHARGE CHEMICAL IS POISONOUS AND CAN CAUSE CORROSION. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT



CAUTION

DO NOT ADD THE PRECHARGE CHEMICAL TO THE WASTE TANK IF THE AIRPLANE CAN FREEZE. DAMAGE TO THE WASTE SYSTEM CAN OCCUR IF THE PRECHARGE CHEMICAL BECOMES FROZEN.

- (1) Use Procedure I or Procedure II to add the precharge chemical, B00490.

SUBTASK 12-17-01-610-002

- (2) Procedure I - Add the precharge chemical, B00490 liquid through the rinse fitting assembly for each waste tank.

- (a) Connect the precharge hose from the toilet service waste system servicing equipment, STD-1142 to the rinse fitting assembly.

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- (b) Put six gallons of the precharge chemical, B00490 into the waste tank.
- (c) Disconnect the precharge hose from the rinse fitting assembly.

NOTE: Keep the rinse fitting assembly open for approximately one minute to permit the liquid to drain from the line.

- (d) Close the cap on the rinse fitting assembly.

SUBTASK 12-17-01-610-003

- (3) Procedure II - Use one of the toilets to add the precharge chemical, B00490.
 - (a) If it is necessary, do this task: Potable Water Tank - Fill, TASK 12-14-01-600-802.
 - (b) If it is necessary, do this task: Potable Water System - Activation, TASK 38-42-00-800-802.
 - (c) Put a quantity of the dry precharge chemical, B00490 (per the manufacturer instructions) in an aft toilet.
 - (d) After you put the dry precharge chemical, B00490 in the applicable toilet, operate the toilet 2 to 3 times.
 - NOTE: This will make sure the precharge chemical, B00490 is in the waste tank.
 - (e) Put 6 gal (23 l) of water into the waste water tank.

SUBTASK 12-17-01-080-001

- (4) Disconnect the waste drain hose from the service panel drain valve assembly to the toilet service waste system servicing equipment, STD-1142.

SUBTASK 12-17-01-790-001



DO NOT LET LIQUID STAY IN THE LINES. FROZEN LIQUIDS CAN CAUSE DAMAGE TO THE WASTE SYSTEM.

- (5) Make sure there is no liquid leakage from the waste service panel.

SUBTASK 12-17-01-860-008

- (6) Push the flapper on the service panel drain valve assembly to close the service panel drain valve assembly.

SUBTASK 12-17-01-860-007

- (7) Close the cap for the service panel drain valve assembly.

SUBTASK 12-17-01-160-001

- (8) Clean all the components and the door for the waste service panel.
 - (a) Dry all the components and the door for the waste service panel.

SUBTASK 12-17-01-410-001

- (9) Close this access panel:

Number Name/Location

145AL Waste Service Door

SUBTASK 12-17-01-710-001

- (10) Make sure all the toilets operate.

———— END OF TASK ————

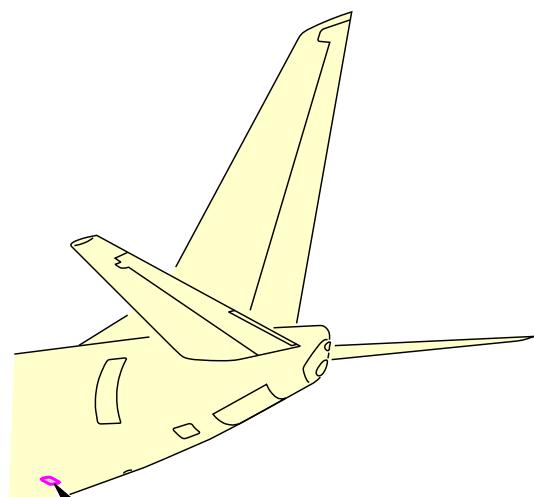
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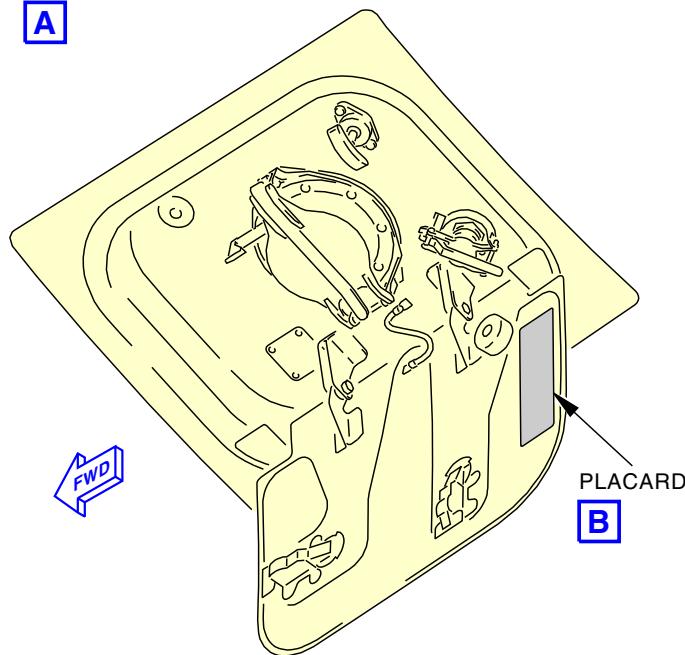


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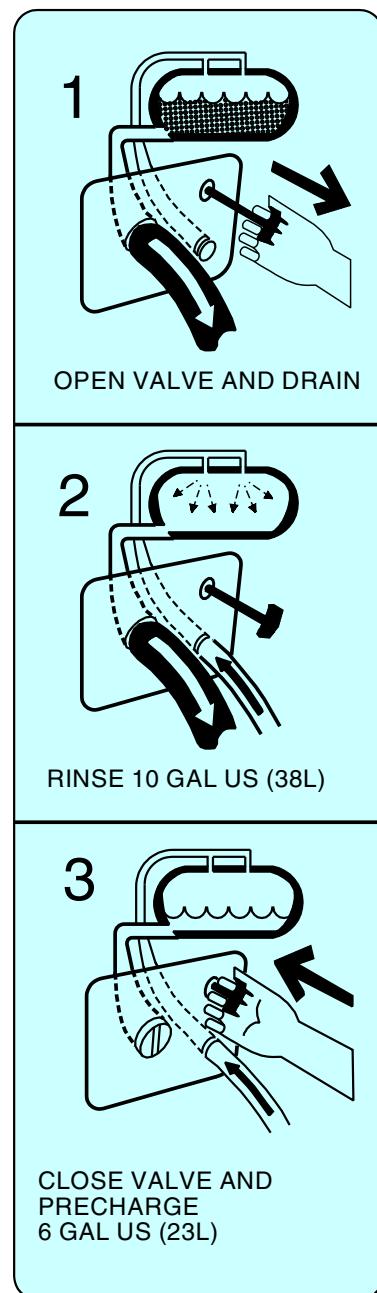
WASTE TANK SERVICE PANEL

A



WASTE TANK SERVICE PANEL

A



PLACARD

B

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Waste Tank Servicing
Figure 301/12-17-01-990-810 (Sheet 1 of 3)

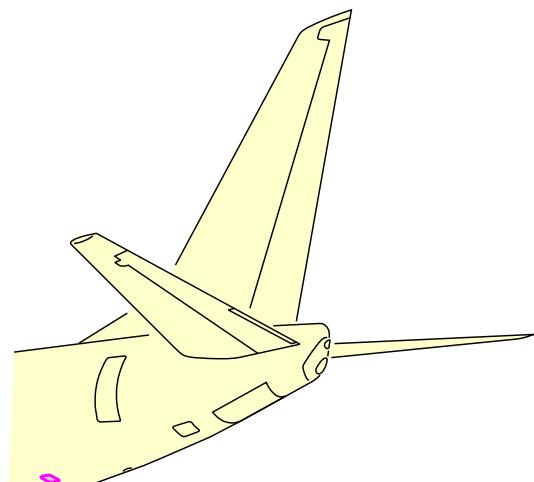
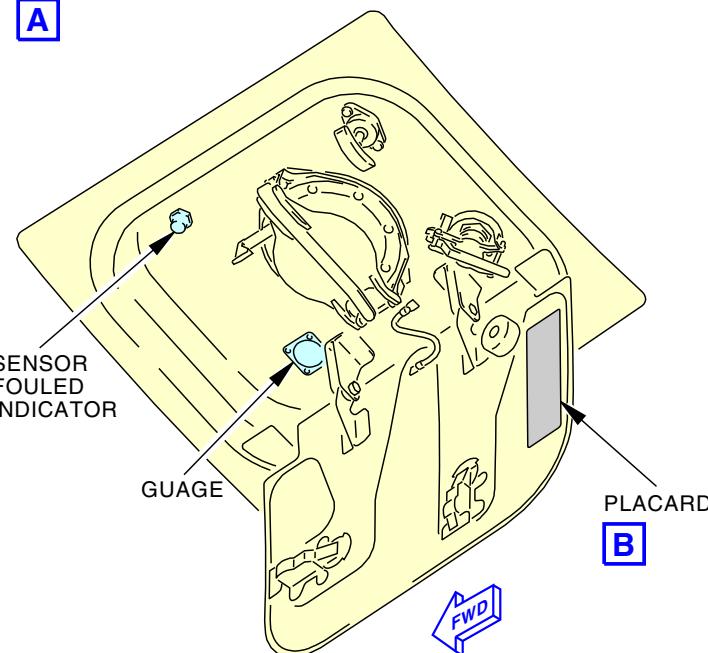
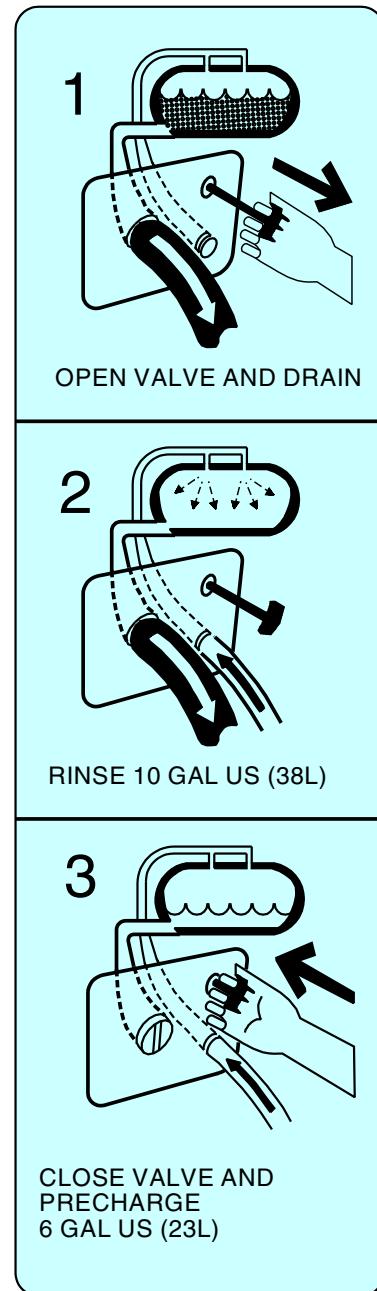
EFFECTIVITY
LOM 402, 406, 407, 411, 412, 415, 420, 422-431, 433,
434, 437-442, 445-447, 450-999

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

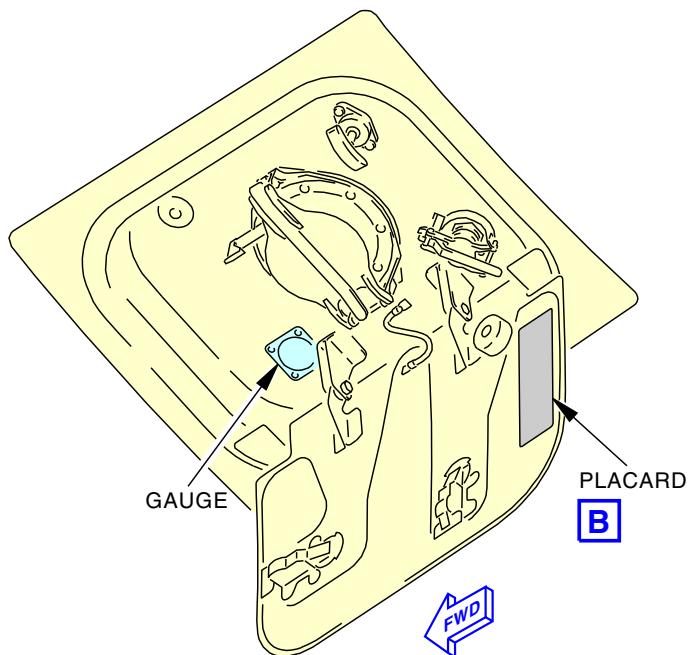
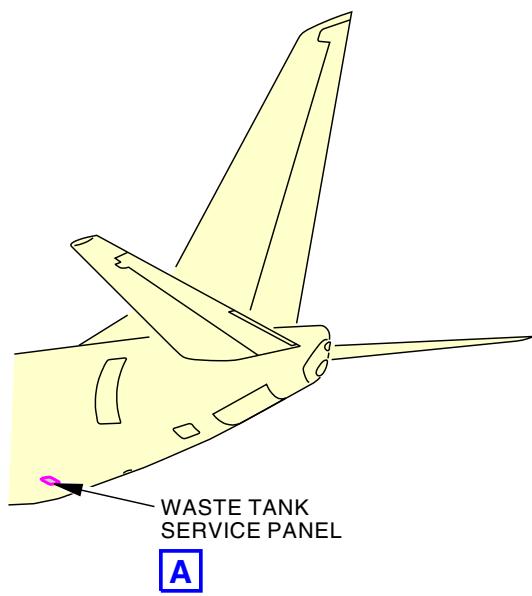
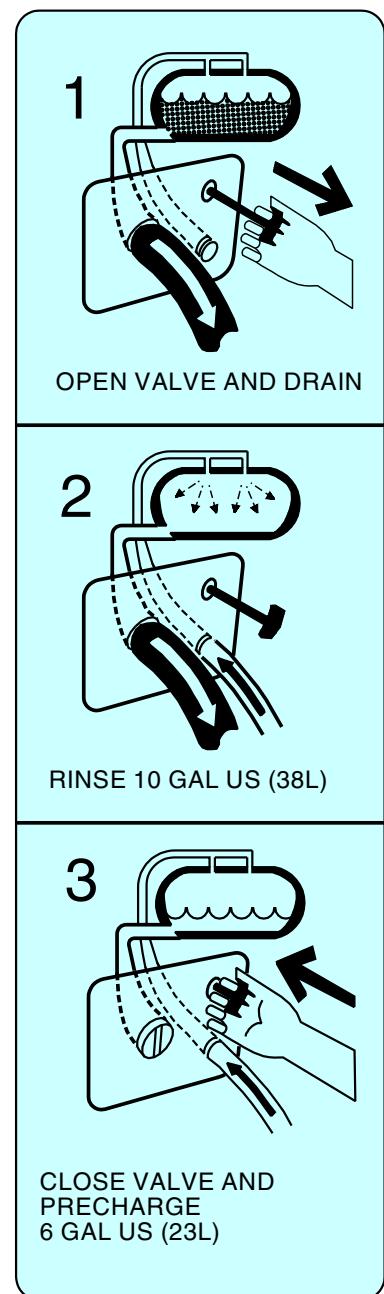
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**WASTE TANK
SERVICE PANEL**
A

WASTE TANK SERVICE PANEL
A

PLACARD
B

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Waste Tank Servicing
Figure 301/12-17-01-990-810 (Sheet 2 of 3)
EFFECTIVITY
LOM 432, 443, 444
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WASTE TANK SERVICE PANEL
A


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Waste Tank Servicing
Figure 301/12-17-01-990-810 (Sheet 3 of 3)

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LOM 404, 416
12-17-01

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AIRPLANE LUBRICATION - SERVICING

1. General

- A. This procedure contains these tasks:
 - (1) General Instruction for Lubrication
 - (2) Intermixing or Purging of Greases
 - (3) Lubrication of Landing Gear During Cold Weather Operation

TASK 12-20-00-640-801

2. General Instructions for Lubrication

A. General

- (1) Description
 - (a) This section of the Aircraft Maintenance Manual (AMM) gives the usual on-airplane lubrication procedures. Specific data about where to lubricate is given in the subsequent subjects of this section.
 - (b) There are other lubrication instructions in other Air Transport Association (ATA) sections of the AMM about equipment removal and replacement.
- (2) General-Purpose Aviation Grease
 - (a) Boeing chooses the grease to use based on the specific application. Greases that meet the following specifications are considered general-purpose aviation grease for applications that operate in the -100°F (-73°C) to 250°F (121°C) range:
 - 1) grease, D00633
 - 2) grease, D00013
 - (b) grease, D00633 is the preferred general-purpose aviation grease recommended by Boeing for applications exposed to temperatures of less than 250°F (121°C). It is recommended because it shows better wear, corrosion protection, and low temperature torque properties.
 - 1) grease, D00633 is satisfactory to be used:
 - a) When grease, D00013 was specified.
 - 2) grease, D00633 cannot be used where Royco 11MS grease, D00528 is the only grease specified because grease, D00633 was found not to be satisfactory in heavily loaded sliding applications.
 - 3) Greases that have been used before and approved by Boeing for the specific assembly are listed as flag notes on the lubrication instructions for the specific assembly. If there is an application where only one grease must be used, it will be listed with the word "Only" after it.
- (3) Special Performance Greases
 - (a) Special performance greases include:
 - 1) Royco 11MS grease, D00528
 - 2) grease, D00016
 - (b) In some applications, a special purpose grease is necessary. Where only one grease is recommended for a specific application, it will be listed with the word "Only" after it.
- (4) Other Lubricants
 - (a) Landing gear shock strut fluid, D00467, Anti-Wear.

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- (b) hydraulic fluid, D50090, Petroleum base, Aircraft.
 - (c) Lubricating oil, D00091, General Purpose, Low Temperature.
- (5) Lubrication Symbols
- (a) Lubrication blocks are used to show the part or unit to be lubricated
 - (b) Examples of Lubrication blocks used in the manual are shown in Lubrication Symbols (Figure 301). If necessary, more data is given near the lubrication block to help you lubricate the airplane correctly. Each block shows this data:
 - 1) The lubrication method.
 - 2) The type of lubricant.
 - 3) The access panel number is given above or below the lubrication block for points if it is not easy to find the area you must lubricate.
 - (c) More data on commonly used grease is available in Boeing Service Letter 737-SL-20-027, Summary of Most Commonly Used Greases on Boeing Airplanes.

B. References

Reference	Title
20-10-24 P/B 401	LUBRICATION FITTINGS - 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
SPL-4879	Coupler - Grease, Midget Part #: 314150 Supplier: 0FKM1

D. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00016	Grease - Aircraft, General Purpose, Wide Temperature Range	MIL-PRF-81322
D00091	Oil - General Purpose, Low Temperature, Lubricating	MIL-PRF-7870 (NATO O-142)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00528	Grease - Aircraft - Royco 11MS	
D00633	Grease - Aircraft General Purpose	BMS3-33
D50090	Hydraulic Fluid - Petroleum Base NATO H-515 PETROLEUM BASE AIRCRAFT HYDRAULIC FLUID	MIL-PRF-5606H (NATO H-515)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Lubrication Application Procedures and Cautions

SUBTASK 12-20-00-640-001

- (1) Do these steps to prevent lubricant contamination:

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- (a) Put lubricant identification labels on all containers, guns, and dispensers.
- (b) Keep lubricants in containers that have tight covers.
 - 1) Make sure that the container material will not absorb contamination.
- (c) Do not let contamination get in the lubricant.
 - 1) Keep out dust and other contamination when the container is open.
 - 2) Keep the grease guns, brushes, and oil cans clean.

SUBTASK 12-20-00-640-003

- (2) Do these steps for correct lubrication:



CAUTION

DO NOT LET DIRT, METAL PARTICLES, AND OTHER UNWANTED MATERIAL GET IN THE LUBRICANT. CONTAMINATION IN THE LUBRICANT WILL CAUSE DAMAGE TO THE COMPONENT.



WARNING

DO NOT SET THE GUN TO A PRESSURE OF MORE THAN THE LIMIT GIVEN. TOO MUCH PRESSURE WILL CAUSE THE FITTING TO COME OUT AT A HIGH SPEED. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (a) Remove dirt from the grease fittings before you attach the grease gun.
- (b) Make sure that the maximum operating pressure is less than 2500 psi (17,237 kPa).
- (c) Set the pressure at 100 psi (689 kPa) to 200 psi (1379 kPa) unless otherwise specified.

NOTE: The grease pressure delivered by a specific grease gun should be measured or estimated from the manufacturer's specifications. Refer to the manufacturer's information for pumping ratios. Use an inlet air pressure that will result in a maximum operating pressure of 2500 psi (17,237 kPa) that is calculated using the pumping ratios.

NOTE: This is usually sufficient to push out the used grease.

NOTE: Use of pneumatic or electric grease guns is not recommended unless the grease delivery pressure can be measured or controlled. Manually operated grease guns with maximum operating pressures of 2500 psi (17,237 kPa) or less are recommended. Use low input forces to operate the gun.
- (d) Find all of the lubrication points that are identified in the specific maintenance task.
 - 1) Use the specified lubricant.
 - 2) Use grease coupler, SPL-4879 for flush-type grease fittings.
 - 3) Apply all lubricants slowly and smoothly.
 - 4) Dispense grease into the grease fitting until the used grease is visually removed and only new grease comes out.

NOTE: This removes contamination along with the used grease.
- (e) After lubrication, remove the unwanted grease or lubricating fluid that is around the part or on other parts with a cotton wiper, G00034 to prevent contamination and damage to other surfaces.

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CAUTION

LUBRICATE ONLY THE COMPONENTS THAT HAVE LUBRICATION FITTINGS. DO NOT LUBRICATE TEFLON BEARINGS AND BUSHINGS. LUBRICANTS CAUSE DAMAGE TO THE TEFLON, AND DECREASE THE LIFE OF THE BEARINGS.

- (f) Do not lubricate Teflon bearings and bushings.
NOTE: It is not necessary to lubricate these bearings.
- (g) If a grease fitting comes out, do these steps:
 - 1) Look for blockage in the fitting or part.
 - 2) If it is necessary, disassemble the part to remove the blockage.
 - 3) Install a new fitting LUBRICATION FITTINGS - REMOVAL/INSTALLATION, PAGEBLOCK 20-10-24/401.
- (h) Be careful when you lubricate sealed-ball, or sealed-roller bearings that have a grease fitting.
 - 1) Do not push the seal out with the grease.
 - 2) Use a restrictor-type adapter to decrease the flow rate of the grease.
 - 3) Stop the operation if the shape of the seal starts to change, or if the grease comes out of the bearing.

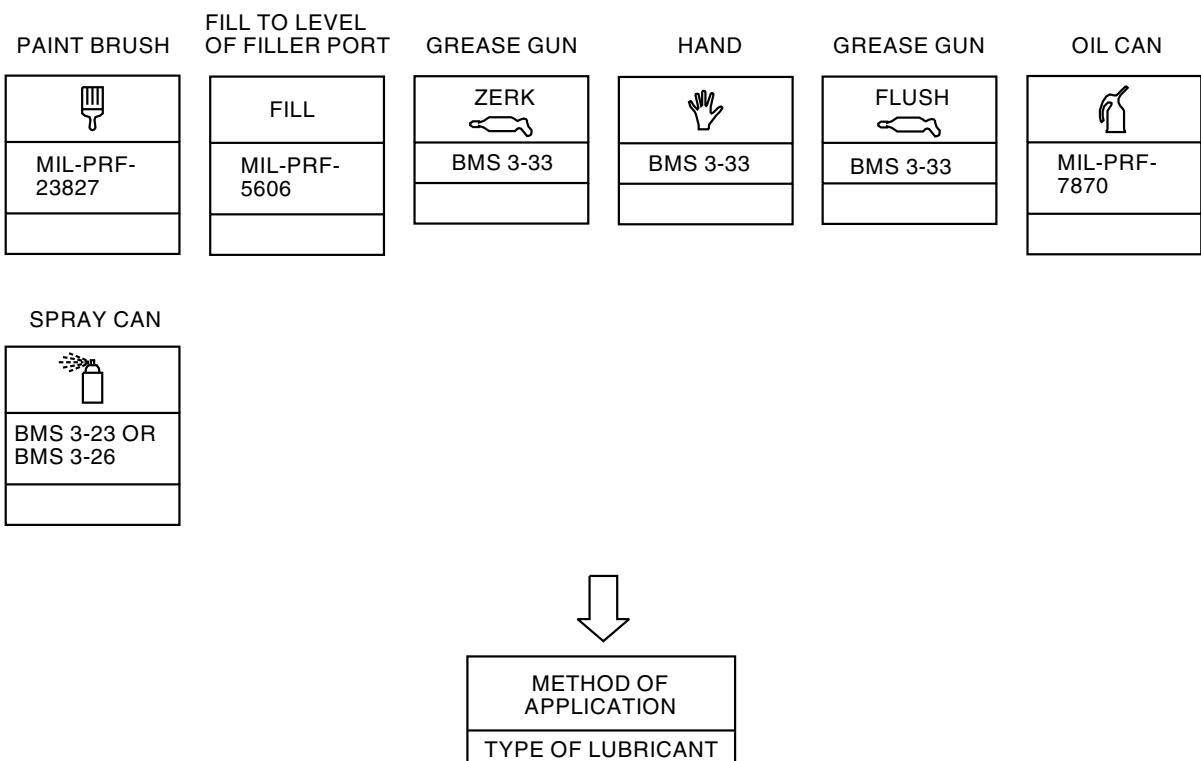
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(SAMPLE SYMBOLS)

G47040 S0006561369_V4

Lubrication Symbols
Figure 301/12-20-00-990-801

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TASK 12-20-00-640-802

3. Intermixing or Purging of Greases

A. General

- (1) Boeing and grease manufacturers agree it is a best practice to limit intermixing of different types or brand-names of grease.
- (2) If you mix two different types or brand-names of greases, the performance and properties of the mixture may be degraded when compared with the performance and properties of the original, unmixed greases.
- (3) Use a different grease (alternative, optional, or brand-name) only after you remove the used grease as discussed below either by pumping or disassembly.
- (4) **Purging**
 - (a) Purging is the industry-recognized practice of replacing one grease with another. It is also the recommended procedure to be followed in all lubrication tasks, even when not switching from one grease brand or type to another. It is used to ensure that as much of the used grease as possible or practical is removed from the assembly and is replaced by new grease.
 - 1) Purge the grease only when it is not possible or practical to disassemble to remove the used grease.
 - 2) The new grease can be the same type or a different type of grease if permitted for the application.
 - 3) Purging removes the contamination (wear debris, etc.) along with the used grease.
 - (b) Purging applies both to greasing with a new brand of grease and to usual greasing with the same grease.
 - (c) When an assembly is purged with a new brand of grease, a quantity of the previously used grease can continue to be in the assembly. The subsequent purging from the second and third lubrication operations with the new grease will decrease the remaining concentration of the previously used grease.

B. Procedure

SUBTASK 12-20-00-640-004

- (1) Make sure that the grease that you use is permitted by the specific AMM instructions and your local maintenance practices.

SUBTASK 12-20-00-640-005

- (2) Where surfaces are exposed or disassembly is a practical part of the lubrication procedure (e.g., wheel bearings), do these steps to replace the used grease:
 - (a) Remove all of the used grease from the bearing surfaces, and internal spaces of the mechanism with wipes
 - (b) Lubricate the bearing surfaces with the new grease

SUBTASK 12-20-00-640-006

- (3) Where it is not possible or practical to disassemble the mechanism, do these steps to purge the used grease:
 - (a) Slowly put the new grease into each grease fitting.
 - (b) Continue to add grease until all used grease is visually removed and only the new grease comes out.

———— END OF TASK ————

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TASK 12-20-00-600-801

4. Lubrication of Landing Gear During Cold Weather Operation

A. General

- (1) This task provides maintenance instructions for the landing gear during cold weather operation. For the purposes of this task, cold weather is defined as the point where the temperature drops below 32°F (0°C).



MAKE SURE THAT YOU OBEY WITH SPECIAL PRECAUTIONS RECOMMENDED BY MANUFACTURER WHEN YOU LUBRICATE THE LANDING GEAR BELOW 32 DEG F (0 DEG C). THE GREASE WILL FLOW CORRECTLY AT APPLICABLE TEMPERATURE OPERATION. IF YOU DO NOT OBEY, YOU WILL NOT LUBRICATE JOINT CORRECTLY AND THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (2) Landing gear maintenance such as lubrication, shock strut servicing, and tire servicing are affected by cold weather operation. Proper maintenance procedures during cold weather operation for landing gear can help reduce degradation of the structural joints and ensure optimal shock strut performance. Lubrication is affected at lower temperatures due to increased viscosity of the grease and/or restricted (blocked) lubrication passages due to frozen moisture. Shock strut servicing and tire servicing are affected due to the reduced volume of air/nitrogen at lower temperatures. Special precautions, as described in this procedure, should be taken to ensure that the landing gear is properly maintained. Improperly maintained landing gear can potentially lead to excessive wear of bushings/joints, corrosion, heat damage, component fractures and reduced shock absorption capability.
- (3) Washing the landing gear should be avoided or reduced in frequency as much as possible. The practice of washing removes protective grease films in bearings and joints and accelerates corrosion and wear. When it is necessary to wash the gear for inspection purposes, it is recommended to re-grease the entire gear within approximately six hours to displace moisture and detergents.

B. References

Reference	Title
12-15-31-610-801	Main Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-41-610-801	Nose Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)

C. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00504	Grease - Petrolatum	VV-P-236

D. Landing Gear Structures Maintenance

SUBTASK 12-20-00-640-007

- (1) Where possible, perform scheduled lubrication at maintenance bases where the weather is above 32°F (0°C), or in a heated hangar.

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SUBTASK 12-20-00-640-009

- (2) If necessary, use pressurized equipment to enable the grease to reach all surfaces of the joint.

NOTE: Attempting to grease a joint at higher pressures increases the risk of dislodging a lube fitting.

SUBTASK 12-20-00-640-010

- (3) Heat the landing gear structure using one of the methods below. The minimum time required to warm the structure is dependent on the surrounding temperature.

- (a) Blow hot air directly onto the structure

- 1) Position the heater so that the warm air is directed to each zerk fitting and lubrication cavity prior to lubrication.

- (b) Blow hot air into an enclosure around the structure

- 1) Use a tent-like enclosure (fabricated tent or parachute) made from heavy-duty material that is large enough to enclose the entire truck assembly.

NOTE: You can also use the cover for wheel/tire/brake protection during deicing/anti-icing or washing of the aircraft.

SUBTASK 12-20-00-640-011

- (4) Apply heat until the "touch temperature" of the steel landing gear structure (not the surrounding air temperature) has warmed above 32°F (0°C).

- (a) Use a thermocouple or infrared device to determine the temperature of the structure.

SUBTASK 12-20-00-640-012

- (5) Do not apply the heated air directly to the tires, as high temperatures can damage tires.

SUBTASK 12-20-00-640-013

- (6) Use one of the following heat sources to supply hot air directly to the structure or to the confined (tent) area surrounding the structure:

- (a) Space heaters (commercially available and can be used inside or outside hangars).

- (b) Spencer Coldbuster Mark IV Flameless Heaters (can be used only outside or placed outside with ducting to direct hot air into the hangar/tented area).

- (c) Herman-Nelson or Polar GSH-1 Heaters (placed outside with heat output directed into the hangar/tented area).

- (d) Electric powered heaters (commercially available and may be used when the airplane is parked at the gate).

- (e) Electric heat blankets connected to the airplane power.

SUBTASK 12-20-00-640-014

- (7) Continue to supply hot air to the area until the re-lubrication is completed.

SUBTASK 12-20-00-640-015

- (8) To ensure that grease can flow freely, make sure that the grease gun itself is warmed to room temperature prior to grease application.

- (a) Heat the grease gun and spare grease tube using a portable grease gun heater for approximately 15 minutes.

SUBTASK 12-20-00-640-016

- (9) If you find a plugged lubrication passage, do these steps:

- (a) Fill a hand-held grease gun with a warm mineral-based oil such as fluid, D00070.

- (b) Flush the joint using a rapid pumping action.

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- (c) Purge the oil with grease (Intermixing or Purging of Greases, TASK 12-20-00-640-802).
- (d) If the passage is still blocked or if the fitting becomes dislodged, do these steps:
 - 1) Disassemble the joint to remove the blockage.
 - 2) Install a new fitting.

SUBTASK 12-20-00-640-017

- (10) If desired, you may use a Grease Joint Rejuvenator to open clogged grease joints and fittings.

E. Shock Strut Maintenance and Servicing

SUBTASK 12-20-00-640-018

- (1) During cold weather operation, some leakage of the shock strut fluid may occur. Minor leakage is acceptable.
 - (a) To prevent leakage during long layovers at temperatures below 0°F (-18°C), apply grease, D00504 to cover the gap between the gland nut and inner cylinder.

SUBTASK 12-20-00-880-002

- (2) For airplanes originating in a warm environment and terminating in a cold environment, do these steps:
 - (a) At the origin, over-inflate the shock struts by approximately 1 in. (25 mm).
 - (b) At the destination, perform a pressure/extension check (Main Landing Gear Shock Strut Fluid Check, TASK 12-15-31-610-801 or Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-41-610-801).
 - 1) If you will use a two-point check, do these steps:
 - a) Make sure that the difference in ambient temperature at which the two measurements are made is not more than 20°F (-7°C).
 - b) Take the first measurement when the airplane is empty after arrival.
 - c) Take the second measurement when the airplane is fully loaded, at the same location as the first.
 - 2) If the strut is under-inflated, then service with nitrogen to bring the strut back onto the low end of the servicing band.

SUBTASK 12-20-00-710-001

- (3) For airplanes originating in a cold environment and terminating in a warm environment, do these steps:
 - (a) At the origin, perform a pressure/extension check (Main Landing Gear Shock Strut Fluid Check, TASK 12-15-31-610-801 or Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-41-610-801).
 - 1) If the strut is under-inflated, then service with nitrogen to bring the strut back onto the low end of the servicing band.
 - (b) At the destination, re-service the strut only if the airplane will remain in service in a warm environment.

NOTE: When the airplane arrives in the warmer location, the shock strut will appear slightly over-inflated. It is not recommended to re-service the strut if the airplane will soon return to a colder environment.

SUBTASK 12-20-00-210-001

- (4) Do these steps to ensure that the shock strut scraper functions properly:
 - (a) Wipe the chrome surface of the landing gear inner cylinder with fluid, D00467.

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- (b) Inspect the scraper ring and shock strut seals to make sure that there is no damage.

F. Parking and Tire Maintenance

SUBTASK 12-20-00-550-001

- (1) Do one of the following steps to park the airplane in an area where there is snow, ice, or slush:
- (a) If possible, clear snow, ice, or slush from the areas directly under where the main and nose gear tires will be positioned, prior to parking the airplane.
 - (b) If the parking area is covered with packed snow or ice, park the airplane with the main gear tires on a thin layer of sand or a mat.

SUBTASK 12-20-00-880-003



DO NOT TRY TO MOVE THE AIRPLANE IF THE TIRES ARE FROZEN TO THE GROUND. MAKE SURE THAT THE WHEELS TURN WHEN YOU MOVE THE AIRPLANE. IF THE WHEELS DO NOT TURN, DAMAGE TO THE WHEELS AND THE AIRPLANE CAN OCCUR.

- (2) If wheel assemblies are frozen to the ramp, thaw ice around the tires with a ground heater, or soften ice by spraying a glycol mixture around the base of the tires.
- (a) Make sure that the glycol or deicing fluid is not applied to the brake assemblies.

SUBTASK 12-20-00-610-001

- (3) For airplanes originating in a warm environment and terminating in a cold environment, do these steps:
- (a) Service the tires (Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801) to ensure that they have sufficient pressure, even if the airplane will fly to a warmer environment.
- NOTE: It is better for the tires to be slightly over-inflated in a warmer environment than under-inflated in a colder environment.

NOTE: If the airplane sits stationary in cold weather, the tires may develop flat spots. These flat spots are temporary and will go away when the tires are rolled. However, they may cause objectionable vibration during taxi or takeoff.

- (4) If desired, taxi the airplane to smooth out the flat spots.

— END OF TASK —

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MAIN LANDING GEAR - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) A servicing of the main landing gear upper end components
 - (2) A servicing of the main landing gear lower end components
 - (3) A servicing of the main landing gear bushings.
- B. This procedure shows only the left main landing gear, but it is applicable to the right main landing gear also.

TASK 12-21-11-640-801

2. Main Landing Gear Upper End Components Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the upper end components of the main landing gear.

B. References

Reference	Title
20-10-24-420-801	Lubrication Fitting Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
C00755	Compound - Organic Corrosion Inhibiting, Heavy Duty	BMS3-26
D00633	Grease - Aircraft General Purpose	BMS3-33
G00009	Compound - Organic Corrosion Inhibiting	BMS3-23

D. Location Zones

Zone	Area
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
734	Left Main Landing Gear
744	Right Main Landing Gear

E. 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

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F. Prepare for the Main Landing Gear Upper End Components Servicing

SUBTASK 12-21-11-480-001



WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL 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 12-21-11-010-001

- (2) 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

NOTE: You must open this panel to lubricate the walking beam assembly, actuator assembly, and the retraction link assembly.

G. Main Landing Gear Upper End Components Servicing

SUBTASK 12-21-11-840-001



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (1) Put on protective gloves and eye protection.

SUBTASK 12-21-11-640-001



CAUTION

YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA) WHEN YOU LUBRICATE THE MAIN LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA), YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (2) Use the grease gun to lubricate the main landing gear with grease, D00633 (Figure 301, Table 301).

NOTE: The table makes a list of all the lubrication fittings for the upper end components of the main landing gear.

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Table 301/12-21-11-993-805 Main Landing Gear Upper End Components Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	WALKING BEAM ASSEMBLY	BMS3-33	Zerk	3
2	ACTUATOR ASSEMBLY	BMS3-33	Zerk	3
3	RETRACTION LINK ASSEMBLY	BMS3-33	Zerk	1
4	ACTUATOR ATTACH PIN	BMS3-33	Zerk	1
5	WALKING BEAM ATTACH PIN	BMS3-33	Zerk	1
6	OUTER CYLINDER *[1]	BMS3-33	Zerk	7
7	AFT TRUNNION BEARING	BMS3-33	Zerk	1
8	FORWARD TRUNNION BEARING HOUSING	BMS3-33	Zerk	1
9	UPPER DOWNLOCK LINK ASSEMBLY	BMS3-33	Zerk	4
10	LOWER DOWNLOCK LINK ASSEMBLY	BMS3-33	Zerk	2
11	HANGER LINK ASSEMBLY	BMS3-33	Zerk	2
12	UPPER SIDE STRUT	BMS3-33	Zerk	4
13	LOWER SIDE STRUT	BMS3-33	Zerk	2
14	LOWER DOWNLOCK PIN	BMS3-33	Zerk	1
15	REACTION LINK ASSEMBLY	BMS3-33	Zerk	6
16	OUTER CYLINDER BUSHING	corrosion inhibiting compound, G00009 OR compound, C00755	SPRAY	2

*[1] It is necessary that the two trunnion zerk fittings on the outer cylinder be lubricated with BMS 3-33 grease as an alternative to the BMS 3-27 grease that is called out on the yellow decal.

SUBTASK 12-21-11-420-001

- (3) If a fitting blows off, do these steps:
 - (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-24-420-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-11-010-002

- (1) Close the applicable access panels:

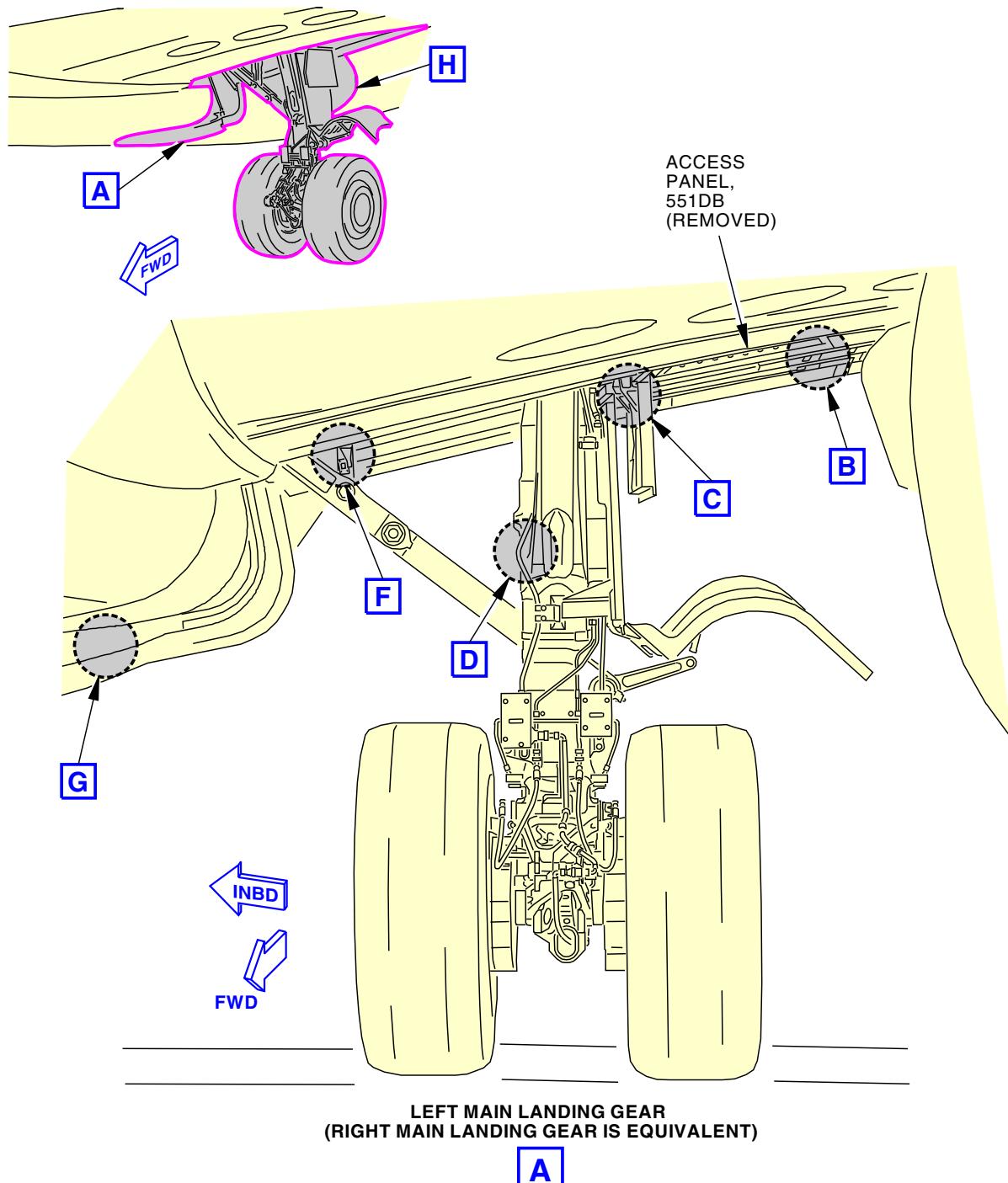
Number Name/Location

- | | |
|-------|--|
| 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 |

———— END OF TASK ————

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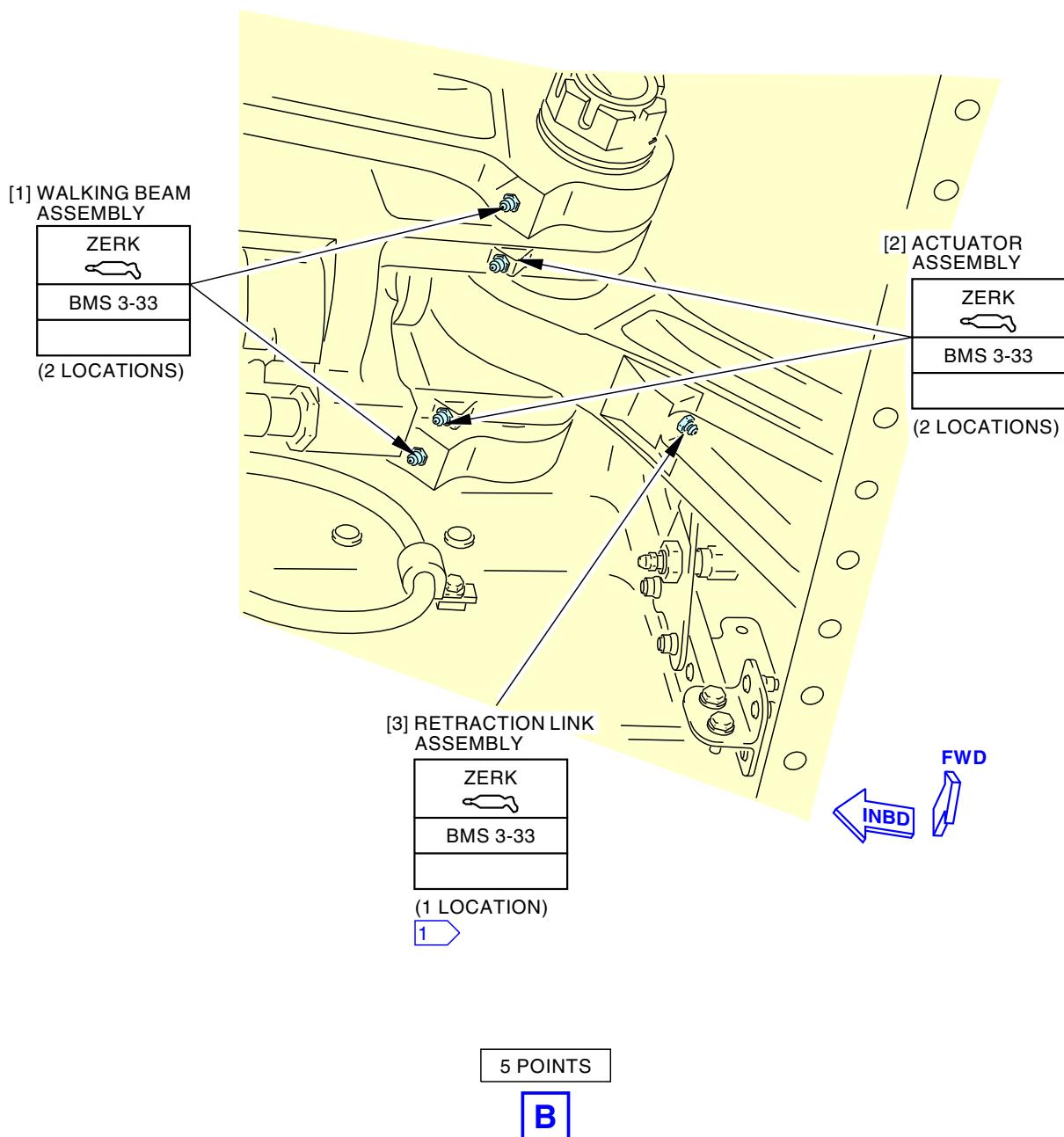
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**Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 1 of 8)**

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1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
LUBRICATE ONLY ONE LUBE POINT.

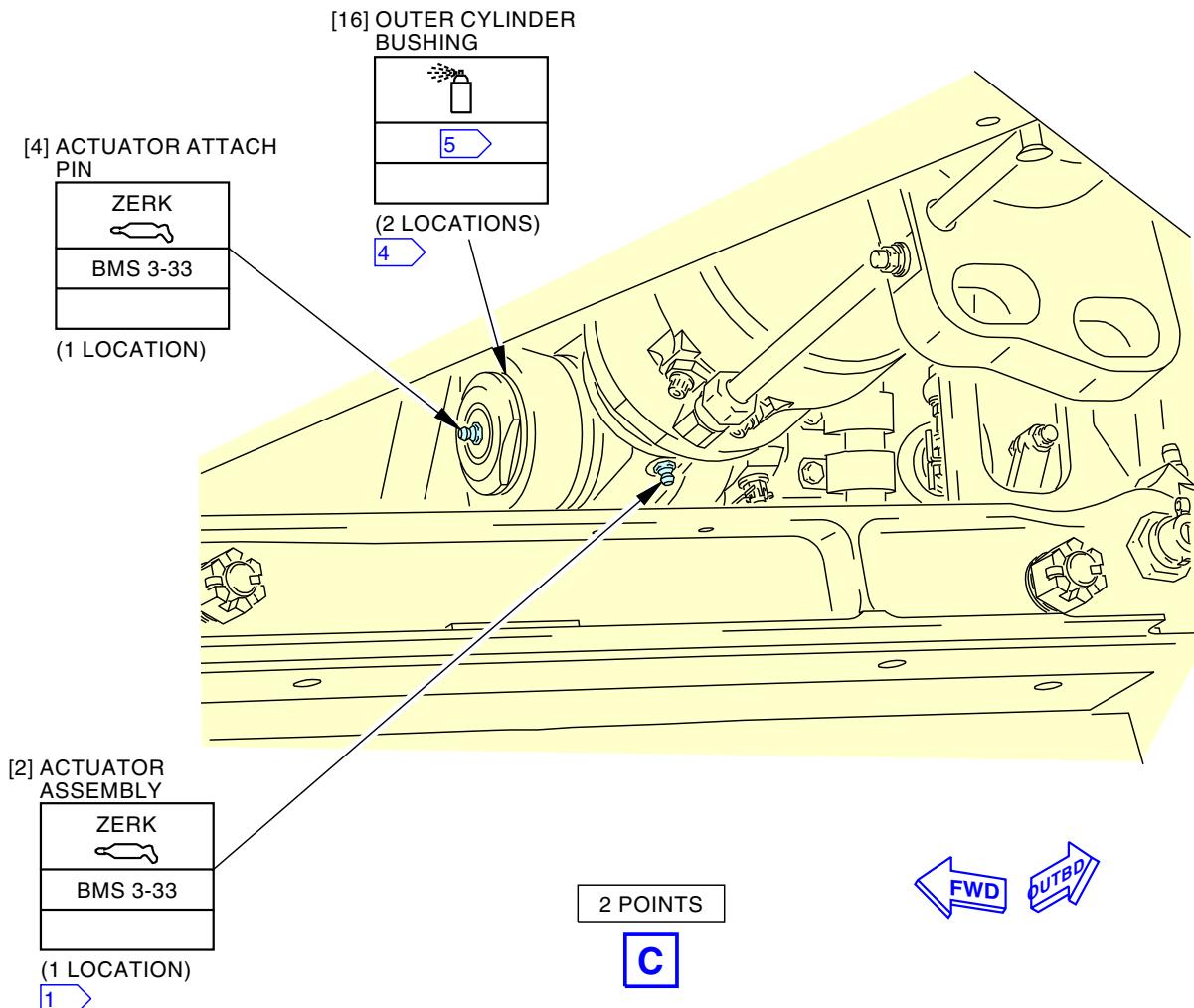
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**Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 2 of 8)**

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- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN). LUBRICATE ONLY ONE LUBE POINT
- 4 ONE MORE BUSHING IS ON THE OPPOSITE SIDE UNDER THE NUT AND WASHER.

- 5 BUSHINGS WITH PAINTED WITNESS LINE (OR EQUIVALENT IDENTIFICATION MARK), DO THESE STEPS:
- LUBRICATE THE JOINT
 - APPLY BMS 3-23 OR BMS 3-26. COMPOUND, POINT THE SPRAY AROUND THE BUSHING FLANGE BETWEEN THE BUSHING AND THE MATING LUG SURFACE.
 - LUBRICATE THE JOINT AGAIN TO REMOVE ALL COMPOUND FROM THE JOINT.

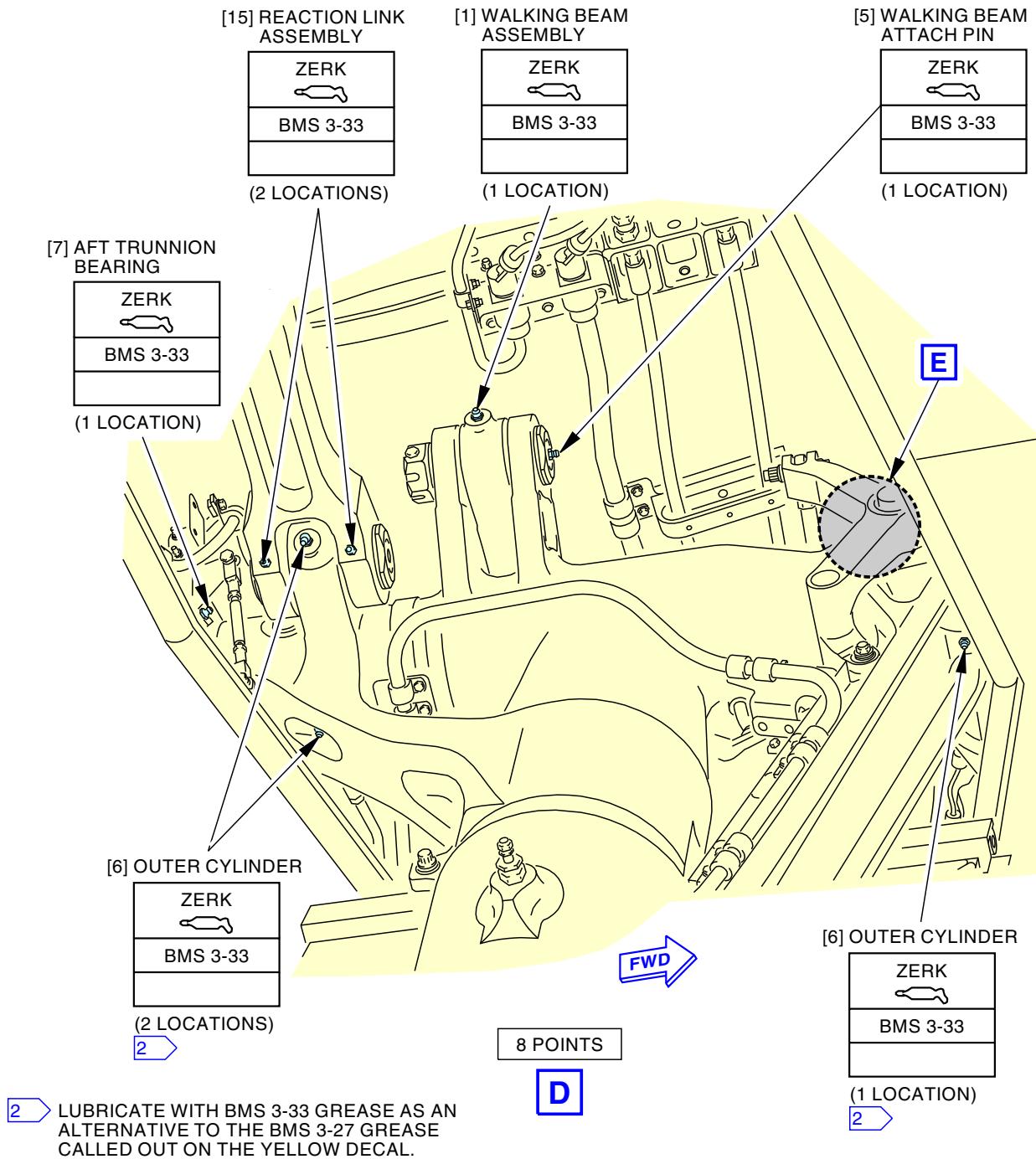
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Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 3 of 8)

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**Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 4 of 8)**

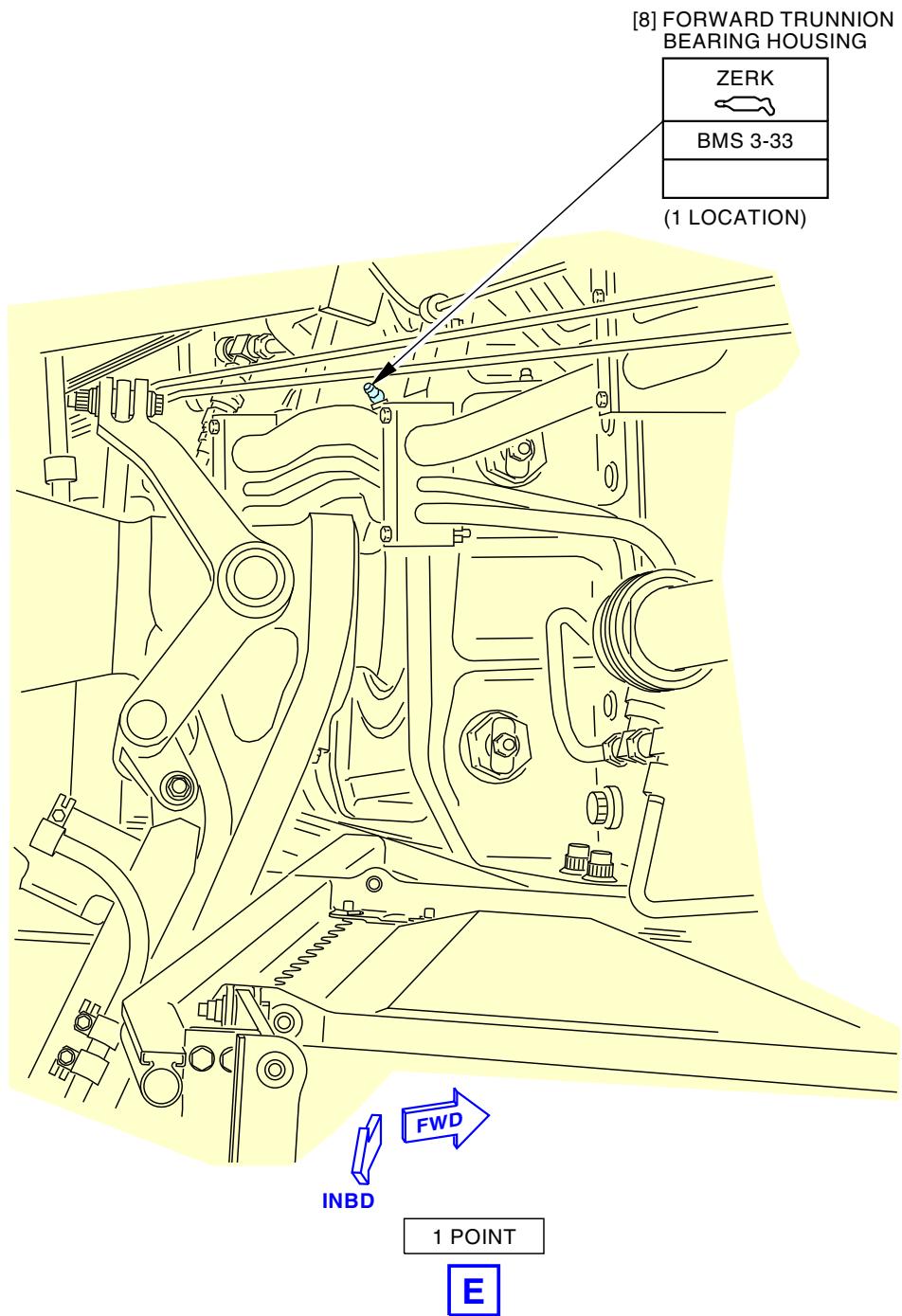
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Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 5 of 8)

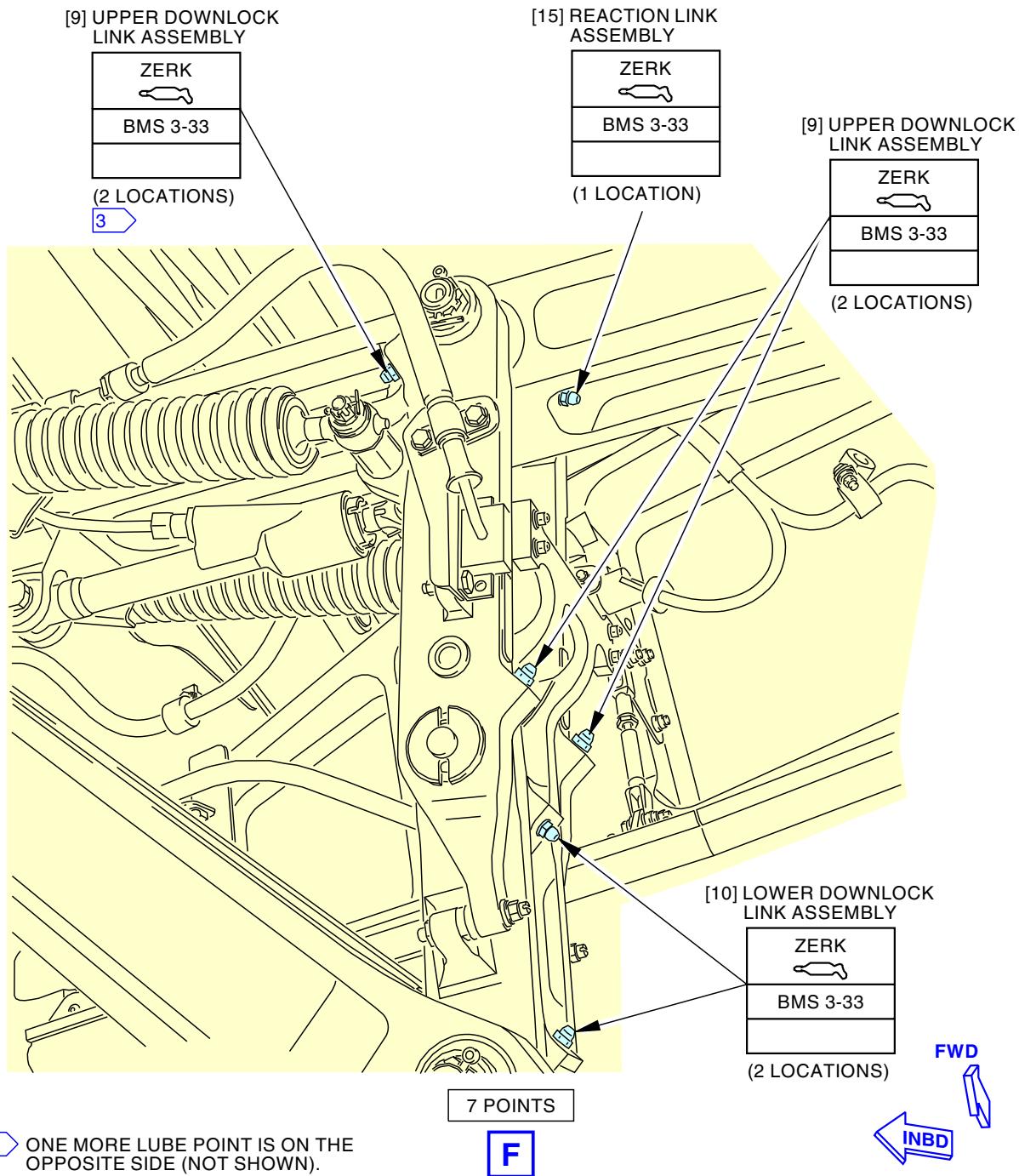
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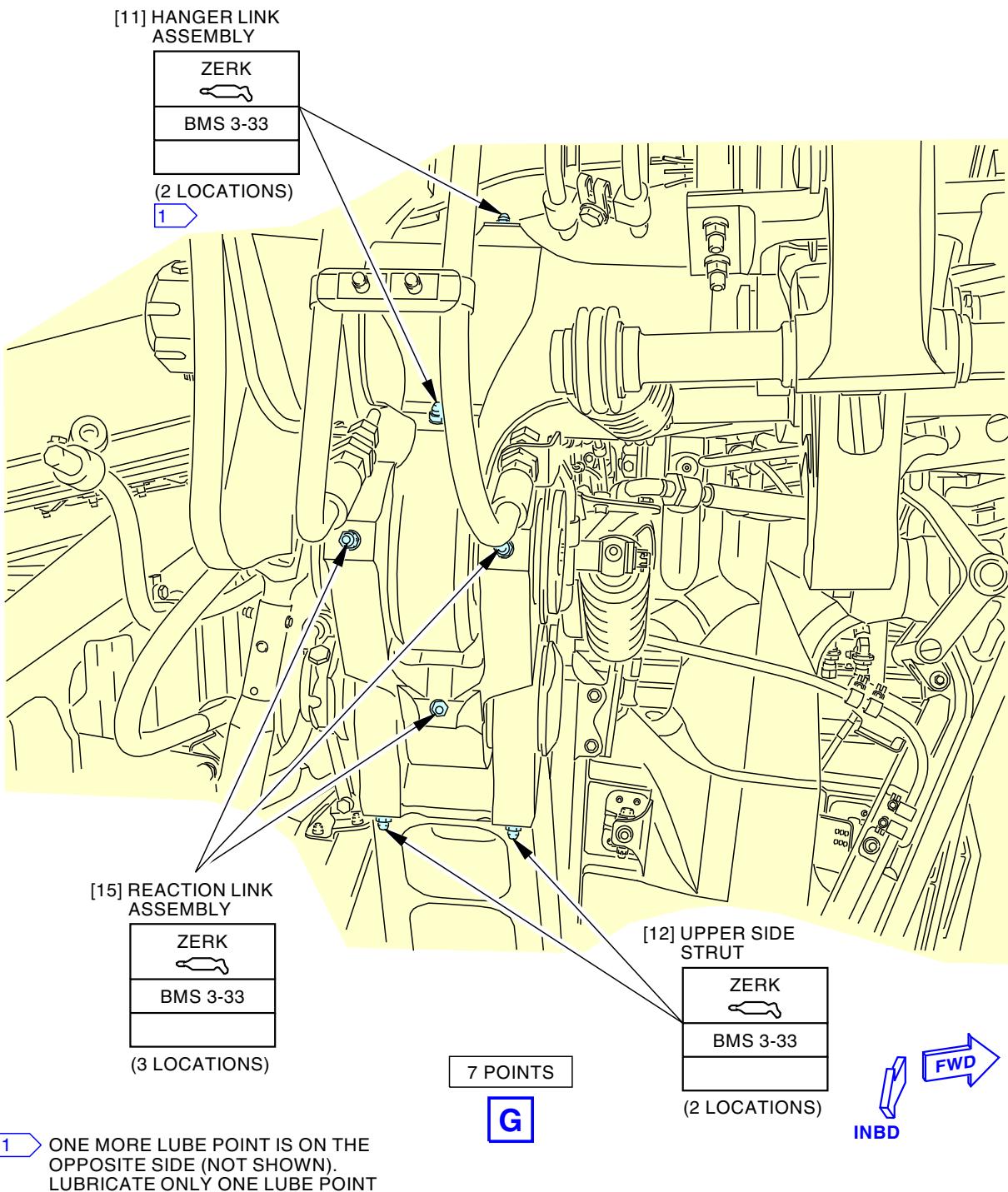
Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 6 of 8)

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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Main Landing Gear Upper End Components Servicing

Figure 301/12-21-11-990-801 (Sheet 7 of 8)

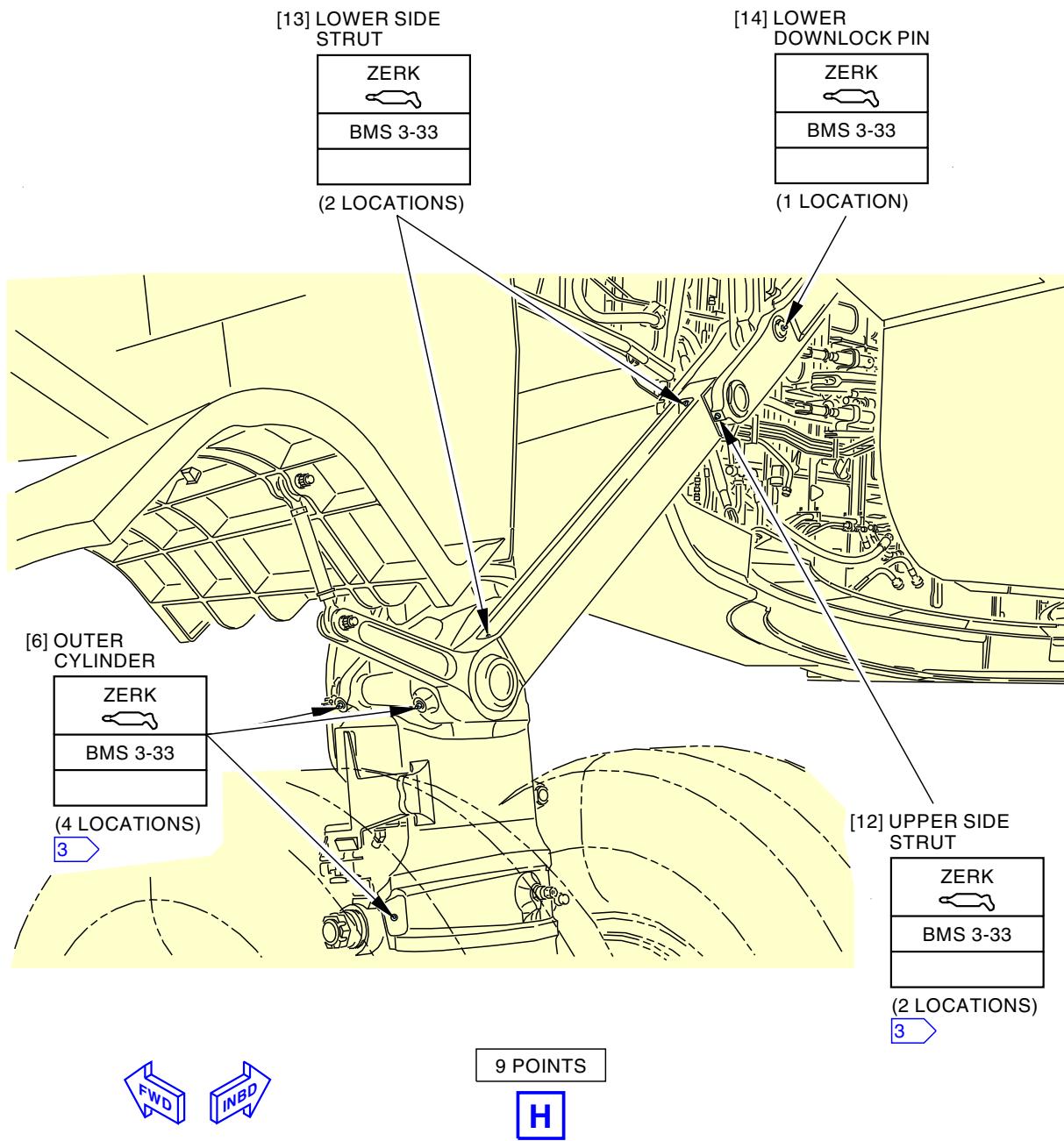
EFFECTIVITY
LOM ALL

12-21-11

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G08392 S0006561382_V2

Main Landing Gear Upper End Components Servicing
Figure 301/12-21-11-990-801 (Sheet 8 of 8)

EFFECTIVITY
LOM ALL

12-21-11

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 12-21-11-640-802

3. Main Landing Gear Lower End Components Servicing

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the lower end components of the main landing gear.

B. References

Reference	Title
20-10-24-420-801	Lubrication Fitting Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00378	Grease - Aircraft, General Purpose, Wide Temperature - Aeroshell 22	MIL-PRF-81322
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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
734	Left Main Landing Gear
744	Right Main Landing Gear

E. Prepare for the Main Landing Gear Lower End Components Servicing

SUBTASK 12-21-11-480-002



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 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.

F. Main Landing Gear Lower End Components Servicing

SUBTASK 12-21-11-840-002



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (1) Put on protective gloves and eye protection.

SUBTASK 12-21-11-640-002



CAUTION

YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

EFFECTIVITY
LOM ALL

12-21-11



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(CAUTION PRECEDES)



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA) WHEN YOU LUBRICATE THE MAIN LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA), YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (2) Use the grease gun to lubricate the main landing gear with grease, D00633 (Figure 302, Table 302).

NOTE: The table makes a list of all the lubrication fittings for the lower end components of the main landing gear.



DO NOT APPLY TOO MUCH GREASE TO THE LANDING GEAR BRAKE HOUSING BUSHINGS. A FIRE CAN OCCUR WHEN THE BRAKE BECOMES HOT. FIRE CAN CAUSE INJURIES TO PERSONNEL.



DO NOT LUBRICATE THE FITTING WITH TOO MUCH GREASE. TOO MUCH GREASE CAN CAUSE A FIRE.

- (a) If desired, lubricate the Main Landing Gear (MLG) brake housing bushing with Aeroshell 22 grease, D00378.

NOTE: There is no periodic requirement to lubricate the MLG brake housing bearing. The MLG brake housing bearing is lubricated during brake installation.

Table 302/12-21-11-993-806 Main Landing Gear Lower End Components Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
31	INNER CYLINDER	BMS3-33	Zerk	4
32	LOWER TORSION LINK PIN	BMS3-33	Zerk	1
33	LOWER TORSION LINK	BMS3-33	Zerk	3
34	UPPER TORSION LINK	BMS3-33	Zerk	3
LOM 412, 415, 423, 424, 432, 439, 441, 464; LOM 402, 404, 406, 407, 420, 437, 438, 458-460 PRE SB 737-32-1429 AND PRE SB 737-32-1441; LOM 427, 428 POST SB 737-32-1494				
35	MLG BRAKE HOUSING BUSHING *[1]*[2]	Aeroshell 22 grease, D00378	Zerk	2
LOM ALL				

*[1] Equivalent greases are Mobil 28 and Mobil Aviation Grease SHC 100.

*[2] Lubricate after installation only.

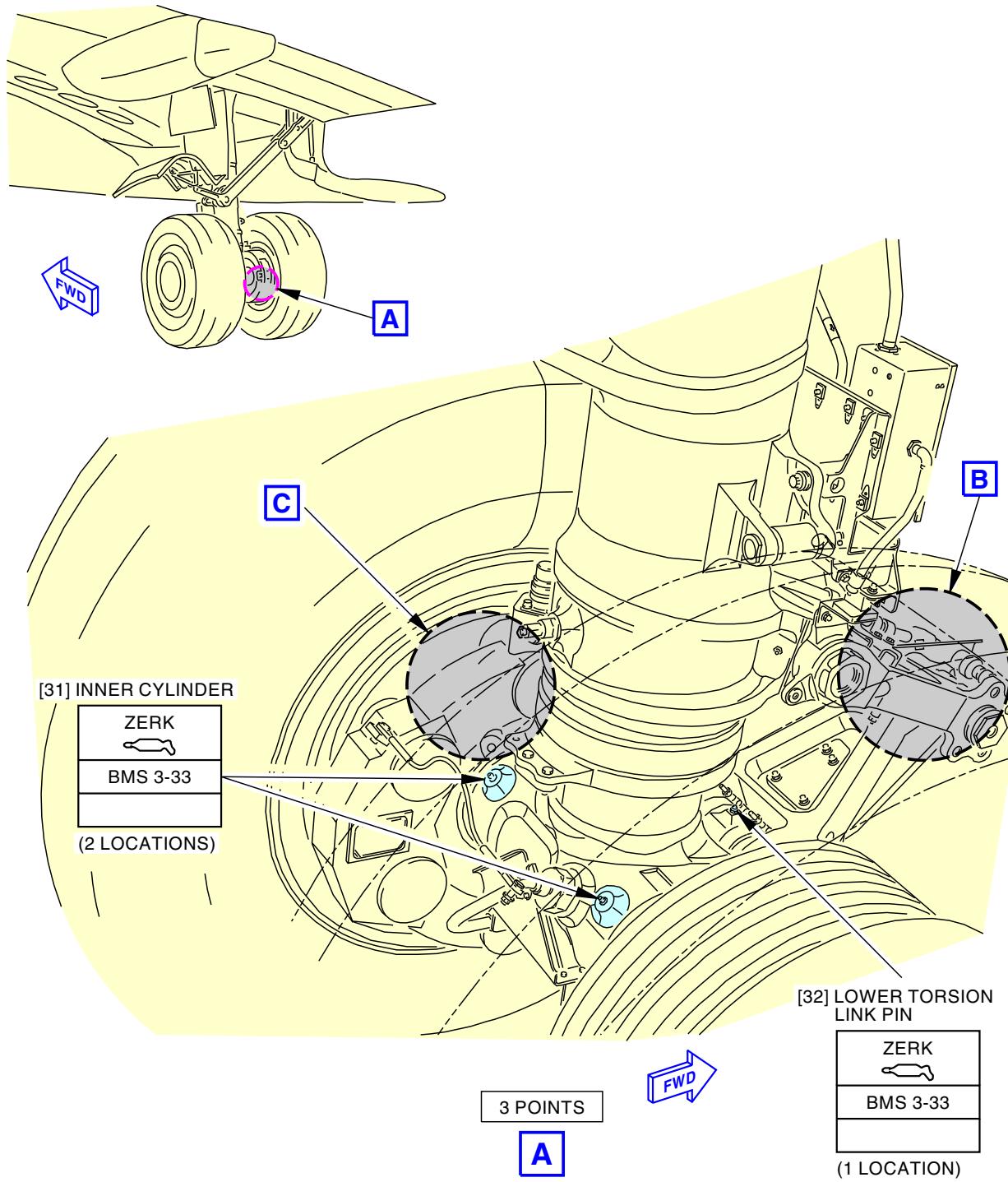
SUBTASK 12-21-420-002

- (3) If a fitting blows off, do these steps:
- Make sure there is not a blockage in the lubrication path.
 - Do this task: Lubrication Fitting Installation, TASK 20-10-24-420-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-21-11



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**Main Landing Gear Lower End Components Servicing
 Figure 302/12-21-11-990-802 (Sheet 1 of 4)**

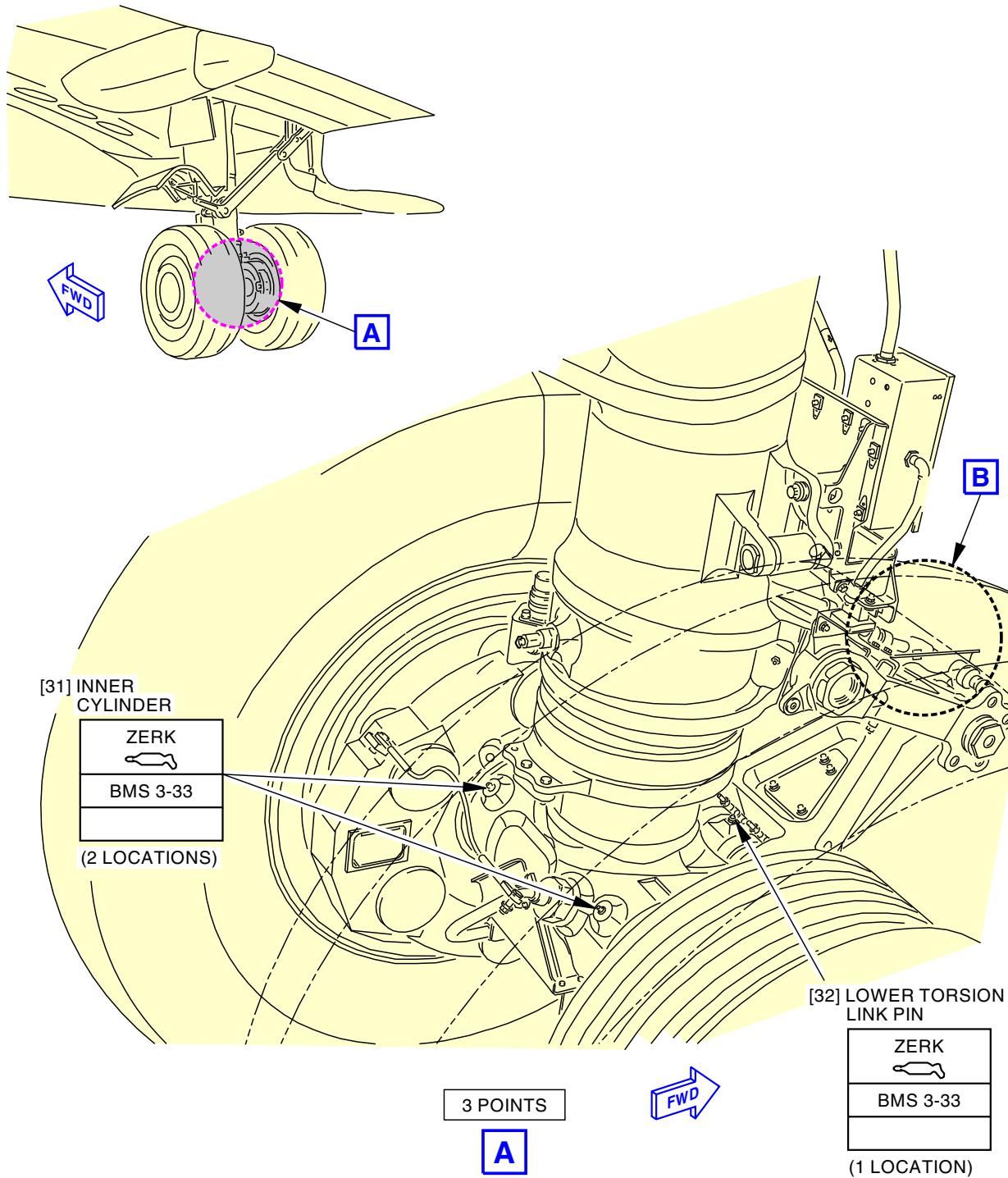
EFFECTIVITY
 LOM 412, 415, 423, 424, 432, 439, 441, 464; LOM 402,
 404, 406, 407, 420, 437, 438, 458-460 PRE SB
 737-32-1429 AND PRE SB 737-32-1441; LOM 427,
 428 POST SB 737-32-1494

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1981078 S0000382799_V2

**Main Landing Gear Lower End Components Servicing
Figure 302/12-21-11-990-802 (Sheet 2 of 4)**

EFFECTIVITY

LOM 411, 416, 422, 425, 426, 429-431, 433, 434, 440,
442-447, 450-457, 461-463, 465-999; LOM 402, 404, 406,
407, 420, 437, 438, 458-460 POST SB 737-32-1441 OR
POST SB 737-32-1429; LOM 427, 428 PRE SB
737-32-1494

D633A101-LOM

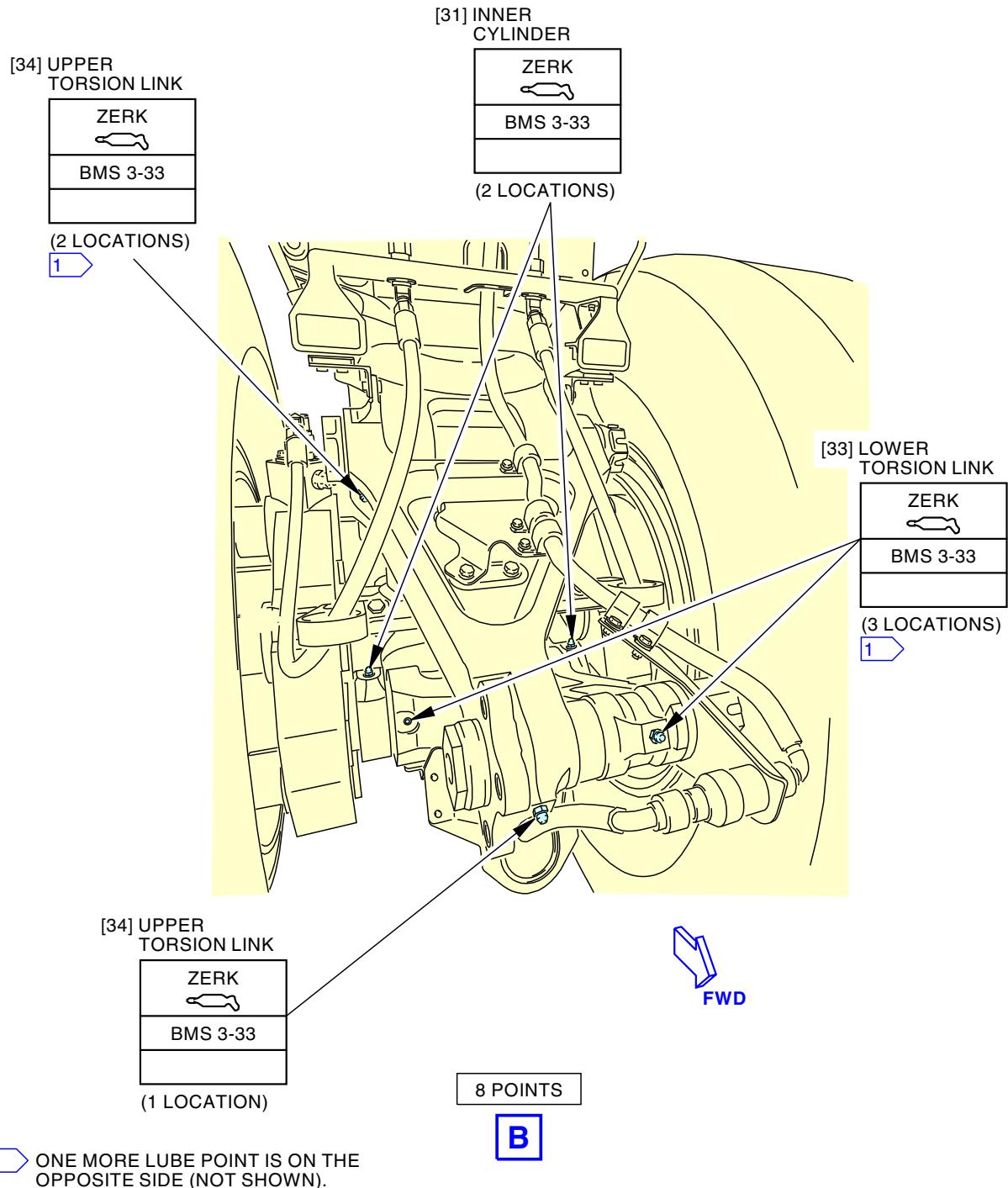
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G08299 S0006561386_V2

Main Landing Gear Lower End Components Servicing
Figure 302/12-21-11-990-802 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

12-21-11

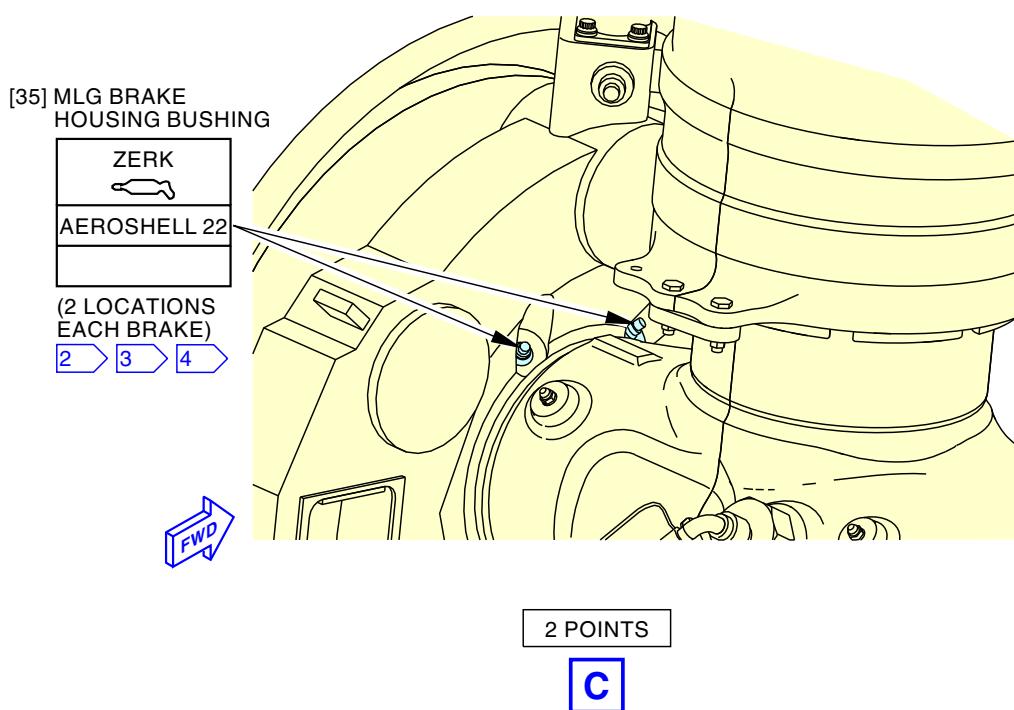
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- [2] LUBRICATION AFTER INSTALLATION ONLY
- [3] MOBIL 28, MOBIL AVIATION GREASE SHC 100, OR AEROSHELL 22
- [4] DO NOT LUBRICATE THE FITTING WITH TOO MUCH GREASE. TOO MUCH GREASE CAN CAUSE A FIRE DURING AN OPERATION.

2450636 S0000568358_V1

Main Landing Gear Lower End Components Servicing
Figure 302/12-21-11-990-802 (Sheet 4 of 4)

EFFECTIVITY
LOM 412, 415, 423, 424, 432, 439, 441, 464; LOM 402, 404, 406, 407, 420, 437, 438, 458-460 PRE SB 737-32-1429 AND PRE SB 737-32-1441; LOM 427, 428 POST SB 737-32-1494

D633A101-LOM

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TASK 12-21-11-620-801

4. Main Landing Gear Bushings Servicing

(Figure 303).

A. General

- (1) This task provides instructions to service the specific bushings of the Main Landing Gear (MLG).
- (2) Contact The Boeing Company (TBC) with findings in any other bushings of the MLG.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
C00755	Compound - Organic Corrosion Inhibiting, Heavy Duty	BMS3-26
G00009	Compound - Organic Corrosion Inhibiting	BMS3-23
G51751	Putty/Lacquer - Tamper-proof, Hydraulic Fluid Resistant	BMS8-45 Type III

D. Location Zones

Zone	Area
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
734	Left Main Landing Gear
744	Right Main Landing Gear

E. Prepare for the Main Landing Gear Bushings Servicing.

SUBTASK 12-21-11-480-003



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 Landing Gear (NLG) and MLG, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

F. Main Landing Gear Bushings Servicing.

SUBTASK 12-21-11-620-001

- (1) JOINTS THAT HAVE BUSHING FILLET SEALS

- (a) In joints that have bushing fillet seals, do the steps that follow:
 - 1) If there are no cracks in the sealant, no more steps are necessary (cracks in the paint are OK).
 - 2) If there are cracks in the sealant, but the cracks do not go to the lug surface:
NOTE: You can remove a section of sealant to see the depth of the crack.
 - a) Apply sealant to fill the cracks or replace sealant removed for check (no more steps are necessary).
 - 3) If there are cracks that go to the lug surface, do these steps:

EFFECTIVITY
LOM ALL

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- a) Look for corrosion on the lug surface. You may remove additional sealant as required to see the lug surface.
 - b) If there is no corrosion, replace sealant (no more steps are necessary).
 - c) If you cannot replace the sealant right away, do this step:
 - <1> Apply corrosion inhibiting compound, G00009 (preferred) compound, C00755 (optional) to the lug.
 - d) Contact TBC if lug corrosion is found.
- (b) In the joints that have migrated or rotated bushings, do the steps that follow:

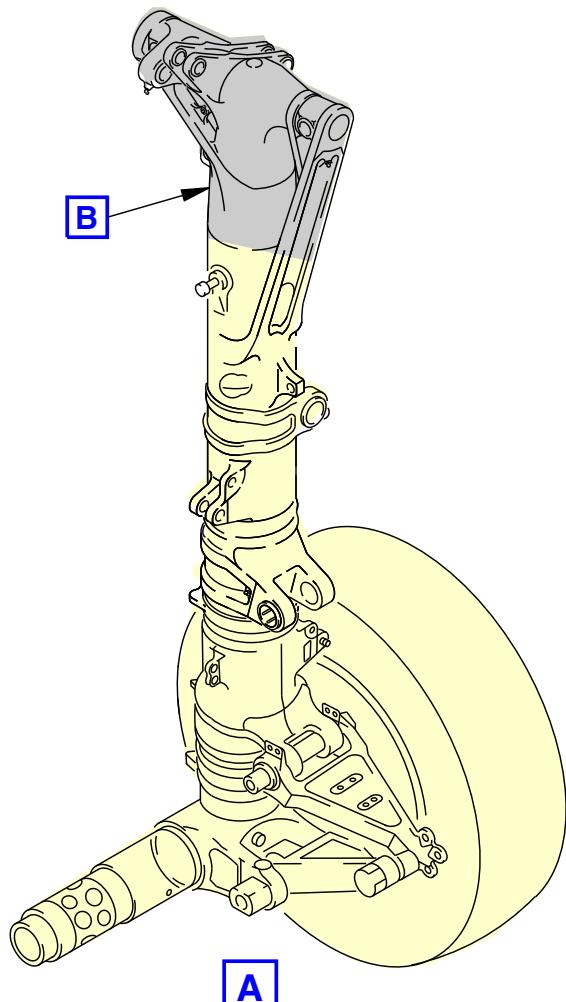
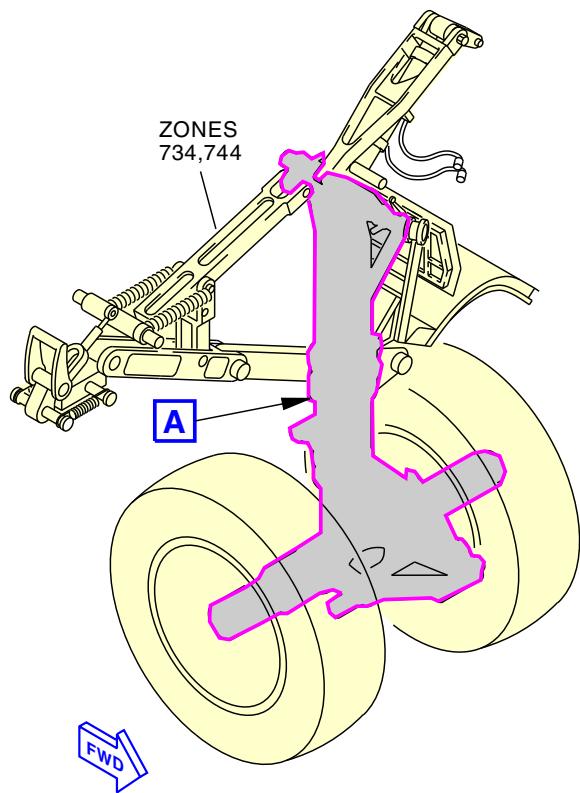
NOTE: A migrated bushing is a bushing which has moved away from the lug surface. A rotated bushing is a bushing that rotates in a lug bore. Cracks or separation of the bushing fillet seal around the bushing flange is an indication that bushing migration or rotation has occurred.

- 1) Replace the rotated bushing and apply bushing fillet seal.
 - a) Contact TBC for repair instructions.
- 2) If you cannot replace the bushing right away, do the steps that follow:
 - a) Remove the bushing fillet seal.
 - b) Do an inspection of the lug surface and the area adjacent to the bushing flange interface for corrosion.
 - c) Apply tamper-proof putty/lacquer, G51751 to the part to make an identification mark (red witness line).
NOTE: This will help you identify a migrated or rotated bushing during a subsequent maintenance interval.
 - d) Apply the corrosion inhibiting compound, G00009 (preferred) compound, C00755 (optional) between the bushing flange and lug surface.
 - e) Contact TBC if you find corrosion.
 - f) On subsequent maintenance intervals, do the steps that follow until you replace the bushing:
 - <1> Make sure all corrosion inhibiting compound is removed from the joint.
 - <2> Do an inspection of the joint and lug surface for signs of corrosion.
 - <3> If you do not find corrosion, apply the corrosion inhibiting compound, G00009 (preferred) compound, C00755 (optional) between the bushing flange and lug surface.
 - <4> Contact TBC if you find lug corrosion.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-21-11



2958582 S0000736724_V1

MLG WALKING BEAM CLEVIS BUSHINGS AND OUTER CYLINDER RETRACT ACTUATOR BUSHINGS
Figure 303/12-21-11-990-803 (Sheet 1 of 2)

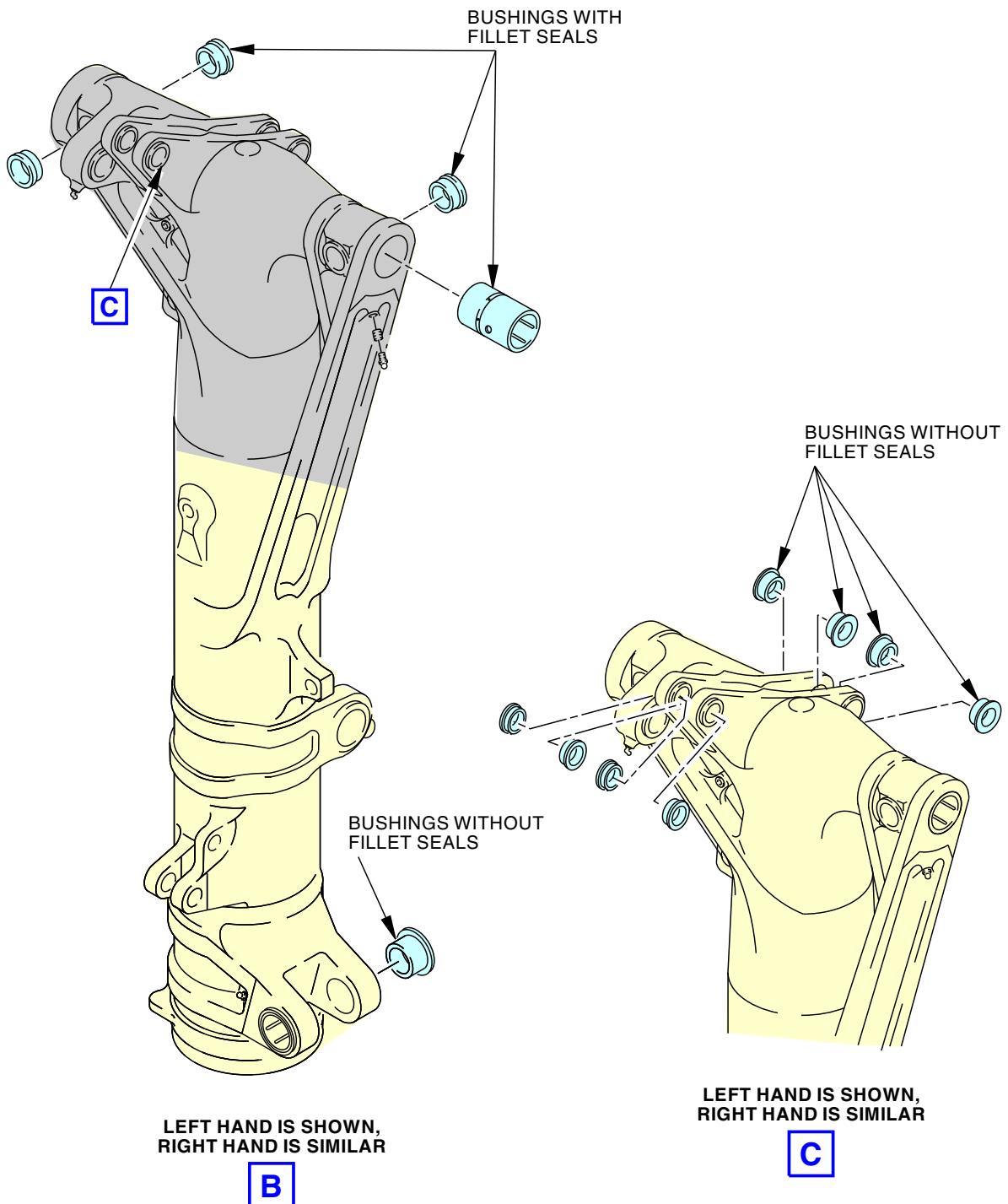
EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2958586 S0000736725_V1

MLG WALKING BEAM CLEVIS BUSHINGS AND OUTER CYLINDER RETRACT ACTUATOR BUSHINGS
Figure 303/12-21-11-990-803 (Sheet 2 of 2)

EFFECTIVITY	LOM ALL
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NOSE LANDING GEAR - SERVICING

1. General

- A. This procedure has these tasks:
- (1) The lubrication of the upper end components of the nose landing gear
 - (2) The lubrication of the lower end components of the nose landing gear.

TASK 12-21-21-640-801

2. Nose Landing Gear Upper End Components Servicing

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task supplies instructions to lubricate the upper end components of the nose landing gear.

B. References

Reference	Title
20-10-24-420-801	Lubrication Fitting Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1137	Glasses - Safety
STD-6517	Gloves, Neoprene or Nitrile

D. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

E. Location Zones

Zone	Area
115	Nose Landing Gear Wheel Well - Left
116	Nose Landing Gear Wheel Well - Right
713	Nose Landing Gear

F. Prepare for the Servicing

SUBTASK 12-21-21-480-001



WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL 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

G. Nose Landing Gear Upper End Components Servicing

SUBTASK 12-21-21-840-001



WARNING USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (1) Put on neoprene or nitrile glove, STD-6517, and safety glasses, STD-1137.

EFFECTIVITY
LOM ALL

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SUBTASK 12-21-21-640-001



YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA) WHEN YOU LUBRICATE THE NOSE LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA), YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (2) Use the grease gun to lubricate the nose landing gear with grease, D00633, (Figure 301, Table 301)

NOTE: The table makes a list of all the lubrication fittings for the upper end components of the nose landing gear.

NOTE: Actuator rod ends have two grease fittings. It is only necessary to lubricate the fitting to which you can get access.

Table 301/12-21-21-993-805 Nose Landing Gear Upper End Components Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Actuator Support	BMS 3-33	Zerk	1
2	Retract Actuator	BMS 3-33	Zerk	3
3	Upper Drag Strut	BMS 3-33	Zerk	6
4	Lower Drag Strut	BMS 3-33	Zerk	2
5	Outer Cylinder	BMS 3-33	Zerk	2
6	Trunnion Bushing	BMS 3-33	Zerk	2

SUBTASK 12-21-21-640-002

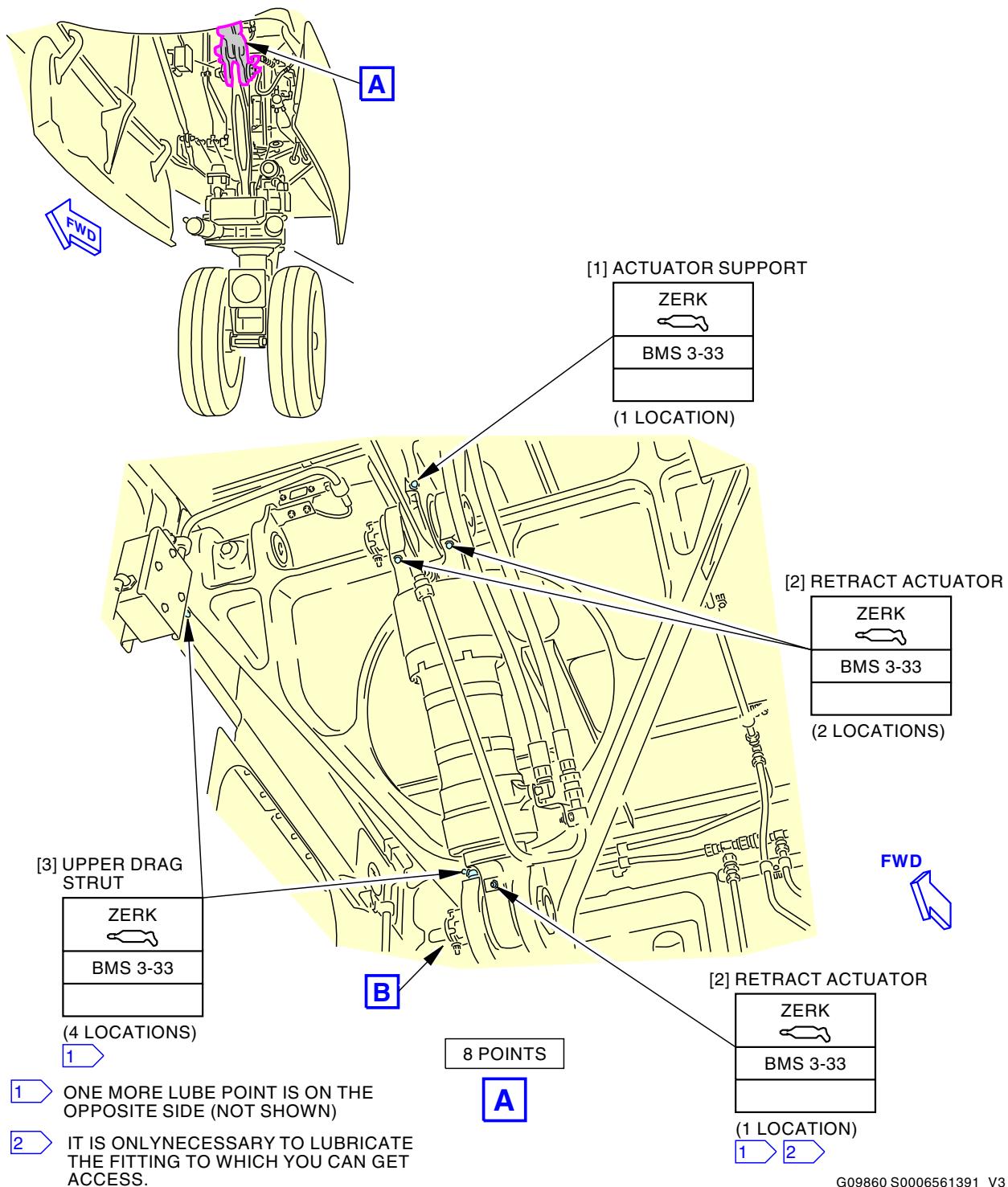
- (3) If a fitting blows off, do these steps:

- Make sure there is not a blockage in the lubrication path.
- Do this task: Lubrication Fitting Installation, TASK 20-10-24-420-801.

— END OF TASK —

EFFECTIVITY
LOM ALL

12-21-21



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Nose Landing Gear Upper End Components Servicing

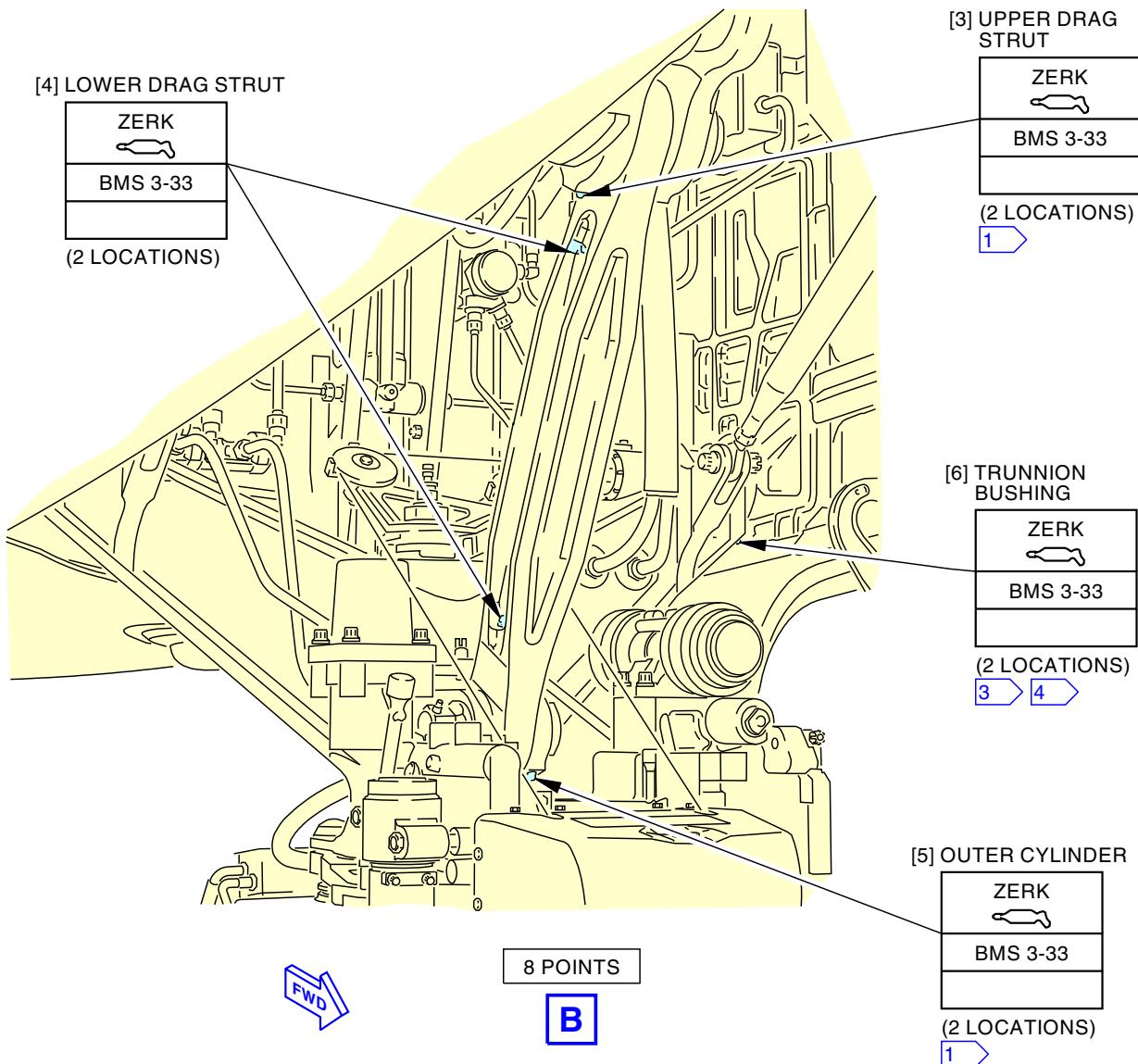
Figure 301/12-21-21-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-21-21

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- 3 ONE MORE LUBE POINT IS ON OPPOSITE WHEEL WELL WALL (NOT SHOWN)
- 4 IF NECESSARY, DO A CHECK BEHIND THE WHEEL WELL WALL FOR UNWANTED GREASE. THE GREASE CAN FLOW OUT OF THE TRUNNION PIN BUSHING AND COLLECT ON THE CABLES, PULLEYS AND STRUCTURE. REMOVE THE UNWANTED GREASE TO PREVENT DAMAGE TO THE CABLES AND A BLOCKAGE OF THE DRAIN PATHS.

G09863 S0006561392_V8

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-21-990-801 (Sheet 2 of 2)

 EFFECTIVITY
 LOM ALL

12-21-21

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TASK 12-21-21-640-802

3. Nose Landing Gear Lower End Components Servicing

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the lower end components of the nose landing gear.

B. References

Reference	Title
20-10-24-420-801	Lubrication Fitting Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
115	Nose Landing Gear Wheel Well - Left
116	Nose Landing Gear Wheel Well - Right
713	Nose Landing Gear

E. Prepare for the Servicing

SUBTASK 12-21-21-490-001



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 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.

F. Nose Landing Gear Lower End Components Servicing

SUBTASK 12-21-21-840-002



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (1) Put on protective gloves and eye protection.

SUBTASK 12-21-21-640-003



CAUTION

YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

(CAUTION PRECEDES)



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA) WHEN YOU LUBRICATE THE NOSE LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG (17200 KPA), YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (2) Use the grease gun to lubricate the nose landing gear with grease, D00633, (Figure 302, Table 302).

NOTE: The table makes a list of all the lubrication fittings for the lower end components of the nose landing gear.

NOTE: Start with center grease fitting when lubricating the Steering Collar. The RH side of the Steering collar contains the center grease fitting. Dispense grease into the grease fitting until the old grease is visually shown and/or only new grease comes out.

Table 302/12-21-21-993-806 Nose Landing Gear Lower End Components Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	UPPER TORSION LINK	BMS 3-33	Zerk	3
2	STEERING COLLAR	BMS 3-33	Zerk	10
3	TOW FITTING ASSEMBLY	BMS 3-33	Zerk	2
4	LOWER TORSION LINK	BMS 3-33	Zerk	4
5	INNER CYLINDER	BMS 3-33	Zerk	1
LOM ALL; AIRPLANES WITH 275A1106-5 STEERING ACTUATOR ROD END				
6	STEERING ACTUATOR	BMS 3-33	Zerk	4
LOM ALL				

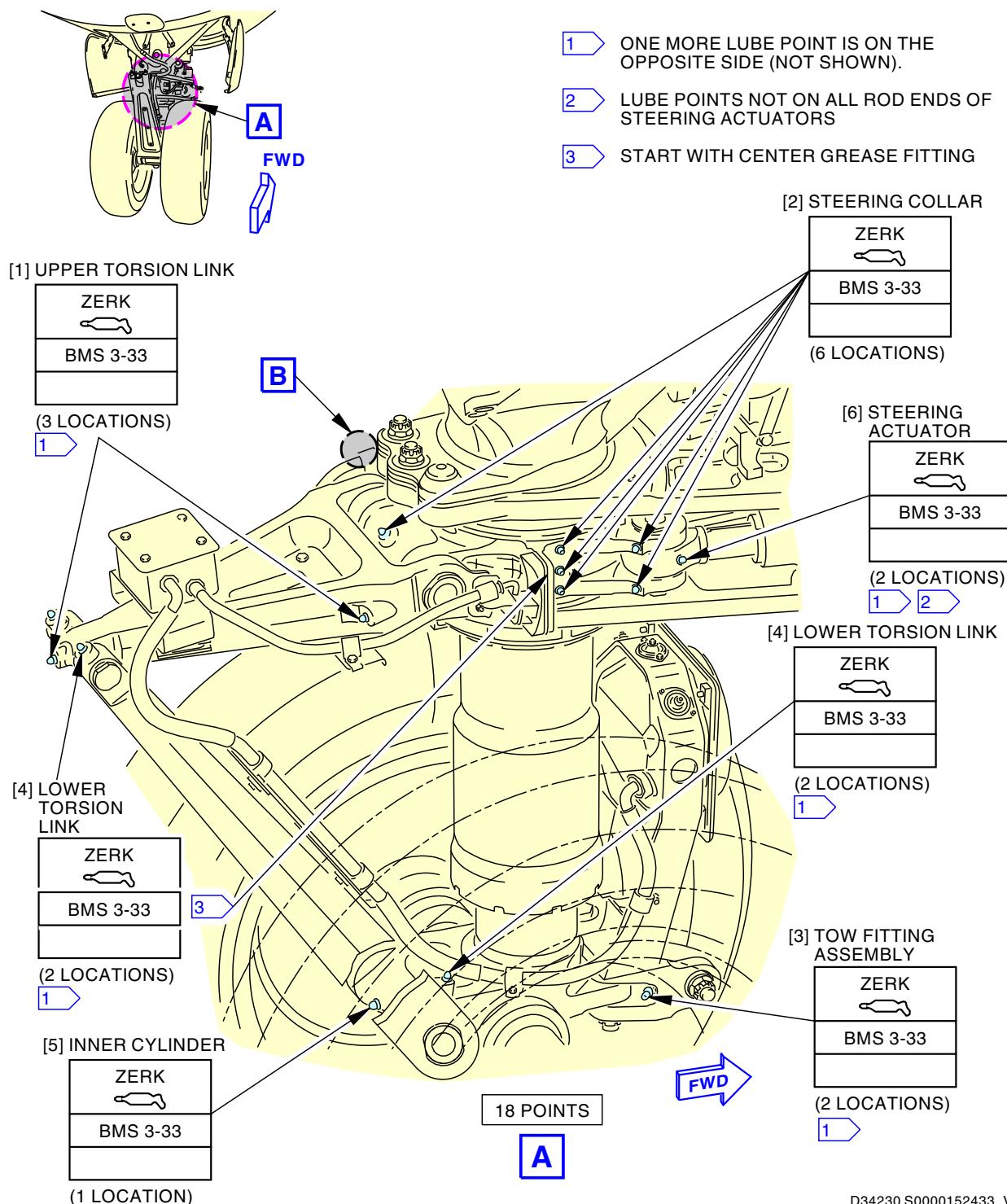
SUBTASK 12-21-640-004

- (3) If a fitting blows off, do these steps:
- Make sure there is not a blockage in the lubrication path.
 - Do this task: Lubrication Fitting Installation, TASK 20-10-24-420-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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**Nose Landing Gear Lower End Components Servicing
Figure 302/12-21-21-990-803 (Sheet 1 of 2)**

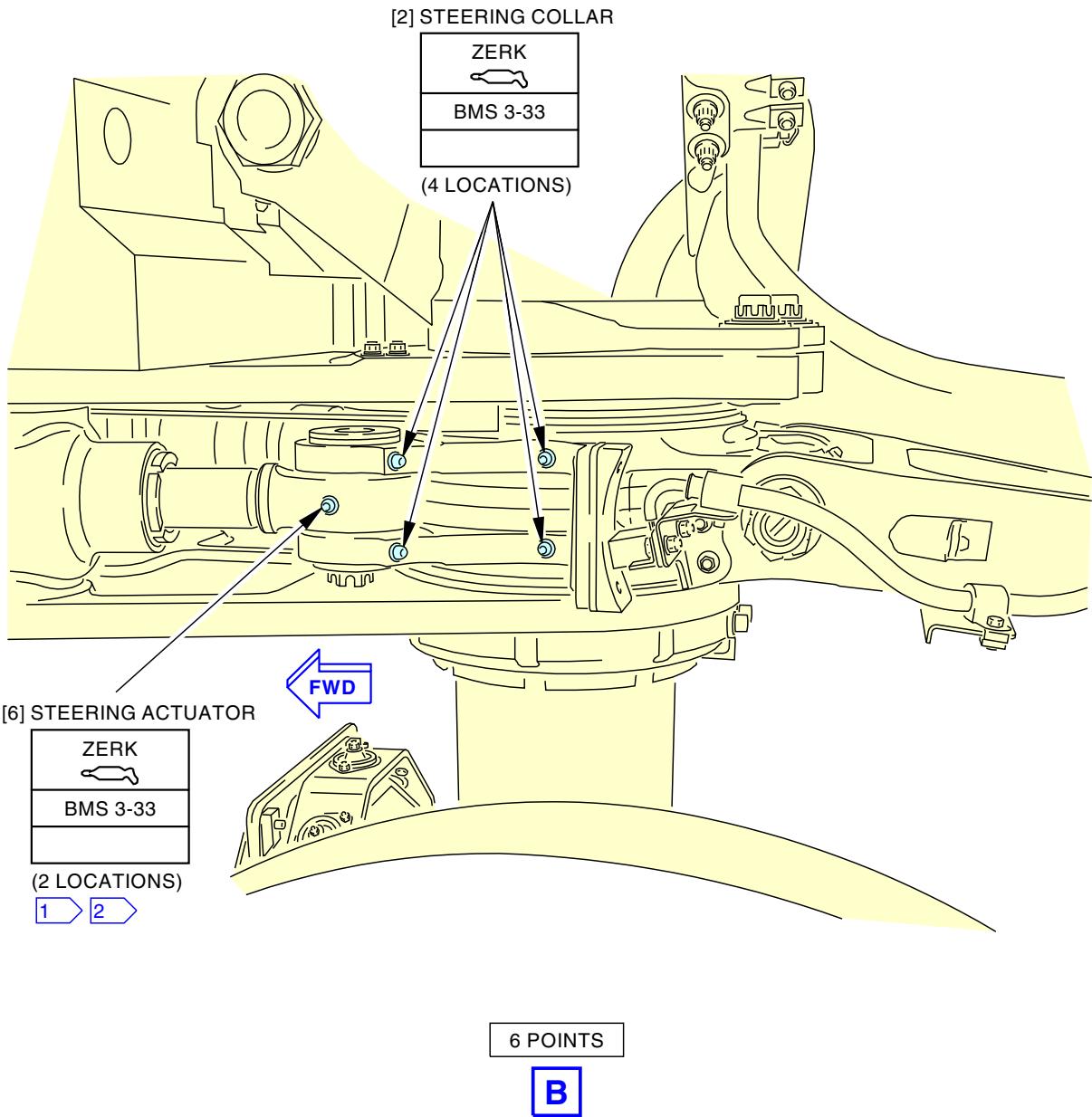
EFFECTIVITY
LOM ALL; AIRPLANES WITH 275A1106-5 STEERING
ACTUATOR ROD END

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Nose Landing Gear Lower End Components Servicing
Figure 302/12-21-21-990-803 (Sheet 2 of 2)

EFFECTIVITY
 LOM ALL; AIRPLANES WITH 275A1106-5 STEERING
 ACTUATOR ROD END

D633A101-LOM

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STRUT ATTACH FITTING LUBRICATION

1. General

- A. This procedure provides the data to lubricate the strut attach fittings.

TASK 12-21-32-600-801

2. Lubricate the Strut Attach Fittings

(Figure 301)

A. References

Reference	Title
54-51-01-040-801	Prepare the Strut for Maintenance Operations (P/B 201)
54-51-01-440-801	Put the Strut Back to its Usual Condition (P/B 201)
54-52-03-010-801	Wing Junction Fairing - Removal (P/B 401)
54-52-03-410-801	Wing Junction Fairing - Installation (P/B 401)
54-52-06-010-801	Aft Fairing Access Panel Removal (P/B 401)
54-52-06-410-801	Aft Fairing Access Panel Installation (P/B 401)
54-53-02-000-802	Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal (P/B 401)
54-53-02-410-801	Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00014	Grease - Molybdenum Disulfide, Low & High Temperature	MIL-G-21164 (NATO G-353)

C. Location Zones

Zone	Area
432	Engine 1 - Fan Cowl Support Beam
433	Engine 1 - Strut Torque Box
442	Engine 2 - Fan Cowl Support Beam
443	Engine 2 - Strut Torque Box

D. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1
431EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 1
431ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 1
434BL	Aft Strut Fairing, Left Aft Panel, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2
441EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 2
441ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 2
444BR	Aft Strut Fairing, Right Aft Panel, Strut 2

E. Lubricate the Strut Attach Fittings

SUBTASK 12-21-32-040-001

- (1) Do this task: Prepare the Strut for Maintenance Operations, TASK 54-51-01-040-801.

EFFECTIVITY
LOM ALL



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SUBTASK 12-21-32-010-001

- (2) To get access to the aft upper link fitting, do this task: Wing Junction Fairing - Removal, TASK 54-52-03-010-801

Remove the applicable access panels:

Number

Name/Location

431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

SUBTASK 12-21-32-010-002

- (3) To get access to the aft diagonal brace fitting, do this task: (Aft Fairing Access Panel Removal, TASK 54-52-06-010-801)

Remove the applicable aft fairing access panels:

Number

Name/Location

434BL	Aft Strut Fairing, Left Aft Panel, Strut 1
444BR	Aft Strut Fairing, Right Aft Panel, Strut 2

SUBTASK 12-21-32-010-003

- (4) To get access to the midspar fitting, do these steps to remove the applicable access panels: Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal, TASK 54-53-02-000-802

(a) Remove the applicable strut access panels:

Number

Name/Location

431EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 1
431ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 1
441EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 2
441ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 2

SUBTASK 12-21-32-640-001

- (5) Do these steps to lubricate the applicable strut attach fitting as shown: (Figure 301, Table 301)

- (a) Inject the grease, D00014 into the fitting until grease shows at the other side of the joint.
 (b) Remove the unwanted grease from the fitting with a rag.

Table 301/12-21-32-993-802

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Midspar Fitting	MIL-G-21164	Zerk	2
2	Aft Diagonal Brace Fitting	MIL-G-21164	Zerk	1
3	Aft Upper Link Fitting	MIL-G-21164	Zerk	2

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-32-010-004

- (1) To close access to the aft upper link fitting, do this task: Wing Junction Fairing - Installation, TASK 54-52-03-410-801

Install the applicable access panels:

Number

Name/Location

431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
-------	---

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(Continued)

<u>Number</u>	<u>Name/Location</u>
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

SUBTASK 12-21-32-010-005

- (2) To close the access to the aft diagonal brace fitting, do this task: **Aft Fairing Access Panel Installation**, TASK 54-52-06-410-801

Install the applicable aft fairing access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Aft Strut Fairing, Left Aft Panel, Strut 1
444BR	Aft Strut Fairing, Right Aft Panel, Strut 2

SUBTASK 12-21-32-410-001

- (3) To close access to the midspur fitting, do this task: **Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Installation**, TASK 54-53-02-410-801

Install the strut access panels:

<u>Number</u>	<u>Name/Location</u>
431EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 1
431ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 1
441EL	Forward Strut Fairing, Left T.R. Strut Fairing, Strut 2
441ER	Forward Strut Fairing, Right T.R. Strut Fairing, Strut 2

SUBTASK 12-21-32-440-001

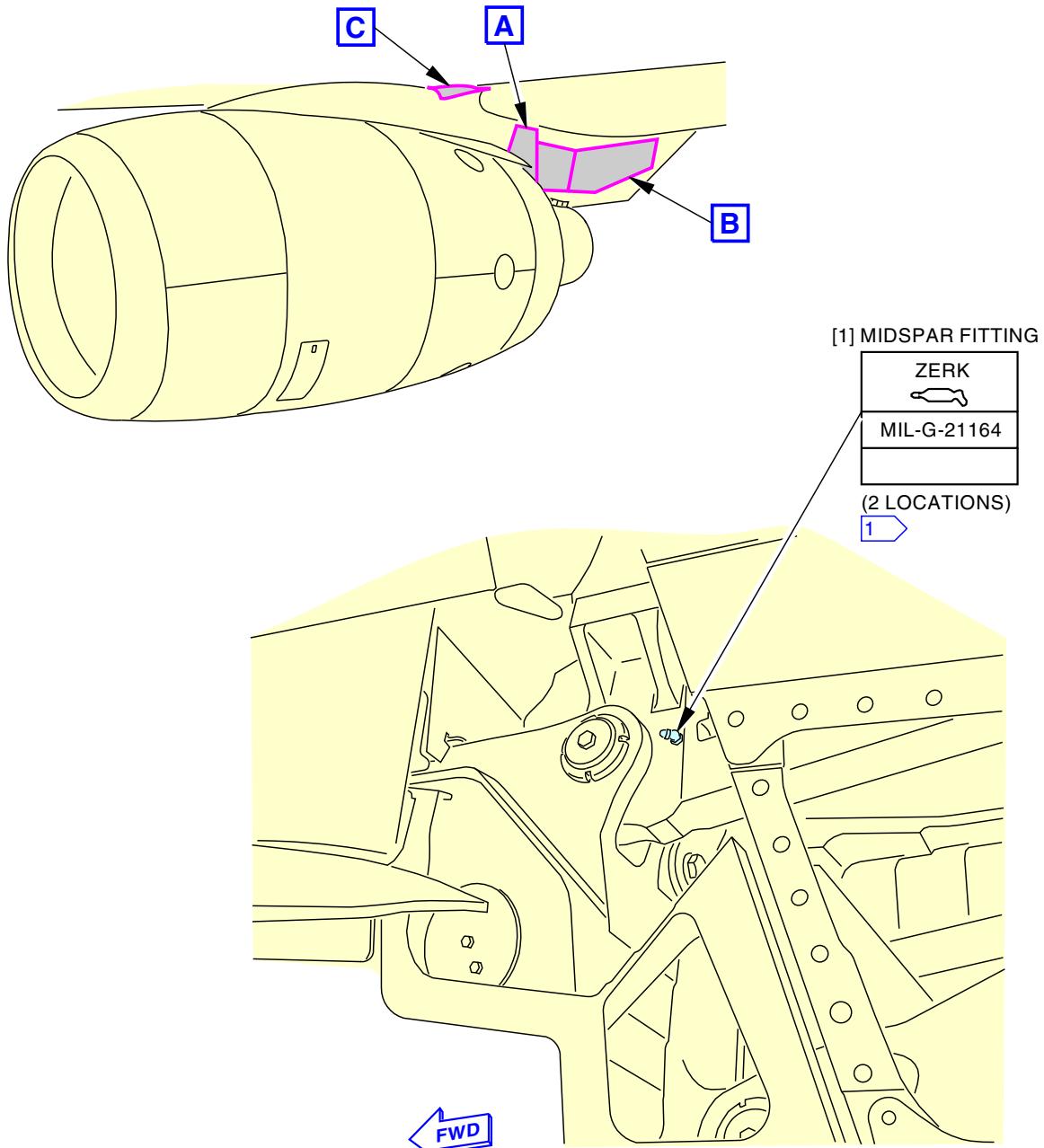
- (4) If you will do no more maintenance operations on the strut, do this task: **Put the Strut Back to its Usual Condition**, TASK 54-51-01-440-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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NOTE:

LEFT STRUT IS SHOWN, RIGHT STRUT IS
 OPPOSITE.

1 ONE MORE LUBE POINT IS ON THE
 OPPOSITE SIDE (NOT SHOWN).

2 POINTS

A

H02200 S0006561401_V4

Strut Attach Fitting Lubrication
Figure 301/12-21-32-990-801 (Sheet 1 of 3)

EFFECTIVITY
 LOM ALL

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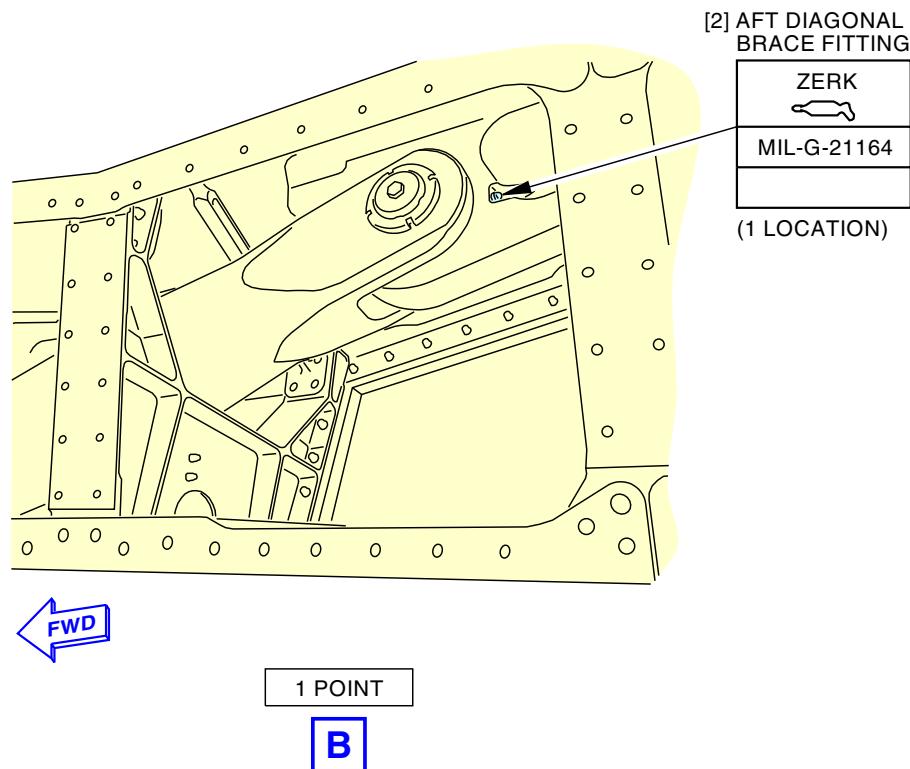
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NOTE:

LEFT STRUT IS SHOWN, RIGHT
STRUT IS OPPOSITE.

H02201 S0006561402_V4

Strut Attach Fitting Lubrication
Figure 301/12-21-32-990-801 (Sheet 2 of 3)

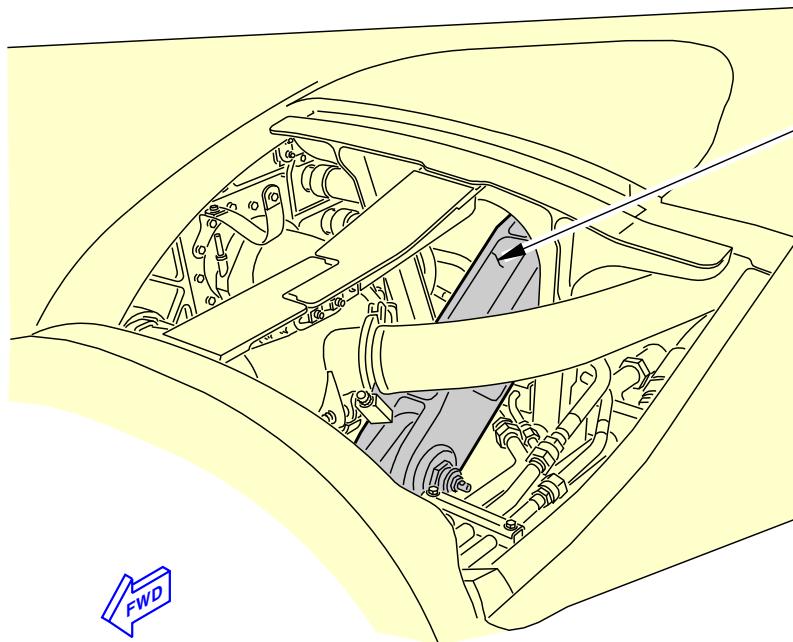
EFFECTIVITY
LOM ALL

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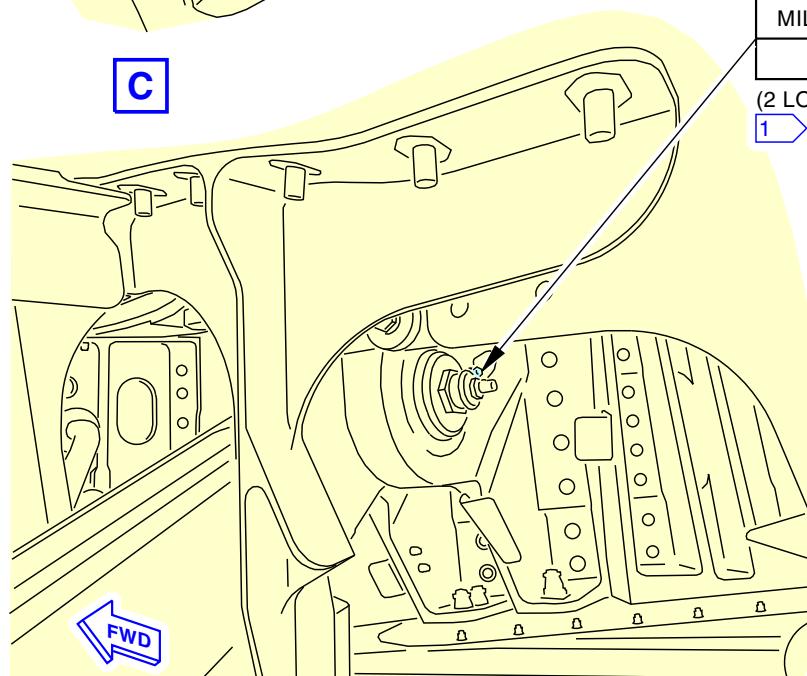
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UPPER LINK
D



[3] AFT UPPER LINK FITTING

ZERK
MIL-G-21164

(2 LOCATIONS)
1

UPPER LINK

2 POINTS



NOTE:

LEFT STRUT IS SHOWN, RIGHT
STRUT IS OPPOSITE.

H02203 S0006561403_V4

Strut Attach Fitting Lubrication
Figure 301/12-21-32-990-801 (Sheet 3 of 3)

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LOM ALL

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AILERON - SERVICING

1. General

- A. This procedure has these tasks:
- (1) A task to lubricate the aileron hinge support
 - (2) A task to lubricate the aileron balance tab
 - (3) A task to lubricate the aileron tab control rods
 - (4) A task to lubricate the control rod on the aileron wing quadrant
 - (5) A task to lubricate the aileron power output lever.

TASK 12-22-11-640-801

2. Aileron Hinge Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure has the steps to lubricate the aileron hinge.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (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-15268	Lock Equipment - Aileron Full-up Lubrication Part #: C12006-14 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

E. Location Zones

Zone	Area
572	Left Wing - Aileron
672	Right Wing - Aileron

F. Access Panels

Number	Name/Location
572BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00
572CB	Lower Aileron, Hinge Cover - WBL 447.00
572FB	Lower Aileron, Hinge Cover - WBL 502.00
572GB	Lower Aileron, Hinge Cover - WBL 528.00
572HB	Lower Aileron, Hinge Cover - WBL 553.00

EFFECTIVITY
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AIRCRAFT MAINTENANCE MANUAL

(Continued)

<u>Number</u>	<u>Name/Location</u>
672BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00
672CB	Lower Aileron, Hinge Cover - WBL 447.00
672FB	Lower Aileron, Hinge Cover - WBL 502.00
672GB	Lower Aileron, Hinge Cover - WBL 528.00
672HB	Lower Aileron, Hinge Cover - WBL 553.00

G. Prepare for the Lubrication

SUBTASK 12-22-11-700-001

- (1) Make sure that the aileron is in the full up position.
 - (a) Optional to use the lock equipment, SPL-15268.

NOTE: See usage placard for details.

SUBTASK 12-22-11-860-001

- (2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 12-22-11-010-001

- (3) On hinges 1, 2, 3 and 5:
 - (a) If it is necessary to lubricate the left wing, remove these access panels:

<u>Number</u>	<u>Name/Location</u>
572CB	Lower Aileron, Hinge Cover - WBL 447.00
572FB	Lower Aileron, Hinge Cover - WBL 502.00
572GB	Lower Aileron, Hinge Cover - WBL 528.00
572HB	Lower Aileron, Hinge Cover - WBL 553.00

- (b) If it is necessary to lubricate the right wing, remove these access panels:

<u>Number</u>	<u>Name/Location</u>
672CB	Lower Aileron, Hinge Cover - WBL 447.00
672FB	Lower Aileron, Hinge Cover - WBL 502.00
672GB	Lower Aileron, Hinge Cover - WBL 528.00
672HB	Lower Aileron, Hinge Cover - WBL 553.00

NOTE: The cover for hinge 4 does not need to be removed.

- (c) Remove the hinge seals.

SUBTASK 12-22-11-010-007

- (4) On hinge 6:
 - (a) If it is necessary to lubricate the left wing, open this access panel:

<u>Number</u>	<u>Name/Location</u>
572BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00
 - (b) If it is necessary to lubricate the right wing, open this access panel:

<u>Number</u>	<u>Name/Location</u>
672BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00
 - (c) Remove the removable fairing.

EFFECTIVITY
LOM ALL

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H. Aileron Hinge Lubrication

SUBTASK 12-22-11-640-006

- (1) This table supplies data for the subsequent lubrication step:

Table 301/12-22-11-993-806 Aileron Hinge Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Aileron hinge	BMS 3-33	Flush	6

SUBTASK 12-22-11-640-001

- (2) Lubricate the aileron hinges with grease, D00633.
(a) Make sure that the grease fitting is installed on the side of the bearing.
 1) If it is necessary, replace the grease fitting.
(b) Hold the grease fitting in its position when you apply the grease.

NOTE: The grease fitting can get pushed out during the grease application.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-11-010-002

- (1) Install the seals and fairing that you removed.

SUBTASK 12-22-11-080-001

- (2) If it is installed, remove the lock equipment, SPL-15268.

SUBTASK 12-22-11-410-001

- (3) On hinges 1, 2, 3 and 5:

- (a) If you lubricated the left aileron hinges, install these access panels:

<u>Number</u>	<u>Name/Location</u>
572CB	Lower Aileron, Hinge Cover - WBL 447.00
572FB	Lower Aileron, Hinge Cover - WBL 502.00
572GB	Lower Aileron, Hinge Cover - WBL 528.00
572HB	Lower Aileron, Hinge Cover - WBL 553.00

- (b) If you lubricated the right aileron hinges, install these access panels:

<u>Number</u>	<u>Name/Location</u>
672CB	Lower Aileron, Hinge Cover - WBL 447.00
672FB	Lower Aileron, Hinge Cover - WBL 502.00
672GB	Lower Aileron, Hinge Cover - WBL 528.00
672HB	Lower Aileron, Hinge Cover - WBL 553.00

SUBTASK 12-22-11-410-002

- (4) On hinge 6:

- (a) If you lubricated the left aileron hinges, close this access panel:

<u>Number</u>	<u>Name/Location</u>
572BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00

- (b) If you lubricated the right aileron hinges, close this access panel:

<u>Number</u>	<u>Name/Location</u>
672BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00



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SUBTASK 12-22-11-860-002

- (5) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation,
TASK 27-11-00-860-802.

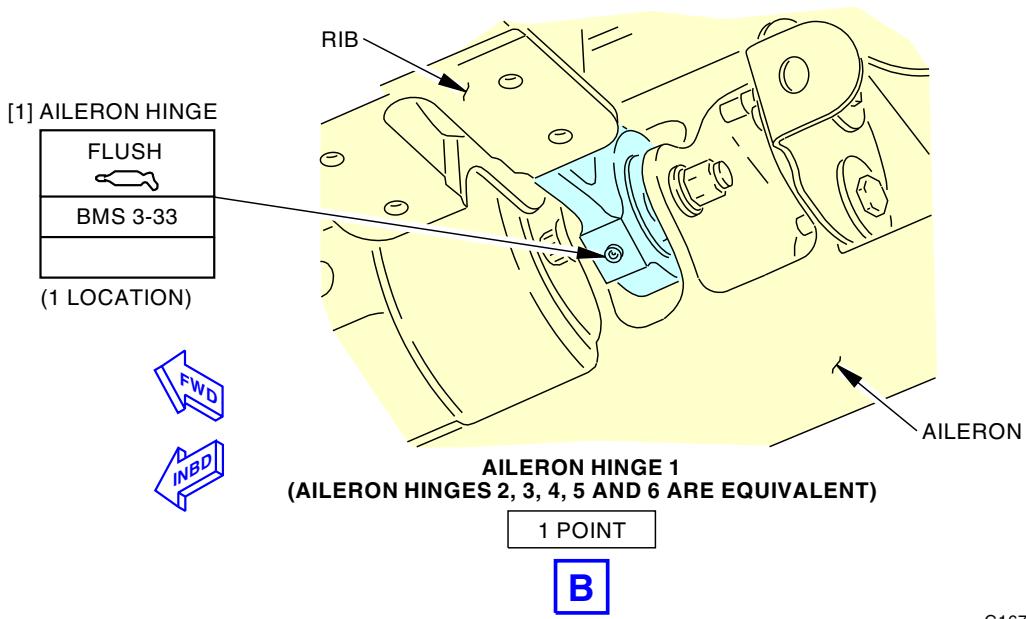
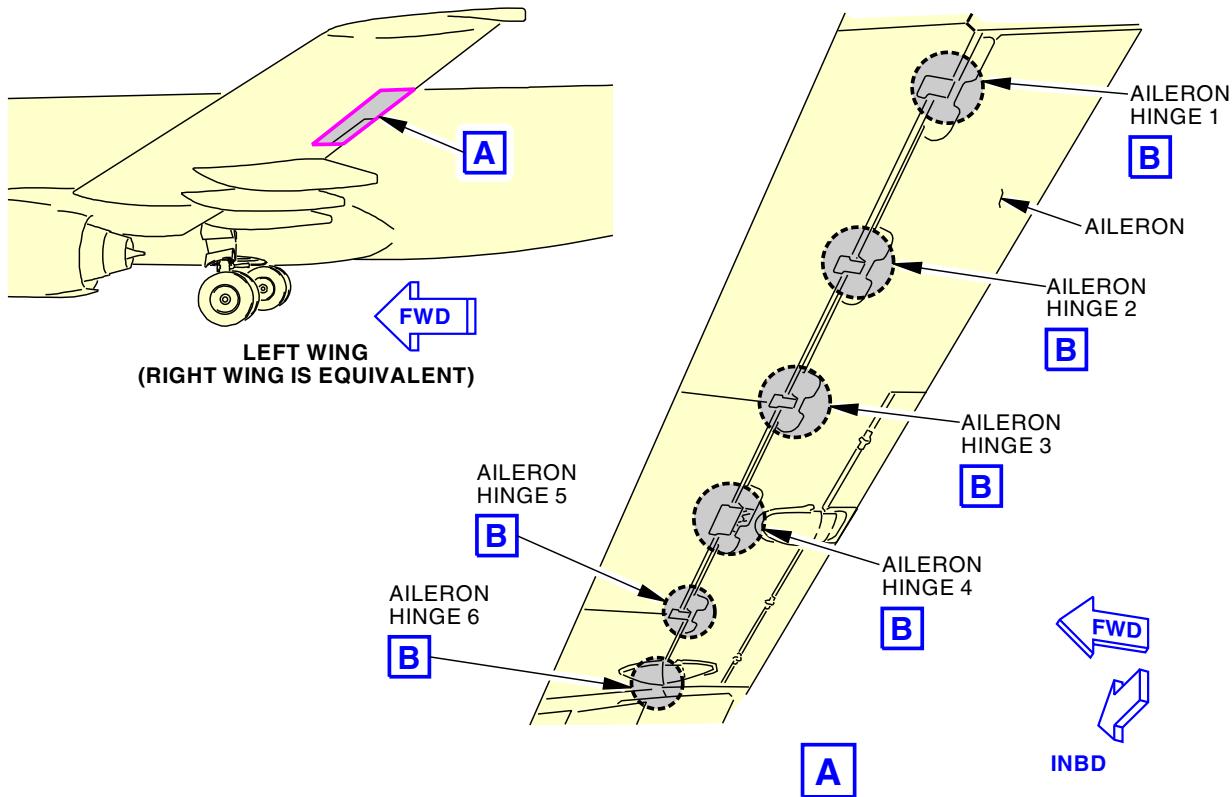
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

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Aileron Hinge Servicing
Figure 301/12-22-11-990-801

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TASK 12-22-11-600-801

3. Aileron Balance Tab Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
572	Left Wing - Aileron
672	Right Wing - Aileron

E. Prepare for the Lubrication

SUBTASK 12-22-11-860-003

- (1) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 12-22-11-020-001

- (2) Remove the forward removable fairing [101] and the aft removable fairing [103] to get access to tab hinges 2 and 3:
- Remove the bolts [106] that attach the forward removable fairing [101] to the aileron [102].
 - Remove the forward removable fairing [101].
 - Remove the bolts [104] that attach the aft removable fairing [103] to the aileron balance tab [105].
 - Remove the aft removable fairing [103].

F. Aileron Balance Tab Lubrication

(Table 302)

SUBTASK 12-22-11-640-007

- (1) This table supplies data for the subsequent lubrication step:

Table 302/12-22-11-993-807 Aileron Balance Tab Hinge Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Tab Hinge	BMS 3-33	Flush	5

SUBTASK 12-22-11-640-002

- (2) Lubricate the tab hinges on the aileron balance tab [105] with grease, D00633:

EFFECTIVITY
LOM ALL

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LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-465

- (a) Make sure that the two grease fittings are installed on the side of the bearing. Replace them if necessary.
- (b) Hold the unused grease fitting in its position when you apply grease, D00633. The grease fitting can get pushed out during grease application.

LOM ALL

- (c) Fill the tab hinges with grease, D00633 until clean grease comes out of the bearings.
NOTE: It is only necessary to put grease in one of the lubrication holes on each tab hinge.
- (d) Wipe unwanted grease, D00633 from around the tab hinges.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-11-420-001

- (1) Install the forward removable fairing [101] and the aft removable fairing [103] with the bolts [104] and bolts [106]:
 - (a) Put the aft removable fairing [103] in its position.
 - (b) Install the aft removable fairing [103] with the bolts [104].
 - (c) Put the forward removable fairing [101] in its position.
 - (d) Install the forward removable fairing [101] with the bolts [106].

SUBTASK 12-22-11-860-009

- (2) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

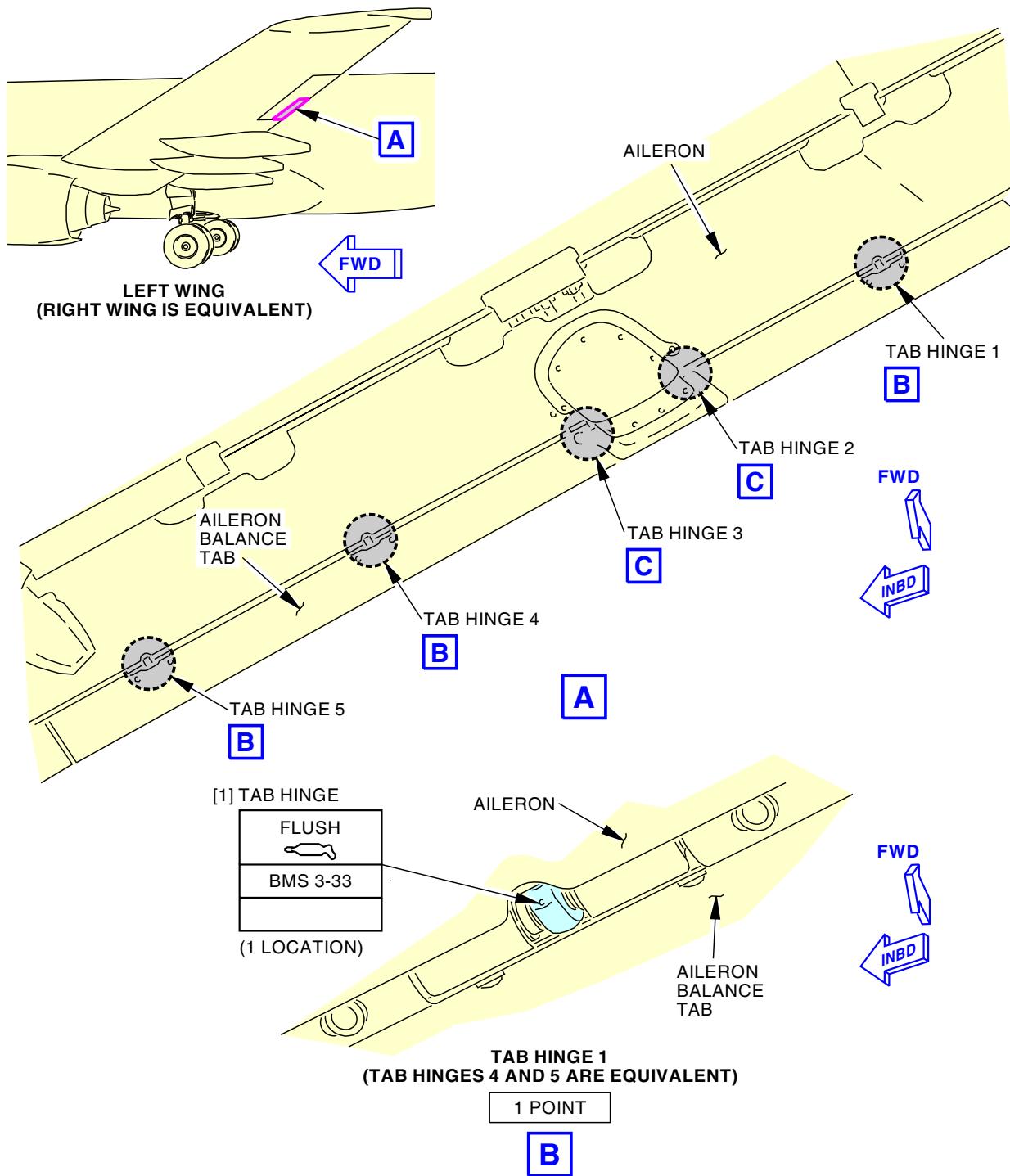
———— END OF TASK ————

EFFECTIVITY
LOM ALL

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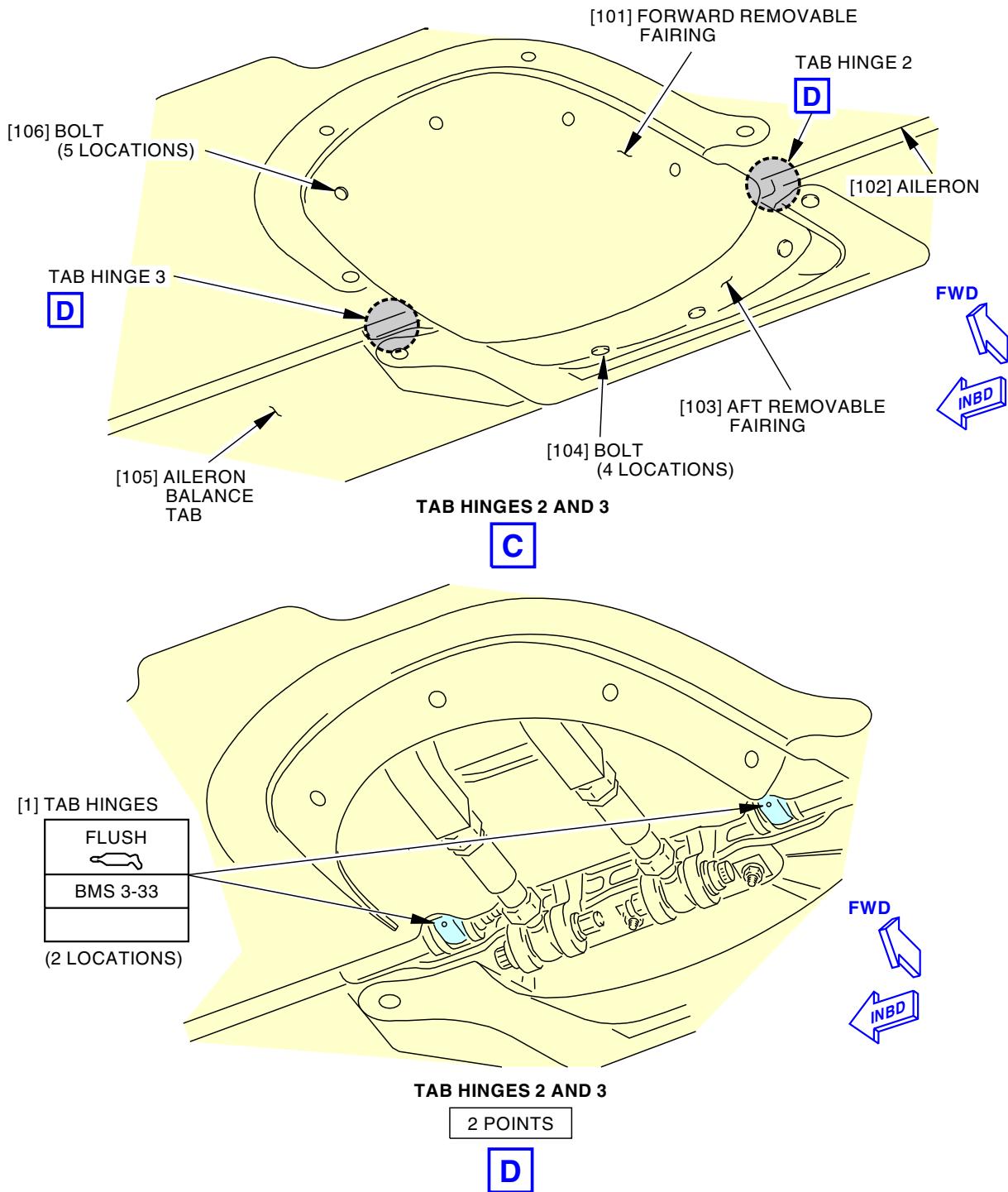
Aileron Balance Tab Hinge Servicing
Figure 302/12-22-11-990-802 (Sheet 1 of 4)

EFFECTIVITY
LOM 466-999

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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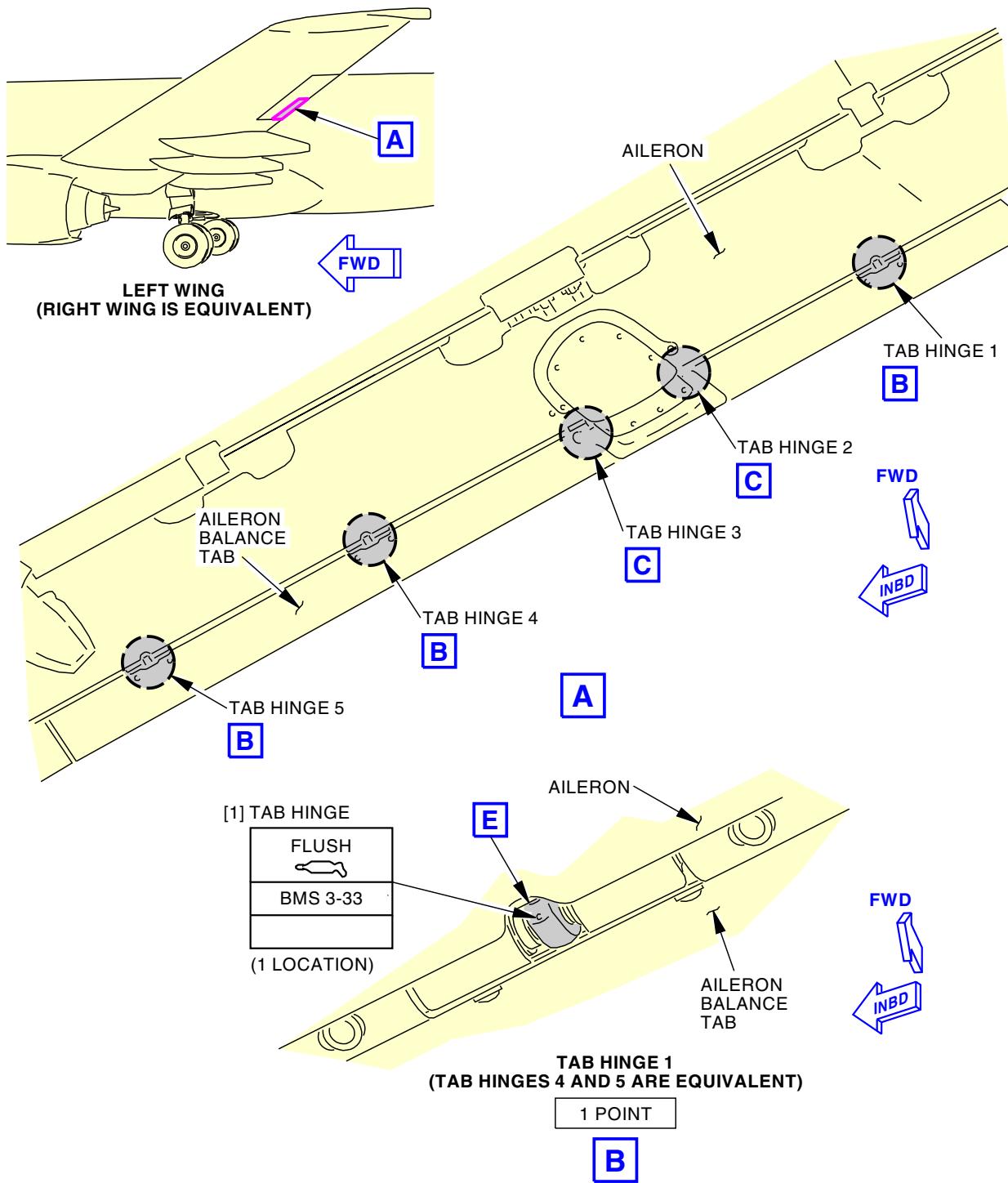
Aileron Balance Tab Hinge Servicing
Figure 302/12-22-11-990-802 (Sheet 2 of 4)

EFFECTIVITY
LOM 466-999

12-22-11

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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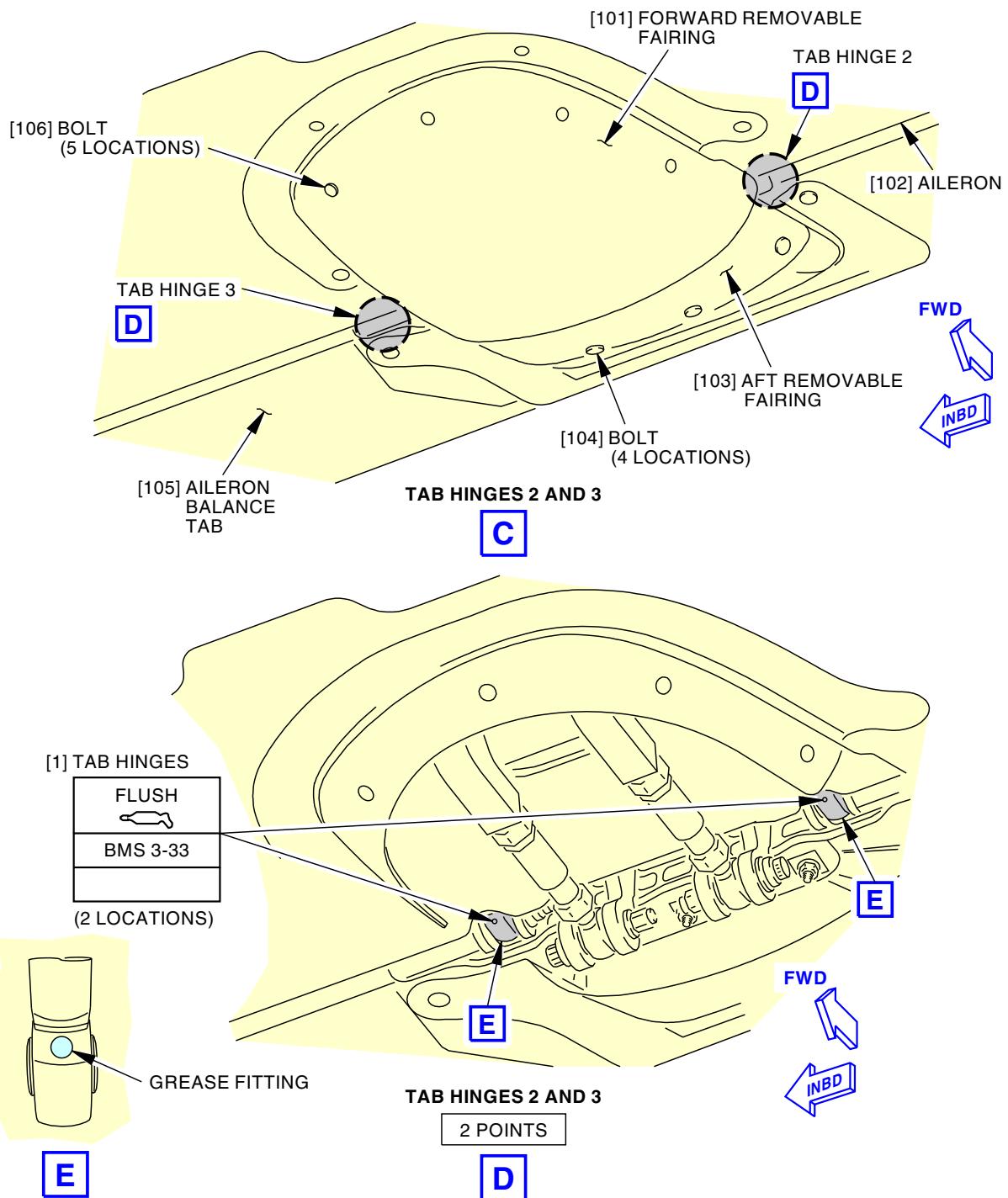
Aileron Balance Tab Hinge Servicing
Figure 302/12-22-11-990-802 (Sheet 3 of 4)

EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
 422-434, 437-447, 450-465

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**Aileron Balance Tab Hinge Servicing
Figure 302/12-22-11-990-802 (Sheet 4 of 4)**

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-447, 450-465

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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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TASK 12-22-11-640-802

4. Aileron Tab Control Rods Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure has the steps to lubricate the aileron tab control rods.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)
51-21-72-370-804	BMS10-11 Primer - Application (P/B 701)

C. Consumable Materials

Reference	Description	Specification
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
572	Left Wing - Aileron
672	Right Wing - Aileron

E. Prepare for the Lubrication

SUBTASK 12-22-11-860-005

- (1) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 12-22-11-020-004

- (2) Remove the hinge seal [107].
(a) Remove the bolts [108].

SUBTASK 12-22-11-020-002

- (3) Remove the forward removable fairing [101].
(a) Remove the bolts [106] that attach the forward removable fairing [101] to the aileron [102].
(b) Remove the forward removable fairing [101].

SUBTASK 12-22-11-020-003

- (4) Remove the aft removable fairing [103].
(a) Remove the bolts [104] that attach the aft removable fairing [103] to the aileron balance tab [105].
(b) Remove the aft removable fairing [103].

EFFECTIVITY
LOM ALL

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F. Aileron Tab Control Rods Lubrication

SUBTASK 12-22-11-640-010

- (1) This table supplies data for the subsequent lubrication step (Table 303):

Table 303/12-22-11-993-808 Aileron Tab Control Rods Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Rod end bearing	BMS 3-33	Flush	4

SUBTASK 12-22-11-640-003

- (2) Lubricate the rod end bearings of the aileron tab control rods with grease, D00633.
- (a) At the aileron balance tab, fill the rod end bearings with grease, D00633, until clean grease comes out of the bearings.
NOTE: It is only necessary to put grease in one of the lubrication holes on each rod end bearing.
 - (b) At the aileron, fill the rod end bearings with grease, D00633.
 - (c) Wipe unwanted grease, D00633, from around the rod end bearings.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-11-420-003

- (1) Install the aft removable fairing [103].
- (a) Put the aft removable fairing [103] in its position.
 - (b) Install the bolts [104] to attach the aft removable fairing [103].

SUBTASK 12-22-11-420-004

- (2) Install the forward removable fairing [101].
- (a) Put the forward removable fairing [101] in its position.
 - (b) Install the bolts [106] to attach the forward removable fairing [101].

SUBTASK 12-22-11-420-005

- (3) Install the hinge seal [107].
- (a) If it is necessary, apply primer, C00259, to all areas of the holes for the bolts [108], do this task: BMS10-11 Primer - Application, TASK 51-21-72-370-804.
NOTE: All areas of the hole for the bolt include the areas around the hole on the installation base and the inner surface of the bolt hole.
 - (b) If it is necessary, apply compound, C00528, to all areas of the holes for the bolts [108] and immediately install bolts [108].

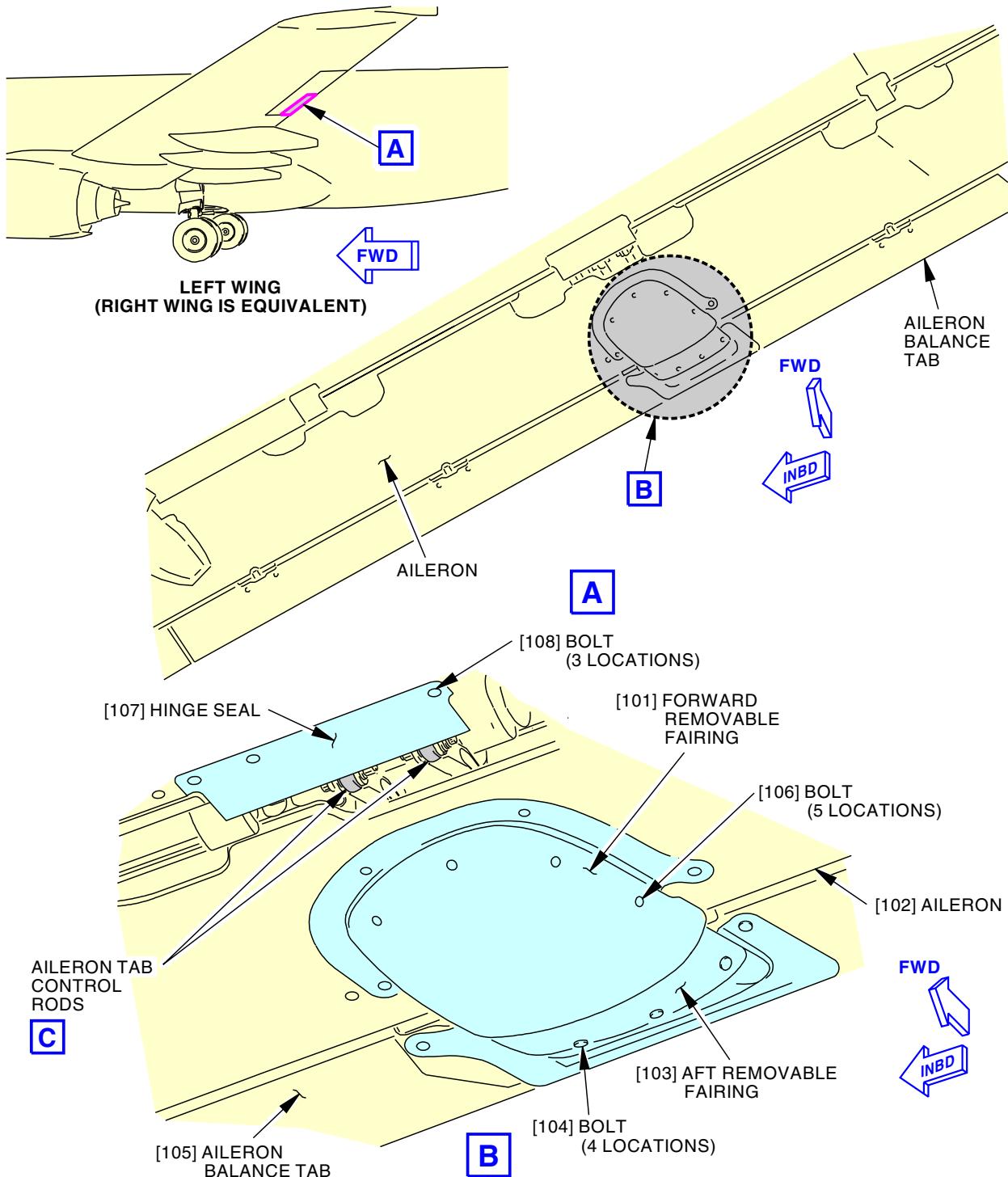
SUBTASK 12-22-11-860-006

- (4) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-11



G16870 S0006561416_V3

Aileron Tab Control Rods Servicing Figure 303/12-22-11-990-803 (Sheet 1 of 2)

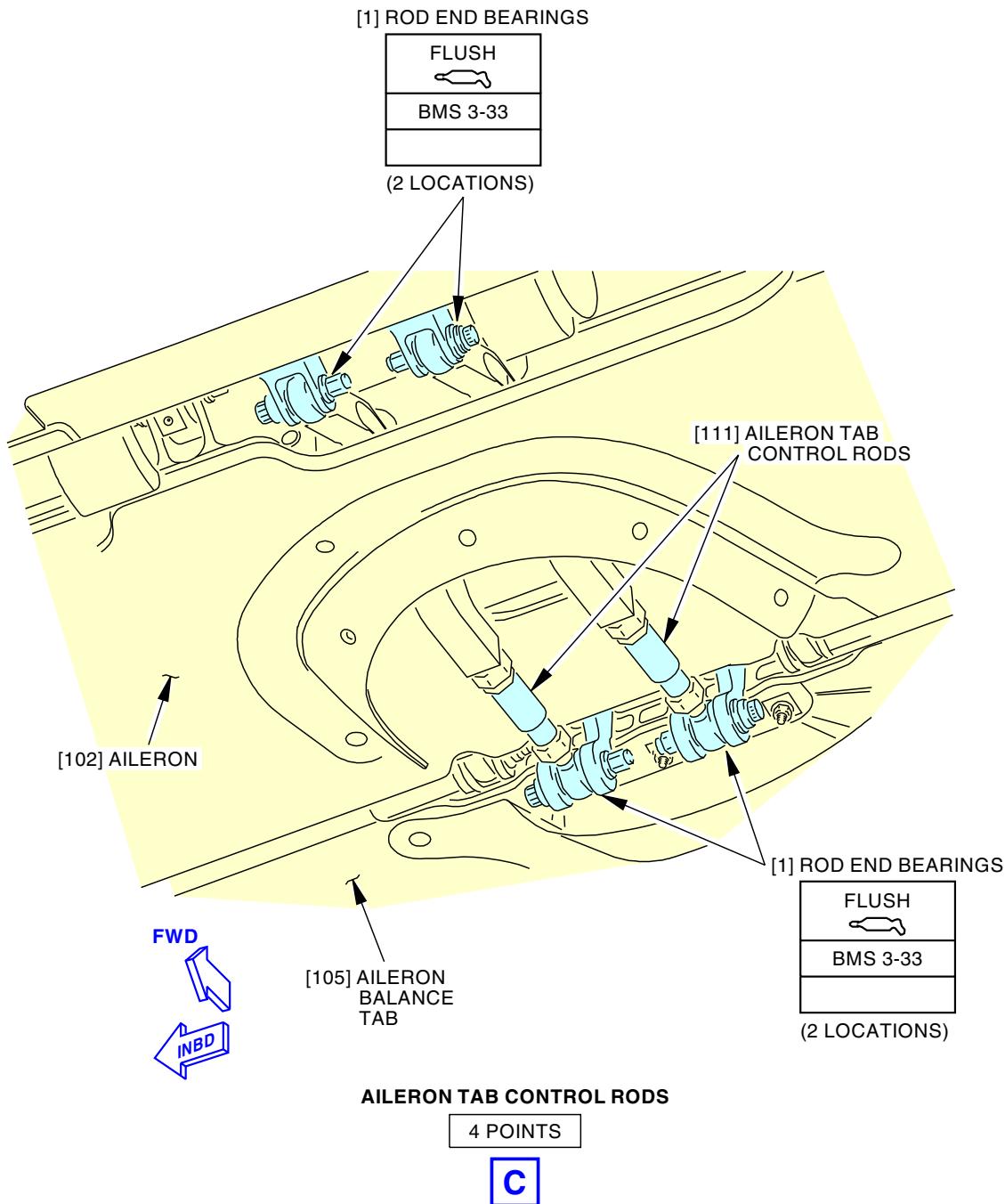
EFFECTIVITY
LOM ALL

12-22-11

D633A101-LOM



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G16871 S0006561417_V4

Aileron Tab Control Rods Servicing
Figure 303/12-22-11-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-11

D633A101-LOM



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-11-640-803

5. Aileron Wing Quadrant Control Rod Lubrication

(Figure 304)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure has the steps to lubricate the aileron wing quadrant control rod.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
572	Left Wing - Aileron
672	Right Wing - Aileron

E. Access Panels

Number	Name/Location
571BB	Lower Outboard Fixed Trailing Edge Access Panel
572BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00
671BB	Lower Outboard Fixed Trailing Edge Access Panel
672BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00

F. Prepare for the Lubrication

SUBTASK 12-22-11-860-007

- (1) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 12-22-11-010-003

- (2) If you work on the left wing, remove these access panels:

Number	Name/Location
571BB	Lower Outboard Fixed Trailing Edge Access Panel
572BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00

SUBTASK 12-22-11-010-006

- (3) If you work on the right wing, remove these access panels:

Number	Name/Location
671BB	Lower Outboard Fixed Trailing Edge Access Panel
672BB	Lower Aileron, Actuator Rod Fairing - WBL 427.00

G. Aileron Wing Quadrant Lubrication

SUBTASK 12-22-11-640-008

- (1) This table supplies data for the subsequent lubrication step (Table 304):

EFFECTIVITY	
LOM ALL	

12-22-11



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Table 304/12-22-11-993-809 Aileron Wing Quadrant Control Rod Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Rod end bearing	BMS 3-33	Flush	2

SUBTASK 12-22-11-640-004

- (2) Lubricate the rod end bearings of the aileron control rod on the aileron wing quadrant with grease, D00633.

- (a) Fill the rod end bearings with grease, D00633 until clean grease comes out of the bearings.

NOTE: It is only necessary to put grease in one of the lubrication holes on each rod end bearing.

- (b) Wipe unwanted grease, D00633 from around the rod end bearings.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-11-010-004

- (1) Install the applicable access panels.

- (a) For the left wing, close these access panels:

Number Name/Location

571BB Lower Outboard Fixed Trailing Edge Access Panel

572BB Lower Aileron, Actuator Rod Fairing - WBL 427.00

- (b) For the right wing, close these access panels:

Number Name/Location

671BB Lower Outboard Fixed Trailing Edge Access Panel

672BB Lower Aileron, Actuator Rod Fairing - WBL 427.00

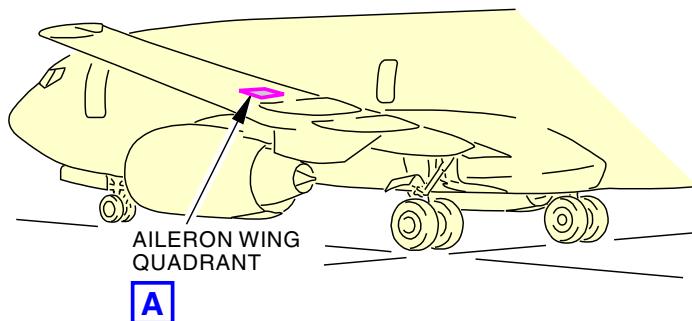
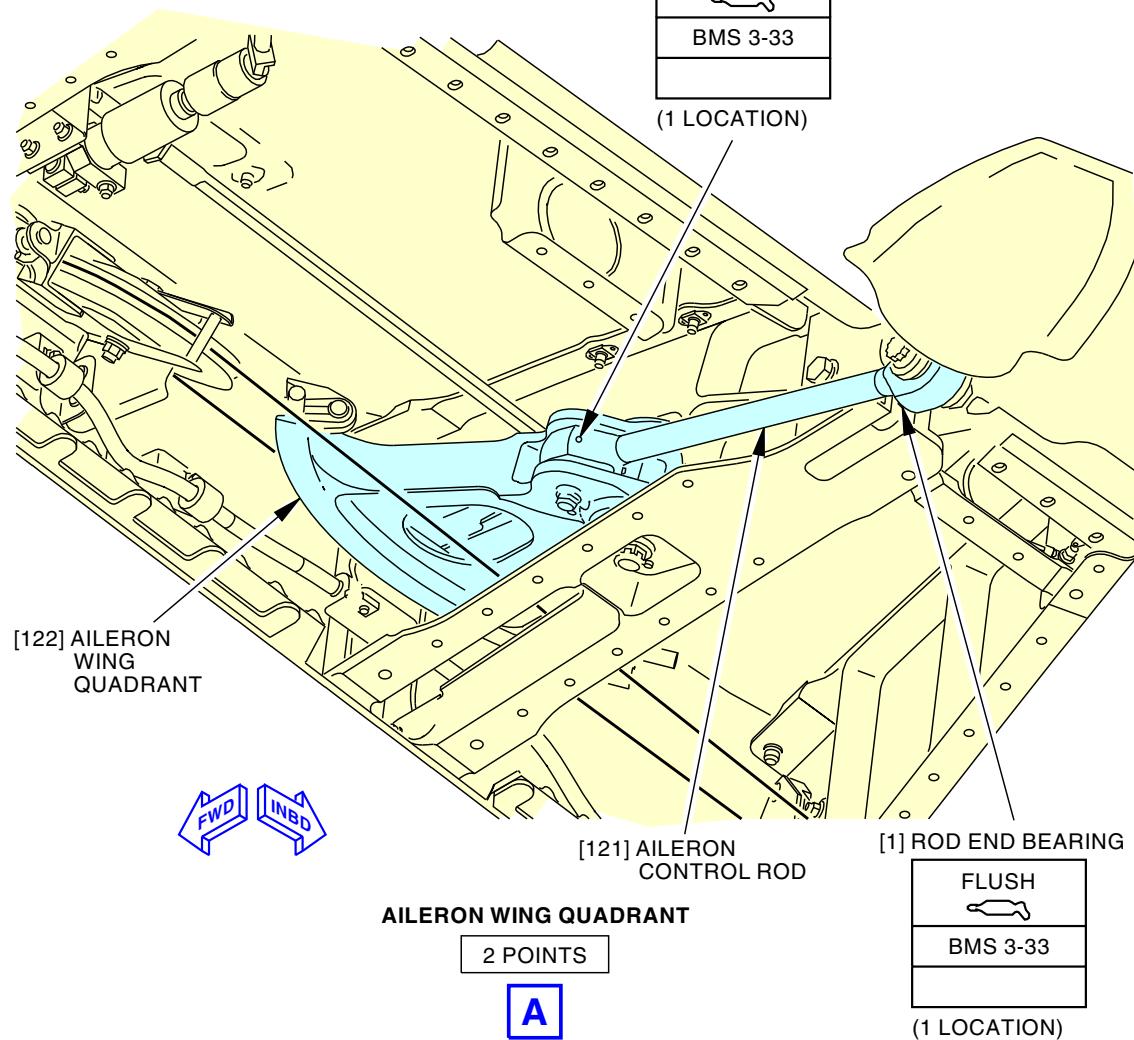
SUBTASK 12-22-11-860-008

- (2) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-11


A
**LEFT WING
(RIGHT WING IS EQUIVALENT)**
[1] ROD END BEARING
FLUSH
BMS 3-33
(1 LOCATION)


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Aileron Wing Quadrant Control Rod Servicing
Figure 304/12-22-11-990-804
EFFECTIVITY
LOM ALL
12-22-11

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-11-640-804

6. Aileron Power Output Lever Lubrication

(Figure 305)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure has the steps to lubricate the aileron power output lever.

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

D. Aileron Power Output Lever Lubrication

SUBTASK 12-22-11-640-009

- (1) This table supplies data for the subsequent lubrication step (Table 305):

Table 305/12-22-11-993-810 Aileron Power Output Lever Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Power Output Lever	BMS 3-33	Flush	2

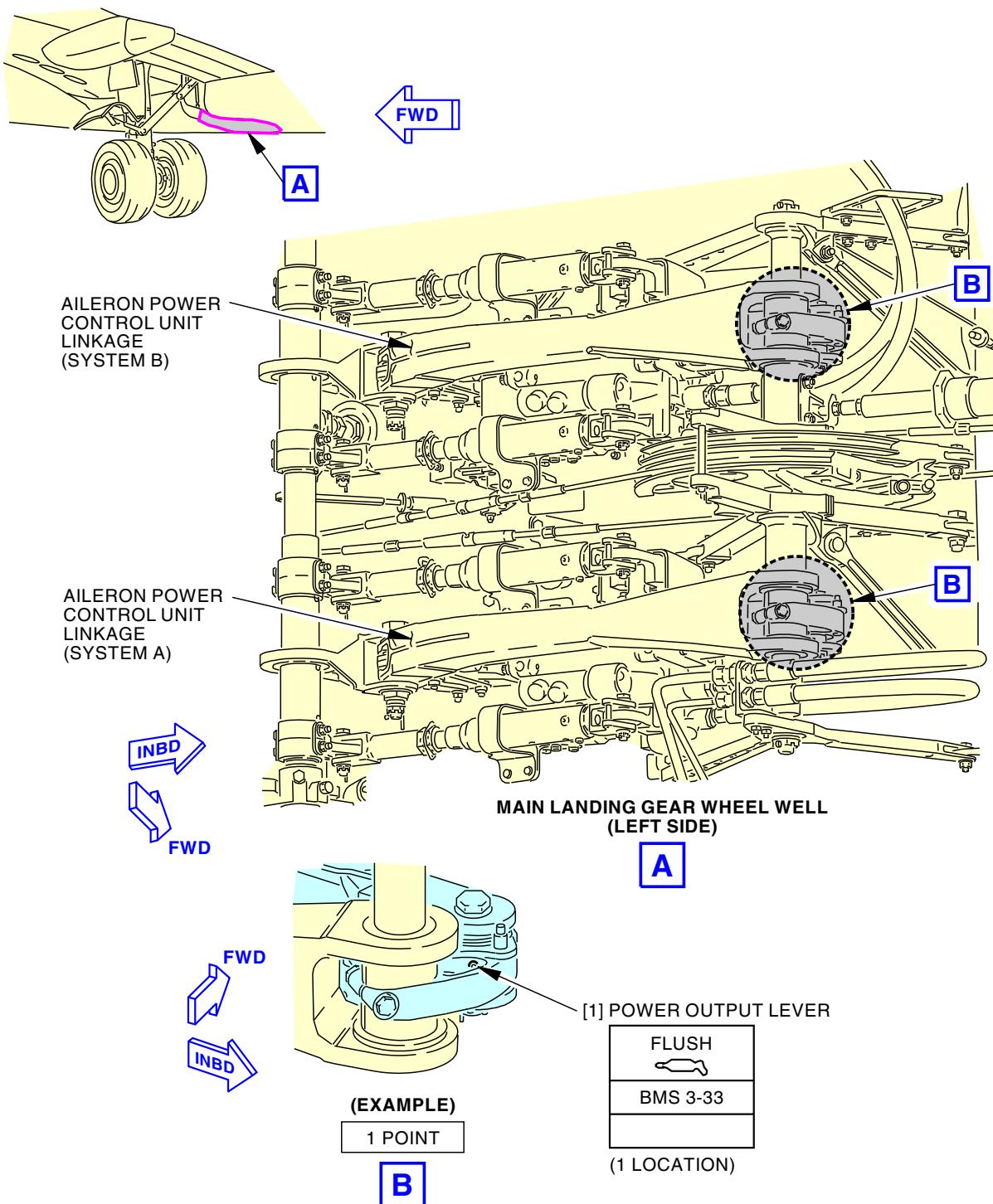
SUBTASK 12-22-11-640-005

- (2) Lubricate the power output lever with grease, D00633.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-11



G16998 S0006561423_V3

Aileron Power Output Lever Servicing
Figure 305/12-22-11-990-805

EFFECTIVITY
LOM ALL
12-22-11

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL

RUDDER - SERVICING

1. General

- A. This procedure has these tasks:
- (1) A lubrication of the rudder Power Control Units (PCUs)
 - (2) A lubrication of the rudder spring slider shaft
 - (3) A lubrication of the rudder hinge.

TASK 12-22-21-600-801

2. Rudder Power Control Units (PCUs) Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task includes steps to lubricate rudder main Power Control Unit (PCU) and standby rudder PCU bearings.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)
27-21-00-840-802	Pressure to the Rudder Systems A, B, and Standby - Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

F. Prepare for the Lubrication

SUBTASK 12-22-21-860-001

- (1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 12-22-21-010-004

- (2) Open this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

SUBTASK 12-22-21-640-003

- (3) Move the rudder to the full left position to get access to the PCUs rod ends.

G. Rudder Power Control Units Lubrication

SUBTASK 12-22-21-640-006

- (1) This table supplies data for the subsequent lubrication step:

EFFECTIVITY	
LOM ALL	

12-22-21



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Table 301/12-22-21-993-803 Rudder Power Control Units (PCUs) Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	PCU Rod End	grease, D00633	Flush	2

SUBTASK 12-22-21-640-001

- (2) Put grease, D00633, in the lubrication fittings of the rod end bearings for the PCU and rudder.

NOTE: Only the bearing at the aft end of each PCU use lubricant. The bearings at the front of the PCU do not use lubricant.

- (a) Add grease, D00633, until clean grease, D00633, comes out of the bearings.

SUBTASK 12-22-21-100-001

- (3) Remove the excess grease, D00633, from around the bearing.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-21-410-002

- (1) Close this access panel:

Number Name/Location

324DR Vertical Fin, Trailing Edge Access

SUBTASK 12-22-21-860-002

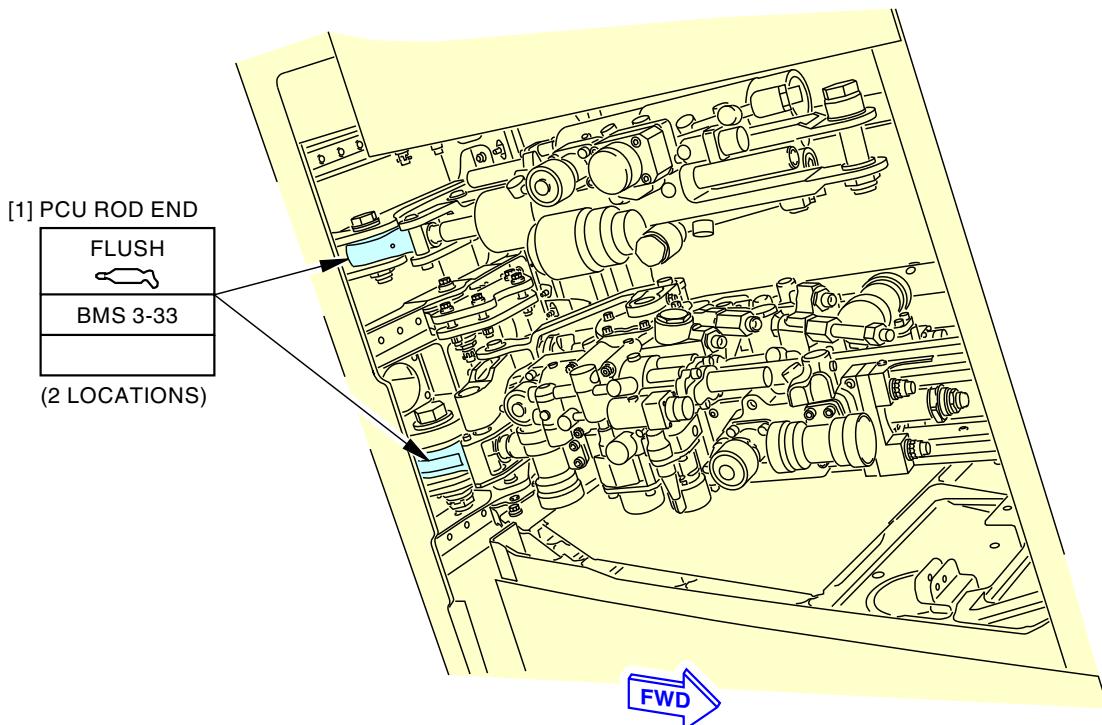
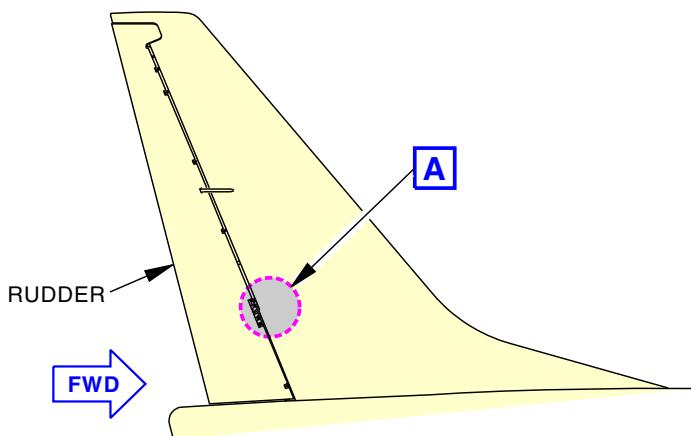
- (2) Do this task: Pressure to the Rudder Systems A, B, and Standby - Activation, TASK 27-21-00-840-802.

———— END OF TASK ————

— EFFECTIVITY —

LOM ALL

12-22-21


RUDDER PCU TO RUDDER ATTACHMENTS
2 POINTS
A

G08481 S0006561428_V3

Rudder Power Control Units (PCUs) Servicing
Figure 301/12-22-21-990-801
EFFECTIVITY
LOM ALL
12-22-21

D633A101-LOM



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TASK 12-22-21-600-802

3. Spring Slider Shaft Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task includes steps to lubricate the spring slider shaft of the rudder feel and centering unit.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)
27-21-00-840-802	Pressure to the Rudder Systems A, B, and Standby - Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324CL	Vertical Fin, Access

F. Prepare for the Lubrication

SUBTASK 12-22-21-860-003

- (1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 12-22-21-010-001

- (2) To get access to the rudder feel and centering unit, open this access panel:

Number	Name/Location
324CL	Vertical Fin, Access

G. Lubricate the Spring Slider Shaft

SUBTASK 12-22-21-640-007

- (1) This table supplies data for the subsequent lubrication step:

Table 302/12-22-21-993-804 Spring Slider Shaft Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Spring Slider Shaft	grease, D00633	Hand	1

SUBTASK 12-22-21-640-002

- (2) Do these steps to lubricate the spring slider shaft of the rudder feel and centering unit:

- (a) Push one of the rudder pedals fully forward to get access to the spring slider shaft.

EFFECTIVITY
LOM ALL

12-22-21



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- (b) Apply a thin layer of grease, D00633, to the part of the spring slider shaft that you can get access to.
NOTE: There must be sufficient grease on the spring slider shaft for you to see the grease.
- (c) Put the rudder pedals back to the center position.
- (d) Apply a thin layer of grease, D00633, to the part of the spring slider shaft that you can get access to through the spring cartridge.
NOTE: There must be sufficient grease on the spring slider shaft for you to see the grease.
- (e) Move the rudder pedals through 10 cycles to apply the grease equally.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-21-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
324CL	Vertical Fin, Access

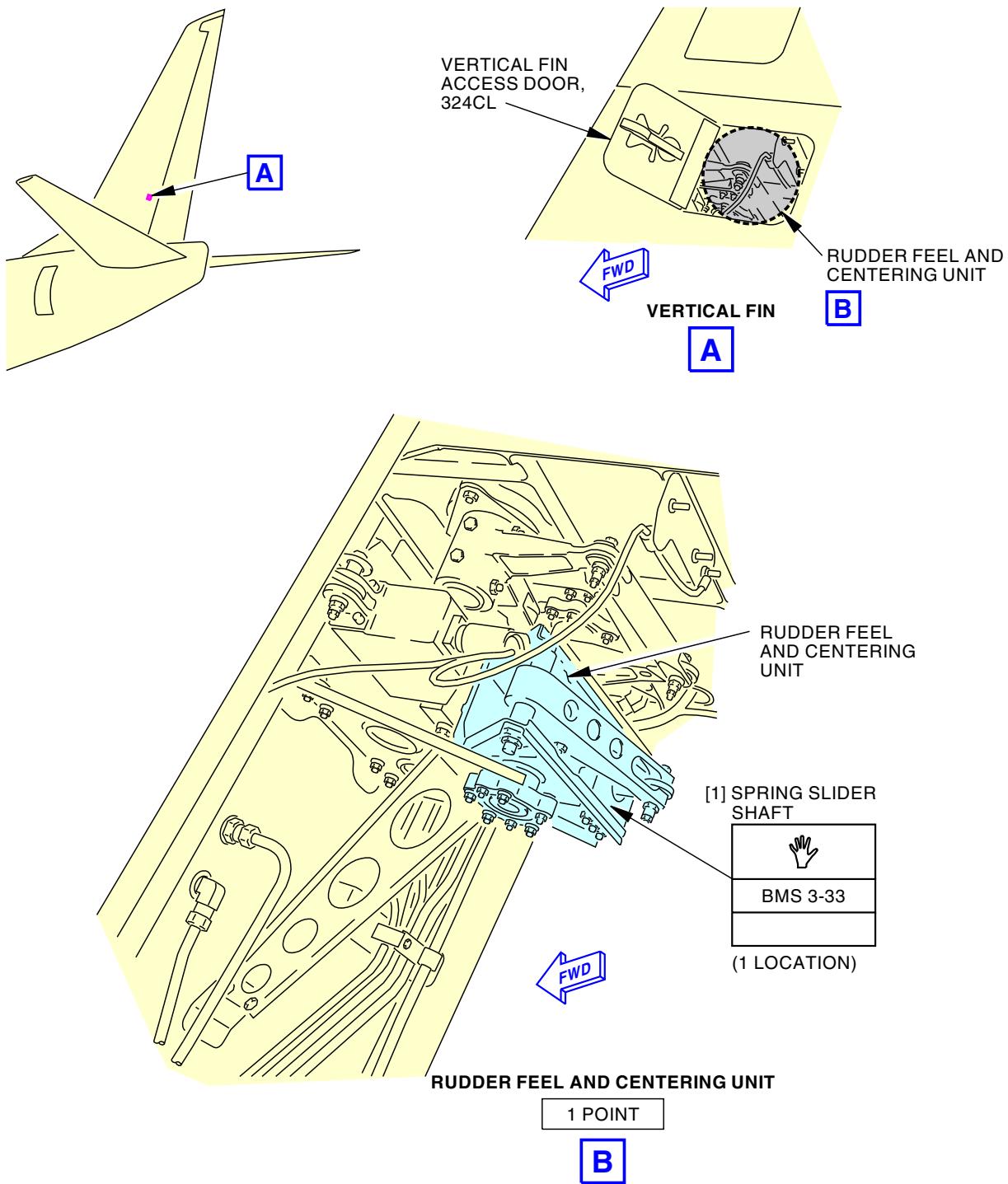
SUBTASK 12-22-21-860-004

- (2) Do this task: Pressure to the Rudder Systems A, B, and Standby - Activation, TASK 27-21-00-840-802.

———— END OF TASK ————



12-22-21



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Spring Slider Shaft Servicing
Figure 302/12-22-21-990-802

 EFFECTIVITY
 LOM ALL

12-22-21

D633A101-LOM



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TASK 12-22-21-640-801

4. Rudder Hinge Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task includes steps to lubricate rudder hinges.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)
27-21-00-840-802	Pressure to the Rudder Systems A, B, and Standby - Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
325	Vertical Fin - Rudder

E. Access Panels

Number	Name/Location
324AAL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324ABL	Panel Assy - Trailing Edge, Beam Seal, Vertical Fin
324ACL	Rudder Nose Cover/Rudder Hinge No. 8 At Rudder Station 276.24
324ADL	Rudder Nose Cover/Rudder Hinge No. 7 At Rudder Station 257.92
324AEL	Rudder Nose Cover/Rudder Hinge No. 6 At Rudder Station 239.61
324AFL	Rudder Nose Cover/Rudder Hinge No. 5 At Rudder Station 184.67
324AHL	Rudder Nose Fairing/Rudder Hinge No. 4 At Rudder Station 129.74.
324AJL	Rudder Nose Fairing/Rudder Hinge No. 3 At Rudder Station 70.65
324AKL	Rudder Nose Fairing/Rudder Hinge No. 2 At Rudder Station 53.48
324ALL	Rudder Nose Cover/Rudder Hinge No. 1 At Rudder Station 6.96
324QL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324SL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324UL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324XL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324ZL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin

F. Prepare for the Lubrication

SUBTASK 12-22-21-860-005

- (1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 12-22-21-010-002

- (2) Open the applicable access panels:

Number	Name/Location
324AAL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin

EFFECTIVITY
LOM ALL

12-22-21



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AIRCRAFT MAINTENANCE MANUAL

(Continued)

<u>Number</u>	<u>Name/Location</u>
324ABL	Panel Assy - Trailing Edge, Beam Seal, Vertical Fin
324ACL	Rudder Nose Cover/Rudder Hinge No. 8 At Rudder Station 276.24
324ADL	Rudder Nose Cover/Rudder Hinge No. 7 At Rudder Station 257.92
324AEL	Rudder Nose Cover/Rudder Hinge No. 6 At Rudder Station 239.61
324AFL	Rudder Nose Cover/Rudder Hinge No. 5 At Rudder Station 184.67
324AHL	Rudder Nose Fairing/Rudder Hinge No. 4 At Rudder Station 129.74.
324AJL	Rudder Nose Fairing/Rudder Hinge No. 3 At Rudder Station 70.65
324AKL	Rudder Nose Fairing/Rudder Hinge No. 2 At Rudder Station 53.48
324ALL	Rudder Nose Cover/Rudder Hinge No. 1 At Rudder Station 6.96
324QL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324SL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324UL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324XL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324ZL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin

G. Rudder Hinge Lubrication

SUBTASK 12-22-21-640-008

- (1) This table supplies data for the subsequent lubrication step:

Table 303/12-22-21-993-806 Rudder Hinge Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Rudder Hinge	grease, D00633	Zerk	9

SUBTASK 12-22-21-640-004

- (2) Move the rudder to the full right position to get access to the rudder hinge fittings.

SUBTASK 12-22-21-640-005

- (3) Lubricate the rudder hinges with grease, D00633.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-21-010-003

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
324AAL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324ABL	Panel Assy - Trailing Edge, Beam Seal, Vertical Fin
324ACL	Rudder Nose Cover/Rudder Hinge No. 8 At Rudder Station 276.24
324ADL	Rudder Nose Cover/Rudder Hinge No. 7 At Rudder Station 257.92
324AEL	Rudder Nose Cover/Rudder Hinge No. 6 At Rudder Station 239.61
324AFL	Rudder Nose Cover/Rudder Hinge No. 5 At Rudder Station 184.67
324AHL	Rudder Nose Fairing/Rudder Hinge No. 4 At Rudder Station 129.74.
324AJL	Rudder Nose Fairing/Rudder Hinge No. 3 At Rudder Station 70.65
324AKL	Rudder Nose Fairing/Rudder Hinge No. 2 At Rudder Station 53.48
324ALL	Rudder Nose Cover/Rudder Hinge No. 1 At Rudder Station 6.96
324QL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324SL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324UL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin

EFFECTIVITY
LOM ALL

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(Continued)

Number

Name/Location

324XL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin
324ZL	Panel Assy - Trailing Edge, Beam Seal, Vert Fin

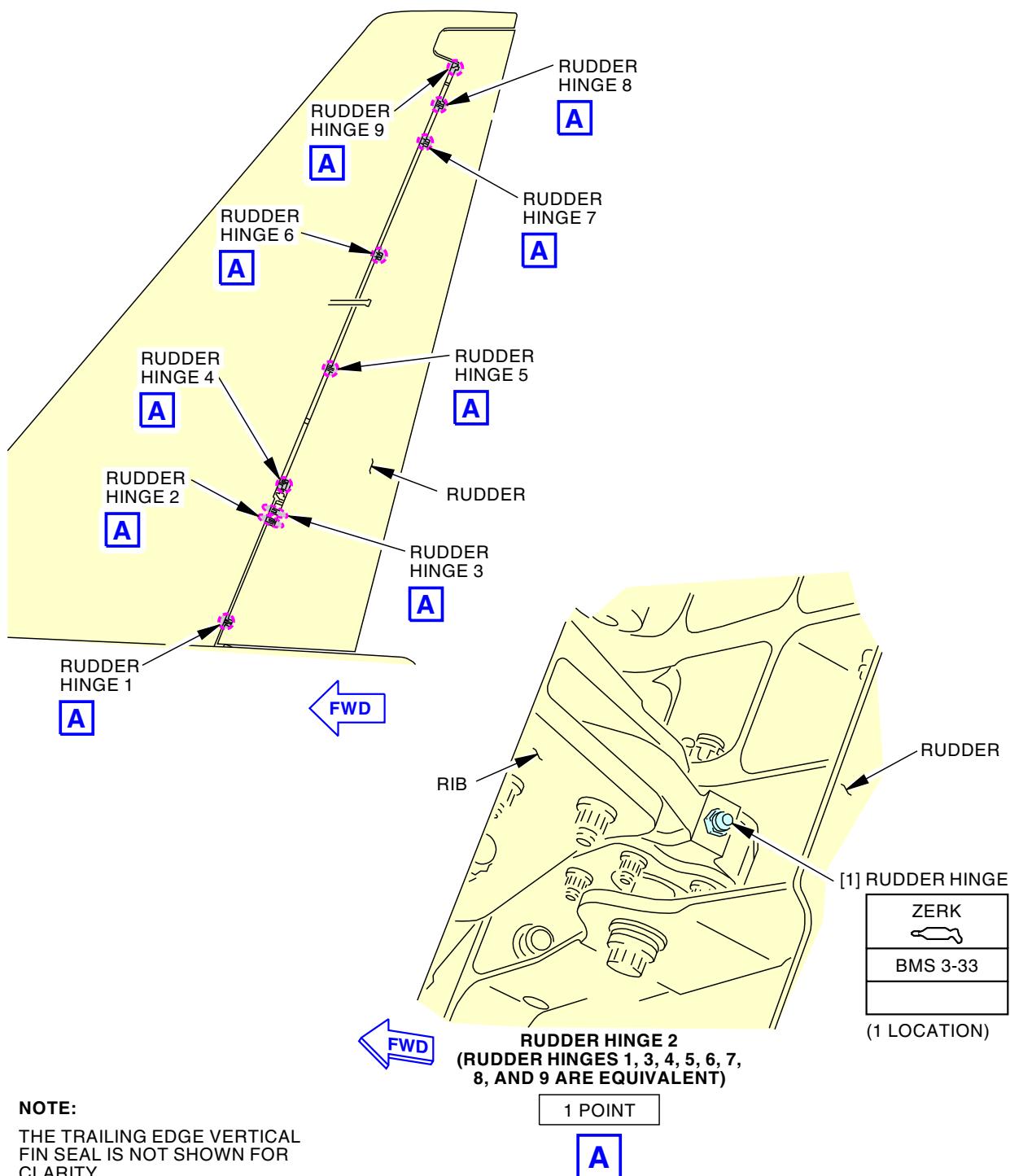
SUBTASK 12-22-21-860-006

- (2) Do this task: Pressure to the Rudder Systems A, B, and Standby - Activation,
TASK 27-21-00-840-802.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-21

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**Rudder Hinge Servicing
Figure 303/12-22-21-990-805**
12-22-21



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ELEVATOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A lubrication of the elevator buss crank and lubrication of the master arm hinge fitting.
 - (2) A lubrication of the elevator hinges.
 - (3) A lubrication of the elevator tab hinges.
 - (4) A lubrication of the elevator balance panel hinges.

TASK 12-22-31-600-801

2. Elevator Buss Crank and Master Arm Fitting - Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
27-31-00-840-801	Put the Elevator Hydraulic systems A and B Back to the Condition Before the Pressurization (P/B 201)
27-31-00-840-802	Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
334	Left Horizontal Stabilizer - Elevator
344	Right Horizontal Stabilizer - Elevator

D. Access Panels

Number	Name/Location
333AT	Horizontal Stabilizer, Gap Cover, Horizontal Stabilizer to Body
343AT	Horizontal Stabilizer, Gap Cover - H. Stab. to Body

E. Prepare for the Lubrication

SUBTASK 12-22-31-860-010

- (1) Position the control column in the neutral position and place a DO-NOT-MOVE tag on the control column.

SUBTASK 12-22-31-860-011

- (2) Set the FLT CONTROL A and B switches to OFF.

SUBTASK 12-22-31-860-012

- (3) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

EFFECTIVITY
LOM ALL

12-22-31



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SUBTASK 12-22-31-010-004

- (4) For the left elevator buss crank and master arm fitting, open this access panel:

Number Name/Location

333AT Horizontal Stabilizer, Gap Cover, Horizontal Stabilizer to Body

SUBTASK 12-22-31-010-005

- (5) For the right elevator buss crank and master arm fitting, open this access panel:

Number Name/Location

343AT Horizontal Stabilizer, Gap Cover - H. Stab. to Body

F. Elevator Buss Crank and Master Arm Fitting Lubrication

(Table 301)

SUBTASK 12-22-31-640-006

- (1) This table supplies data for the subsequent lubrication step:

Table 301/12-22-31-993-804 Elevator Buss Crank and Master Arm Fitting Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Master Arm Hinge Fitting	grease, D00633	Flush	1
2	Buss Crank Assembly	grease, D00633	Flush	1

SUBTASK 12-22-31-640-002

- (2) Lubricate the elevator output torque tube buss crank [2] (Figure 301).
- Locate the buss crank lubrication fitting.
 - Lubricate the buss crank with grease, D00633.
- Add grease, D00633, into lubrication fitting until clean grease, D00633, comes out of the bearing.

SUBTASK 12-22-31-640-003

- (3) Lubricate the master arm hinge fitting [1] (Figure 301).
- Put grease, D00633, into the master arm hinge fitting [1].
- Add grease, D00633, until clean grease, D00633, comes out of the bearing.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-31-410-004

- (1) For the left elevator buss crank and master arm fitting, close this access panel:

Number Name/Location

333AT Horizontal Stabilizer, Gap Cover, Horizontal Stabilizer to Body

SUBTASK 12-22-31-410-005

- (2) For the right elevator buss crank and master arm fitting, close this access panel:

Number Name/Location

343AT Horizontal Stabilizer, Gap Cover - H. Stab. to Body

SUBTASK 12-22-31-840-001

- (3) Do this task: Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-31-00-840-802.

SUBTASK 12-22-31-860-013

- (4) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

EFFECTIVITY
LOM ALL

12-22-31



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SUBTASK 12-22-31-860-015

- (5) Set the FLT CONTROL A and B switches to ON.

SUBTASK 12-22-31-080-001

- (6) Remove the DO-NOT-MOVE tag from the control column.

SUBTASK 12-22-31-710-003

- (7) Move the elevator through the full range of travel to make sure it moves freely.
(a) Push the control column all the way forward then pull the control column all the way aft, then release the column to the neutral position.

SUBTASK 12-22-31-600-001

- (8) Do this task: Put the Elevator Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-31-00-840-801.

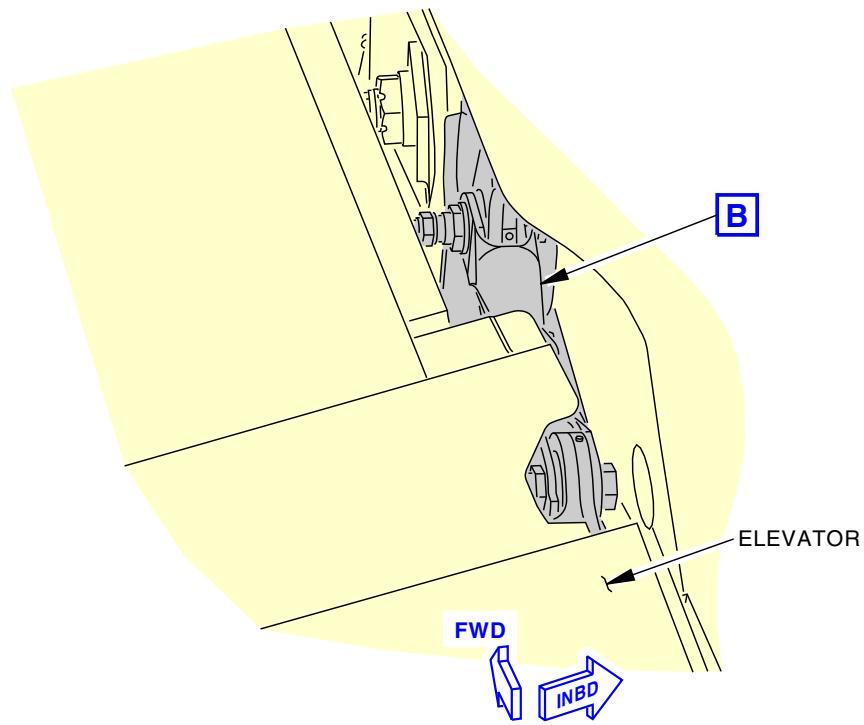
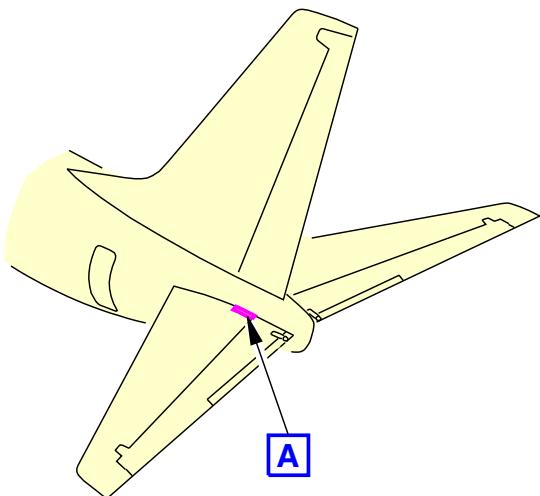
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-31



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A

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Elevator Buss Crank and Master Arm Fitting Lubrication
Figure 301/12-22-31-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

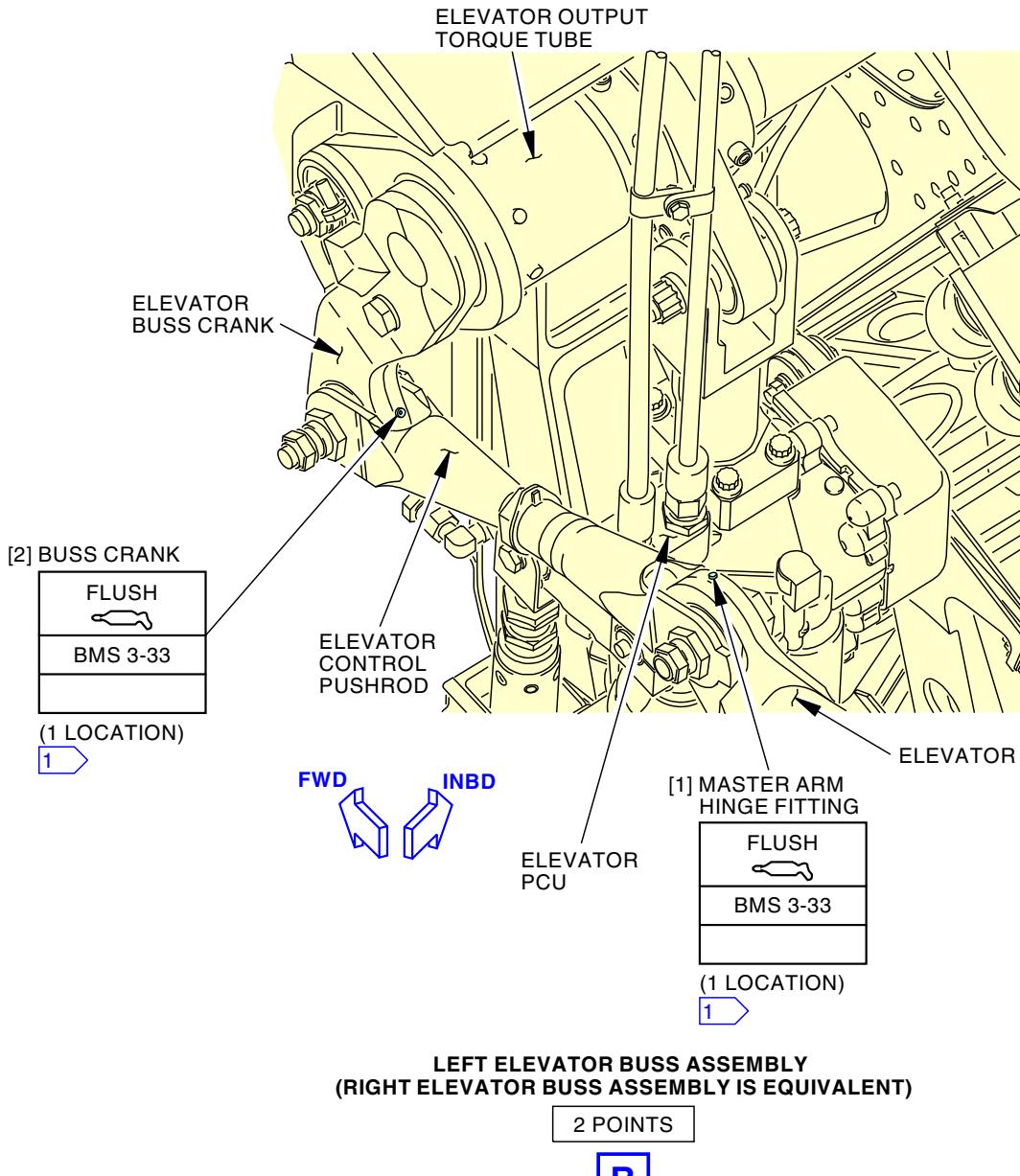
12-22-31

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL

**CAUTION:**

- 1 ON SEALED BEARINGS, DO NOT APPLY GREASE WITH A PRESSURE MORE THAN 1000 PSI (6900 kPa) AND AT A RATE MORE THAN 0.07 GALLON (0.25 LITER) PER MINUTE. WHEN YOU USE A HAND-OPERATED GREASE GUN, DO NOT USE AN EXTENSION HANDLE TO GET MORE FORCE. SEALED BEARINGS CAN BE DAMAGED BY TOO MUCH PRESSURE.

G25626 S0006561440_V3

Elevator Buss Crank and Master Arm Fitting Lubrication
Figure 301/12-22-31-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-31

D633A101-LOM



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TASK 12-22-31-640-801

3. Elevator Hinge Bearings - Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
27-31-00-840-801	Put the Elevator Hydraulic systems A and B Back to the Condition Before the Pressurization (P/B 201)
27-31-00-840-802	Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Access Panels

Number	Name/Location
334GB	Horizontal Stabilizer, Elevator Hinge Cover
334HB	Horizontal Stabilizer, Elevator Hinge Cover
334JB	Horizontal Stabilizer, Elevator Hinge Cover
334KB	Horizontal Stabilizer, Elevator Hinge Cover
334LB	Horizontal Stabilizer, Elevator Hinge Cover
334MB	Horizontal Stabilizer, Elevator Hinge Cover
334NB	Horizontal Stabilizer, Elevator Hinge Cover
344GB	Horizontal Stabilizer, Hinge Cover, Elevator Station 24.09
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54
344JB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 121.59
344KB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 176.64
344LB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 213.32
344MB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 250.04
344NB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 265.45

E. Prepare for the Lubrication

SUBTASK 12-22-31-860-023

- (1) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 12-22-31-860-002

- (2) Move the control column full aft and hold the control column in its position.
(a) Attach a DO NOT OPERATE tag, STD-858, on the control column.

SUBTASK 12-22-31-860-024

- (3) Move the FLT CONTROL A and B switches to the OFF position.

EFFECTIVITY	
LOM ALL	

12-22-31



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SUBTASK 12-22-31-860-001

- (4) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B,
TASK 27-31-00-800-802.

SUBTASK 12-22-31-010-001

- (5) For the left elevator, open these access panels:

<u>Number</u>	<u>Name/Location</u>
334GB	Horizontal Stabilizer, Elevator Hinge Cover
334HB	Horizontal Stabilizer, Elevator Hinge Cover
334JB	Horizontal Stabilizer, Elevator Hinge Cover
334KB	Horizontal Stabilizer, Elevator Hinge Cover
334LB	Horizontal Stabilizer, Elevator Hinge Cover
334MB	Horizontal Stabilizer, Elevator Hinge Cover
334NB	Horizontal Stabilizer, Elevator Hinge Cover

SUBTASK 12-22-31-010-002

- (6) For the right elevator, open these access panels:

<u>Number</u>	<u>Name/Location</u>
344GB	Horizontal Stabilizer, Hinge Cover, Elevator Station 24.09
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54
344JB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 121.59
344KB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 176.64
344LB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 213.32
344MB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 250.04
344NB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 265.45

F. Elevator Hinge Bearings Lubrication

(Table 302)

SUBTASK 12-22-31-640-007

- (1) This table supplies data for the subsequent lubrication step:

Table 302/12-22-31-993-805 Elevator Hinge Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
3	Hinge Fitting	grease, D00633	Zerk	1
4	Hinge Fitting	grease, D00633	Zerk	1
5	Hinge Fitting	grease, D00633	Zerk	2
6	Hinge Fitting	grease, D00633	Zerk	1
7	Hinge Fitting	grease, D00633	Zerk	3

SUBTASK 12-22-31-600-002

- (2) Use the item number [3], [4], [5], [6] and [7] in Table 302 to locate the elevator hinge fittings for lubrication.

SUBTASK 12-22-31-600-003

- (3) Put grease, D00633, into the lube fitting of the elevator hinges.

- Add grease, D00633, until clean grease, D00633, comes out of the bearings.
- Remove the excess grease, D00633, from around the bearing.

EFFECTIVITY
LOM ALL

12-22-31



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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-31-410-009



CAUTION

MAKE SURE THAT THE CUTOUT IN THE HINGE COVER IS FACING THE FORWARD DIRECTION. IF THE HINGE COVER INSTALLATION IS INCORRECT, DAMAGE TO THE HINGE COVER CAN OCCUR.

- (1) For the left elevator, install these access panels:

Number Name/Location

334GB	Horizontal Stabilizer, Elevator Hinge Cover
334HB	Horizontal Stabilizer, Elevator Hinge Cover
334JB	Horizontal Stabilizer, Elevator Hinge Cover
334KB	Horizontal Stabilizer, Elevator Hinge Cover
334LB	Horizontal Stabilizer, Elevator Hinge Cover
334MB	Horizontal Stabilizer, Elevator Hinge Cover
334NB	Horizontal Stabilizer, Elevator Hinge Cover

SUBTASK 12-22-31-410-010



CAUTION

MAKE SURE THAT THE CUTOUT IN THE HINGE COVER IS FACING THE FORWARD DIRECTION. IF THE HINGE COVER INSTALLATION IS INCORRECT, DAMAGE TO THE HINGE COVER CAN OCCUR.

- (2) For the right elevator, install these access panels:

Number Name/Location

344GB	Horizontal Stabilizer, Hinge Cover, Elevator Station 24.09
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54
344JB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 121.59
344KB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 176.64
344LB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 213.32
344MB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 250.04
344NB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 265.45

SUBTASK 12-22-31-860-025

- (3) Do this task: Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-31-00-840-802.

SUBTASK 12-22-31-860-026

- (4) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 12-22-31-860-027

- (5) Set the FLT CONTROL A and B switches to ON.

SUBTASK 12-22-31-860-003

- (6) Remove the DO NOT OPERATE tag, STD-858, from the control column.

SUBTASK 12-22-31-710-001

- (7) Move the elevator through the full range of travel to make sure it moves freely.

SUBTASK 12-22-31-860-004

- (8) Push the control column all the way forward then pull the control column all the way aft, then release to the neutral position.

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-31-730-001

- (9) Do this task: Put the Elevator Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-31-00-840-801.

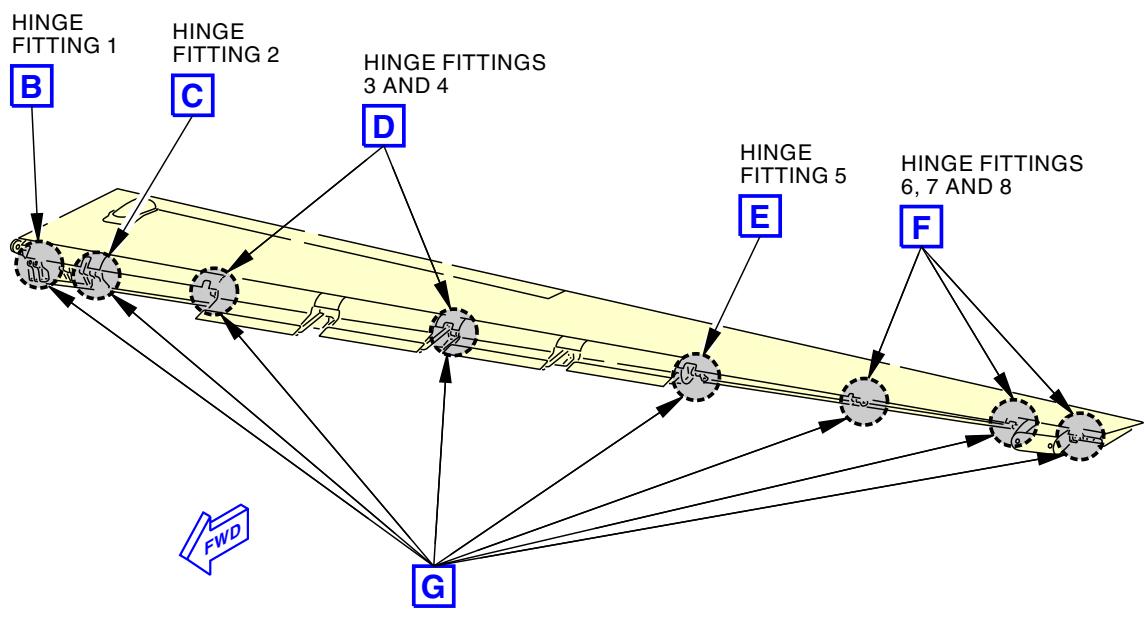
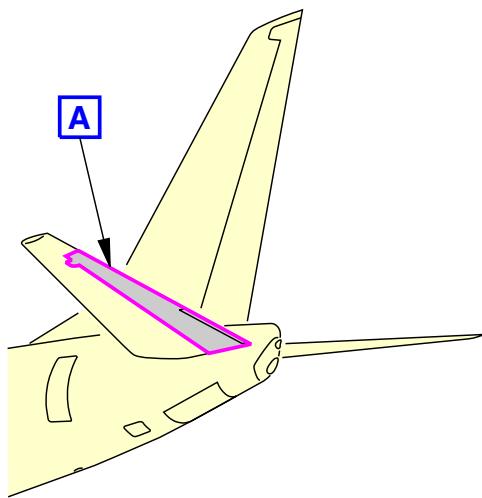
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

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**LEFT ELEVATOR
(RIGHT ELEVATOR IS EQUIVALENT)**

A

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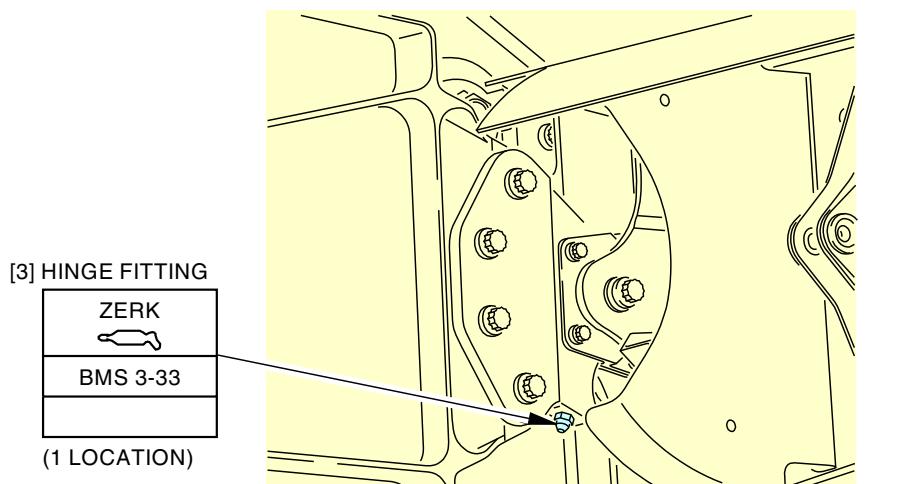
Elevator Hinge Servicing
Figure 302/12-22-31-990-802 (Sheet 1 of 4)

EFFECTIVITY
LOM ALL

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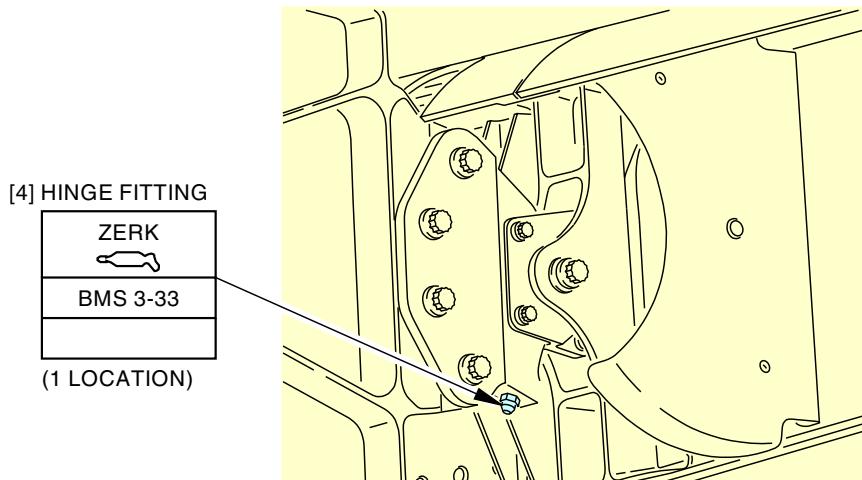
BOEING
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



HINGE FITTING 1

1 POINT

B



HINGE FITTING 2

1 POINT

C



G25283 S0006561444_V3

Elevator Hinge Servicing
Figure 302/12-22-31-990-802 (Sheet 2 of 4)

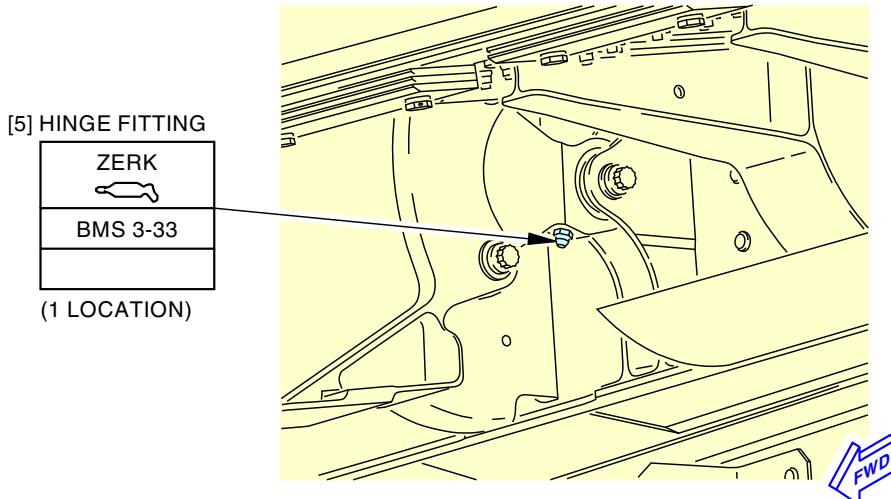
EFFECTIVITY
LOM ALL

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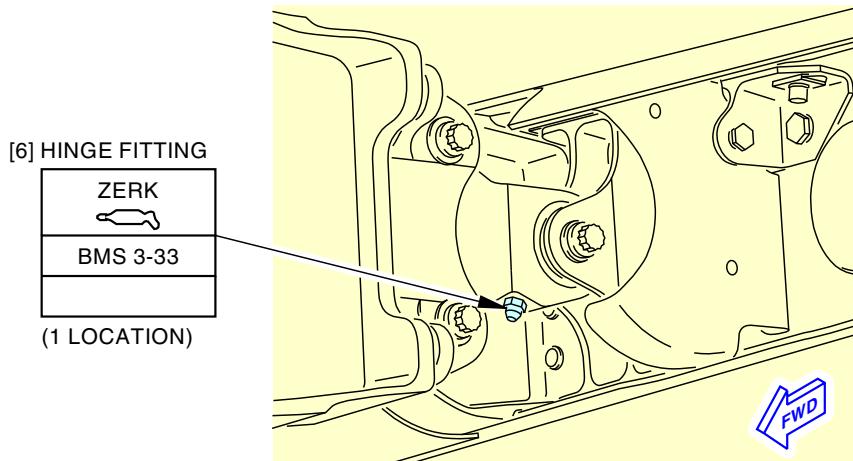
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HINGE FITTING 3
(HINGE FITTING 4 IS EQUIVALENT)

1 POINT

D



HINGE FITTING 5

1 POINT

E

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Elevator Hinge Servicing
Figure 302/12-22-31-990-802 (Sheet 3 of 4)

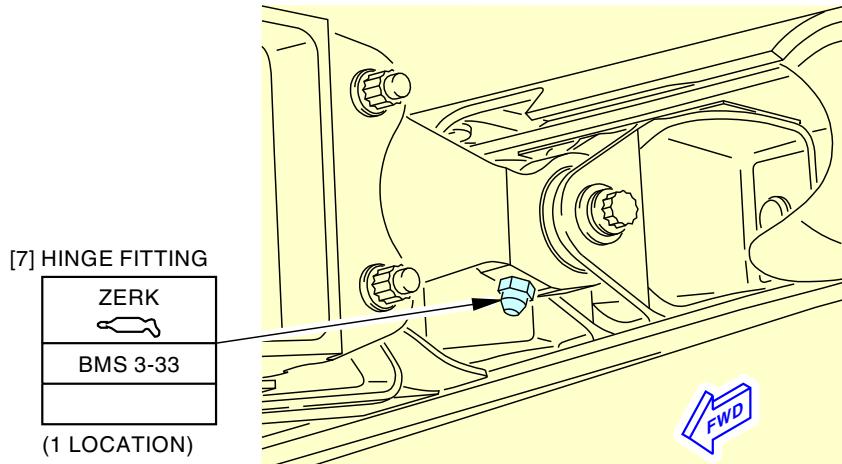
EFFECTIVITY
LOM ALL

12-22-31

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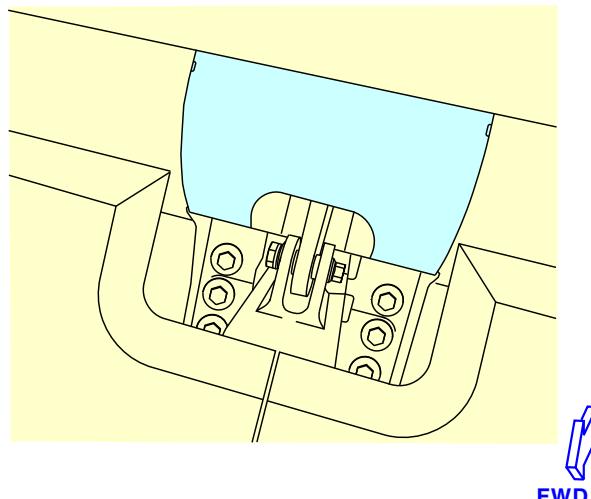
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AIRCRAFT MAINTENANCE MANUAL



HINGE FITTING 6
(HINGE FITTINGS 7 AND 8 ARE EQUIVALENT)

1 POINT

F



HINGE COVER INSTALLATION
(EXAMPLE)

G

G25357 S0006561446_V5

Elevator Hinge Servicing
Figure 302/12-22-31-990-802 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

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TASK 12-22-31-640-802

4. Elevator Tab Hinge Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
27-31-00-840-802	Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Prepare for the Lubrication

SUBTASK 12-22-31-860-006

- (1) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 12-22-31-860-007

- (2) Move the control column full aft and hold the control column in this position. Attach a DO-NOT-MOVE tag.

SUBTASK 12-22-31-860-017

- (3) Move the FLT CONTROL A and B switches to the OFF position.

SUBTASK 12-22-31-860-009

- (4) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

D. Elevator Tab Hinge Lubrication

Table 303

SUBTASK 12-22-31-640-009

- (1) This table supplies data for the subsequent lubrication step:

Table 303/12-22-31-993-809 AIRPLANES WITH SIX HINGE ELEVATOR TABS; Elevator Tab Hinge Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
[8]	Tab Hinge Fitting	grease, D00633	Flush	1
[9]	Tab Hinge Fitting	grease, D00633	Flush	5

SUBTASK 12-22-31-640-004

- (2) Lubricate the elevator tab hinge fitting [8] and tab hinge fittings [9] (Figure 303).
(a) Put grease, D00633, in the tab hinge fitting [8] and tab hinge fittings [9] until clean grease, D00633, comes out of the bearing.
(b) Remove unwanted grease, D00633, from around the hinge bearing.

SUBTASK 12-22-31-860-021

- (3) Remove the DO-NOT-MOVE tag and return the control column to the neutral position.

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-31-710-005

- (4) Move the elevator through the full travel, to make sure it moves freely.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-31-860-018

- (1) Move the FLT CONTROL A and B switches to ON, if it is necessary.

SUBTASK 12-22-31-730-002

- (2) Do this task: Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-31-00-840-802.

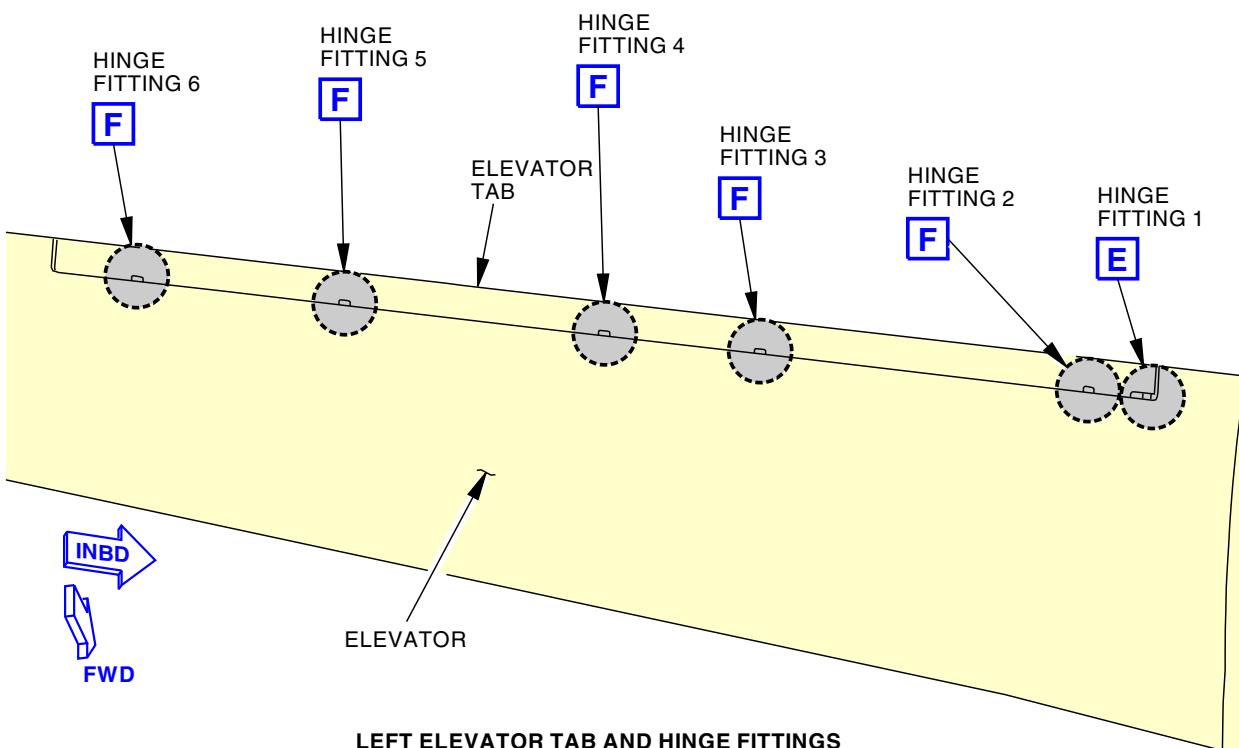
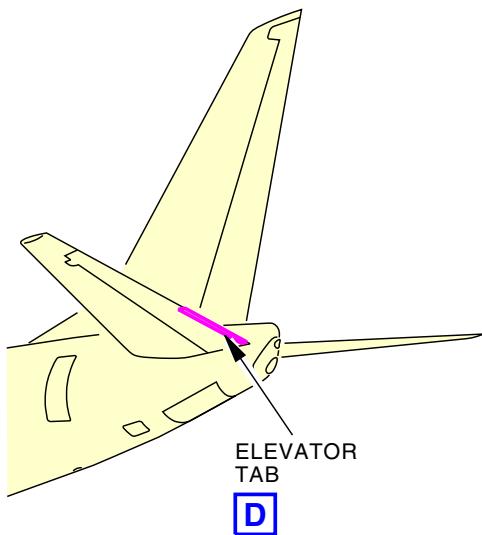
———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

12-22-31



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D

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Elevator Tab Hinge Lubrication (AIRPLANES WITH SIX HINGE ELEVATOR TABS (POST-SB 55A1080 OR PRR 38506))

Figure 303/12-22-31-990-813 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-31

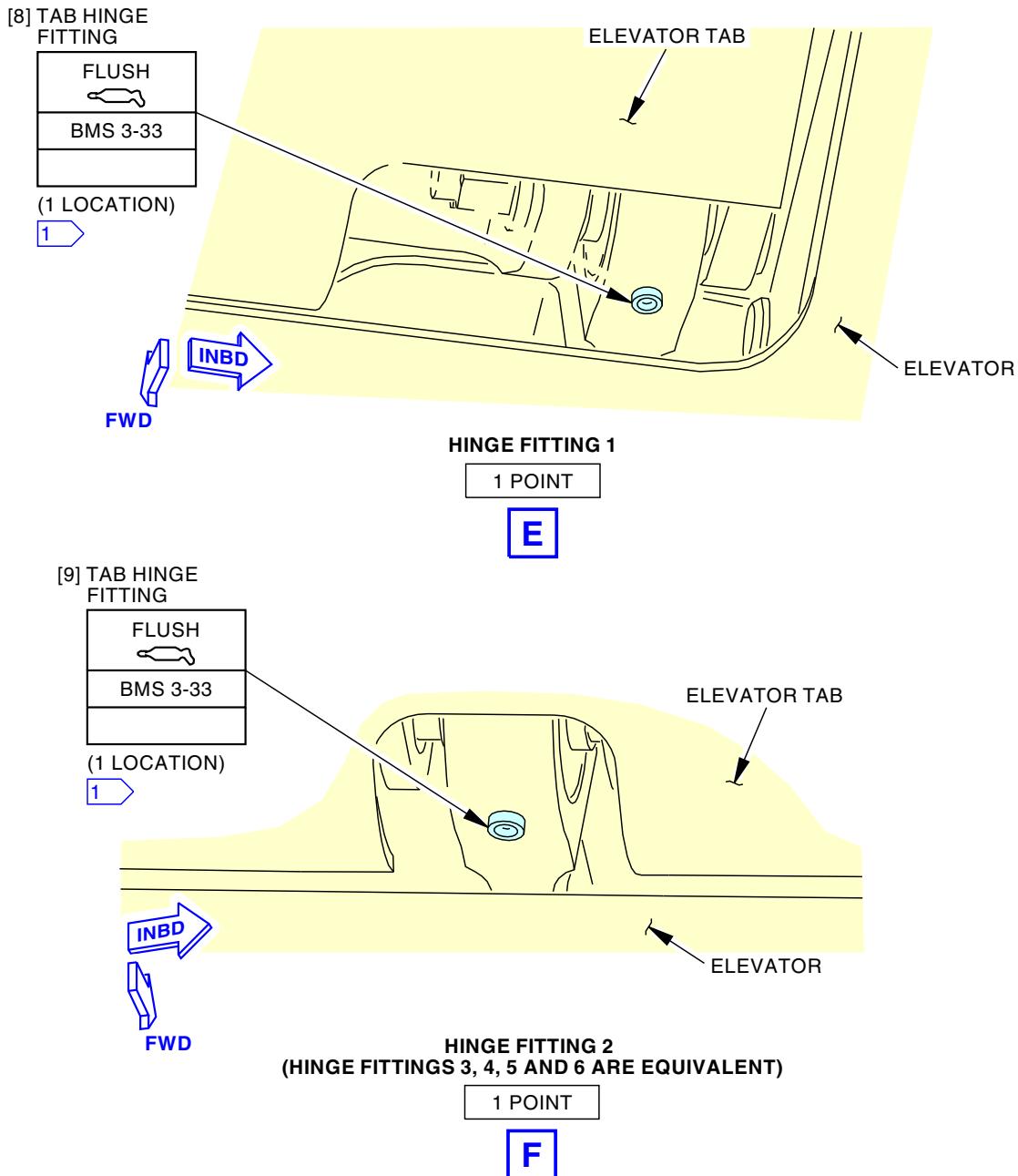
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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1 CAUTION:

ON SEALED BEARINGS, DO NOT APPLY GREASE WITH A PRESSURE MORE THAN 1000 PSI (6900 kPa) AND AT A RATE MORE THAN 0.07 GALLON (0.25 LITER) PER MINUTE. WHEN YOU USE A HAND-OPERATED GREASE GUN, DO NOT USE AN EXTENSION HANDLE TO GET MORE FORCE. SEALED BEARINGS CAN BE DAMAGED BY TOO MUCH PRESSURE.

N14546 S0000128565_V3

Elevator Tab Hinge Lubrication (AIRPLANES WITH SIX HINGE ELEVATOR TABS (POST-SB 55A1080 OR PRR 38506))

Figure 303/12-22-31-990-813 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 12-22-31-600-802

5. Elevator Balance Panel - Lubrication

(Figure 304)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-31-00-700-803	Elevator Balance Panels - Test (P/B 501)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
27-31-00-840-802	Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00109	Oil - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 (Supersedes MIL-L-7808)
D50102	Lubricating Oil - General Purpose, Low Temperature	MIL-L-7870

C. Access Panels

Number	Name/Location
333CB	Horizontal Stabilizer, Access Panel, Trailing Edge
333DB	Horizontal Stabilizer, Access Panel, Trailing Edge
334HB	Horizontal Stabilizer, Elevator Hinge Cover
343CB	Horizontal Stabilizer, Access Panel - T.E. Area
343DB	Horizontal Stabilizer, Access Panel - T.E. Area
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54

D. Prepare for the Lubrication

SUBTASK 12-22-31-860-019

- (1) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 12-22-31-010-006

- (2) For the left elevator, remove these access panels:

Number	Name/Location
333CB	Horizontal Stabilizer, Access Panel, Trailing Edge
333DB	Horizontal Stabilizer, Access Panel, Trailing Edge
334HB	Horizontal Stabilizer, Elevator Hinge Cover

SUBTASK 12-22-31-010-007

- (3) For the right elevator, remove these access panels:

Number	Name/Location
343CB	Horizontal Stabilizer, Access Panel - T.E. Area
343DB	Horizontal Stabilizer, Access Panel - T.E. Area
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54

EFFECTIVITY
LOM ALL

12-22-31



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E. Elevator Balance Panel Hinge Lubrication

SUBTASK 12-22-31-640-011

- (1) This table supplies data for the subsequent lubrication step:

Table 304/12-22-31-993-811 Elevator Balance Panel Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
[10]	Balance Panel Hinge	MIL-L-7870 oil, D50102 or oil, D00109	Oil Can	3

NOTE: Do not mix MIL-L-7870 oil, D50102, with oil, D00109. It is recommended for the surface to be cleaned prior to the application of the new lubricant.

SUBTASK 12-22-31-020-001

- (2) Get access to the balance panel hinges [10] (bays 2, 3, and 4):
(a) Remove the bolts [12], washers [13], bolts [14], and washers [15] that attach the forward end of the balance panel [11].
(b) Let the balance panel [11] hang by its aft end.

SUBTASK 12-22-31-020-003

- (3) If necessary, remove the bolt [16], washer [17], bolts [18], and washers [19] that attach the aft end of the balance panel [11].

NOTE: In some cases removing the bolts [12], washers [13], bolts [14], and washers [15] that attach the forward end of the balance panel does not allow access to the balance panel hinge.

SUBTASK 12-22-31-020-002

- (4) Lubricate the balance panel hinges [10].
(a) Move the balance panel hinges [10] during lubrication.

SUBTASK 12-22-31-420-007

- (5) Position the loose end of the seal cloth [20] between the balance panel and idler hinge.
(a) Make sure that the seal cloth [20] will not be tight at all elevator positions.

SUBTASK 12-22-31-420-001

- (6) Install the bolts [12] and washers [13] to attach the balance panel [11] to the idler hinge and hinge seal.
(a) Do not tighten the bolts [12] until the elevator has moved through the full range of travel.

SUBTASK 12-22-31-420-006

- (7) If the aft end of the balance panel [11] was removed from the idler hinge and seal, do these steps:
(a) Position the loose end of the seal cloth [21] between the balance panel and idler hinge.
(b) Install the bolt [16], washer [17], bolts [18], and washers [19] that attach the aft end of the balance panel [11] to the idler hinge and hinge seal.
(c) Do not tighten the bolt [16] and bolts [18] until the elevator has moved through the full range of travel.

SUBTASK 12-22-31-420-002

- (8) Manually move the elevator through the full range of travel.

EFFECTIVITY
LOM ALL

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- (a) Make sure that the hinge seal is not tight for all elevator positions.

SUBTASK 12-22-31-420-003

- (9) Tighten the bolts [12] to 23 in-lb (2.6 N·m) - 27 in-lb (3.1 N·m).

SUBTASK 12-22-31-420-004

- (10) Install the bolts [14] and washers [15] to attach the balance panel [11] to the idler hinge and hinge seal.
(a) Tighten the bolts [14] to 23 in-lb (2.6 N·m) - 27 in-lb (3.1 N·m).

SUBTASK 12-22-31-420-005

- (11) If bolt [16] and bolts [18] were removed, tighten them as follows:
(a) Tighten the bolt [16] to 23 in-lb (2.6 N·m) - 27 in-lb (3.1 N·m).
(b) Tighten the bolts [18] to 68 in-lb (7.7 N·m) - 82 in-lb (9.3 N·m).

SUBTASK 12-22-31-710-007

- (12) Do this task: Elevator Balance Panels - Test, TASK 27-31-00-700-803.

SUBTASK 12-22-31-410-007

- (13) For the left elevator, install these access panels:

<u>Number</u>	<u>Name/Location</u>
333CB	Horizontal Stabilizer, Access Panel, Trailing Edge
333DB	Horizontal Stabilizer, Access Panel, Trailing Edge
334HB	Horizontal Stabilizer, Elevator Hinge Cover

SUBTASK 12-22-31-410-008

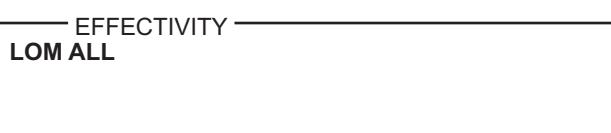
- (14) For the right elevator, install these access panels:

<u>Number</u>	<u>Name/Location</u>
343CB	Horizontal Stabilizer, Access Panel - T.E. Area
343DB	Horizontal Stabilizer, Access Panel - T.E. Area
344HB	Horizontal Stabilizer, Elevator Hinge Cover, Elevator Sta 66.54

SUBTASK 12-22-31-860-020

- (15) Do this task: Put the Elevator Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-31-00-840-802.

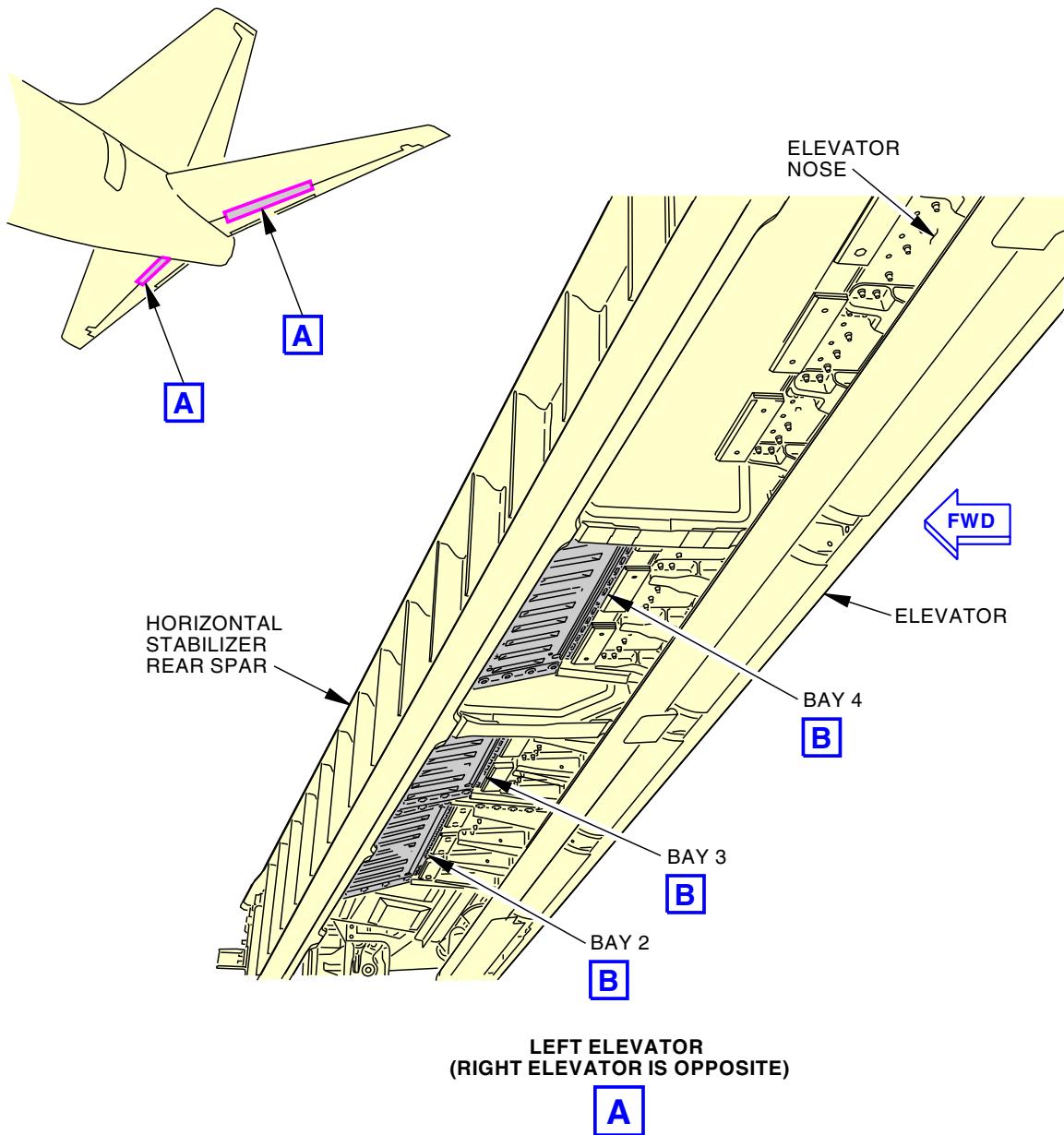
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12-22-31



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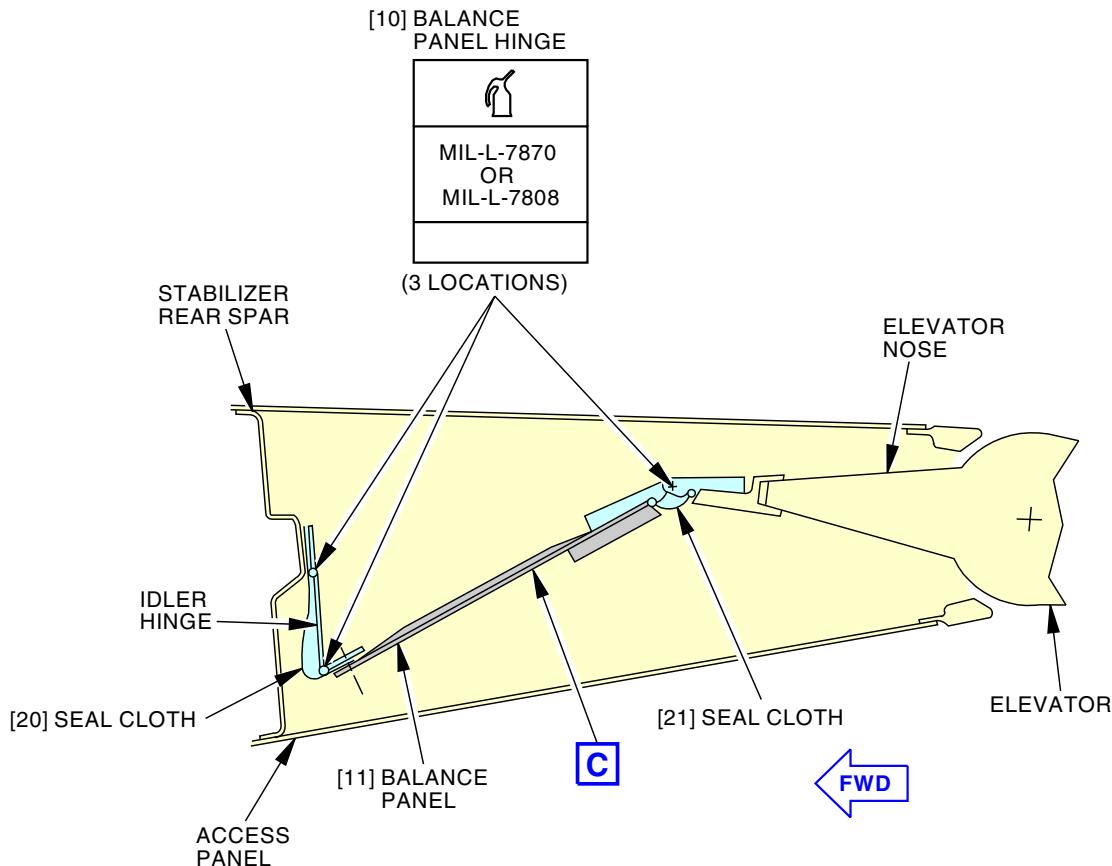
Elevator Balance Panel Lubrication
Figure 304/12-22-31-990-808 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

12-22-31

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details


ELEVATOR BALANCE PANEL

3 POINTS

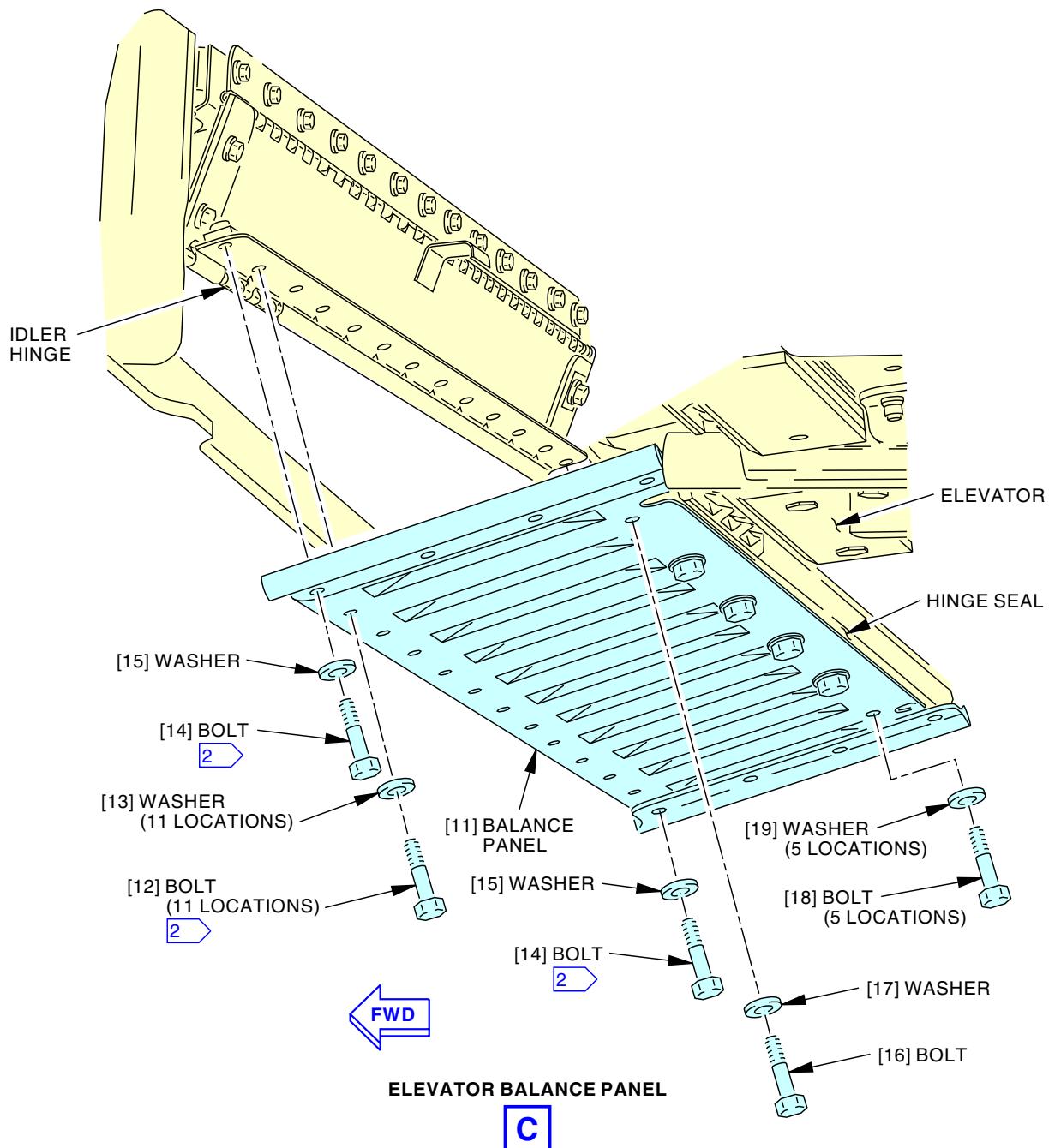
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Elevator Balance Panel Lubrication
Figure 304/12-22-31-990-808 (Sheet 2 of 3)

 EFFECTIVITY
 LOM ALL

12-22-31

D633A101-LOM



2956764 S0000734214_V2

Elevator Balance Panel Lubrication
Figure 304/12-22-31-990-808 (Sheet 3 of 3)

EFFECTIVITY
 LOM ALL

12-22-31



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STABILIZER CONTROL SYSTEM - SERVICING

1. General

- A. This procedure has these tasks:
- (1) A lubrication of the stabilizer trim jackscrew, ballnut and upper and lower gimbal fittings.
 - (2) A lubrication of the stabilizer trim control system chain.
 - (3) A lubrication of the stabilizer trim flexible shaft.
 - (4) A servicing of the stabilizer trim brake mechanism.

TASK 12-22-41-600-801

2. Stabilizer Jackscrew, Ballnut and Gimbal - Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-41-81-000-801	Stabilizer Ball Nut and Jackscrew Gearbox Removal (P/B 401)
27-41-81-400-801	Stabilizer Ball Nut and Jackscrew Gearbox Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
312	Area Aft of Pressure Bulkhead - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Stabilizer Jackscrew, Ballnut and Gimbal Lubrication

SUBTASK 12-22-41-040-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	2	C00849	AFCS STABILIZER TRIM

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-41-010-001

- (2) Open this access door:

Number Name/Location

311BL Stabilizer Trim Access Door

SUBTASK 12-22-41-600-001

- (3) This table supplies information for subsequent lubrication steps:

Table 301/12-22-41-993-803 Stabilizer Jackscrew, Ballnut and Gimbal Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	jackscrew [1]	grease, D00633	Hand	1
2	upper gimbal [2]	grease, D00633	Zerk	2
3	ballnut [3]	grease, D00633	Zerk	1
4	lower gimbal [4]	grease, D00633	Zerk	2

SUBTASK 12-22-41-860-028

- (4) Set the main cutout switch, S272 located on the aft area of the control stand, to the CUTOUT position.

SUBTASK 12-22-41-480-001

- (5) Attach the DO NOT OPERATE tag, STD-858, to the main cutout switch, S272, and the stabilizer trim wheel.

SUBTASK 12-22-41-640-003

- (6) Lubricate the stabilizer trim upper gimbal [2] and lower gimbal [4] with grease, D00633 (Figure 301).

NOTE: The lower gimbal zerk fittings may accept grease at a slow rate, which could make the grease flow coming out of the joint difficult to detect.

- (a) Apply grease, D00633, slowly to the zerk fittings to prevent the gimbal bushings from dislodging.

NOTE: It is recommended to use a hand pump grease gun over a pneumatic gun to limit the pressure and flow of grease.

- (b) Make sure that the grease, D00633, flows into the gimbal joint.

SUBTASK 12-22-41-640-004



WARNING

MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (7) Lubricate the jackscrew [1] (Figure 301).

NOTE: If electrical power is not available, the use of only the stabilizer trim wheel is acceptable for movement of the stabilizer.

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

CAPT Electrical System Panel, P18-1

Row Col Number Name

C 2 C00849 AFCS STABILIZER TRIM

EFFECTIVITY
LOM ALL

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F/O Electrical System Panel, P6-2

Row Col Number Name

B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

- (b) Make sure that the STAB TRIM switch on the stab trim and cabin door panel, P8-47 module, is in the NORMAL position.
- (c) Remove the DO NOT OPERATE tag, STD-858, from the main cutout switch, S272, and the stabilizer trim wheel.
- (d) Set the main cutout switch, S272 located on the aft area of the control stand, to the NORMAL position.
- (e) Move the stabilizer to the maximum leading edge up (APL NOSE DOWN) position (the mechanical limits).
NOTE: This can be done using the STAB TRIM switches and then the stabilizer trim wheel.
- (f) Make sure that the upper gimbal [2] touches the upper stop [11].
- (g) Set the main cutout switch, S272 located on the aft area of the control stand, to the CUTOUT position.
- (h) Attach the DO NOT OPERATE tags, STD-858, to the main cutout switch, S272, and stabilizer trim wheel.
- (i) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-1

Row Col Number Name

C	2	C00849	AFCS STABILIZER TRIM
---	---	--------	----------------------

F/O Electrical System Panel, P6-2

Row Col Number Name

B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

- (j) Remove the old grease and dirt from the bottom part of the jackscrew [1] threads by wiping them with a clean, dry, non-abrasive cloth.
- (k) Lubricate the bottom part of the jackscrew [1] between the ballnut [3] and lower stop [104] with grease, D00633.
- (l) Remove the DO NOT OPERATE tags, STD-858, from the main cutout switch, S272, and stabilizer trim wheel.
- (m) Set the main cutout switch, S272 located on the aft area of the control stand, to the NORMAL position.
- (n) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row Col Number Name

C	2	C00849	AFCS STABILIZER TRIM
---	---	--------	----------------------

EFFECTIVITY
LOM ALL

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F/O Electrical System Panel, P6-2

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

B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

- (o) Move the stabilizer to the maximum leading edge down (APL NOSE UP) position (the mechanical limits).
NOTE: This can be done using the STAB TRIM switches and then the stabilizer trim wheel.
- (p) Make sure that the upper gimbal [2] touches the lower stop [104].
- (q) Set the main cutout switch, S272 located on the aft area of the control stand, to the CUTOUT position.
- (r) Attach the DO NOT OPERATE tags, STD-858, to the main cutout switch, S272, and stabilizer trim wheel.
- (s) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-1

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

C	2	C00849	AFCS STABILIZER TRIM
---	---	--------	----------------------

F/O Electrical System Panel, P6-2

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

B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

- (t) Remove the old grease and dirt from the top part of the jackscrew [1] threads by wiping them with a clean, dry, non-abrasive cloth.
- (u) Lubricate the top part of the jackscrew [1] between the ballnut [3] and upper stop [11] with grease, D00633.

SUBTASK 12-22-41-640-009



MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (8) Lubricate the stabilizer trim jackscrew ballnut [3] (Figure 301).
 - (a) Remove the old grease and dirt on and around the jackscrew [1], ballnut [3], and grease vent [106], with a clean, dry, non-abrasive cloth.
 - (b) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

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

C	2	C00849	AFCS STABILIZER TRIM
---	---	--------	----------------------

F/O Electrical System Panel, P6-2

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

B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

EFFECTIVITY
LOM ALL

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- (c) Remove the DO NOT OPERATE tags, STD-858, from the main cutout switch, S272, and stabilizer trim wheel.
- (d) Set the main cutout switch, S272 located on the aft area of the control stand, to the NORMAL position.
- (e) Move the stabilizer to the maximum leading edge up position (the mechanical limits).
 - 1) Use the STAB TRIM switches and then the stabilizer trim wheel for the movement of the stabilizer.
- (f) Make sure that the upper gimbal [2] touches the upper stop [11].
- (g) While the jackscrew [1] moves from the upper stop [11] to the lower stop [104] (one complete cycle), slowly apply grease, D00633, into the ballnut [3].

NOTE: If electrical power is not available, the use of only the stabilizer trim wheel is acceptable for movement of the stabilizer.

- 1) Apply grease, D00633, until the old grease is pushed out and clean grease comes out of the grease vent [106] or upper ballnut seal.

NOTE: It is acceptable for grease to exit the grease vent and the upper ballnut seal.

NOTE: All the old grease must come out from the grease vent and/or the upper ballnut seal to lubricate the full length of the ballnut.

- a) If no grease, D00633, comes out of the grease vent [106] and upper ballnut seal, replace the stabilizer trim actuator (TASK 27-41-81-000-801 and TASK 27-41-81-400-801).
- b) See if grease, D00633, comes out of the lower ballnut seal.

NOTE: It is acceptable for a small quantity of grease to come out from the lower ballnut seal.

NOTE: Grease that comes out from the lower ballnut seal and ball return tube retainers must be a small part of the total quantity of grease that comes out of the ballnut.

- <1> Replace the stabilizer trim actuator if the two conditions that follow occur (TASK 27-41-81-000-801 and TASK 27-41-81-400-801):

<a> A large quantity of grease, D00633, comes out from the lower ballnut seal.

 The quantity of grease, D00633, that comes out of the grease vent [106] and/or the upper ballnut seal is not sufficient to remove the old grease.

- c) If grease, D00633, comes out from the ballnut [3] at a ball return tube retainer, do the steps that follow:

NOTE: It is acceptable for a small quantity of grease to come out at a ball return tube retainer if there are no problems with the checks that follow.

<1> Make sure that the grease that comes out from the lower ballnut seal and ball return tube retainers is a small part of the total quantity of grease that comes out of the ballnut [3].

<2> Examine all ball return tube retainers where grease, D00633, comes out for damage and corrosion.

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- <a> If a ball return tube retainer where grease, D00633, comes out has damage or corrosion, replace the stabilizer trim actuator (TASK 27-41-81-000-801 and TASK 27-41-81-400-801).
- <3> Examine the return tubes for lifting from the ballnut [3].
- <a> If a return tube has lifted from the ballnut [3], replace the stabilizer trim actuator (TASK 27-41-81-000-801 and TASK 27-41-81-400-801).
- d) Examine the grease that comes out of the ballnut [3] for metal particles, discolored water, rust, or other solid particles.
 - <1> If metal particles, or discolored water, or rust, or other solid particles are found in the grease, remove and replace the stabilizer trim actuator (TASK 27-41-81-000-801 and TASK 27-41-81-400-801).
 - e) Remove the unwanted grease, D00633, from the ballnut [3].
- 2) Move the stabilizer to the NEUTRAL position (4 units of trim).
- 3) Set the main cutout switch, S272 located on the aft area of the control stand, to the CUTOUT position.
- 4) Attach the DO NOT OPERATE tags, STD-858, to the main cutout switch, S272, and stabilizer trim wheel.
- 5) Open these circuit breakers and install safety tags:
 - CAPT Electrical System Panel, P18-1**

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C00849	AFCS STABILIZER TRIM
 - F/O Electrical System Panel, P6-2**

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-41-440-004

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C00849	AFCS STABILIZER TRIM

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR



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SUBTASK 12-22-41-080-002

- (2) Remove the DO NOT OPERATE tags, STD-858, from the main cutout switch, S272, and stabilizer trim wheel.

SUBTASK 12-22-41-860-029

- (3) Set the main cutout switch, S272 located on the aft area of the control stand, to the NORMAL position.

SUBTASK 12-22-41-410-001

- (4) Close this access door:

Number Name/Location

311BL Stabilizer Trim Access Door

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

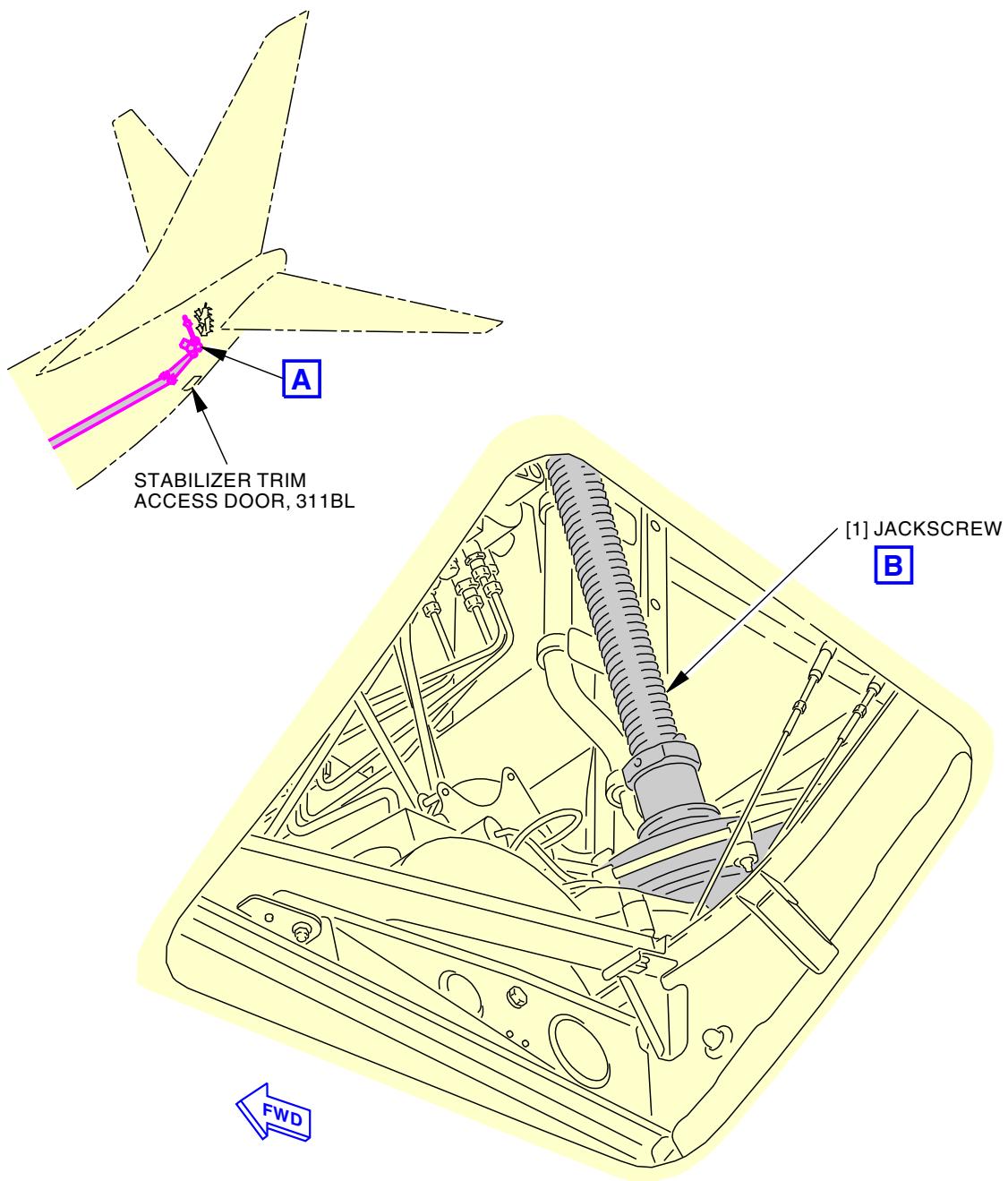
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VIEW THROUGH THE STABILIZER TRIM
ACCESS DOOR, 311BL

A

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Stabilizer Jackscrew, Ballnut and Gimbal Lubrication
Figure 301/12-22-41-990-801 (Sheet 1 of 4)

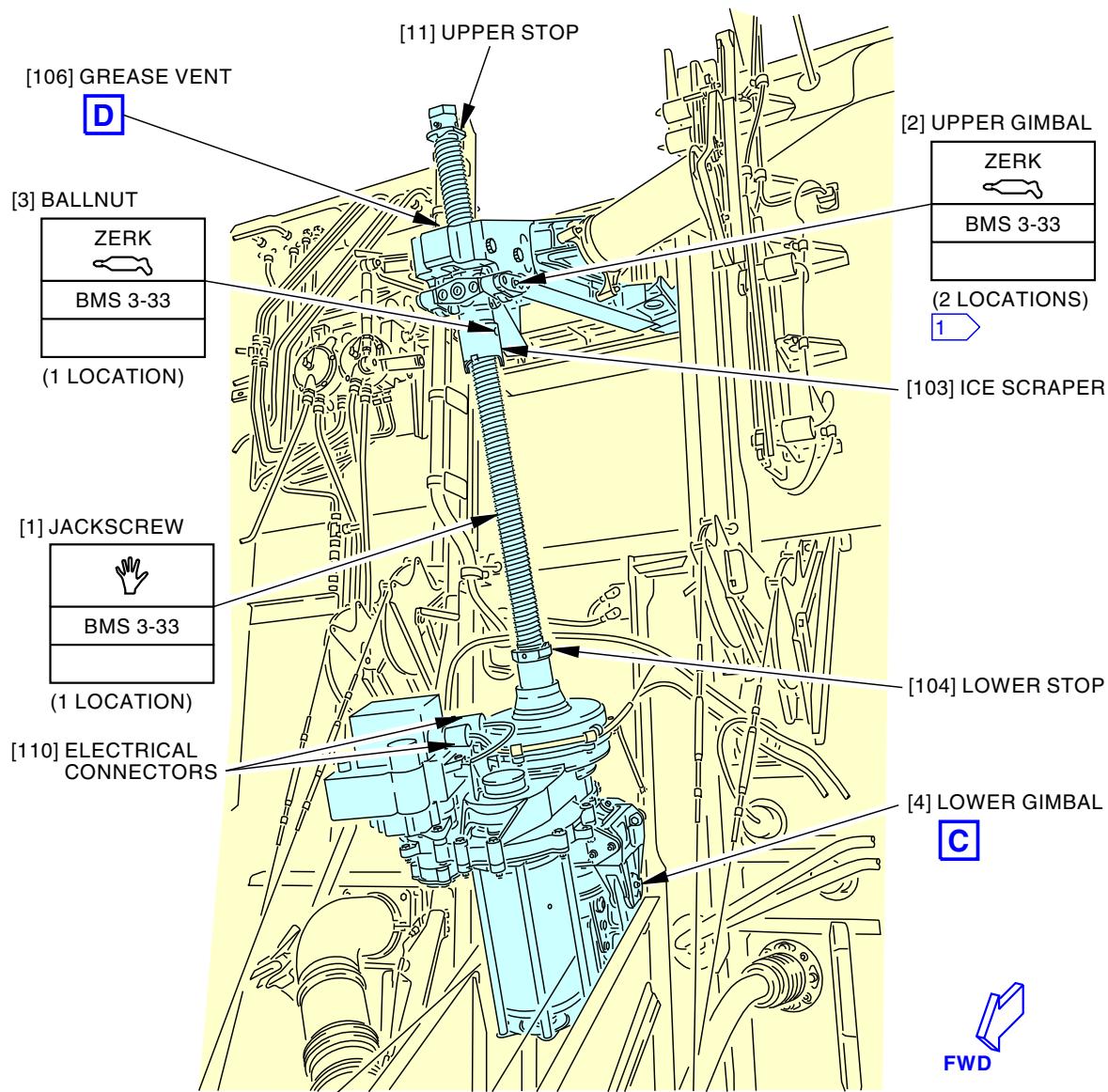
EFFECTIVITY
LOM ALL

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STABILIZER TRIM JACKSCREW, BALLNUT AND GIMBAL
4 POINTS
B

1 ONE MORE LUBE POINT IS ON THE
OPPOSITE SIDE (NOT SHOWN).

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Stabilizer Jackscrew, Ballnut and Gimbal Lubrication
Figure 301/12-22-41-990-801 (Sheet 2 of 4)

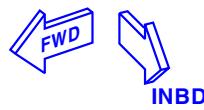
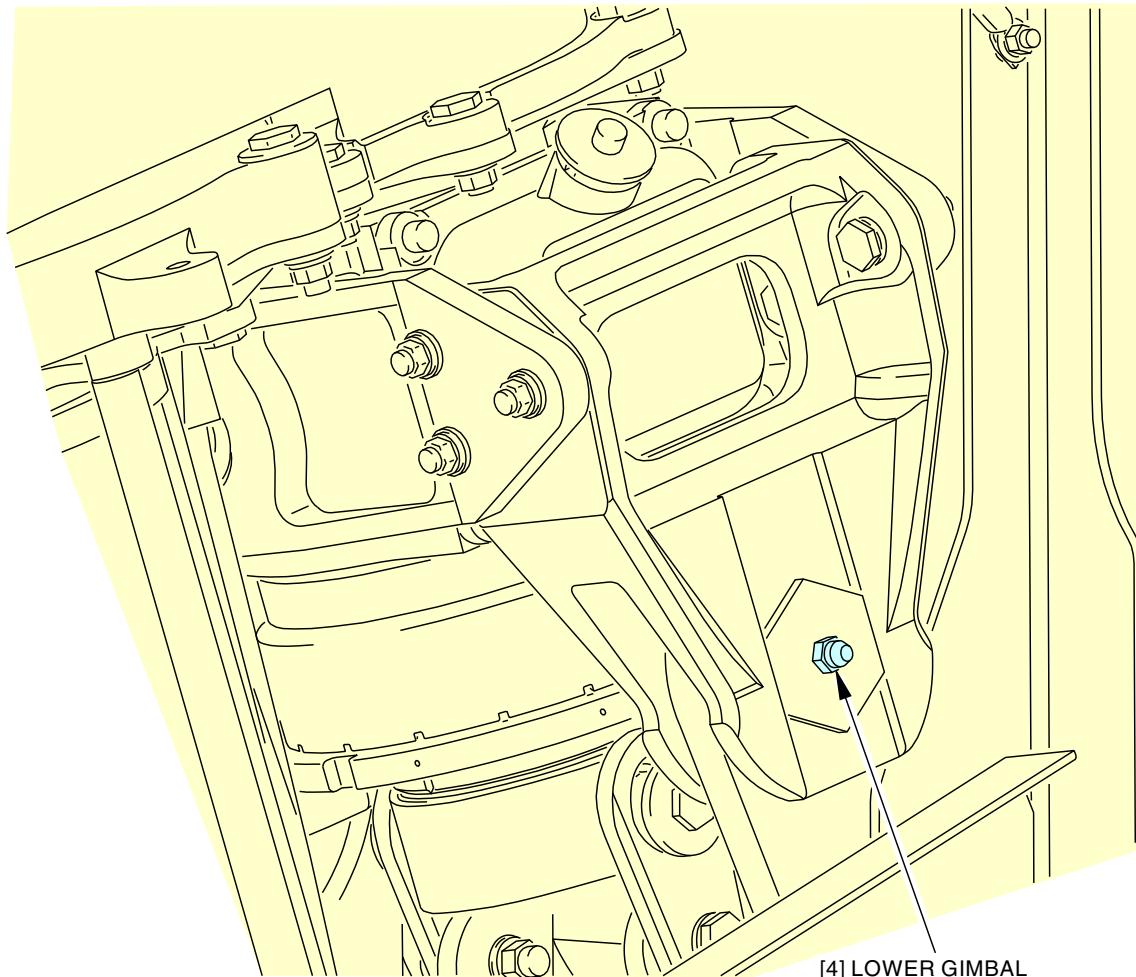
 EFFECTIVITY
 LOM ALL

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[4] LOWER GIMBAL

ZERK
BMS 3-33
(2 LOCATIONS)

1

LOWER GIMBAL

2 POINTS

C

1 ONE MORE LUBE POINT IS ON THE
OPPOSITE SIDE (NOT SHOWN).

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Stabilizer Jackscrew, Ballnut and Gimbal Lubrication
Figure 301/12-22-41-990-801 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

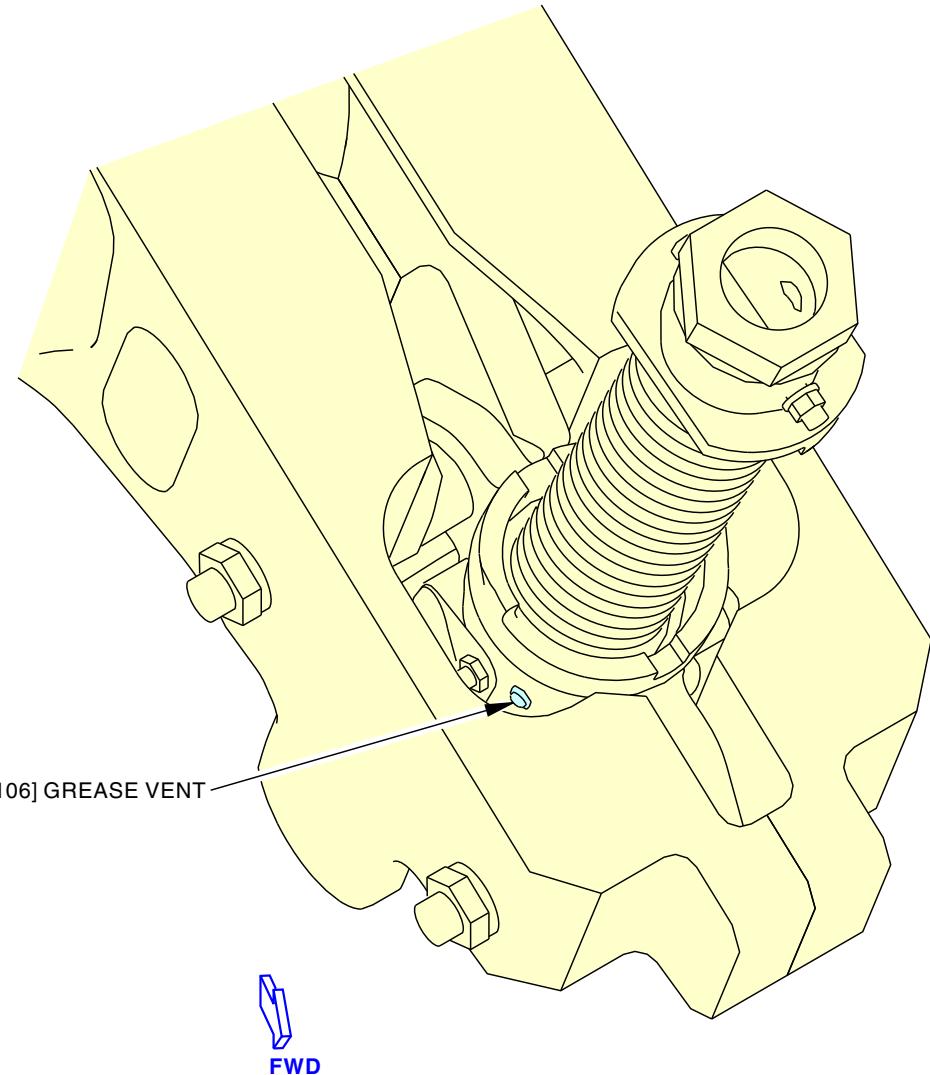
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AIRCRAFT MAINTENANCE MANUAL



GREASE VENT

1 POINT

D

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|
Stabilizer Jackscrew, Ballnut and Gimbal Lubrication
Figure 301/12-22-41-990-801 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 12-22-41-600-802

3. Stabilizer Trim System Chain - Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the lubrication of the stabilizer trim chain.

B. References

Reference	Title
25-11-01-000-801	Captain's and First Officer's Seat Removal (P/B 401)
25-11-01-400-801	Captain's and First Officer's Seat Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

E. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

F. Access Panels

Number	Name/Location
112A	Forward Access Door
211A	Panel Assy - Control Stand Access
211B	Panel Assy - Control Stand Access
212A	Panel Assy - Control Stand Access
212B	Panel Assy - Control Stand Access

G. Prepare for the Lubrication

SUBTASK 12-22-41-860-009



WARNING

MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Using the stabilizer trim wheel on the control stand, move the stabilizer to the NEUTRAL position (4 units of trim).

SUBTASK 12-22-41-860-026

- (2) Set the Main Cutout switch, S272, located on the aft area of the control stand, to the CUTOUT position.

SUBTASK 12-22-41-860-027

- (3) Attach a DO NOT OPERATE tags, STD-858, to the Main Cutout switch, S272, and stabilizer trim wheel.

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-41-860-010

- (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	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-010-002

- (5) To lubricate the stabilizer trim chain [1] from the forward access door, do this step:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 12-22-41-000-001

- (6) To lubricate the stabilizer trim chain [1] from the flight compartment, do these steps:

- (a) If it is necessary, remove either the Captain or First Officer's seat (TASK 25-11-01-000-801).

- (b) Remove the access covers from the control stand:

- 1) From the Captain's seat side:

- a) The left upper side panel.

<u>Number</u>	<u>Name/Location</u>
211A	Panel Assy - Control Stand Access

- b) The left lower side panel.

<u>Number</u>	<u>Name/Location</u>
211B	Panel Assy - Control Stand Access

- 2) From the First Officer's seat side:

- a) The right upper side panel.

<u>Number</u>	<u>Name/Location</u>
212A	Panel Assy - Control Stand Access

- b) The right lower side panel.

<u>Number</u>	<u>Name/Location</u>
212B	Panel Assy - Control Stand Access

H. Stabilizer Trim System Chain Lubrication

SUBTASK 12-22-41-600-002

- (1) This table supplies information for subsequent lubrication steps:

Table 302/12-22-41-993-810 Stabilizer Trim System Chain Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Stabilizer Chain	grease, D00633	Hand	1

SUBTASK 12-22-41-640-008

- (2) Apply grease, D00633, to the stabilizer trim chain [1] (Figure 302).

NOTE: The stabilizer trim chain can be lubricated from the flight compartment or from the forward access door.

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-41-410-003

- (1) If the stabilizer trim chain [1] is lubricated from the flight compartment, do these steps:

- (a) Install the access covers on the control stand:

- 1) To the Captain's seat side:

- a) The left upper side panel.

Number Name/Location

211A Panel Assy - Control Stand Access

- b) The left lower side panel.

Number Name/Location

211B Panel Assy - Control Stand Access

- 2) To the First Officer's seat side:

- a) The right upper side panel.

Number Name/Location

212A Panel Assy - Control Stand Access

- b) The right lower side panel.

Number Name/Location

212B Panel Assy - Control Stand Access

- (b) If it is necessary, install either the Captain or the First Officer's seat
(TASK 25-11-01-400-801).

SUBTASK 12-22-41-410-002

- (2) If the stabilizer trim chain [1] is lubricated from the forward access door, do this step:

- (a) Close this access panel:

Number Name/Location

112A Forward Access Door

SUBTASK 12-22-41-860-011

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

F/O Electrical System Panel, P6-2

Row Col Number Name

B 10 C00207 FLIGHT CONTROL STAB TRIM CONT

D 10 C00840 FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-080-001

- (4) Remove the DO NOT OPERATE tags, STD-858, from the Main Cutout switch, S272, and stabilizer trim wheel.

SUBTASK 12-22-41-860-039

- (5) Set the Main Cutout switch, S272, located on the aft area of the control stand, to the NORMAL position.

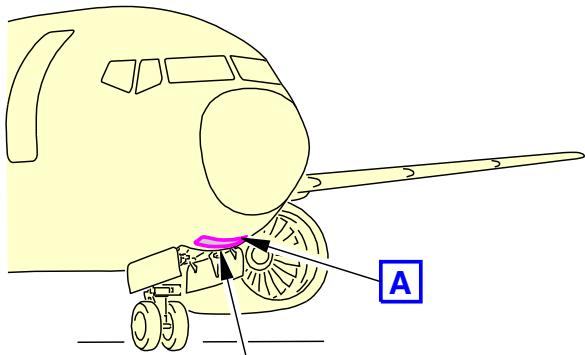
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EFFECTIVITY
LOM ALL

12-22-41

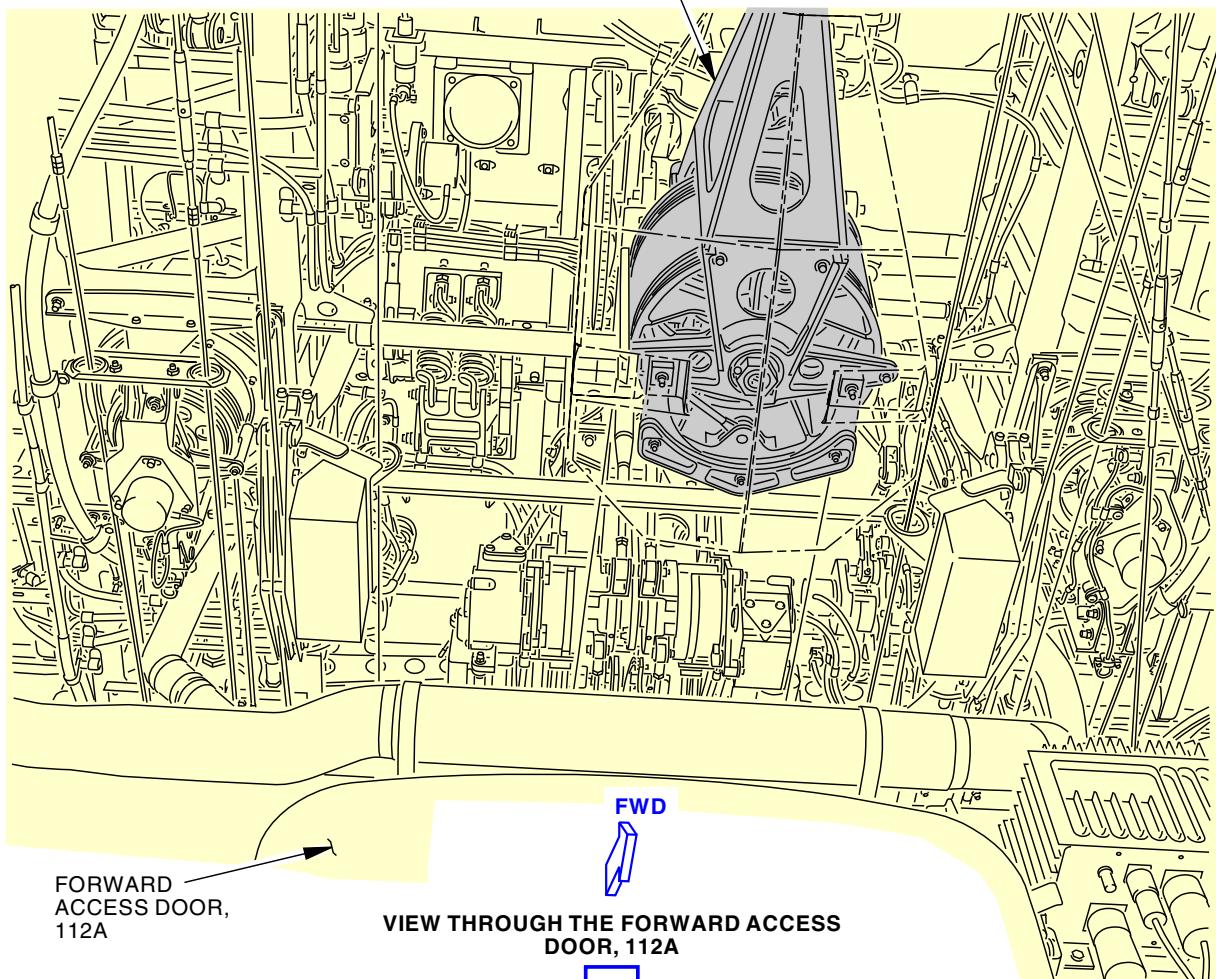


737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



FORWARD
ACCESS DOOR,
112A

B



FORWARD
ACCESS DOOR,
112A

VIEW THROUGH THE FORWARD ACCESS
DOOR, 112A

A

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Stabilizer Trim System Chain Lubrication
Figure 302/12-22-41-990-802 (Sheet 1 of 2)

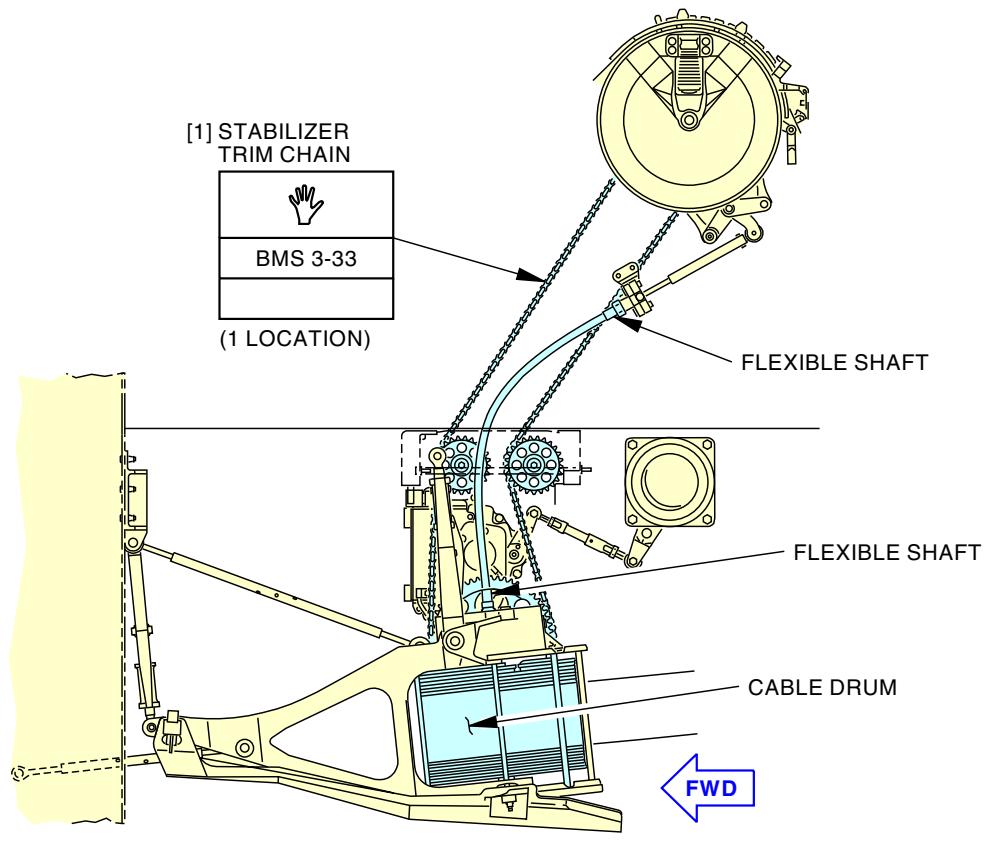
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CHAIN AND FLEXIBLE SHAFT

1 POINT

B

2348820 S0000535766_V4

Stabilizer Trim System Chain Lubrication
Figure 302/12-22-41-990-802 (Sheet 2 of 2)

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TASK 12-22-41-600-803

4. Stabilizer Trim Flexible Shaft - Lubrication

(Figure 303)

A. References

Reference	Title
25-11-01-000-801	Captain's and First Officer's Seat Removal (P/B 401)
25-11-01-400-801	Captain's and First Officer's Seat Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

E. Access Panels

Number	Name/Location
112A	Forward Access Door
211A	Panel Assy - Control Stand Access
211B	Panel Assy - Control Stand Access

F. Prepare for the Lubrication

SUBTASK 12-22-41-860-031



WARNING

MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Using the stabilizer trim wheel on the control stand, move the stabilizer to the NEUTRAL position (4 units of trim).

SUBTASK 12-22-41-860-032

- (2) Set the Main Cutout switch, S272, located on the aft area of the control stand, to the CUTOUT position.

SUBTASK 12-22-41-860-033

- (3) Attach DO NOT OPERATE tags, STD-858, to the switches and stabilizer trim wheel.

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SUBTASK 12-22-41-860-034

- (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	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-010-008

- (5) Open this access panel:

Number Name/Location

112A	Forward Access Door
------	---------------------

SUBTASK 12-22-41-000-002

- (6) If necessary, remove the captain seat: Captain's and First Officer's Seat Removal, TASK 25-11-01-000-801.

SUBTASK 12-22-41-010-009

- (7) Remove the access covers from the control stand.

- (a) The left upper side panel.

Number Name/Location

211A	Panel Assy - Control Stand Access
------	-----------------------------------

- (b) The left lower side panel.

Number Name/Location

211B	Panel Assy - Control Stand Access
------	-----------------------------------

G. Stabilizer Trim Flexible Shaft Lubrication

SUBTASK 12-22-41-640-012

- (1) Do the following to lubricate the stabilizer trim flexible shaft [1].

- (a) Lubricate the flexible shaft [1], (Figure 303):

- 1) Remove flexible shaft [1] from the casing [4]:

- Remove the safety wire from both ends of the coupling nuts [3] on the flexible shaft assembly.
- Remove the flexible shaft coupling nuts [3] from both the flight deck and lower 41 section connection to the cable drum.
- Carefully remove the flexible shaft cable assembly from the aircraft.

NOTE: Make sure not to turn the stabilizer trim wheel while the flexible shaft is removed.

- Expose the press pin [2] so that it can be removed.
- Carefully remove the press pin [2] that connects the upper part of the cable assembly to the flexible shaft [1] with a punch.

NOTE: Take care to retain washers and pin attached to the flexible shaft.

- Remove the flex shaft end fitting [6] where the press pin [2] was removed and slide the flexible shaft [1] out of the casing [4].

- Apply grease, D00633 (preferred), or grease, D00013 (alternate), to the flexible shaft [1].

- Install the flexible shaft [1] into the casing [4].

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- a) If the control wheel was moved beyond the neutral position (4 units of trim), a "B" dimension check for connecting the flexible shaft may be necessary
SUBTASK 27-41-00-420-003.
- b) Install the flex shaft end fitting [6].
- c) Carefully install the press pin [2] into the flex shaft end fitting [6].
- d) Install the coupling nuts [3] to both the lower 41 section connection to the cable drum and flight deck.
- e) Install MS20995NC32 lockwire, G50347, to both coupling nuts [3] with the double twist method.
- f) Remove the DO NOT OPERATE tags, STD-858, from the stabilizer trim wheel and switches.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-41-410-004

- (1) Install the access covers on the control stand.

- (a) The left lower side panel.

<u>Number</u>	<u>Name/Location</u>
211B	Panel Assy - Control Stand Access

- (b) The left upper side panel.

<u>Number</u>	<u>Name/Location</u>
211A	Panel Assy - Control Stand Access

SUBTASK 12-22-41-420-002

- (2) If removed, install the captain seat: Captain's and First Officer's Seat Installation, TASK 25-11-01-400-801.

SUBTASK 12-22-41-410-005

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 12-22-41-860-035

- (4) 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	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-860-038

- (5) Set the Main Cutout Switch, S272, located on the aft area of the control stand, to the NORMAL position.

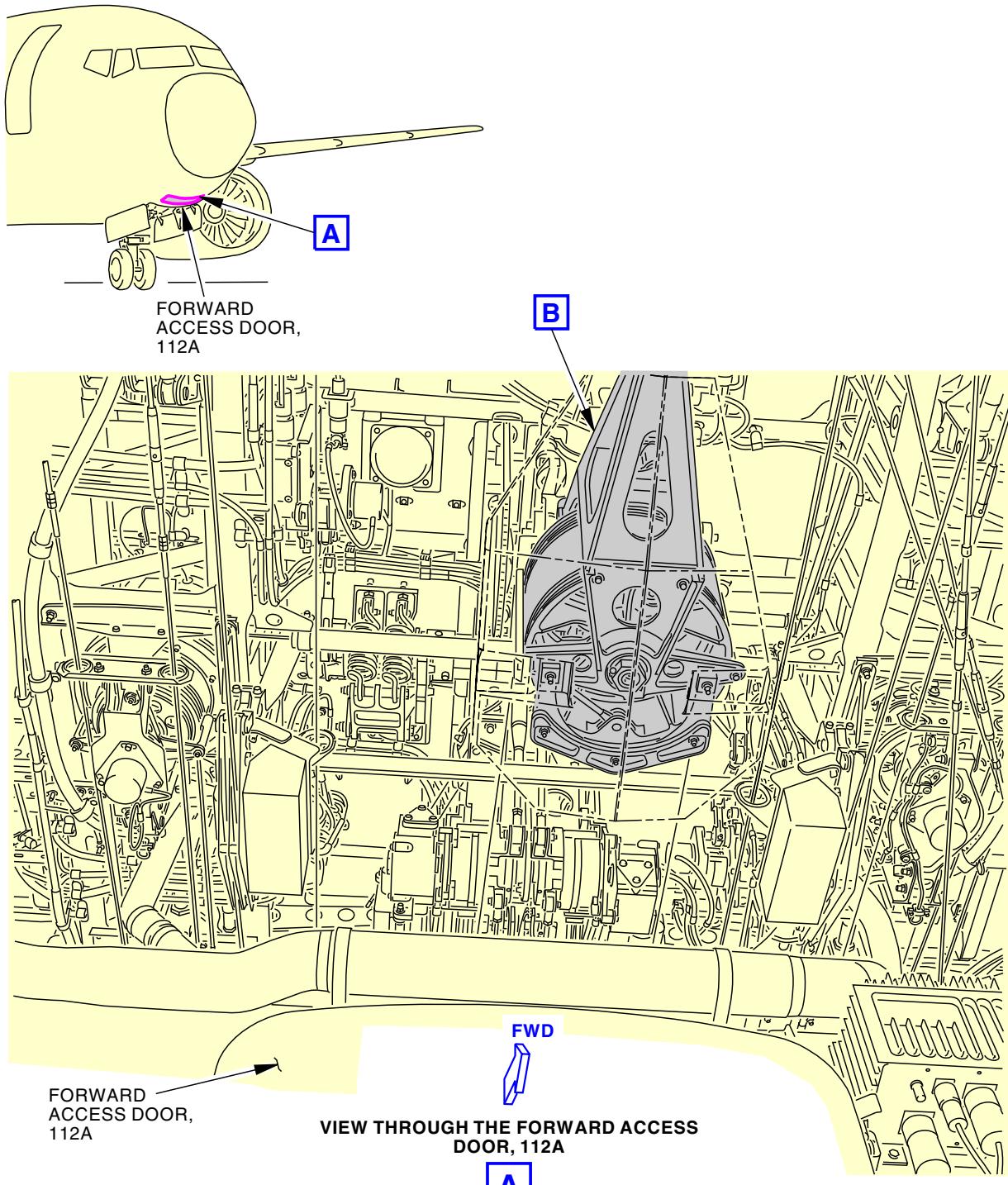
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Stabilizer Trim Flexible Shaft Lubrication
Figure 303/12-22-41-990-806 (Sheet 1 of 3)

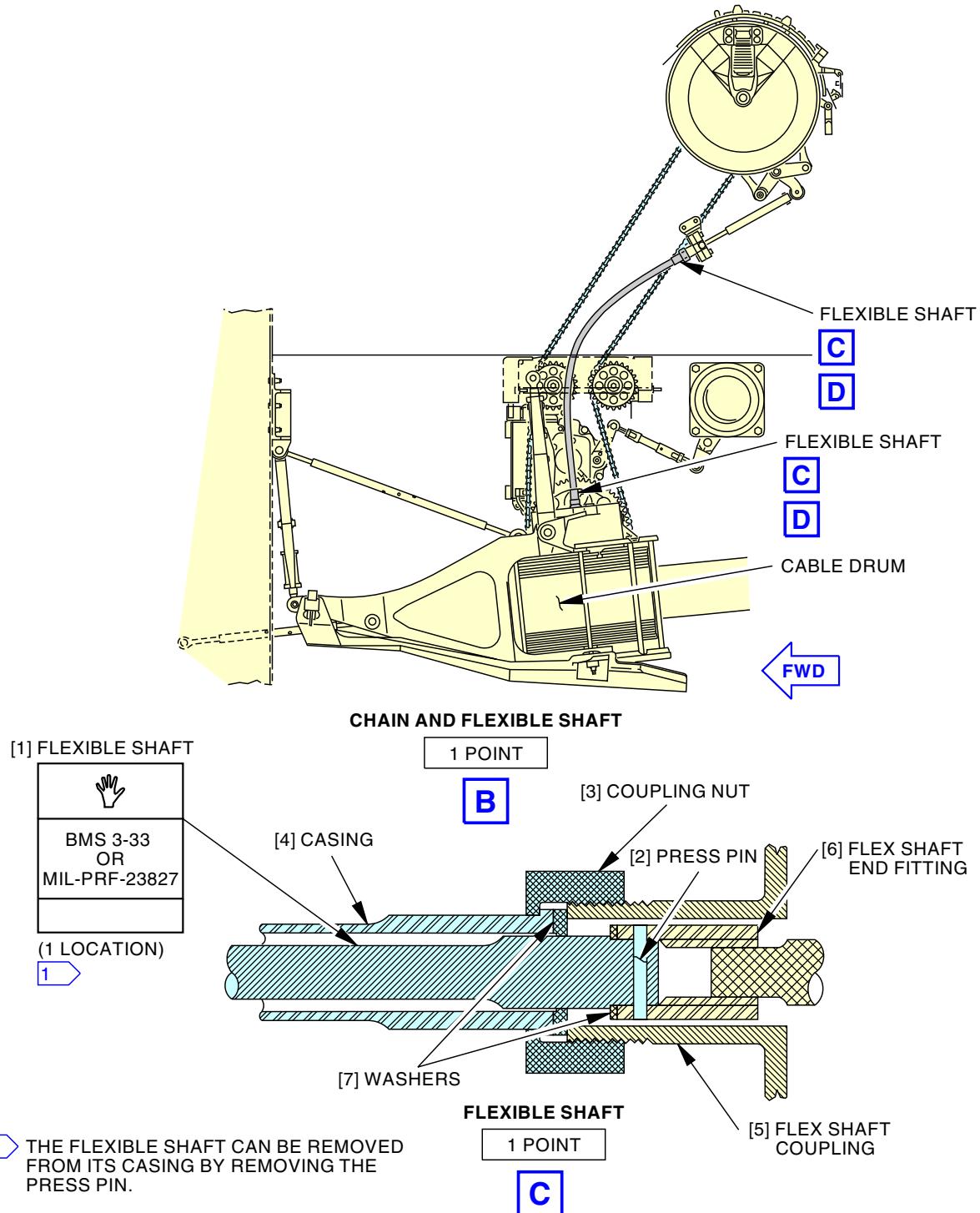
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Stabilizer Trim Flexible Shaft Lubrication
Figure 303/12-22-41-990-806 (Sheet 2 of 3)

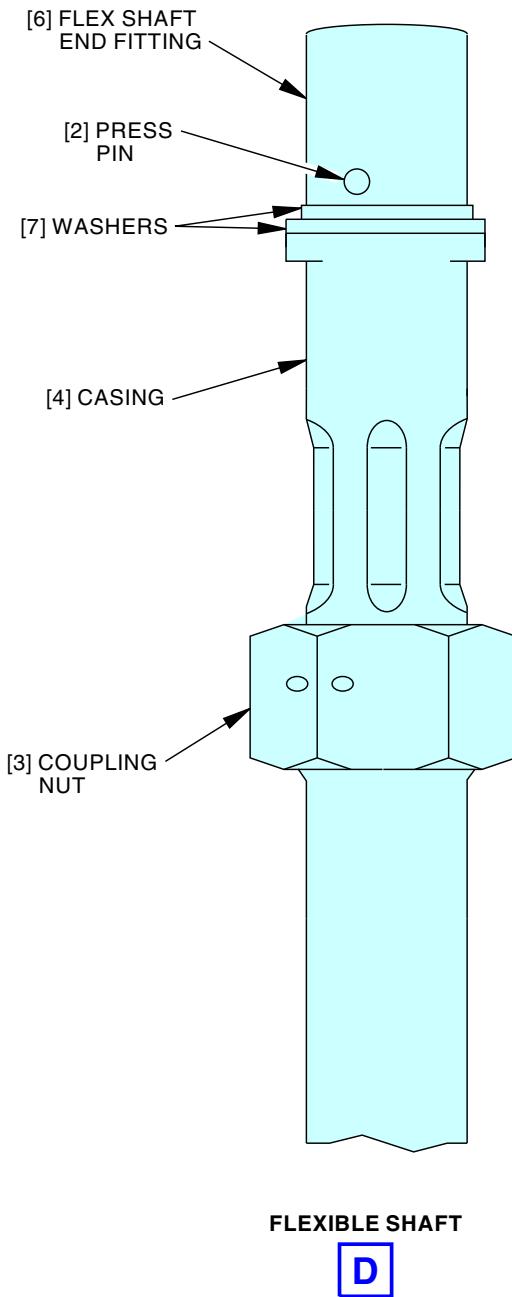
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Stabilizer Trim Flexible Shaft Lubrication
Figure 303/12-22-41-990-806 (Sheet 3 of 3)

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TASK 12-22-41-610-802

5. Horizontal Stabilizer Actuator Brake - Servicing

(Figure 304)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
101	Packing	27-41-81-03-300	LOM ALL
102	Packing	27-41-81-03-125	LOM ALL

C. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
312	Area Aft of Pressure Bulkhead - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

E. Prepare for the Servicing

SUBTASK 12-22-41-860-016

- (1) Move the stabilizer to the APL NOSE DN position (stabilizer leading edge up).

SUBTASK 12-22-41-860-017

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	2	C00849	AFCS STABILIZER TRIM

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-010-005

- (3) Open this access panel:

Number Name/Location

311BL	Stabilizer Trim Access Door
-------	-----------------------------

F. Horizontal Stabilizer Actuator Brake Servicing

SUBTASK 12-22-41-440-003

- (1) The Table 303 supplies information for the horizontal stabilizer brake assembly servicing:

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Table 303/12-22-41-993-808 Horizontal Stabilizer Brake Assembly Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
21	Primary Brake Fill Plug	BMS 3-32, Type II	Fill	1
22	Secondary Brake Fill Plug	BMS 3-32, Type II	Fill	1

SUBTASK 12-22-41-610-002

- (2) Do a check of the fluid level in the stabilizer actuator brake assembly.
 - (a) Do these steps:
 - 1) Service the primary brake.
 - a) Remove MS20995NC32 lockwire, G01912, on the primary brake fill plug [21].
 - <1> Discard MS20995NC32 lockwire, G01912.
 - b) Remove the primary brake fill plug [21] and packing [101] from the primary brake fill port.
 - c) Make sure that the fluid is at the level of the primary brake fill port.
 - d) If the fluid is not at the level of the fill port, remove the primary brake fill cap [23] from the primary brake housing.
 - e) If the fluid is not at the level of the fill port, fill the primary brake with fluid, D00467, through the primary brake fill cap [23] until the fluid spills out of the primary brake fill plug [21].
 - <1> If it is necessary use the stabilizer trim wheel, manually move the stabilizer, to remove any air from the brake assembly.
 - <2> Make sure that any spilled lubricant is cleaned up before continuing with the procedure.
 - f) Lubricate a new packing [101] with fluid, D00467.
 - g) Install the primary brake fill plug [21] and the new packing [101] in the fill port.
 - h) Tighten the primary brake fill plug [21] to 60 in-lb (6.8 N·m) - 80 in-lb (9.0 N·m) more than the run-on torque.
 - i) Install the primary brake fill cap [23].
 - j) Tighten the primary brake fill cap [23] to 30 in-lb (3.4 N·m) - 50 in-lb (5.6 N·m).
 - k) Install the new MS20995NC32 lockwire, G01912, with the double-twist method on the primary brake fill plug [21].
 - 2) Service the secondary brake.
 - a) Remove MS20995NC32 lockwire, G01912, on the secondary brake fill plug [22].
 - <1> Discard MS20995NC32 lockwire, G01912.
 - b) Remove the secondary brake fill plug [22] and packing [102] from the secondary brake fill port.
 - c) Make sure that the fluid is at the level of the fill port.
 - d) If the fluid is not at the level of the fill port, fill the secondary brake with fluid, D00467, through the fill port until the fluid spills out of the fill port.
 - <1> If it is necessary use the stabilizer trim wheel, manually move the stabilizer, to remove any air from the brake assembly.

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<2> Make sure that any spilled lubricant is cleaned up before continuing with the procedure.

- e) Lubricate a new packing [102] with fluid, D00467.
- f) Install the secondary brake fill plug [22] and the new packing [102] in the fill port.
- g) Tighten the secondary brake fill plug [22] to 60 in-lb (6.8 N·m) - 80 in-lb (9.0 N·m) more than the run-on torque.
- h) Install the new MS20995NC32 lockwire, G01912, with the double-twist method on the secondary brake fill plug [22].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-41-010-006

- (1) Close this access panel:

Number Name/Location

311BL Stabilizer Trim Access Door

SUBTASK 12-22-41-860-018

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	2	C00849	AFCS STABILIZER TRIM

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 12-22-41-860-019

- (3) Set the stabilizer to the NEUTRAL position, as necessary.

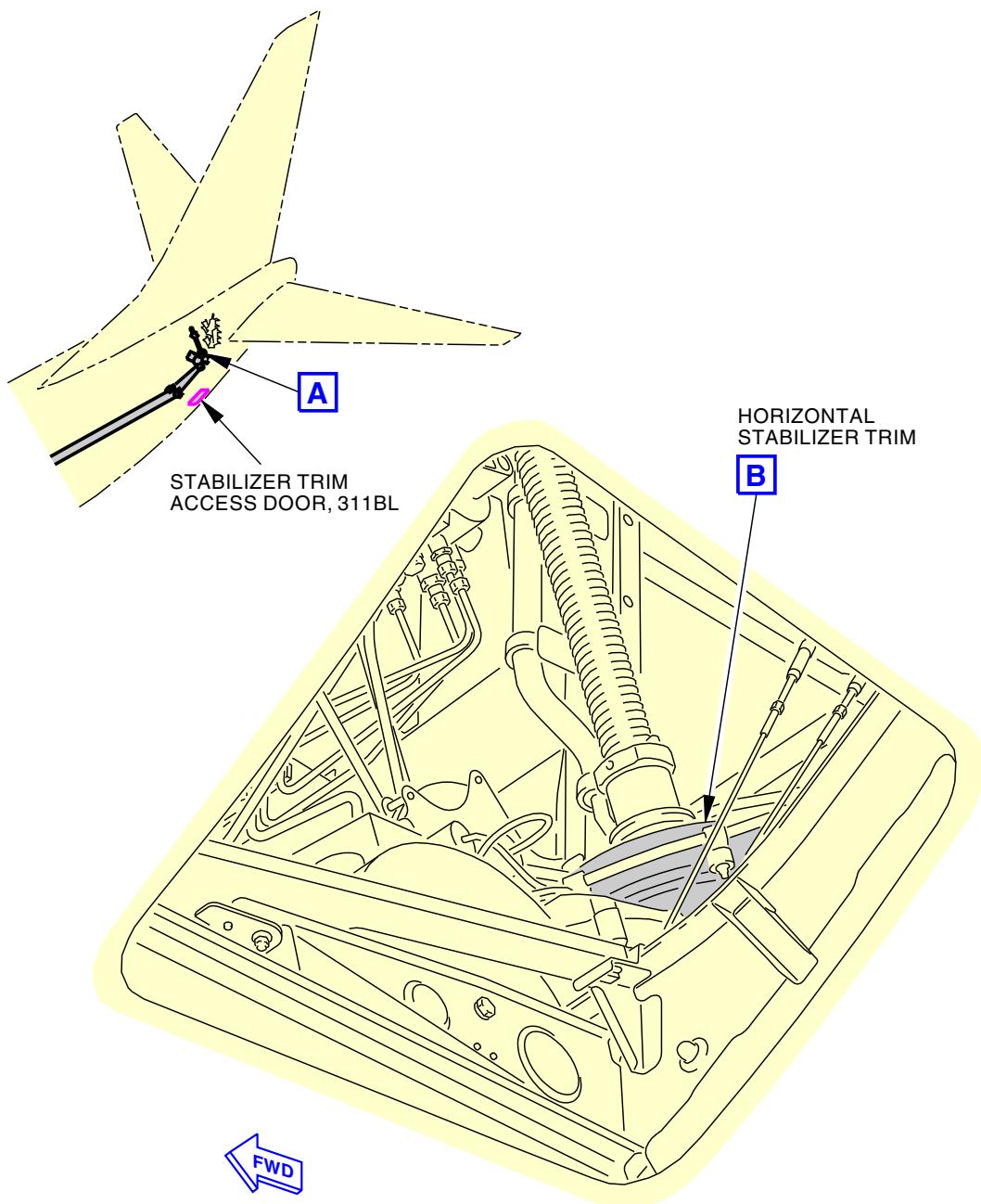
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VIEW THROUGH THE STABILIZER TRIM
ACCESS DOOR, 311BL

A

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Horizontal Stabilizer Actuator Brake Servicing
Figure 304/12-22-41-990-805 (Sheet 1 of 2)

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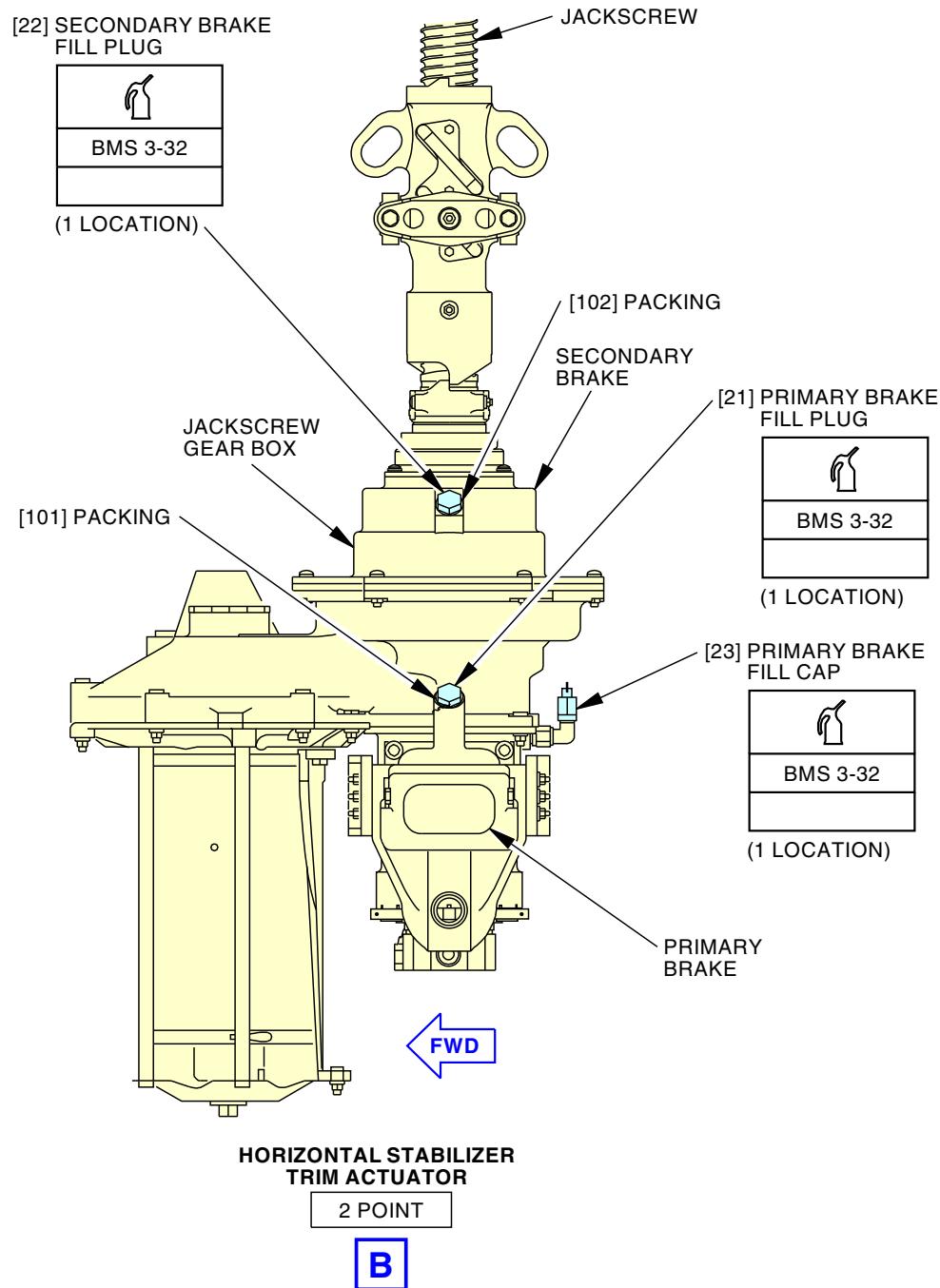
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Horizontal Stabilizer Actuator Brake Servicing
Figure 304/12-22-41-990-805 (Sheet 2 of 2)

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TRAILING EDGE FLAP SYSTEM - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A task to lubricate the torque tubes and torque tube supports for the trailing edge flaps.
 - (2) A task to lubricate the inboard ballscrew for the inboard flap.
 - (3) A task to lubricate the outboard ballscrew and U-joint for the inboard flap.
 - (4) A task to lubricate the inboard ballscrew and U-joint for the outboard flap.
 - (5) A task to lubricate the outboard ballscrew and U-joint for the outboard flap.
 - (6) A task to lubricate the U-joint and tee angle gearbox.
 - (7) A task to lubricate the inboard skew mechanism for the inboard flap.
 - (8) A task to lubricate the outboard skew mechanism for the inboard flap.
 - (9) A task to lubricate the inboard skew mechanism for the outboard flap.
 - (10) A task to lubricate the outboard skew mechanism for the outboard flap.
 - (11) A task to lubricate the inboard main flap and aft flap rollers and linkages.
 - (12) A task to lubricate the outboard main flap and aft flap rollers and linkages.
 - (13) A task to lubricate the attach fittings on the inboard flap track for the inboard flap.
 - (14) A task to lubricate the forward attach fitting on the outboard flap track for the inboard flap.
 - (15) A task to lubricate the forward attach fitting on the inboard flap track for the outboard flap.
 - (16) A task to lubricate the forward attach fitting on the outboard flap track for the outboard flap.
 - (17) A task to fill the flap power drive unit (PDU) for the trailing edge flaps with oil.
 - (18) A task to change the oil in the flap power drive unit (PDU).
 - (19) A task to fill the transmissions for the trailing edge flaps with oil.
 - (20) A task to change the oil in the transmissions for the trailing edge flaps.
 - (21) A task to fill the flap electric motor with oil.

TASK 12-22-51-640-801

2. Trailing Edge Flap Torque Tube and Torque Tube Support Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

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C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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
550	Subzone - Left Wing: Trailing Edge, Aft of Rear Spar, Inbd of Outboard Trailing Edge Flap
553	Left Wing - Inboard Flap
561	Left Wing - Rear Spar to Trailing Edge, Outboard Of Inboard Flap, Inboard of Fixed Trailing Edge
567	Left Wing - Outboard Flap
650	Subzone - Right Wing: Trailing Edge, Aft of Rear Spar, Inboard of Outboard Trailing Edge Flap
653	Right Wing - Inboard Flap
661	Right Wing - Rear Spar to Trailing Edge, Outboard of Inboard Flap, Inboard of Fixed Trailing Edge
667	Right Wing - Outboard Flap

E. Access Panels

Number	Name/Location
561BB	Midspan Fixed Trailing Edge Access Panel - WBL 305
661BB	Midspan Fixed Trailing Edge Access Panel - WBL 305

F. Prepare for the Lubrication

SUBTASK 12-22-51-860-001

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-001

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

G. Trailing Edge Flap Torque Tube and Torque Tube Support Lubrication

SUBTASK 12-22-51-640-038

- (1) This table supplies data for the subsequent lubrication step:

Table 301/12-22-51-993-821 Trailing Edge Flap Torque Tube and Torque Tube Support Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Transmission No. 1 Coupling (No. 8 Coupling Equivalent)	grease, D00633	Flush	2
2	Torque Tube Support Coupling	grease, D00633	Flush	4
3	Torque Tube Support	grease, D00633	Zerk	2
4	Transmission No. 2 Coupling (No. 7 Coupling Equivalent)	grease, D00633	Flush	4
5	Seal Rib Angle Gearbox Coupling	grease, D00633	Flush	4

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**Table 301/12-22-51-993-821 Trailing Edge Flap Torque Tube and Torque Tube Support Servicing
(Continued)**

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
6	Transmission No. 3 Coupling (No. 6 Coupling Equivalent)	grease, D00633	Flush	4
7	MLG Beam Angle Gearbox Coupling	grease, D00633	Flush	4
8	Tee Angle Gearbox Coupling	grease, D00633	Flush	4
9	Flap Power Drive Unit Coupling	grease, D00633	Flush	4

SUBTASK 12-22-51-640-060



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-001

- (3) Lubricate the torque tube couplings on each end of the torque tube:
 - (a) Manually move the torque tube axially in the direction of the coupling you will lubricate.
 - (b) Fill the coupling with grease, D00633, through a minimum of two of the three grease holes.
NOTE: Fill the coupling until clean grease comes out of the curled end of the coupling, or until grease comes out of the other grease holes.
 - (c) Move the torque tube in the opposite direction until it stops.
 - (d) Wipe the grease from around the coupling and the grease holes.

SUBTASK 12-22-51-640-002

- (4) If it is necessary, open these access panels:

Number Name/Location

561BB	Midspan Fixed Trailing Edge Access Panel - WBL 305
661BB	Midspan Fixed Trailing Edge Access Panel - WBL 305

SUBTASK 12-22-51-640-074

- (5) Lubricate the torque tube support with grease, D00633.

SUBTASK 12-22-51-840-003

- (6) Close these access panels, if they were opened:

Number Name/Location

561BB	Midspan Fixed Trailing Edge Access Panel - WBL 305
661BB	Midspan Fixed Trailing Edge Access Panel - WBL 305

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-001

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

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SUBTASK 12-22-51-860-002

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

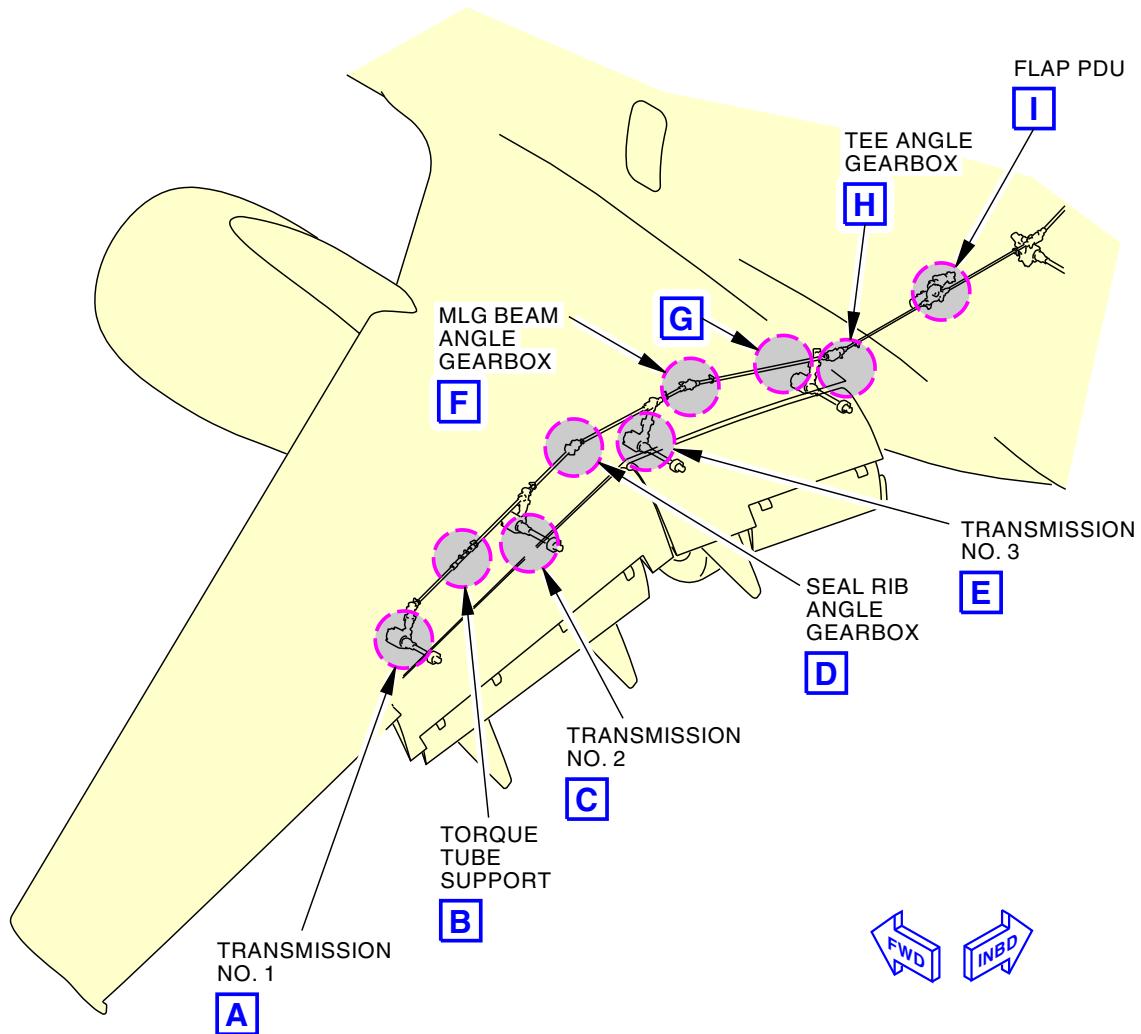
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Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 1 of 10)

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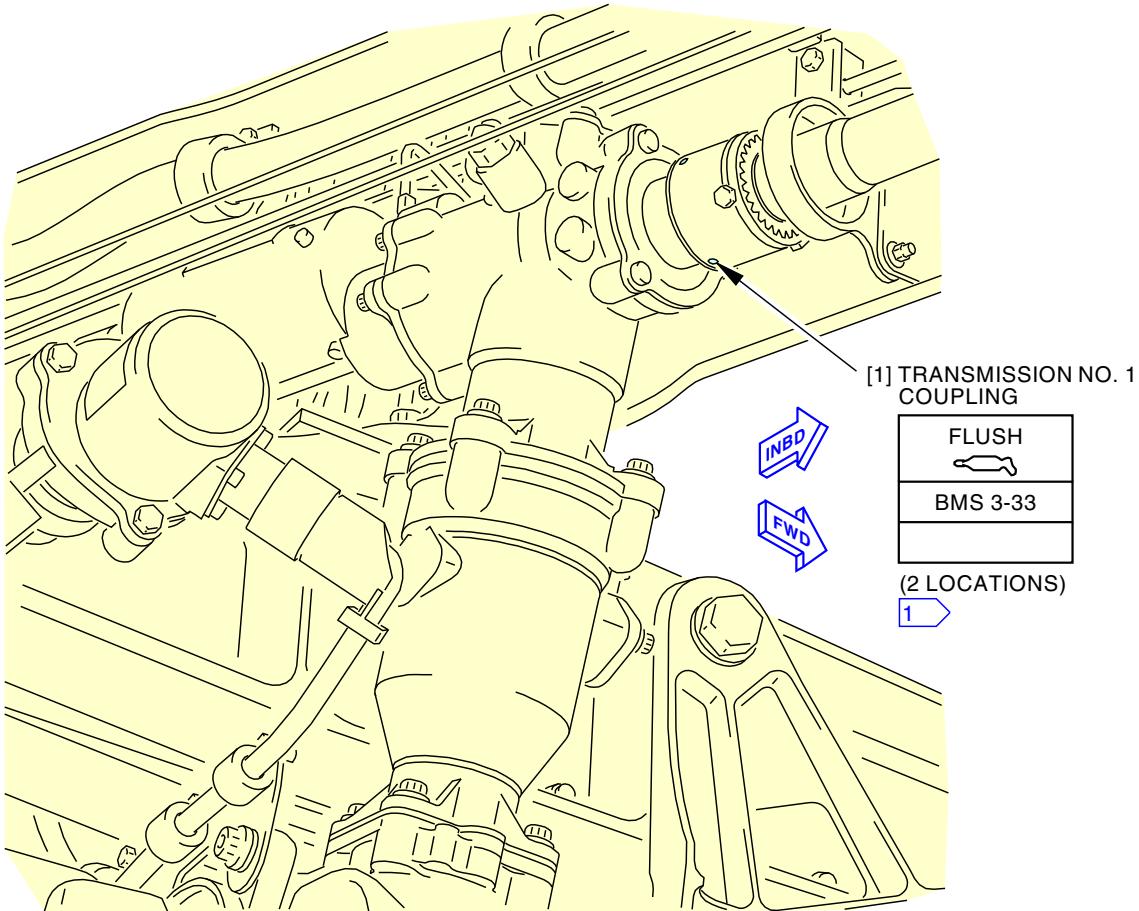
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TRANSMISSION NO. 1
(TRANSMISSION NO. 8 IS EQUIVALENT)

2 POINTS

A

- 1 LUBRICATE A MINIMUM OF TWO LUBE POINTS ON EACH COUPLING UNTIL GREASE COMES OUT OF THE COUPLING.

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Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 2 of 10)

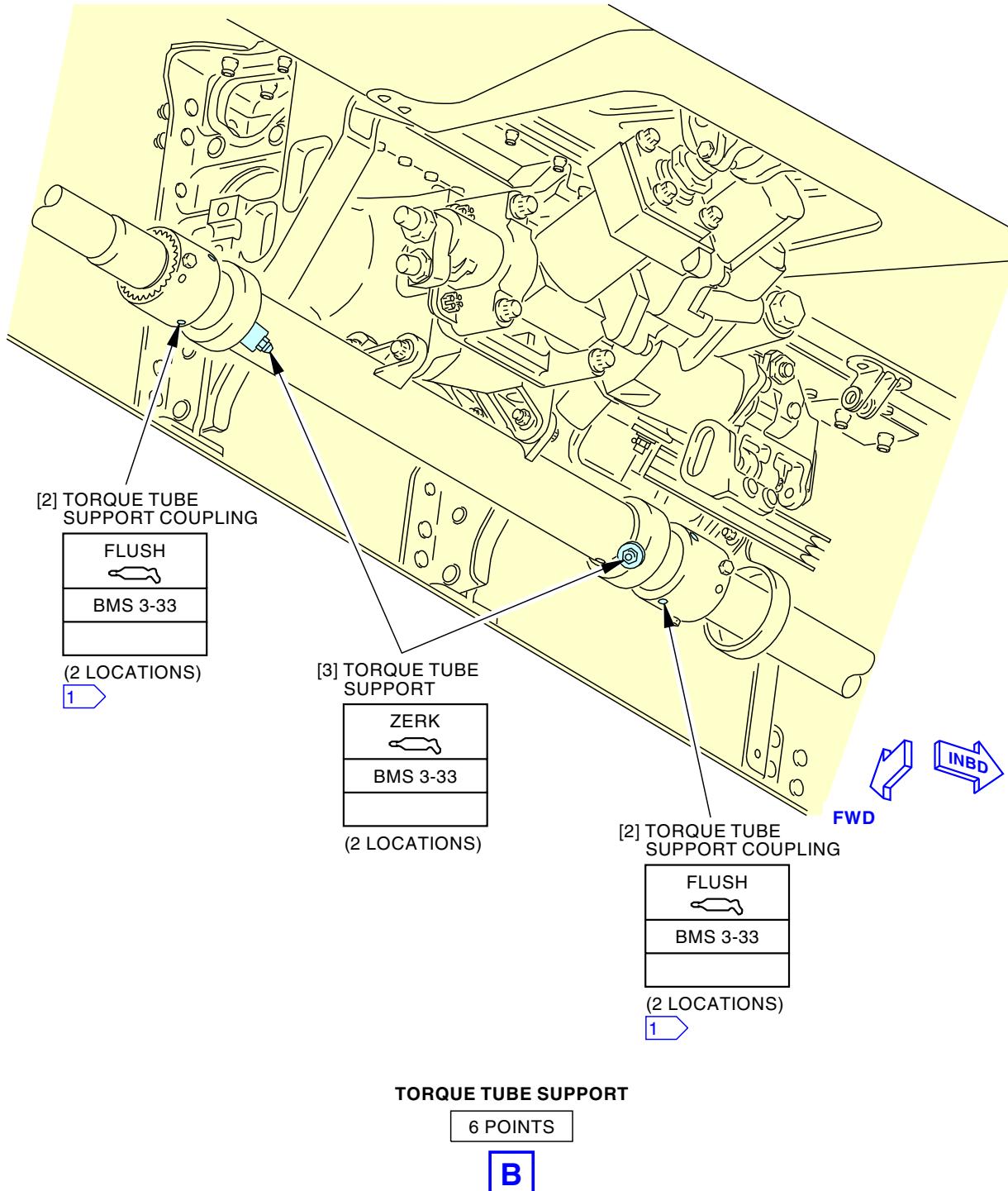
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Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 3 of 10)

EFFECTIVITY
LOM ALL

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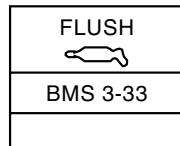
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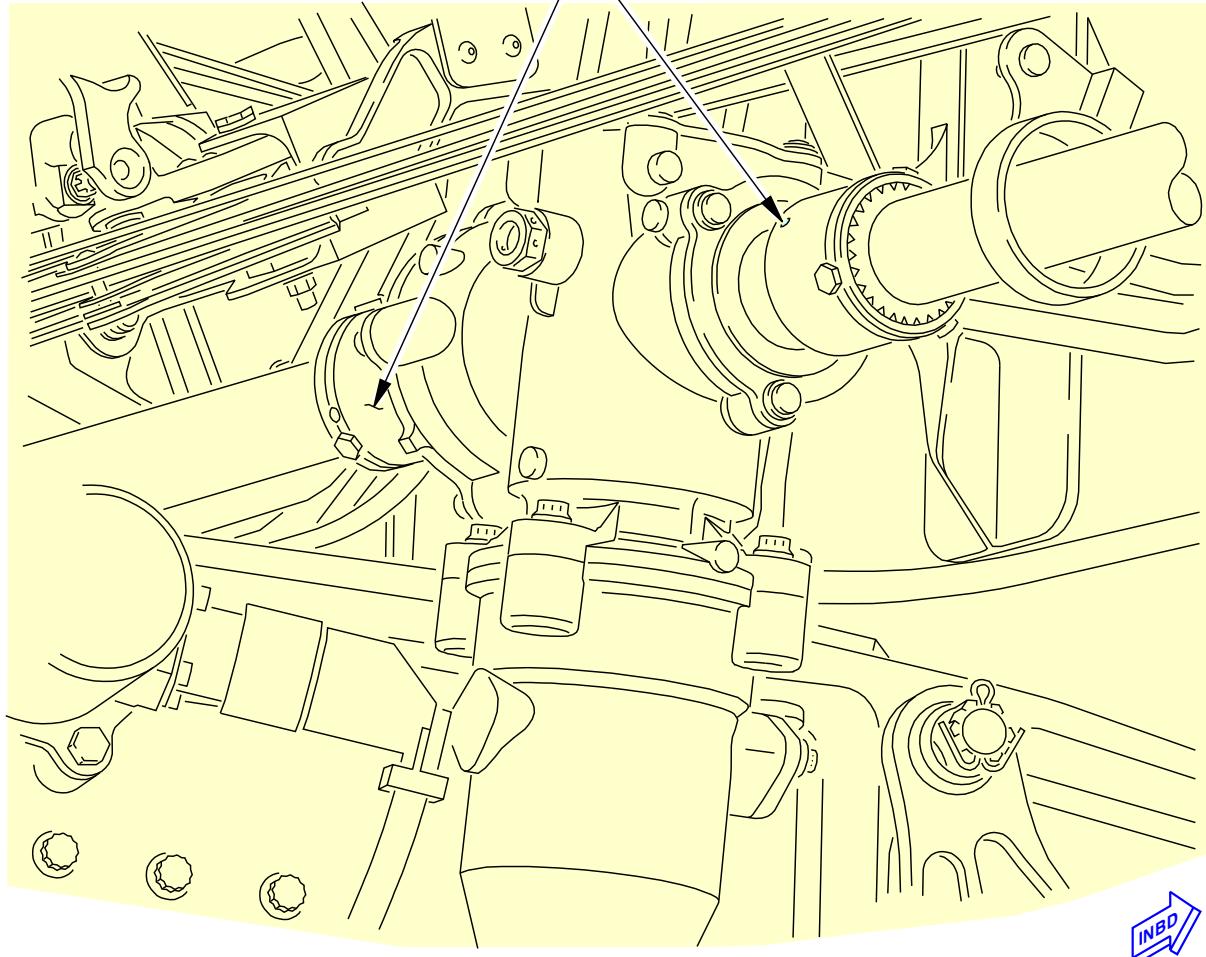
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

[4] TRANSMISSION NO. 2
COUPLINGS



(4 LOCATIONS)

1



G28647 S0006561483_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 4 of 10)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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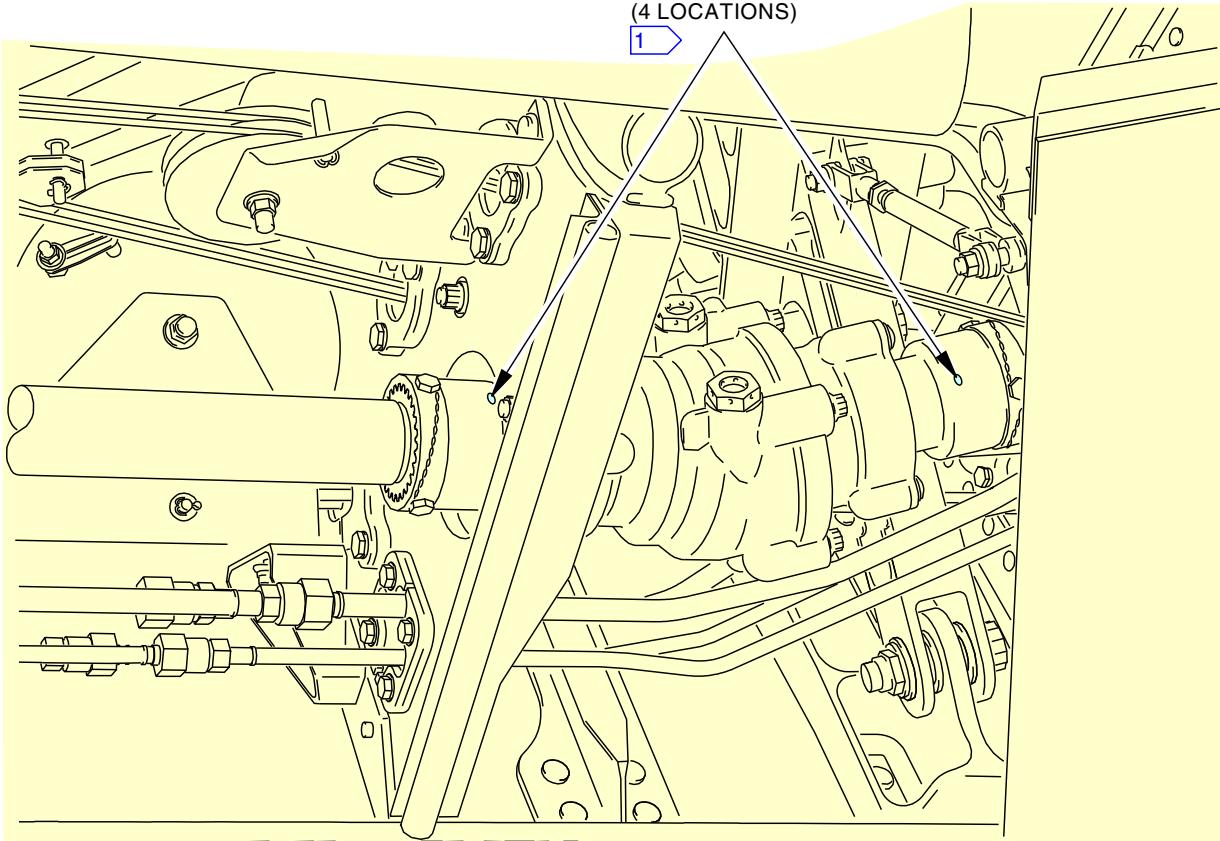
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

[5] SEAL RIB ANGLE
GEARBOX COUPLINGS

FLUSH
BMS 3-33

(4 LOCATIONS)

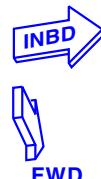
1



SEAL RIB ANGLE GEARBOX

4 POINTS

D



G28671 S0006561484_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 5 of 10)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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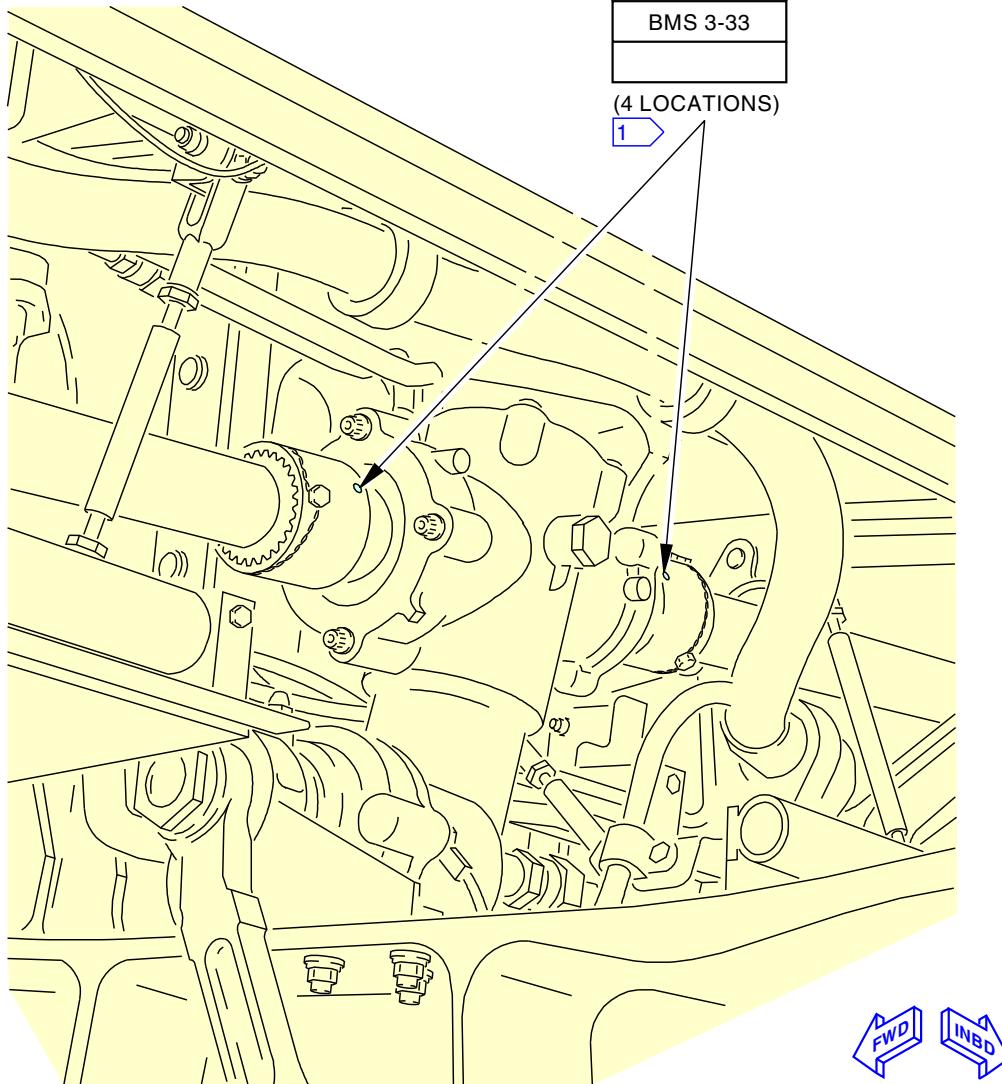
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

[6] TRANSMISSION NO. 3
COUPLINGS

FLUSH
BMS 3-33

(4 LOCATIONS)

1



TRANSMISSION NO. 3
(TRANSMISSION NO. 6 IS EQUIVALENT)

4 POINTS

E

G28677 S0006561485_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 6 of 10)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

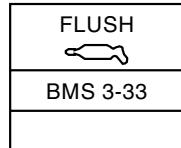
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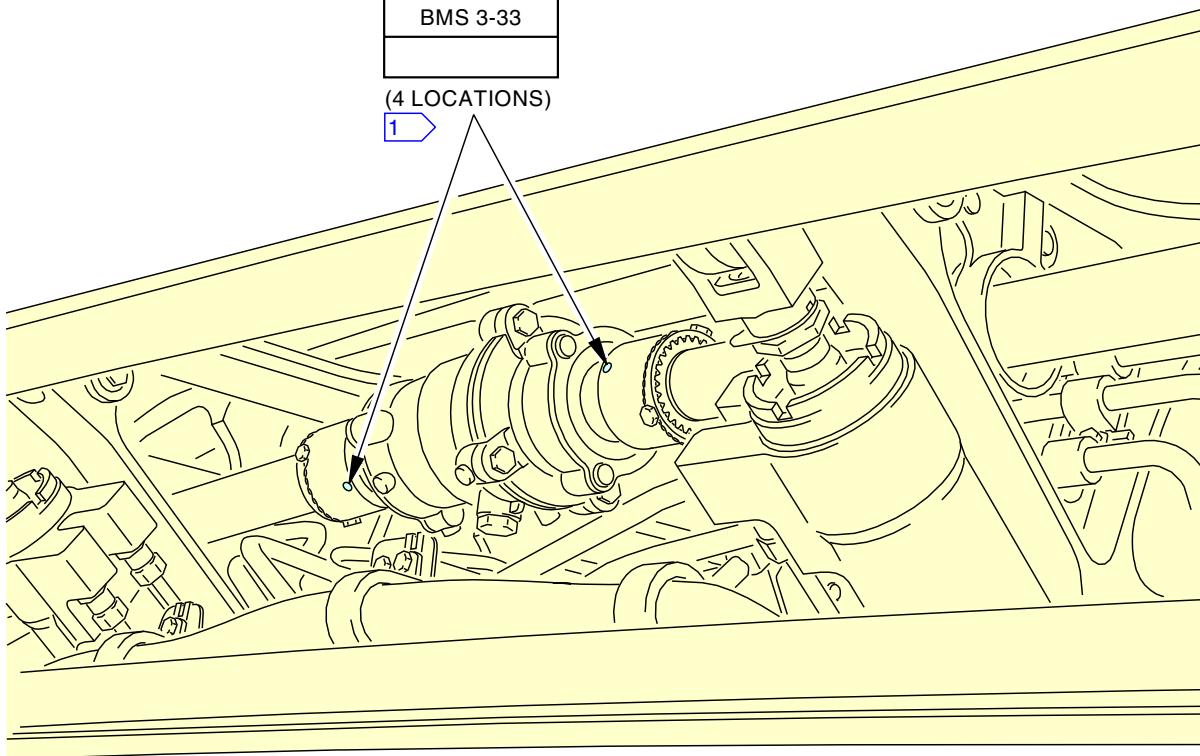
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

[7] MLG BEAM ANGLE
GEARBOX COUPLINGS



(4 LOCATIONS)

1



MLG BEAM ANGLE GEARBOX

4 POINTS

F



G28681 S0006561486_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 7 of 10)

EFFECTIVITY
LOM ALL

12-22-51

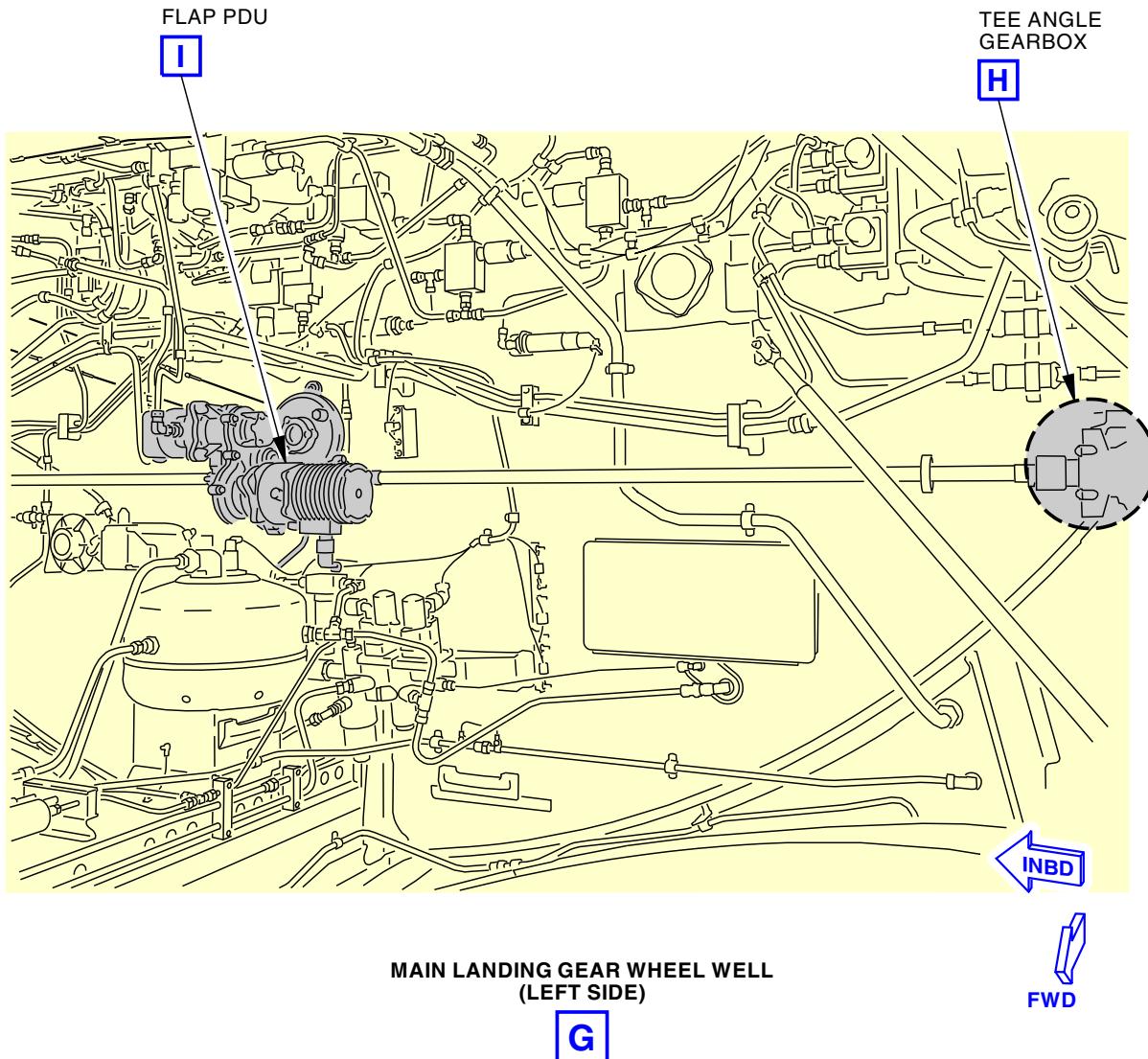
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G28689 S0006561487_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 8 of 10)

EFFECTIVITY
LOM ALL

12-22-51

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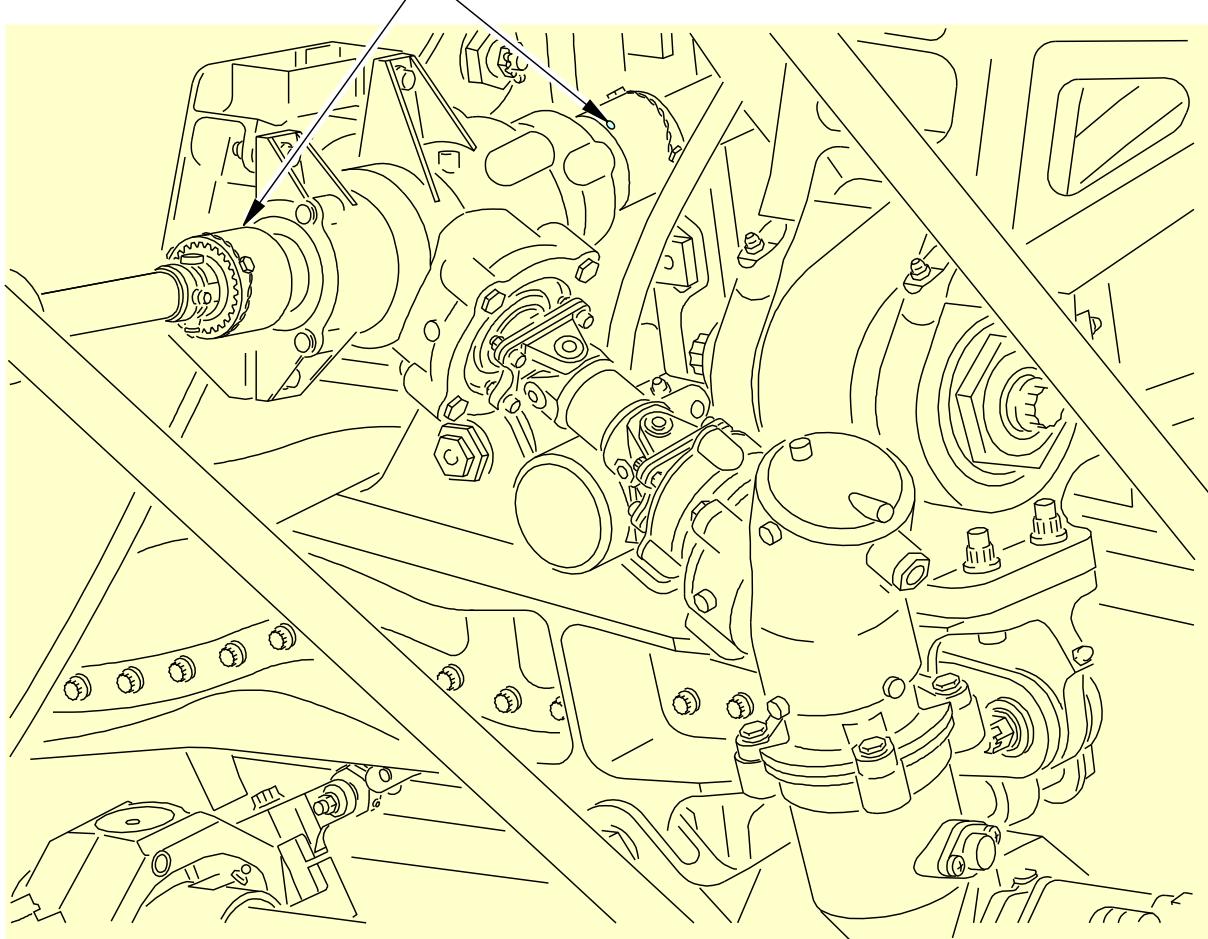
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[8] TEE ANGLE GEARBOX COUPLINGS

FLUSH
BMS 3-33

(4 LOCATIONS)

1



TEE ANGLE GEARBOX

4 POINTS

H



G28698 S0006561488_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 9 of 10)

EFFECTIVITY
LOM ALL

12-22-51

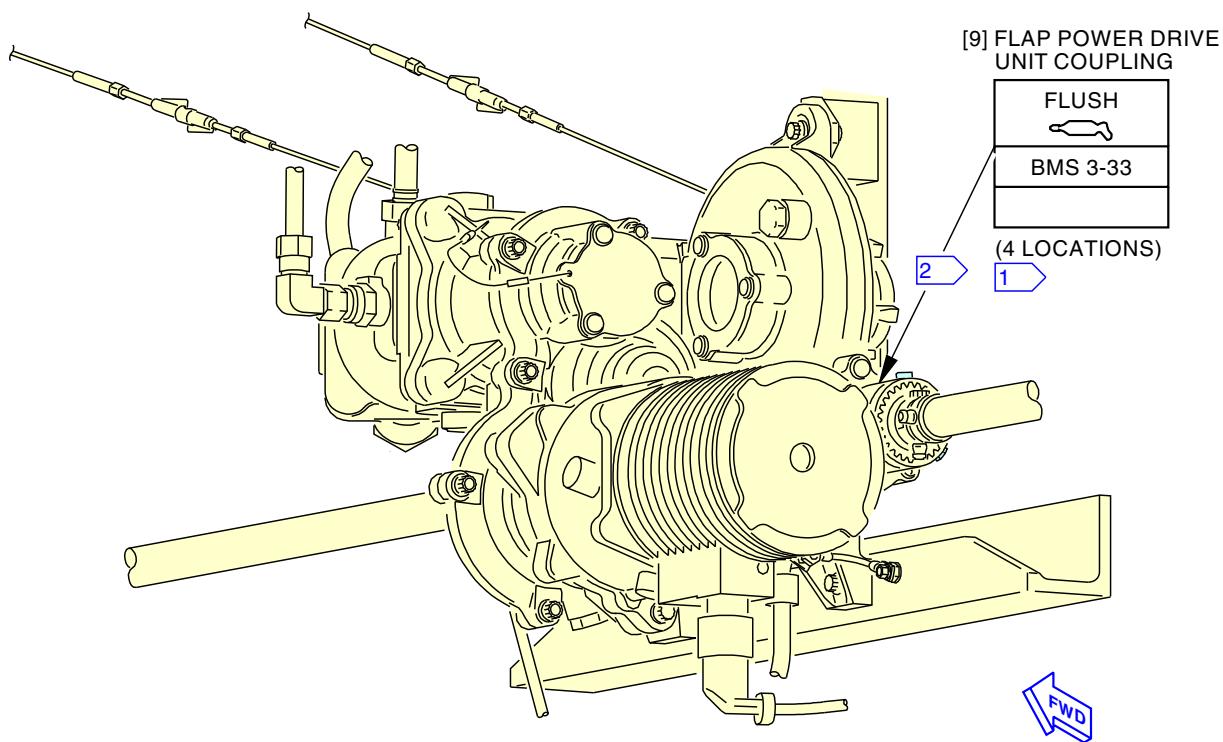
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FLAP POWER DRIVE UNIT

4 POINTS



2 ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

G28703 S0006561489_V2

Trailing Edge Flap Torque Tubes and Torque Tube Support Servicing
Figure 301/12-22-51-990-801 (Sheet 10 of 10)

EFFECTIVITY
LOM ALL

12-22-51

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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-802

3. Inboard Flap Inboard Ballscrew Lubrication and U-Joint Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-002

- (1) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.
- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Inboard Flap Inboard Ballscrew Lubrication and U-Joint Lubrication

(Table 302)

SUBTASK 12-22-51-640-039

- (1) This table supplies data for the subsequent lubrication steps:

Table 302/12-22-51-993-822 Inboard Flap Inboard Ballscrew Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	No. 4 Ballscrew Nut (No. 5 Ballscrew Nut is Equivalent)	grease, D00633	Zerk	1
2	No. 4 U-Joint (No. 5 U-Joint is Equivalent)	grease, D00633	Zerk	4

SUBTASK 12-22-51-640-061



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-51-640-003



CAUTION

DO NOT USE A PNEUMATIC GREASE GUN TO SERVICE THE BALLSCREWS, EXCESSIVE GREASE GUN NOZZLE PRESSURE AND FLOW RATE CAN DAMAGE THE SEALS.



CAUTION

DO NOT USE GREASE GUN PRESSURE IN EXCESS OF 36 PSI (2.5 BAR). EXCESSIVE GREASE GUN NOZZLE PRESSURE AND FLOW RATE CAN DAMAGE THE SEALS.

- (3) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent. The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-22-51-640-004

- (4) Lubricate the fittings on the U-joint with grease, D00633.

NOTE: There are four lubrication fittings on the U-joint. It is necessary to lubricate all of them.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-002

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.
(2) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51

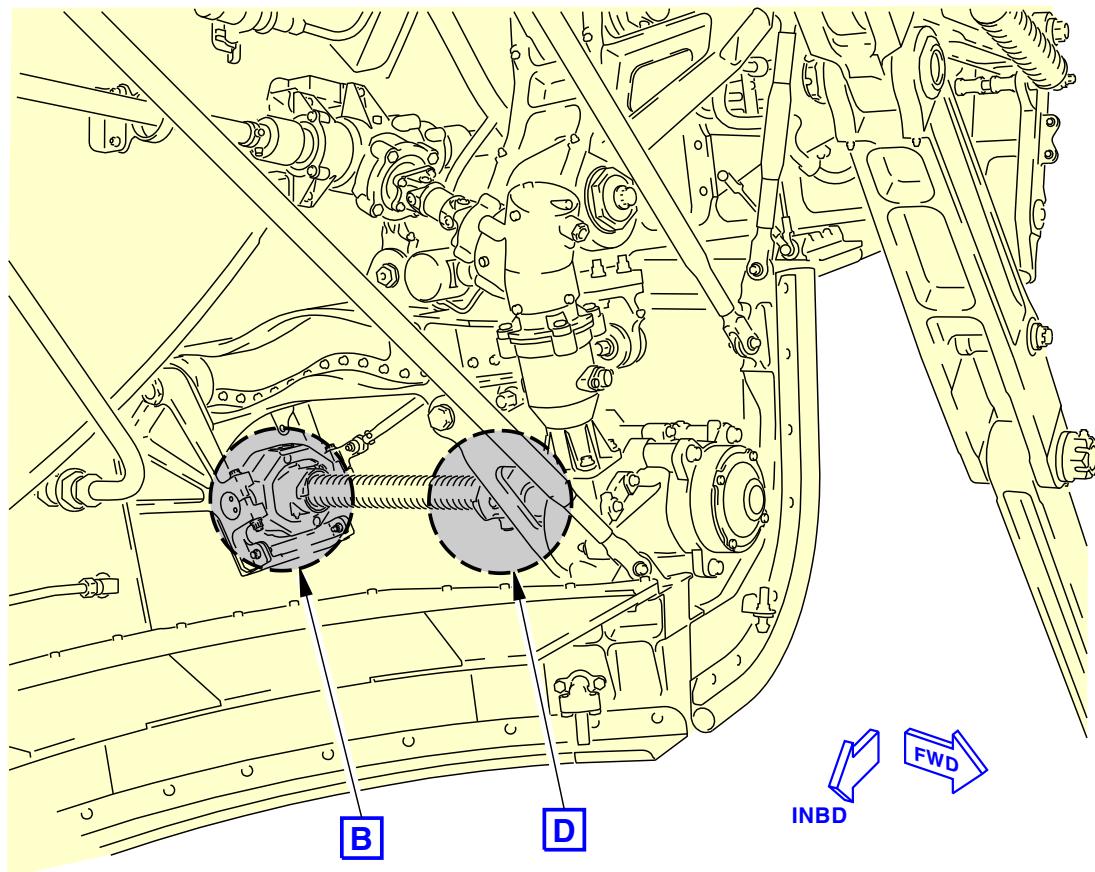
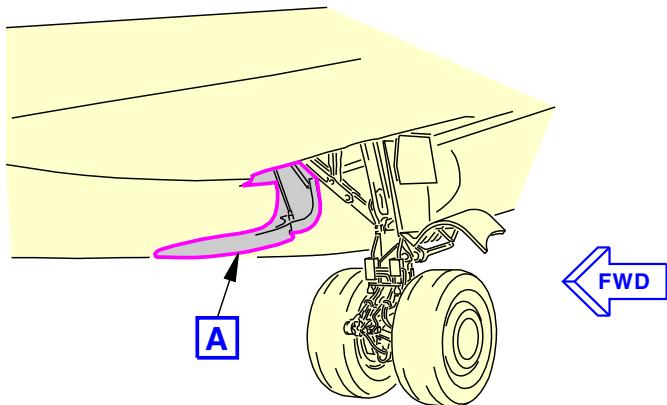
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MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

A

G29034 S0006561492_V2

Inboard Flap Inboard Ballscrew Servicing
Figure 302/12-22-51-990-802 (Sheet 1 of 3)

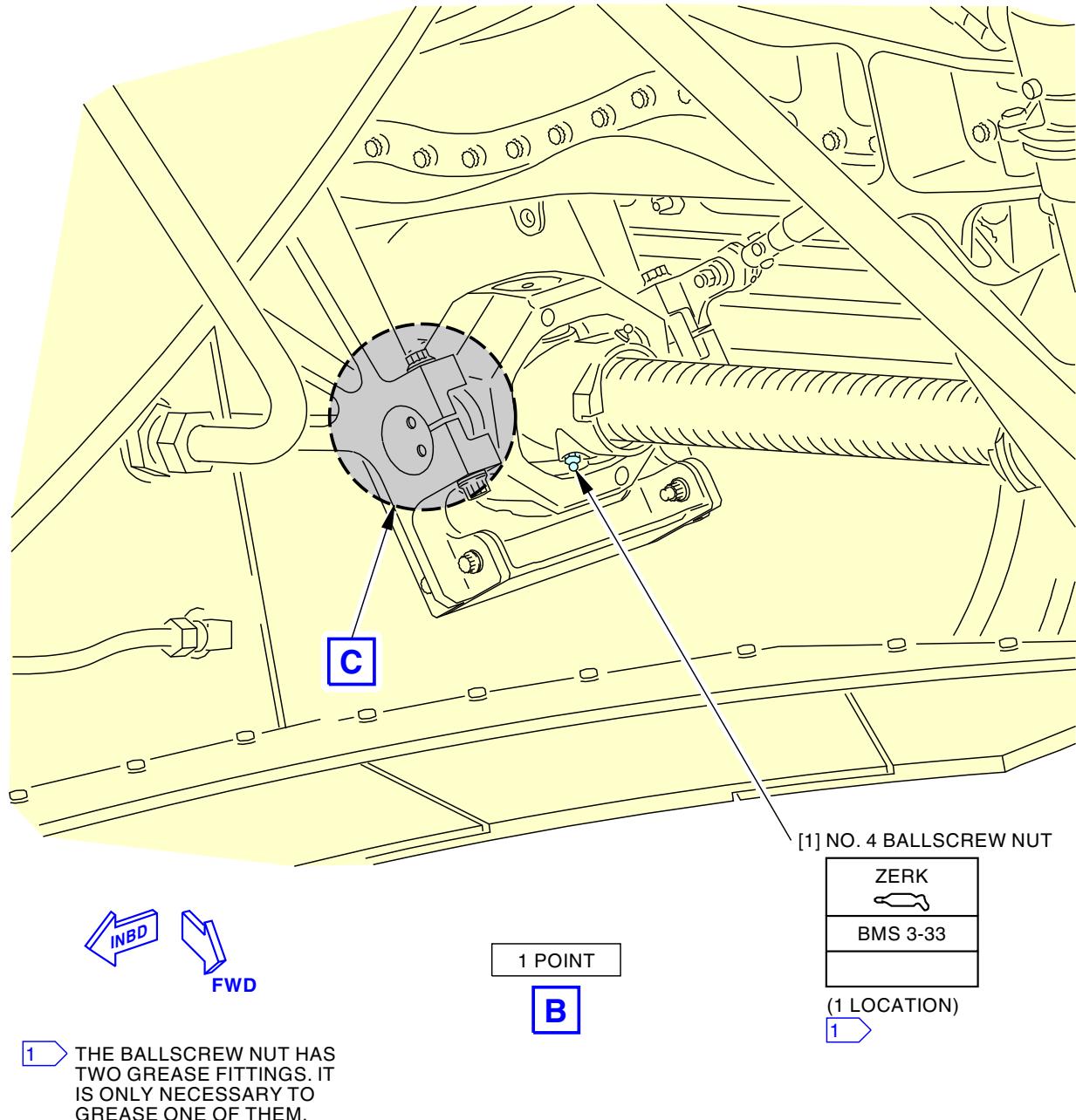
EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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1 THE BALLSCREW NUT HAS
TWO GREASE FITTINGS. IT
IS ONLY NECESSARY TO
GREASE ONE OF THEM.

G29037 S0006561493_V2

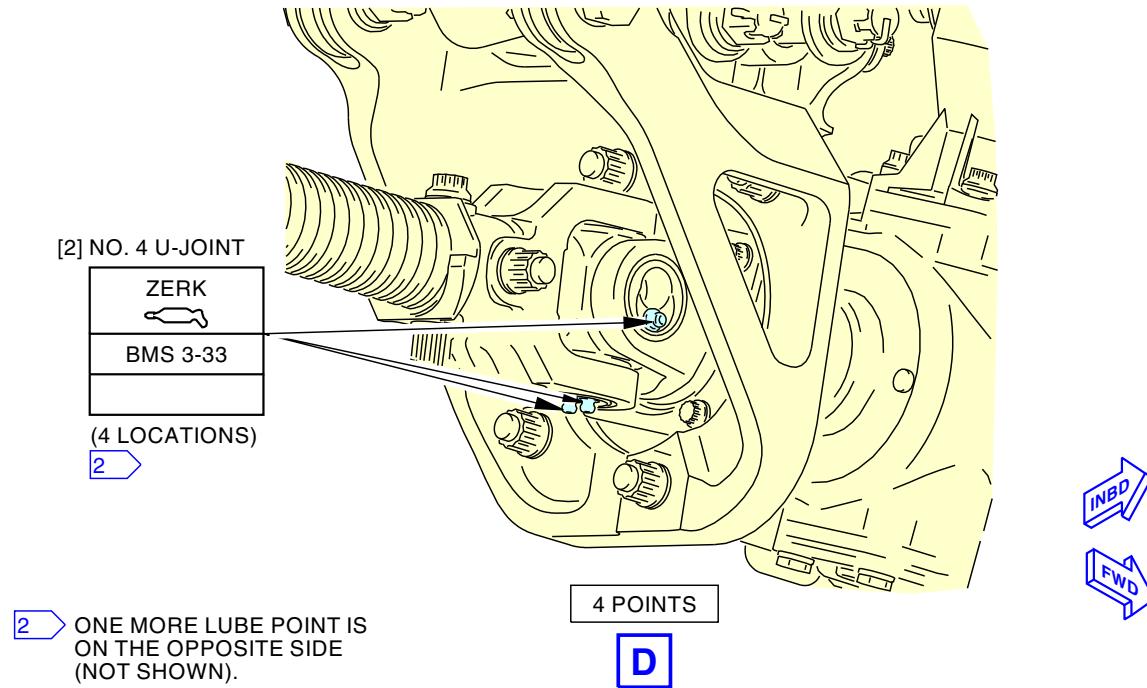
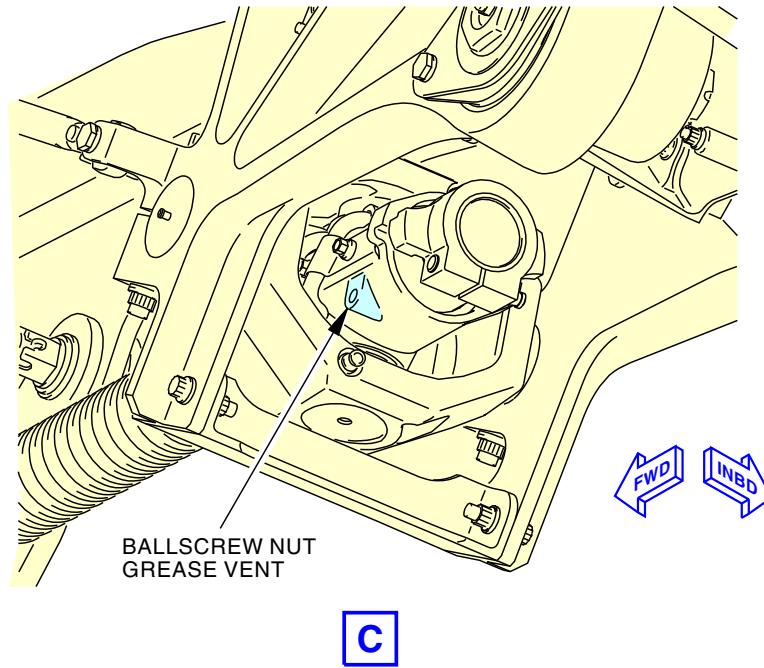
Inboard Flap Inboard Ballscrew Servicing
Figure 302/12-22-51-990-802 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



G29039 S0006561494_V2

Inboard Flap Inboard Ballscrew Servicing
Figure 302/12-22-51-990-802 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-803

4. Inboard Flap Outboard Ballscrew and U-Joint Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
542	Left Wing - Fairing Flap Support No. 3
553	Left Wing - Inboard Flap
642	Right Wing - Fairing Flap Support No. 6
653	Right Wing - Inboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-003

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-003

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Inboard Flap Outboard Ballscrew and U-Joint Lubrication

SUBTASK 12-22-51-640-040

- (1) This table supplies data for the subsequent lubrication step (Table 303):

Table 303/12-22-51-993-823 Inboard Flap Outboard Ballscrew and U-Joint Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
2	No. 3 Ballscrew Nut (No. 6 Ballscrew Nut is Equivalent)	grease, D00633	Zerk	1
4	No. 3 U-Joint (No. 6 U-Joint is Equivalent)	grease, D00633	Zerk	4

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-51-840-001



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-005



CAUTION

DO NOT USE A PNEUMATIC GREASE GUN TO SERVICE THE BALLSCREWS, EXCESSIVE GREASE GUN NOZZLE PRESSURE AND FLOW RATE CAN DAMAGE THE SEALS.

- (3) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent. The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-22-51-640-007

- (4) Lubricate the fittings on the U-joint with grease, D00633.

NOTE: There are four lubrication fittings on the U-joint. It is necessary to lubricate all of them.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-003

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-004

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

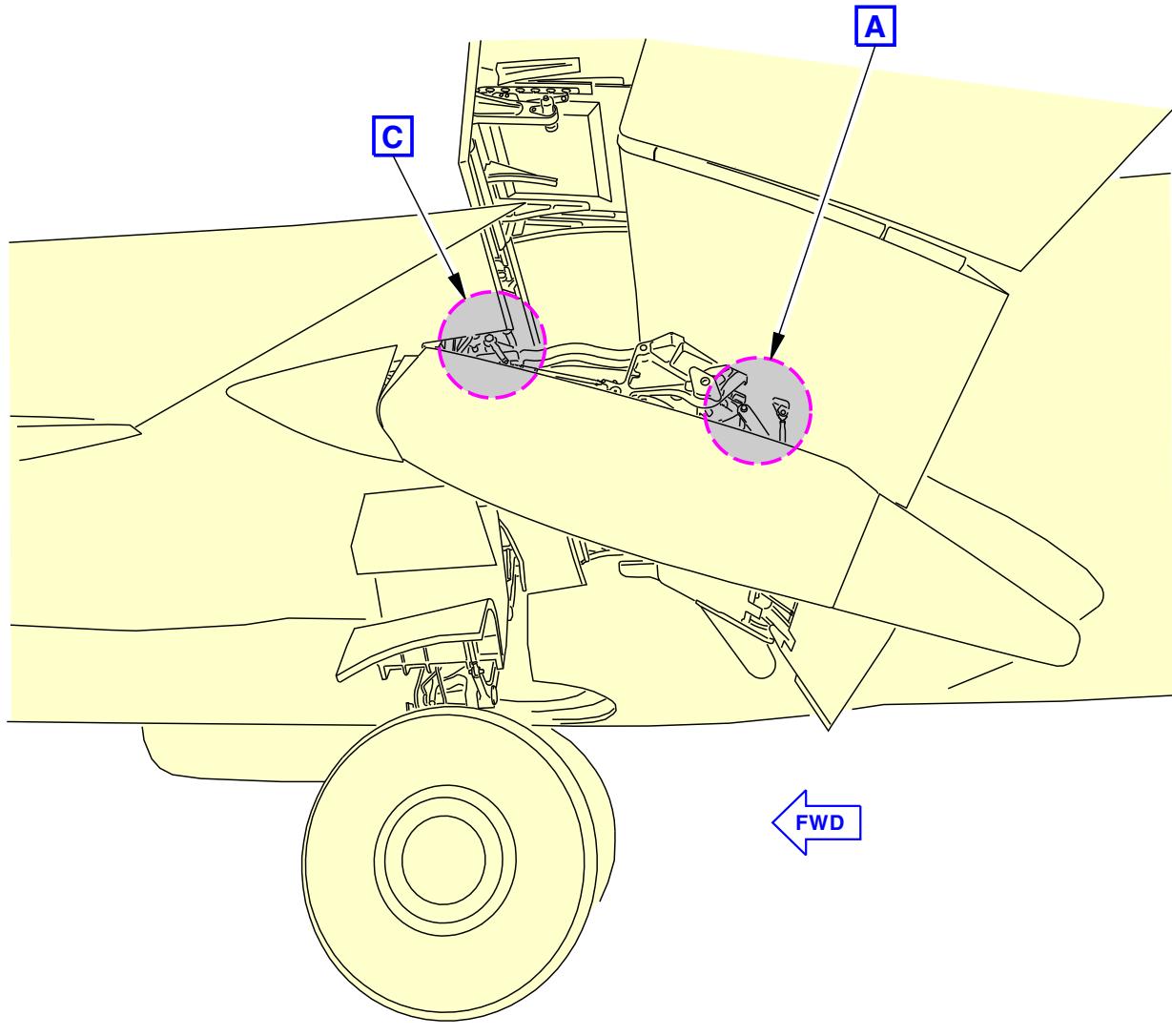
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)

G29040 S0006561497_V3

Inboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 303/12-22-51-990-803 (Sheet 1 of 3)

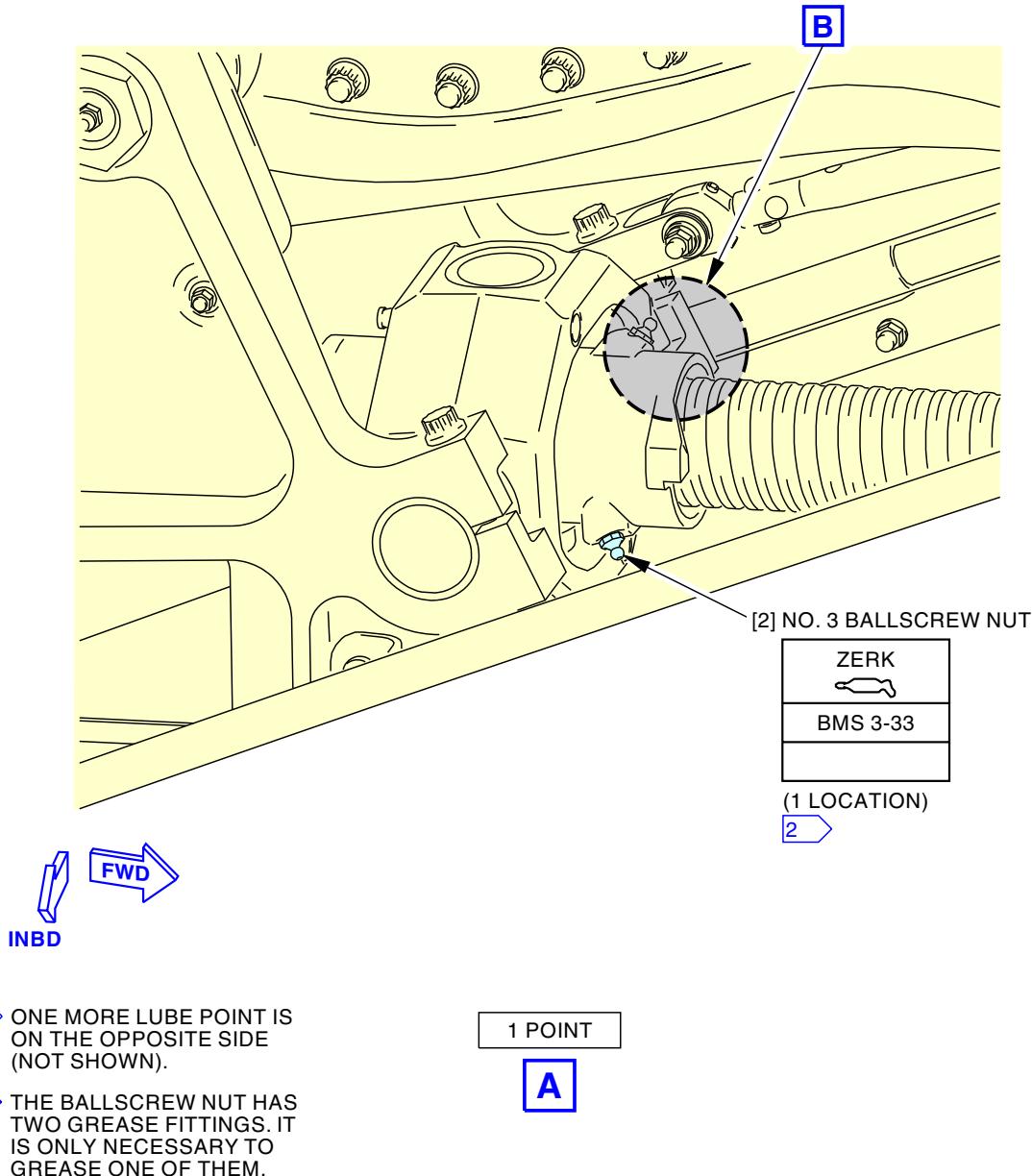
EFFECTIVITY
LOM ALL

12-22-51

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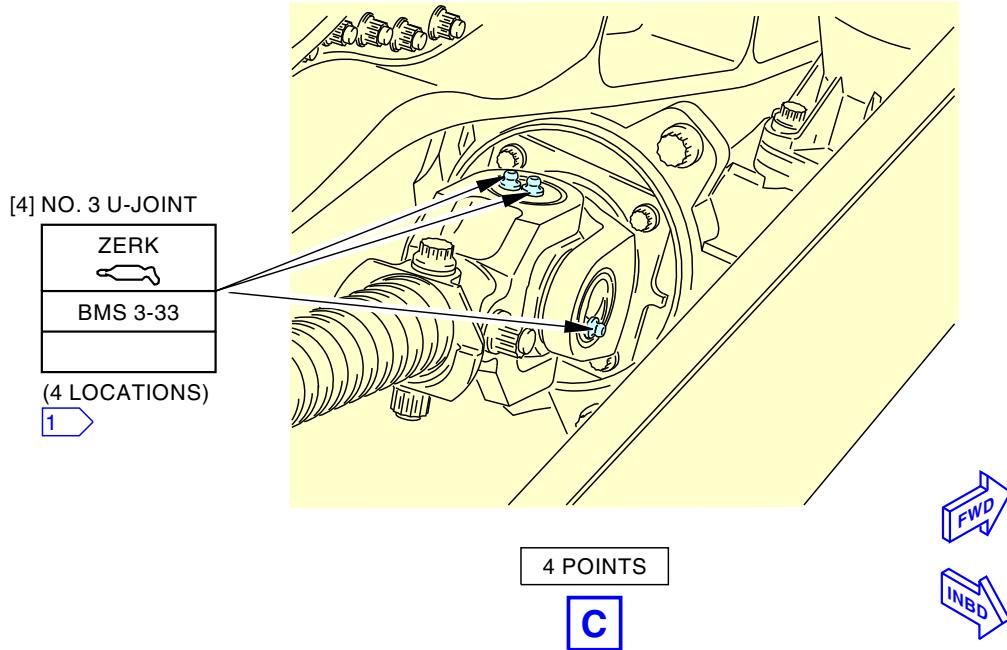
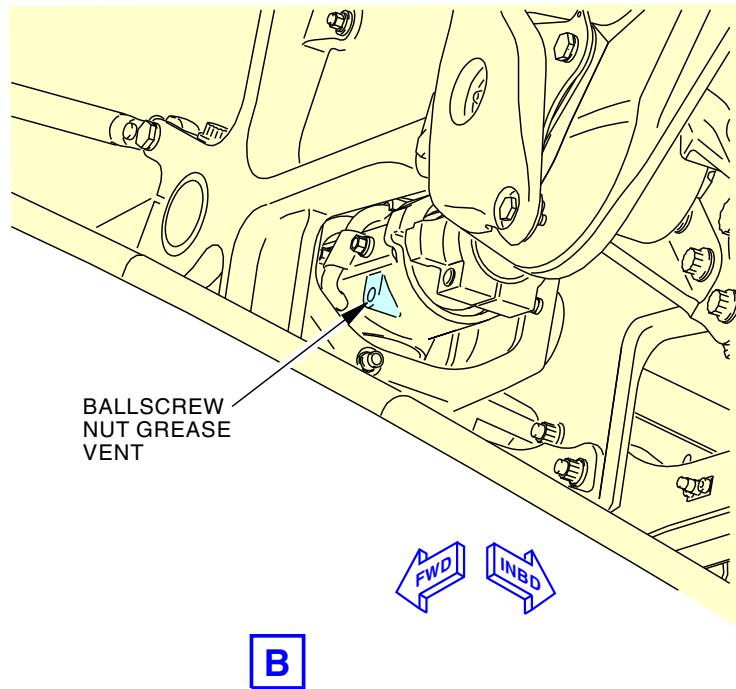


L76792 S0006561499_V2

Inboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 303/12-22-51-990-803 (Sheet 2 of 3)EFFECTIVITY
LOM ALL**12-22-51**

D633A101-LOM

BOEING
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L76797 S0006561502_V2

Inboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 303/12-22-51-990-803 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-640-804

5. Outboard Flap Inboard Ballscrew and U-Joint Lubrication

(Figure 304)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
543	Left Wing - Fairing Flap Support No. 2
567	Left Wing - Outboard Flap
643	Right Wing - Fairing Flap Support No. 7
667	Right Wing - Outboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-005

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-004

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Outboard Flap Inboard Ballscrew and U-Joint Lubrication

SUBTASK 12-22-51-640-041

- (1) This table supplies data for the subsequent lubrication steps (Table 304):

Table 304/12-22-51-993-824 Outboard Flap Inboard Ballscrew and U-Joint Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
3	No. 2 Ballscrew Nut (No. 7 Ballscrew Nut is Equivalent)	grease, D00633	Zerk	1
4	No. 2 U-Joint (No. 7 U-Joint is Equivalent)	grease, D00633	Zerk	4

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-51-640-062



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-008



CAUTION

DO NOT USE A PNEUMATIC GREASE GUN TO SERVICE THE BALLSCREWS, EXCESSIVE GREASE GUN NOZZLE PRESSURE AND FLOW RATE CAN DAMAGE THE SEALS.

- (3) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent. The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-22-51-640-010

- (4) Lubricate the fittings on the U-joint with grease, D00633.

NOTE: There are four lubrication fittings on the U-joint. It is necessary to lubricate all of them.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-004

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-006

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

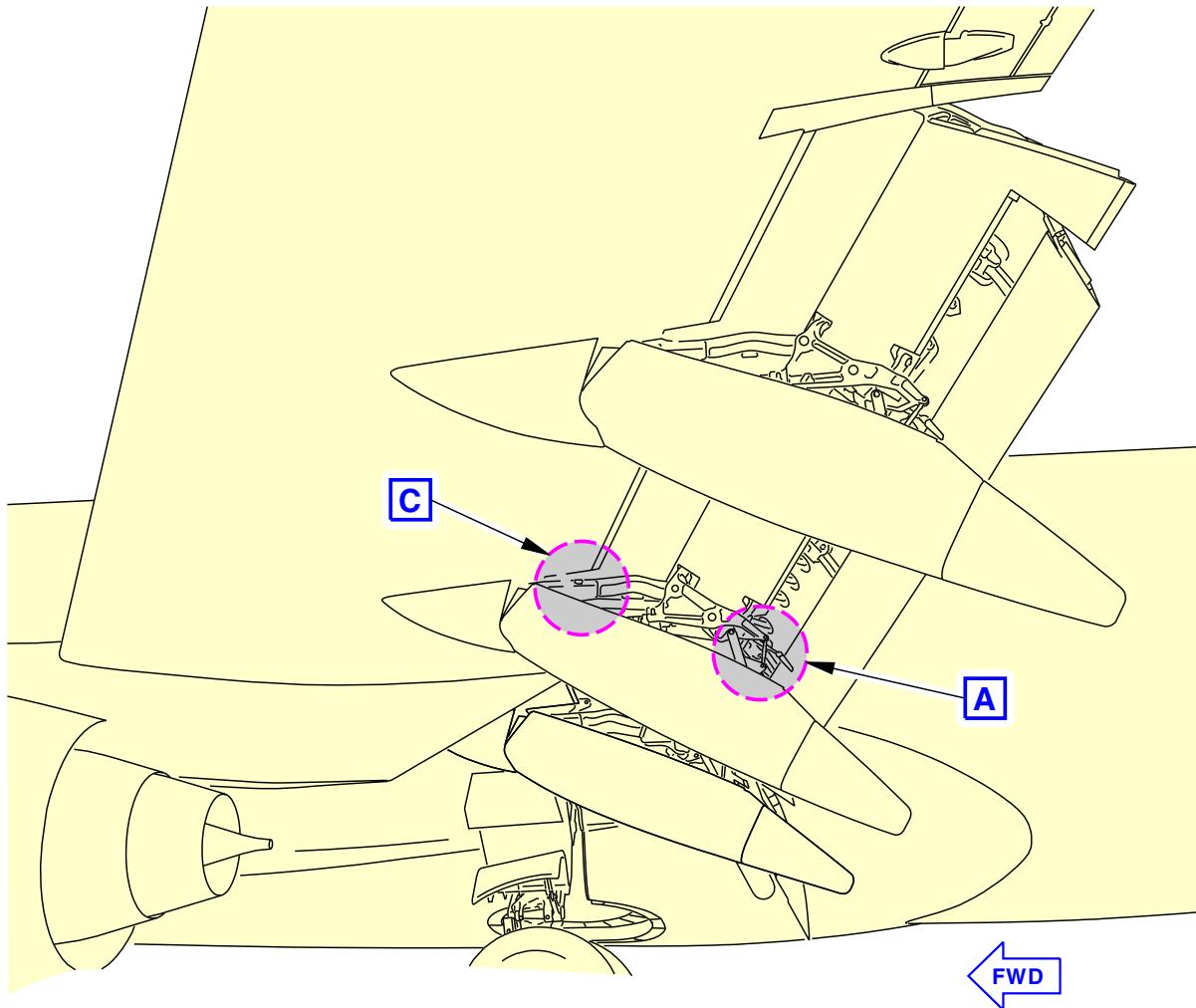
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)

G29144 S0006561507_V3

Outboard Flap Inboard Ballscrew and U-Joint Servicing
Figure 304/12-22-51-990-804 (Sheet 1 of 4)

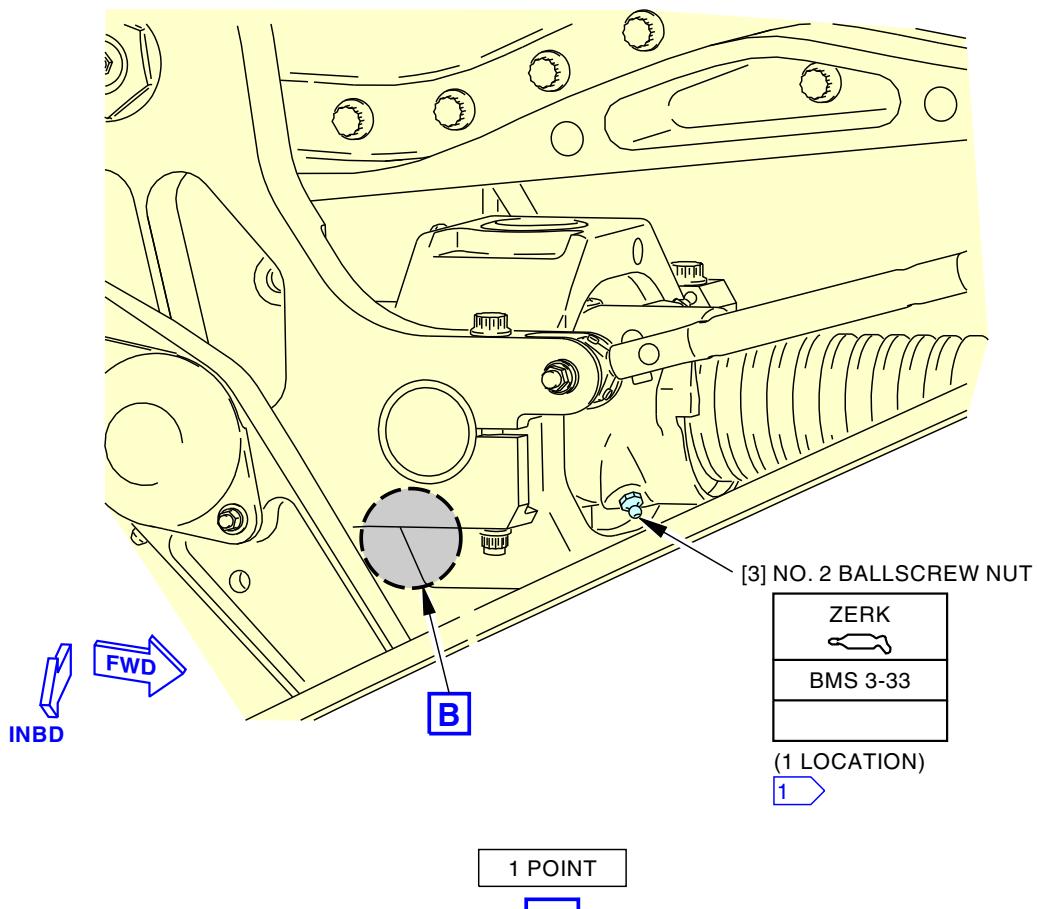
EFFECTIVITY
LOM ALL

12-22-51

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- 1 THE BALLSCREW NUT HAS TWO GREASE FITTINGS. IT IS ONLY NECESSARY TO GREASE ONE OF THEM.

L76809 S0006561509_V2

Outboard Flap Inboard Ballscrew and U-Joint Servicing
Figure 304/12-22-51-990-804 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

12-22-51

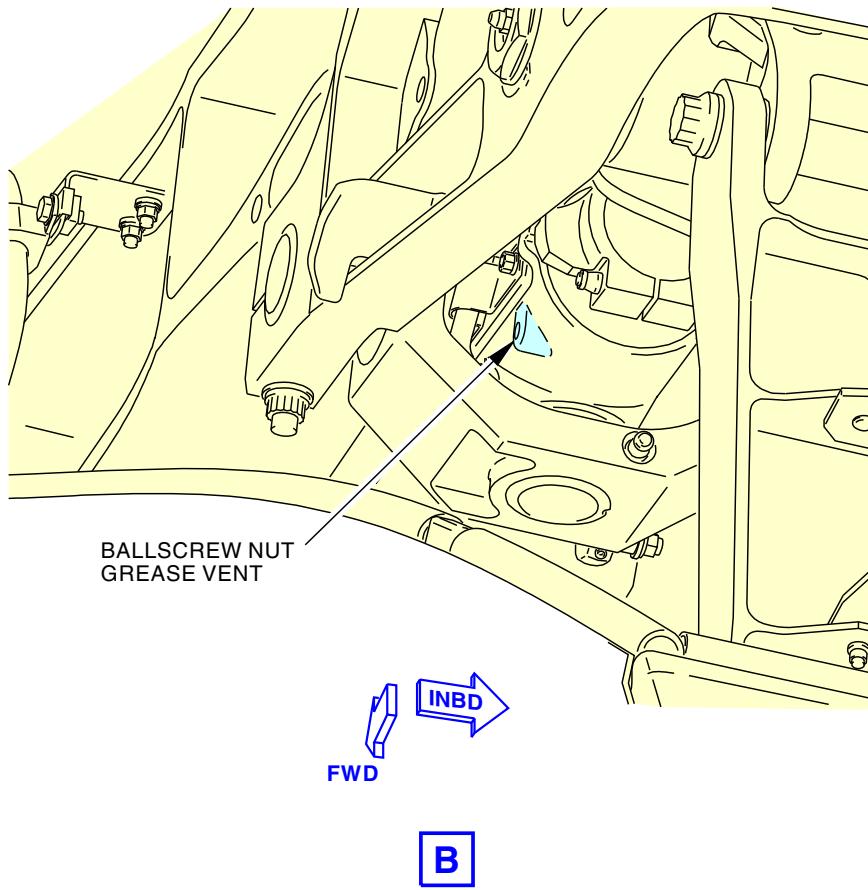
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L76814 S0006561511_V2

Outboard Flap Inboard Ballscrew and U-Joint Servicing
Figure 304/12-22-51-990-804 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

12-22-51

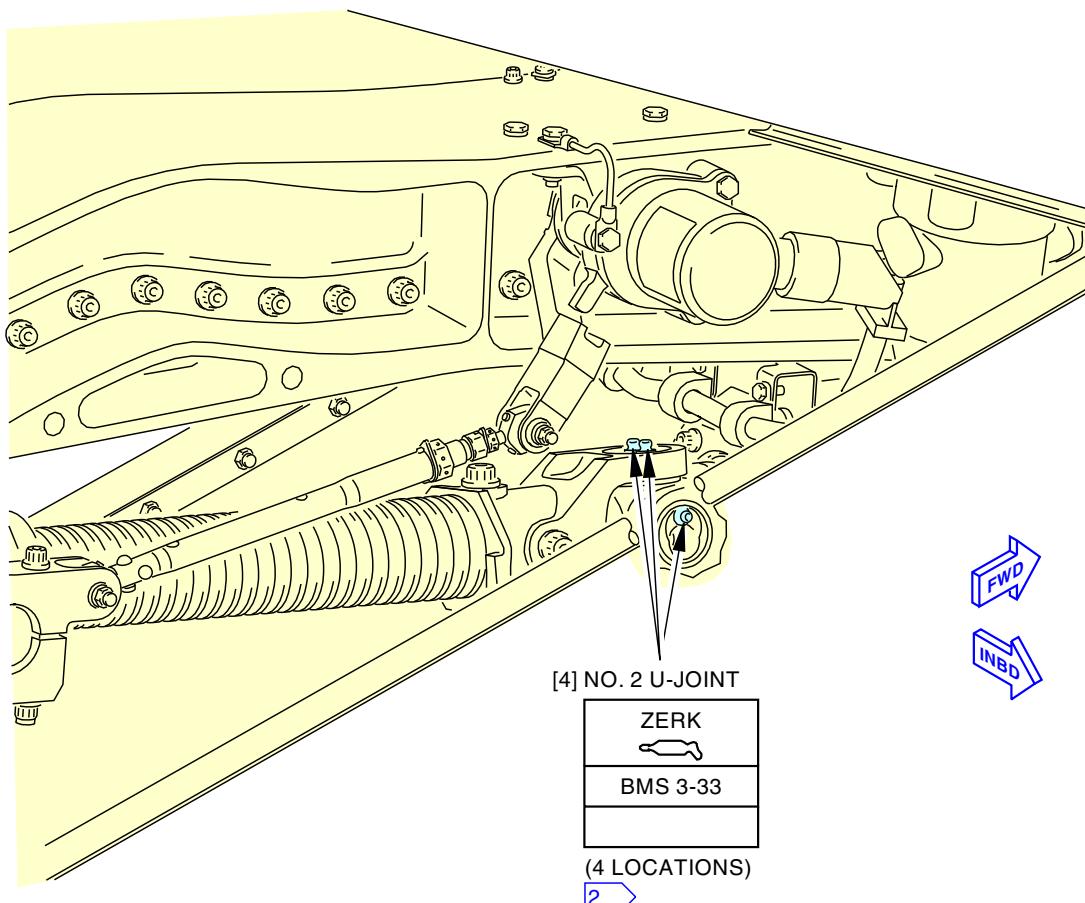
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AIRCRAFT MAINTENANCE MANUAL



2 ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

G29169 S0006561513_V2

Outboard Flap Inboard Ballscrew and U-Joint Servicing
Figure 304/12-22-51-990-804 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-805

6. Outboard Flap Outboard Ballscrew and U-Joint Lubrication

(Figure 305)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
544	Left Wing - Fairing Flap Support No. 1
567	Left Wing - Outboard Flap
644	Right Wing - Fairing Flap Support No. 8
667	Right Wing - Outboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-007

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-005

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Outboard Flap Outboard Ballscrew and U-Joint Lubrication

SUBTASK 12-22-51-640-042

- (1) This table supplies data for the subsequent lubrication steps (Table 305):

Table 305/12-22-51-993-825 Outboard Flap Outboard Ballscrew and U-Joint Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
3	No. 1 Ballscrew Nut (No. 8 Ballscrew Nut is Equivalent)	grease, D00633	Zerk	1
4	No. 1 U-Joint (No. 8 U-Joint is Equivalent)	grease, D00633	Zerk	4

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-640-063



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-011



CAUTION

DO NOT USE A PNEUMATIC GREASE GUN TO SERVICE THE BALLSCREWS, EXCESSIVE GREASE GUN NOZZLE PRESSURE AND FLOW RATE CAN DAMAGE THE SEALS.

- (3) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent. The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-22-51-640-013

- (4) Lubricate the fittings on the U-joint with grease, D00633.

NOTE: There are four lubrication fittings on the U-joint. It is necessary to lubricate all of them.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-005

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-008

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

———— END OF TASK ————

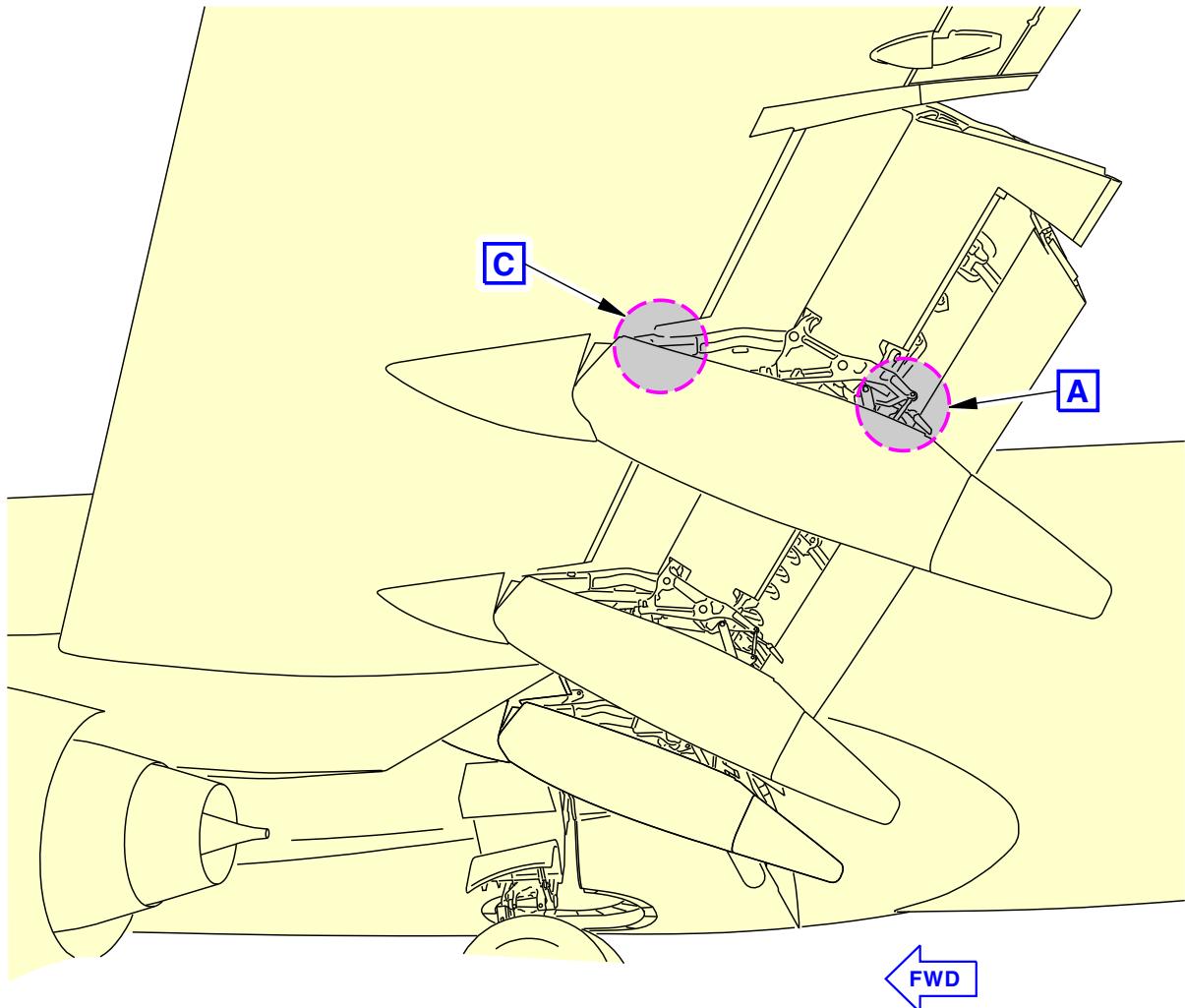
EFFECTIVITY

LOM ALL

12-22-51



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LEFT WING
(RIGHT WING IS OPPOSITE)

G29174 S0006561519_V3

Outboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 305/12-22-51-990-805 (Sheet 1 of 4)

EFFECTIVITY
LOM ALL

12-22-51

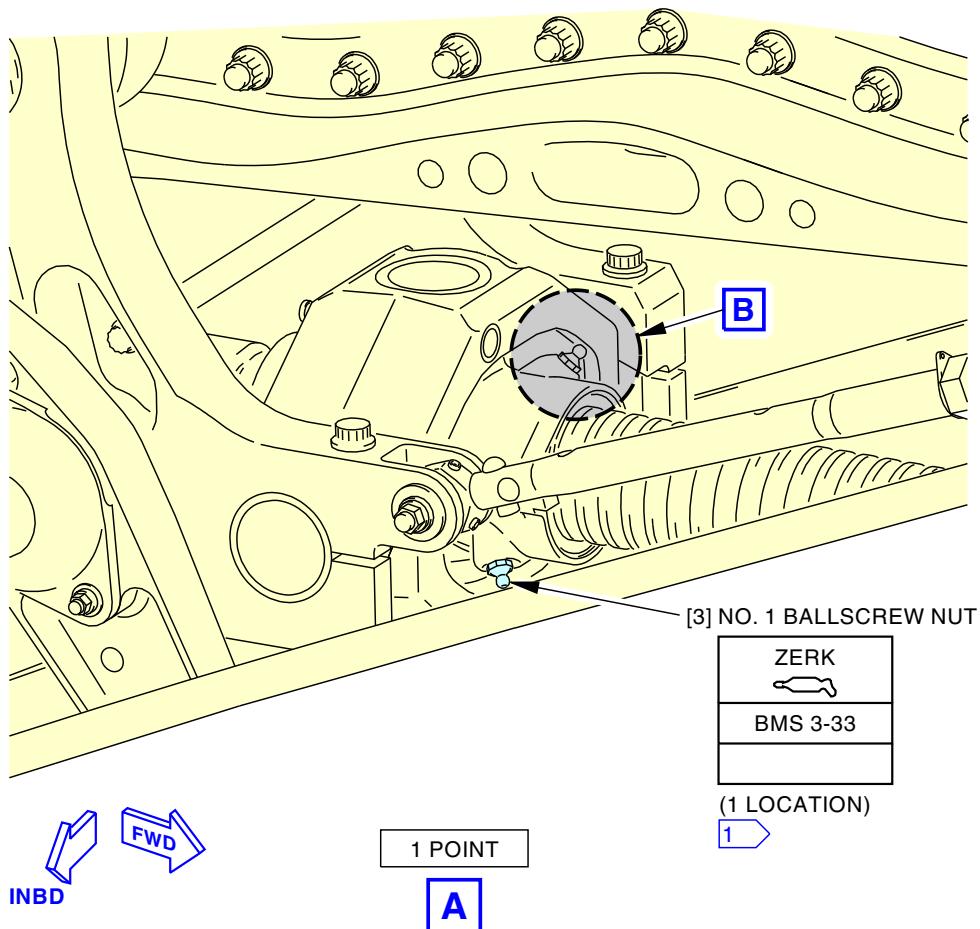
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[1] THE BALLSCREW NUT HAS
TWO GREASE FITTINGS. IT
IS ONLY NECESSARY TO
GREASE ONE OF THEM.

L76820 S0006561521_V2

Outboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 305/12-22-51-990-805 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

12-22-51

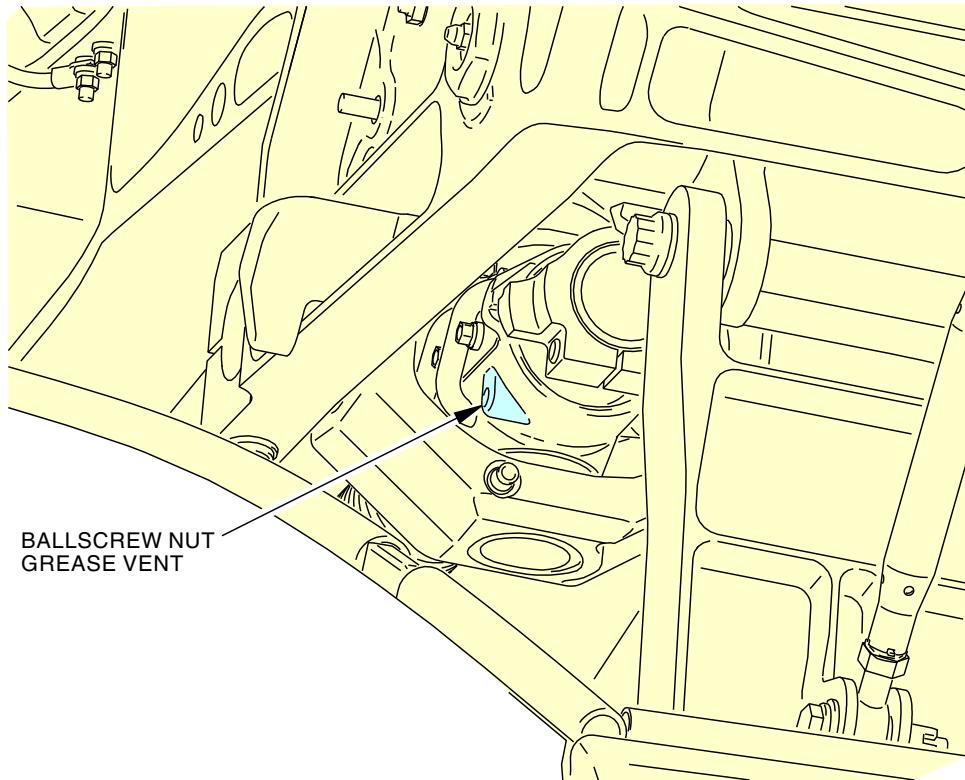
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INBD

FWD

B

L76878 S0006561523_V2

Outboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 305/12-22-51-990-805 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

12-22-51

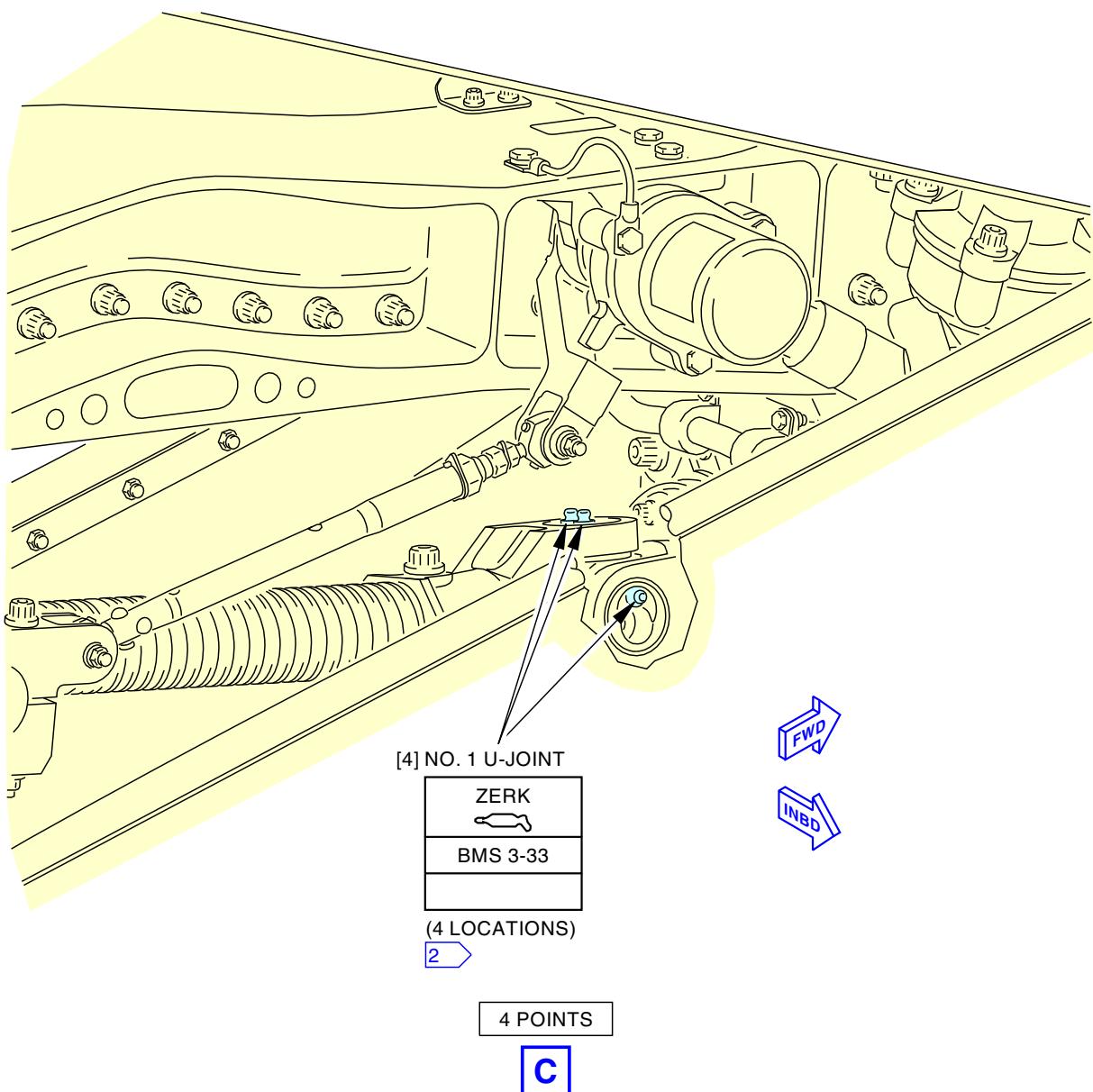
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ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

G29218 S0006561525_V2

Outboard Flap Outboard Ballscrew and U-Joint Servicing
Figure 305/12-22-51-990-805 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

12-22-51

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TASK 12-22-51-640-806

7. U-Joint and Tee Angle Gearbox Lubrication

(Figure 306)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-006

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. U-Joint and Tee Angle Gearbox Lubrication

(Table 306)

SUBTASK 12-22-51-640-043

- (1) This table supplies data for the subsequent lubrication steps:

Table 306/12-22-51-993-826 U-Joint and Tee Angle Gearbox Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Tee Angle Gearbox	grease, D00633	Flush	1
2	U-Joint	grease, D00633	Flush	8

SUBTASK 12-22-51-640-064



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-014

- (3) Lubricate the U-joint with grease, D00633.

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-640-015

- (4) Lubricate the tee angle gearbox with grease, D00633.

NOTE: Put grease in the tee angle gearbox until grease comes out of the vent.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-006

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

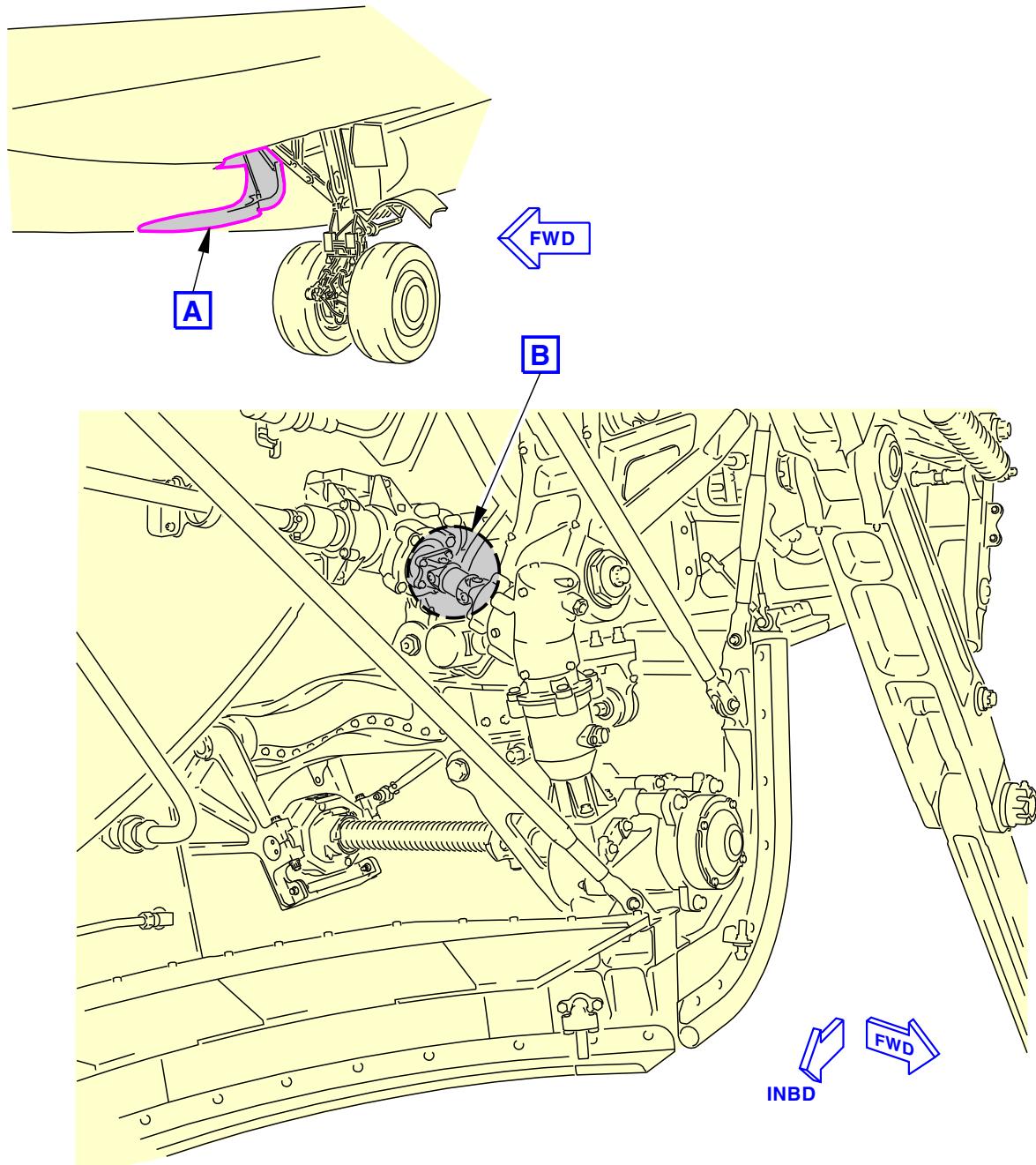
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



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

A

G29222 S0006561531_V2

U-Joint and Tee Angle Gearbox Servicing
Figure 306/12-22-51-990-806 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

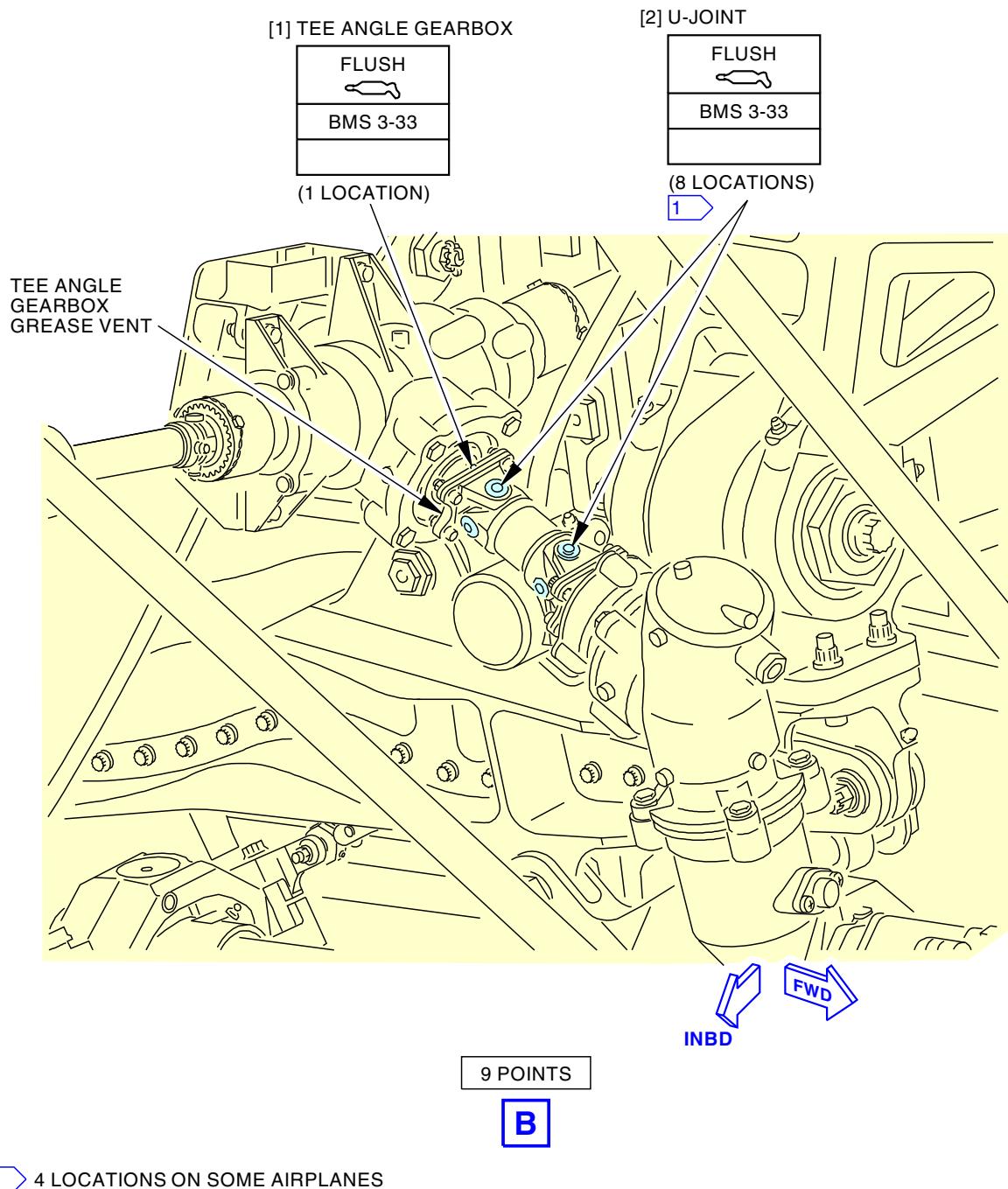
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G29229 S0006561532_V3

U-Joint and Tee Angle Gearbox Servicing
Figure 306/12-22-51-990-806 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-807

8. Inboard Flap Inboard Skew Mechanism Lubrication

(Figure 307)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-007

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Inboard Flap Inboard Skew Mechanism Lubrication

(Table 307)

SUBTASK 12-22-51-640-044

- (1) This table supplies data for the subsequent lubrication steps:

Table 307/12-22-51-993-827 Inboard Flap Inboard Skew Mechanism Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Skew Input Assembly	grease, D00633	Zerk	1
2	Skew Control Rod	grease, D00633	Flush	2

SUBTASK 12-22-51-640-065



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-016

- (3) Lubricate the flap skew input assembly with grease, D00633.

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-640-017

- (4) Lubricate the rod ends on the skew control rod with grease, D00633.

NOTE: The rod ends on the control rod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-007

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

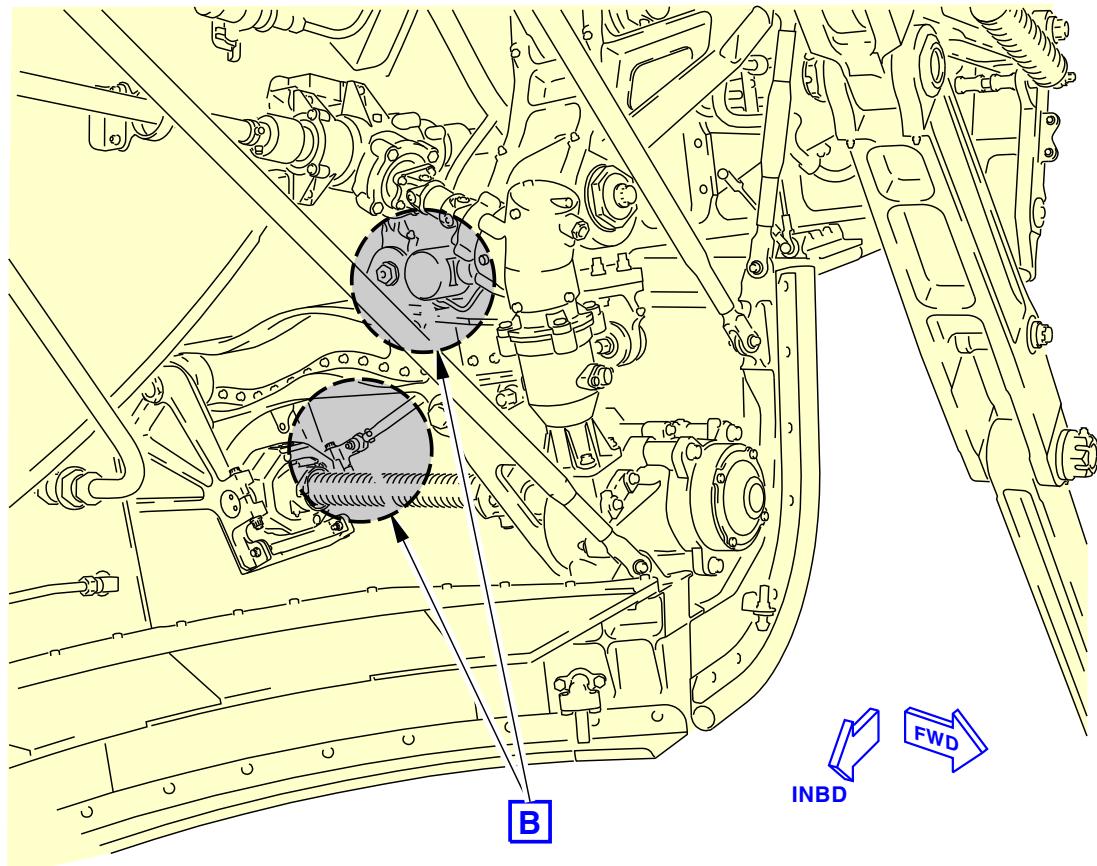
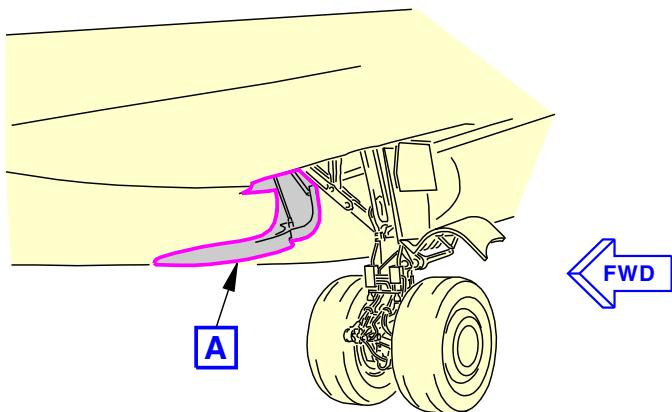
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



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

A

G29241 S0006561535_V2

Inboard Flap Inboard Skew Mechanism Servicing
Figure 307/12-22-51-990-807 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

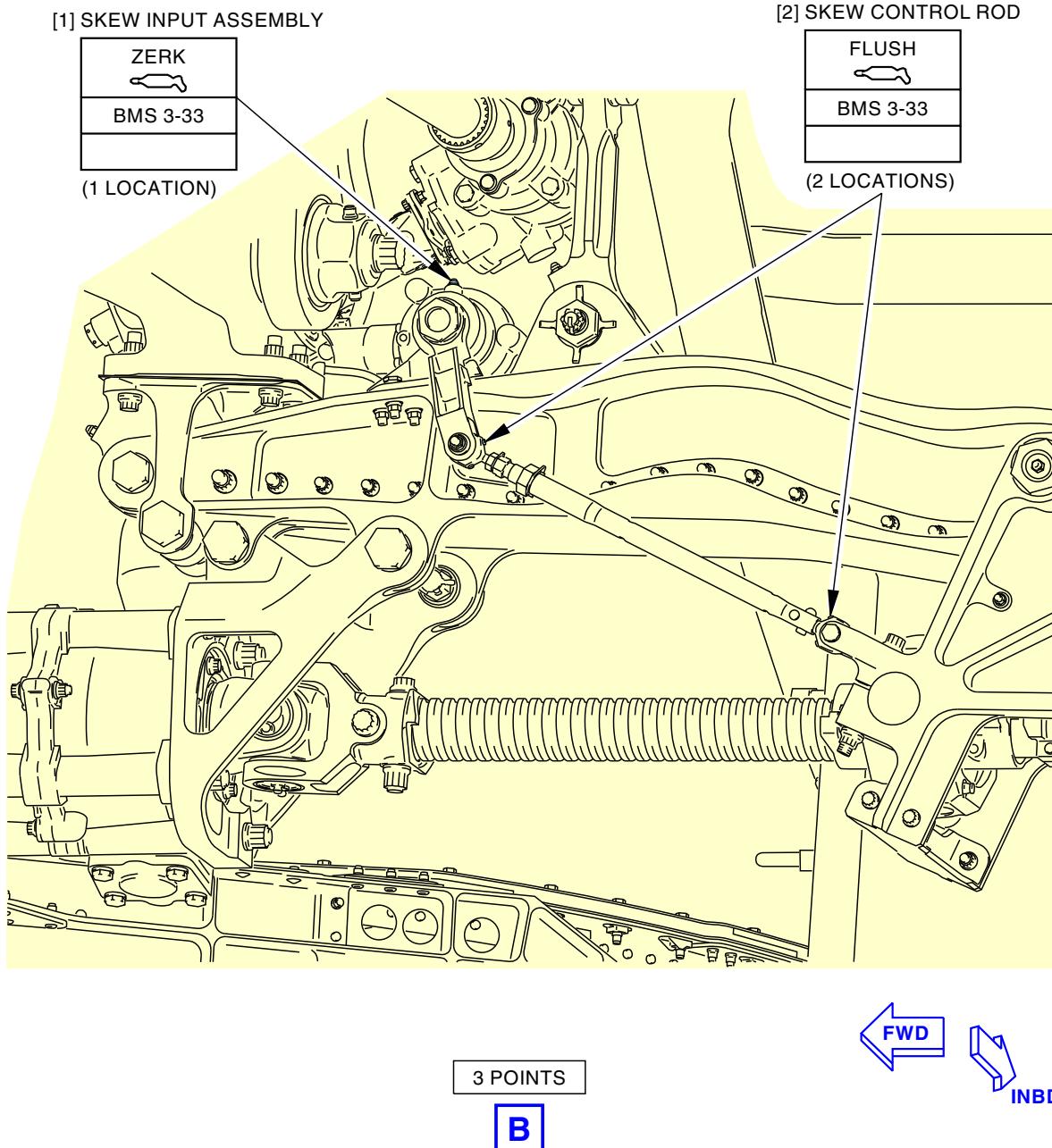
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G29248 S0006561536_V2

Inboard Flap Inboard Skew Mechanism Servicing
Figure 307/12-22-51-990-807 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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TASK 12-22-51-640-808

9. Inboard Flap Outboard Skew Mechanism Lubrication

(Figure 308)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
542	Left Wing - Fairing Flap Support No. 3
553	Left Wing - Inboard Flap
642	Right Wing - Fairing Flap Support No. 6
653	Right Wing - Inboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-009

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-008

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Inboard Flap Outboard Skew Mechanism Lubrication

SUBTASK 12-22-51-640-057

- (1) This table supplies data for the subsequent lubrication steps (Table 308):

Table 308/12-22-51-993-828 Inboard Flap Outboard Skew Mechanism Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Skew Input Assembly	grease, D00633	Zerk	1
2	Skew Control Rod	grease, D00633	Flush	2

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-640-066



WARNING USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-018

- (3) Lubricate the flap skew input assembly with grease, D00633.

SUBTASK 12-22-51-640-019

- (4) Lubricate the rod ends on the skew control rod with grease, D00633.

NOTE: The rod ends on the control rod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-008

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-010

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

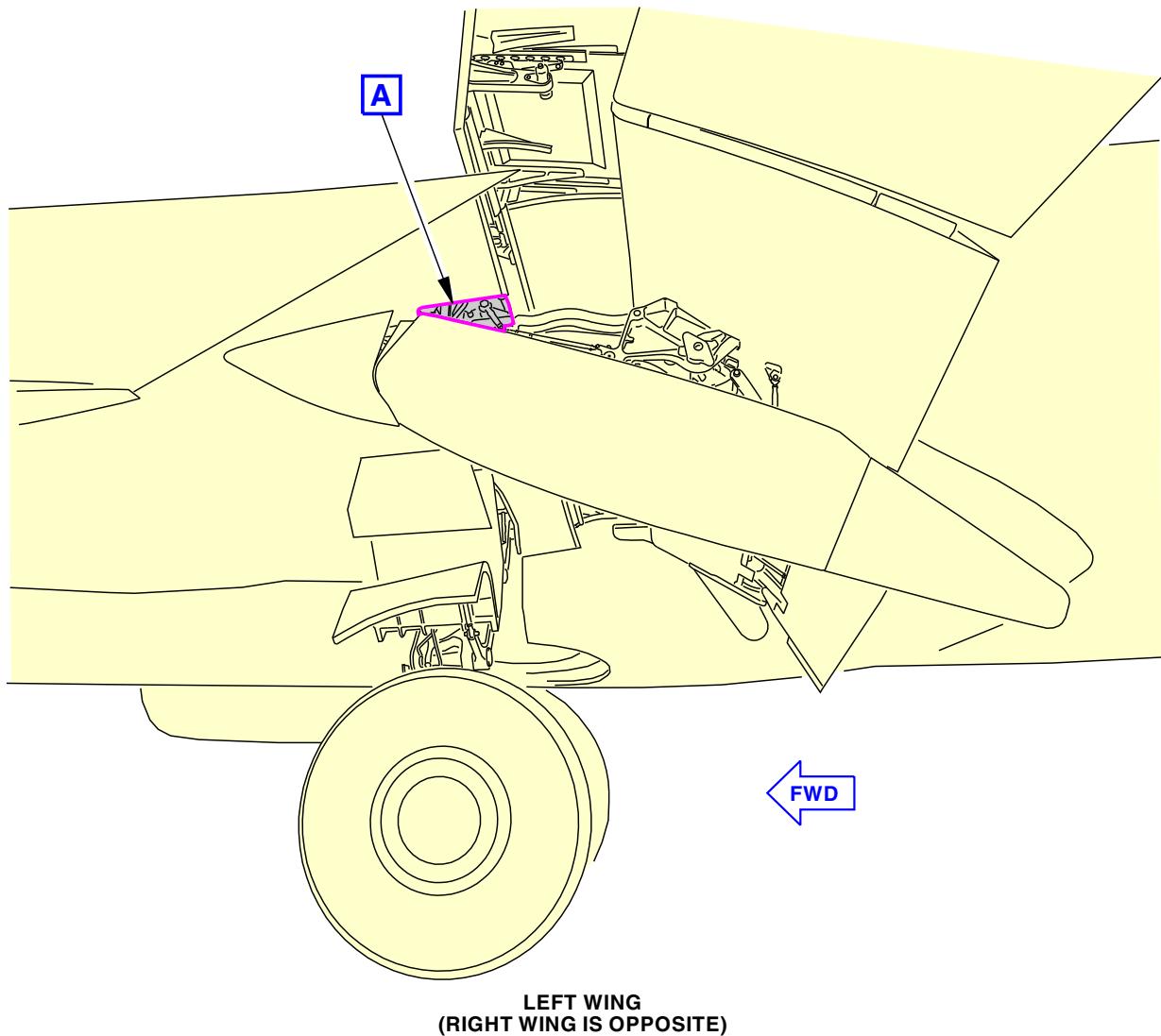
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EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



G29254 S0006561539_V3

Inboard Flap Outboard Skew Mechanism Servicing
Figure 308/12-22-51-990-808 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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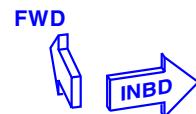
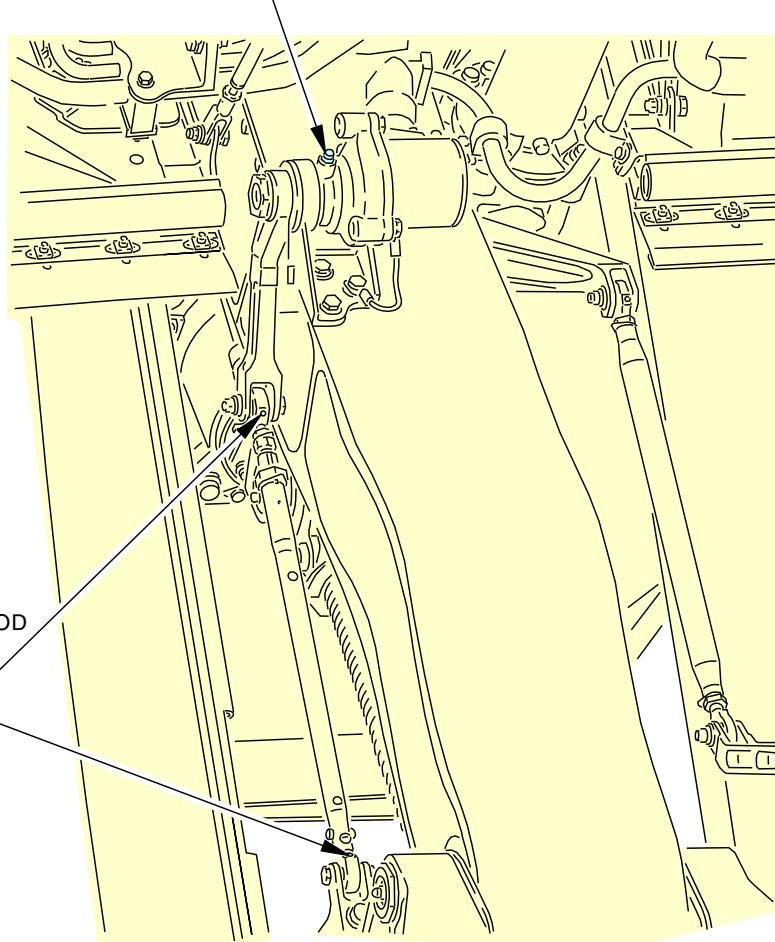


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[1] SKEW INPUT ASSEMBLY

ZERK
BMS 3-33

(1 LOCATION)



3 POINTS

A

G29270 S0006561540_V2

Inboard Flap Outboard Skew Mechanism Servicing
Figure 308/12-22-51-990-808 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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TASK 12-22-51-640-809

10. Outboard Flap Inboard Skew Mechanism Lubrication

(Figure 309)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
543	Left Wing - Fairing Flap Support No. 2
567	Left Wing - Outboard Flap
643	Right Wing - Fairing Flap Support No. 7
667	Right Wing - Outboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-011

- (1) Extend the trailing edge flaps to the 40-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-009

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Outboard Flap Inboard Skew Mechanism Lubrication

(Table 309)

SUBTASK 12-22-51-640-045

- (1) This table supplies data for the subsequent lubrication steps:

Table 309/12-22-51-993-829 Outboard Flap Inboard Skew Mechanism Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Skew Control Rod	grease, D00633	Flush	2
2	Skew Input Assembly	grease, D00633	Zerk	1

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-640-067



WARNING USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-020

- (3) Lubricate the flap skew input assembly with grease, D00633.

SUBTASK 12-22-51-640-021

- (4) Lubricate the rod ends on the skew control rod with grease, D00633.

NOTE: The rod ends on the control rod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-009

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-012

- (2) Retract the trailing edge flaps to the UP position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

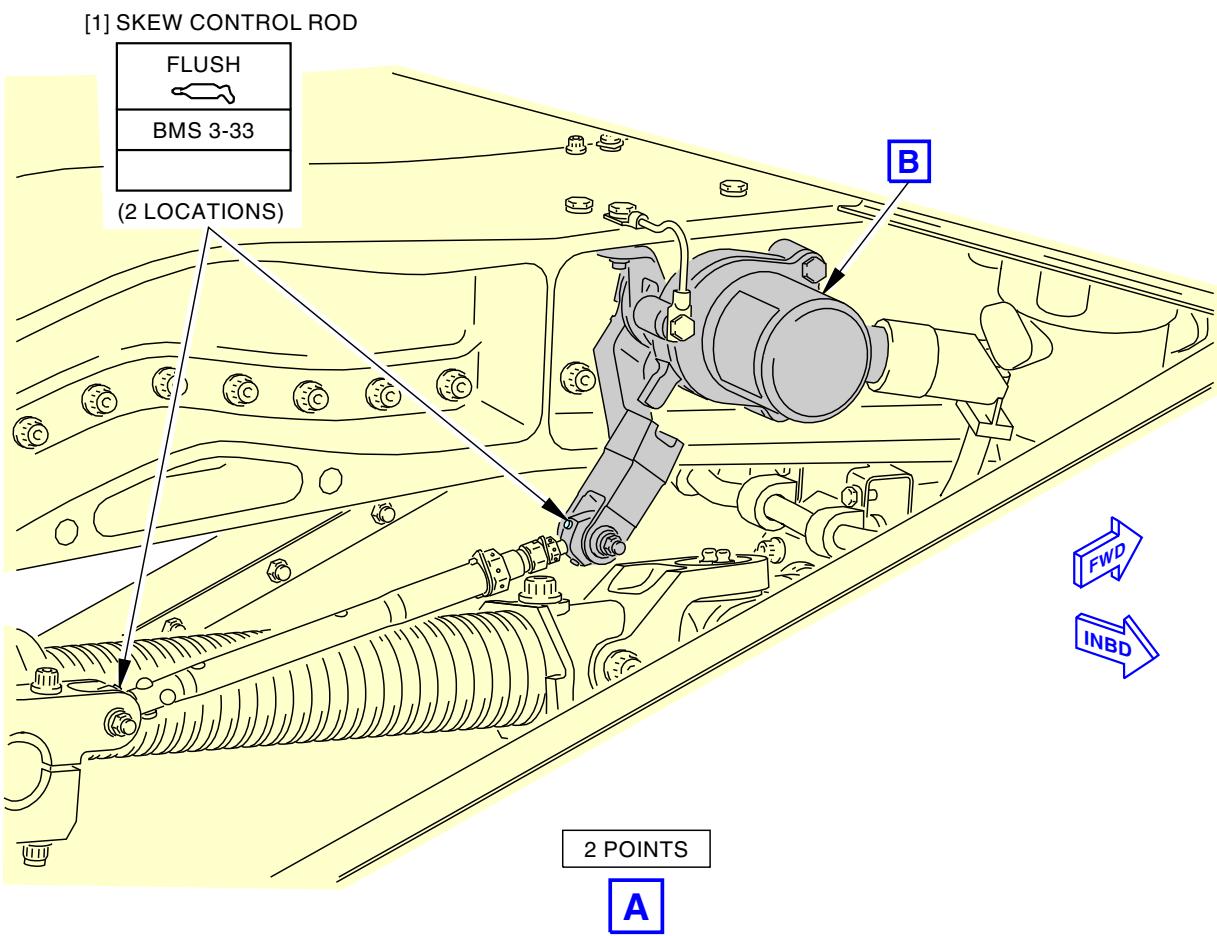
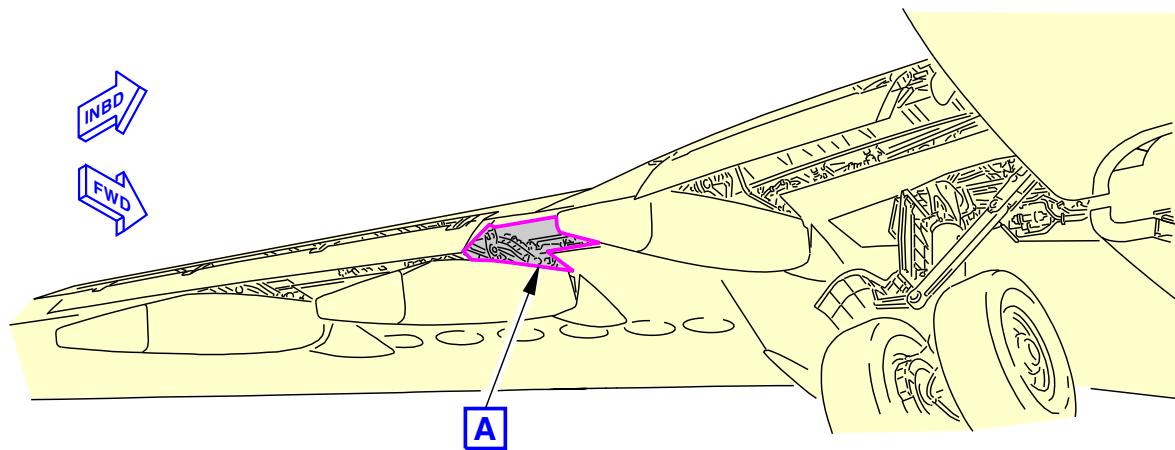
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EFFECTIVITY
LOM ALL

12-22-51



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G29277 S0006561543_V2

Outboard Flap Inboard Skew Mechanism Servicing
Figure 309/12-22-51-990-809 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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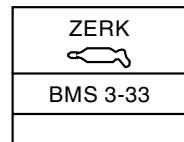
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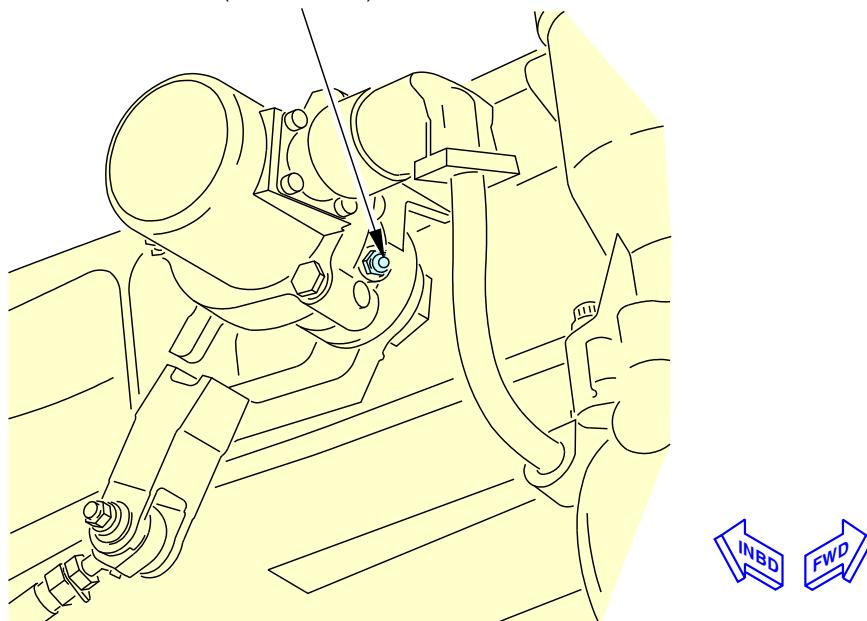


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[2] SKEW INPUT ASSEMBLY



(1 LOCATION)



1 POINT

B

G29280 S0006561544_V2

Outboard Flap Inboard Skew Mechanism Servicing
Figure 309/12-22-51-990-809 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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TASK 12-22-51-640-810

11. Outboard Flap Outboard Skew Mechanism Lubrication

(Figure 310)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
544	Left Wing - Fairing Flap Support No. 1
567	Left Wing - Outboard Flap
644	Right Wing - Fairing Flap Support No. 8
667	Right Wing - Outboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-013

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-010

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Outboard Flap Outboard Skew Mechanism Lubrication

SUBTASK 12-22-51-640-058

- (1) This table supplies data for the subsequent lubrication steps (Table 310):

Table 310/12-22-51-993-830 Outboard Flap Outboard Skew Mechanism Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Skew Control Rod	grease, D00633	Flush	2
2	Skew Input Assembly	grease, D00633	Zerk	1

EFFECTIVITY
LOM ALL

12-22-51



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SUBTASK 12-22-51-840-002



WARNING USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-022

- (3) Lubricate the flap skew input assembly with grease, D00633.

SUBTASK 12-22-51-640-023

- (4) Lubricate the rod ends on the skew control rod with grease, D00633.

NOTE: The rod ends on the control rod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-010

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-014

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

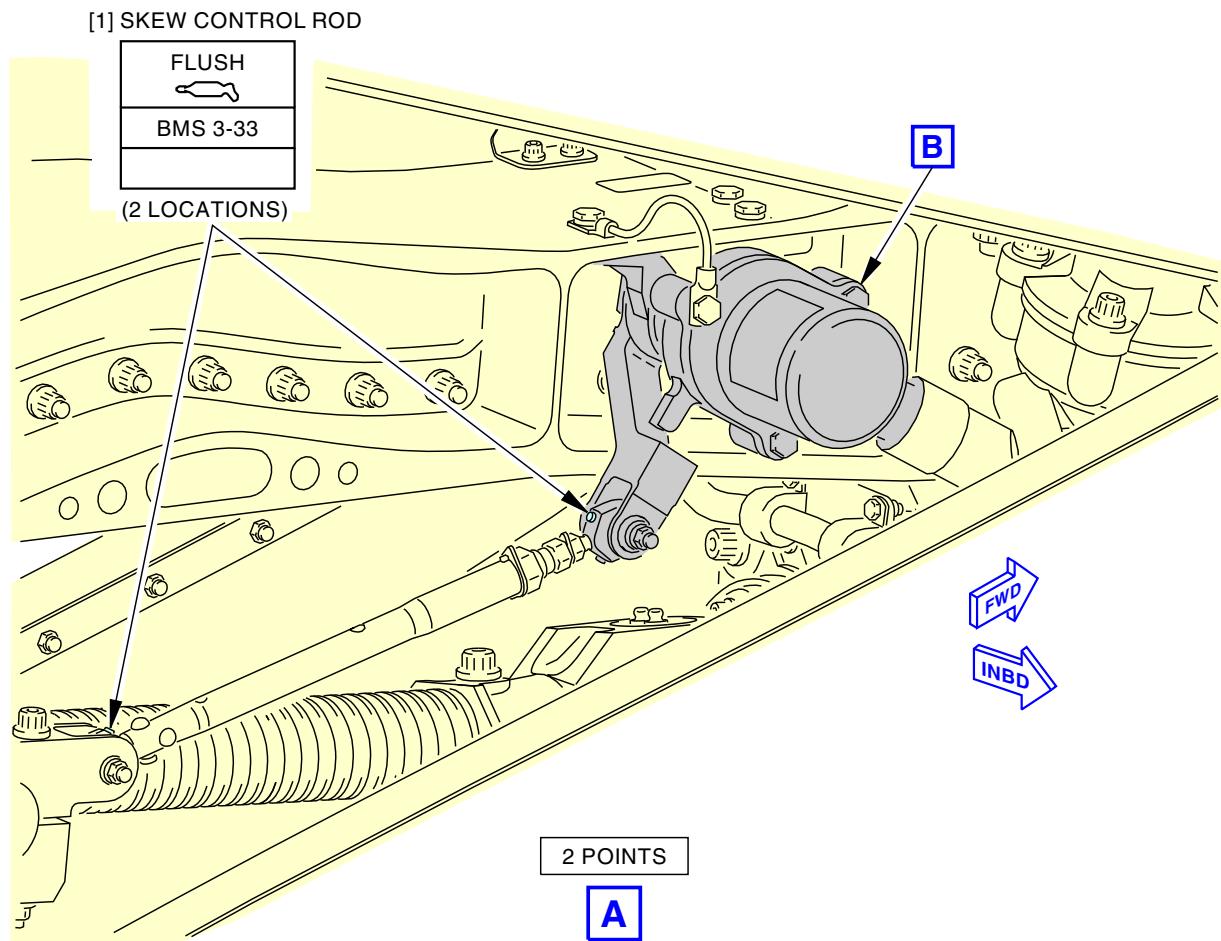
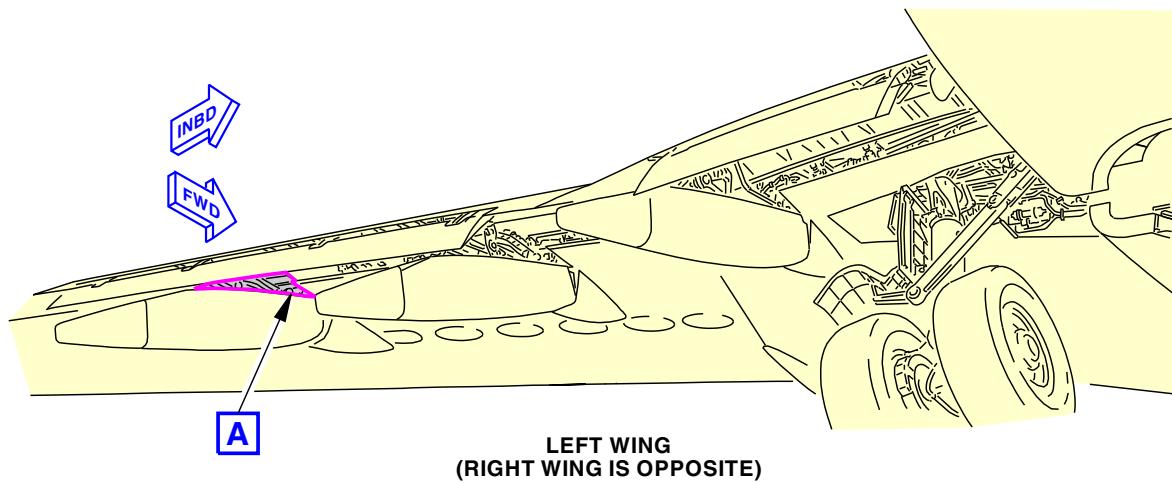
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



G29297 S0006561547_V3

Outboard Flap Outboard Skew Mechanism Servicing
Figure 310/12-22-51-990-810 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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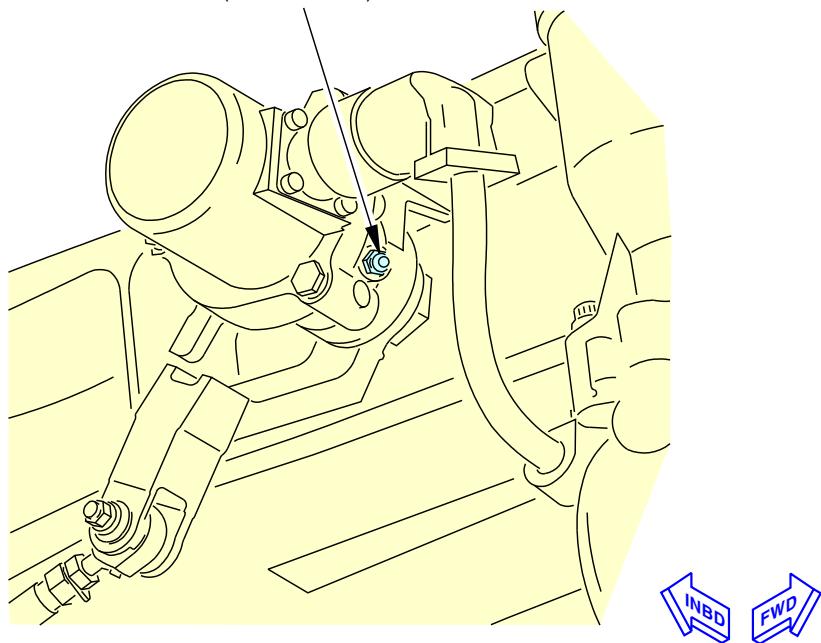


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AIRCRAFT MAINTENANCE MANUAL

[2] SKEW INPUT ASSEMBLY

ZERK
BMS 3-33

(1 LOCATION)



1 POINT

B

G29298 S0006561548_V2

Outboard Flap Outboard Skew Mechanism Servicing
Figure 310/12-22-51-990-810 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-640-811

12. Inboard Main Flap and Aft Flap Roller and Linkage Lubrication

(Figure 311 and Figure 312)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
53-51-21-000-801	Aft Wing-To-Body Fairing Panel Removal (P/B 401)
53-51-21-400-801	Aft Wing-To-Body Fairing Panel Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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
541	Left Wing - Fairing Flap Support No. 4
542	Left Wing - Fairing Flap Support No. 3
553	Left Wing - Inboard Flap
641	Right Wing - Fairing Flap Support No. 5
642	Right Wing - Fairing Flap Support No. 6
653	Right Wing - Inboard Flap

E. Access Panels

Number	Name/Location
194BL	Flap Track Lubrication Panel - Aft
194BR	Flap Track Lubrication Panel - Aft

F. Prepare for the Lubrication

SUBTASK 12-22-51-860-015

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-011

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-51-010-007

- (3) Remove these access panels on the wing to body fairing (TASK 53-51-21-000-801):

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LOM ALL

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- (a) On the left wing, open this access panel:

<u>Number</u>	<u>Name/Location</u>
194BL	Flap Track Lubrication Panel - Aft

- (b) On the right wing, open this access panel:

<u>Number</u>	<u>Name/Location</u>
194BR	Flap Track Lubrication Panel - Aft

G. Inboard Main Flap and Aft Flap Roller and Linkage Lubrication

SUBTASK 12-22-51-640-046

- (1) This table supplies data for the subsequent lubrication steps (Table 311):

Table 311/12-22-51-993-831 Inboard Main Flap and Aft Flap Roller and Linkage Servicing (Fig. 311)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Inboard Carriage Roller	grease, D00633	Zerk	4
2	Inboard Programming Roller	grease, D00633	Flush	1
3	Aft Flap Track Roller	grease, D00633	Zerk	8
4	*[1]Aft Flap Track Attach Fitting	grease, D00633	Zerk	2
5	Outboard Programming Roller	grease, D00633	Flush	1
6	Outboard Carriage Roller	grease, D00633	Zerk	4
7	Aft Flap Drive Rod	grease, D00633	Flush	2

*[1] Lube point not on all attach fittings. Some attach fittings have greaseless bearings with no lubrication needed.

SUBTASK 12-22-51-640-068



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-024

- (3) Lubricate the rollers on the inboard main flap carriage with grease, D00633.

- (a) Remove excess grease, D00633, from the flap carriages and linkages.
- (b) Make sure that there is no grease, D00633, on the flap track flange surfaces.

SUBTASK 12-22-51-640-025

- (4) Lubricate the rollers on the outboard main flap carriage with grease, D00633.

- (a) Remove excess grease, D00633, from the flap carriages and linkages.
- (b) Make sure that there is no grease, D00633, on the flap track flange surfaces.

SUBTASK 12-22-51-640-026

- (5) Lubricate the rollers on the aft flap tracks and aft flap track attach fittings with grease, D00633.

NOTE: Some aft flap track attach fittings have greaseless bearings.

If no lube point are found on any aft flap track attach fittings, no lubrication is necessary at that fitting since the fittings have greaseless bearings.

- (a) Make sure that there is no grease, D00633, on the flap track flange surfaces.

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-51-640-027

- (6) Lubricate the inboard and outboard programming rollers with grease, D00633.
 - (a) Make sure that there is no grease, D00633, on the programming track flange surfaces.

SUBTASK 12-22-51-640-028

- (7) Lubricate the rod ends on the aft flap drive rod with grease, D00633.

NOTE: The rod ends on the drive rod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-410-007

- (1) Install these access panels on the wing to body fairing (TASK 53-51-21-400-801):
 - (a) On the left wing, close this access panel:

Number Name/Location

194BL Flap Track Lubrication Panel - Aft

- (b) On the right wing, close this access panel:

Number Name/Location

194BR Flap Track Lubrication Panel - Aft

SUBTASK 12-22-51-440-011

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-016

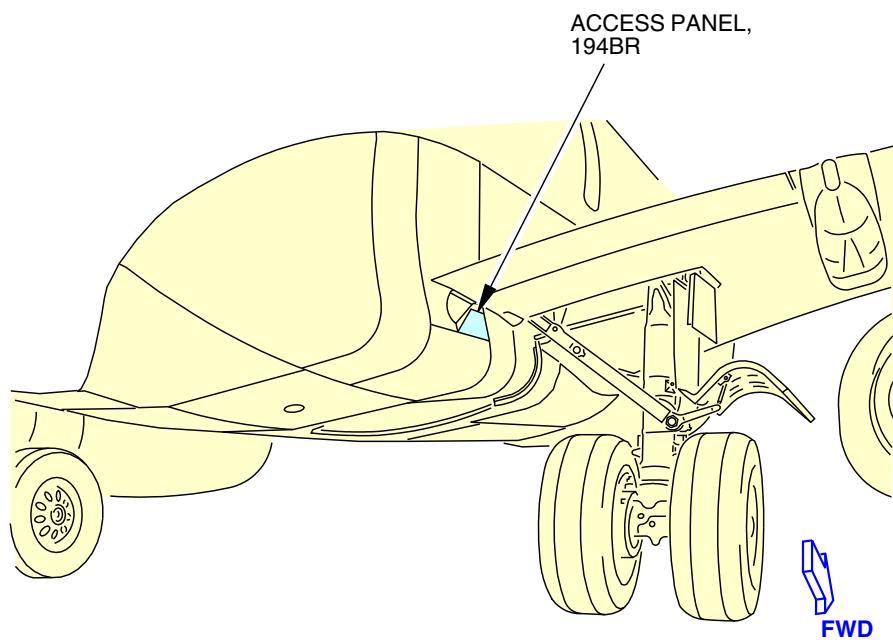
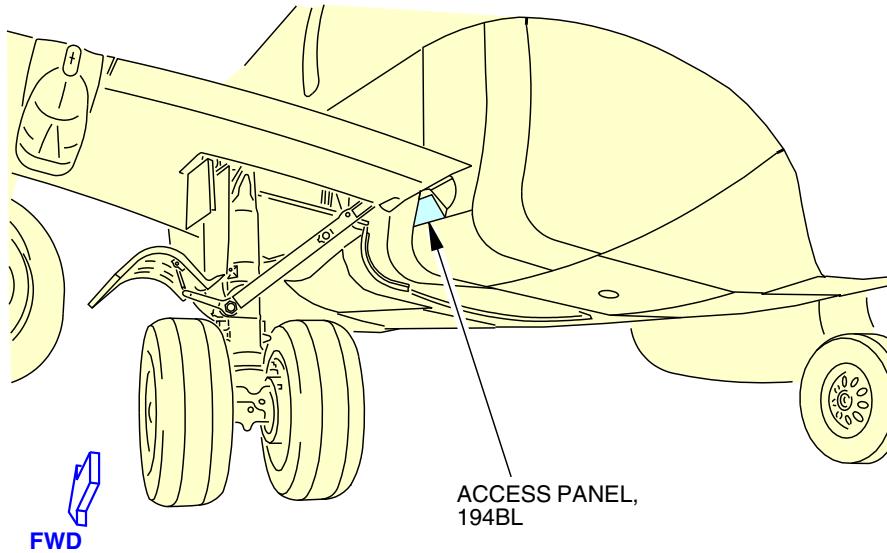
- (3) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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BOEING
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2361591 S0000539496_V3

Inboard Main Flap and Aft Flap Roller and Linkage Access
Figure 311/12-22-51-990-842

EFFECTIVITY
LOM ALL

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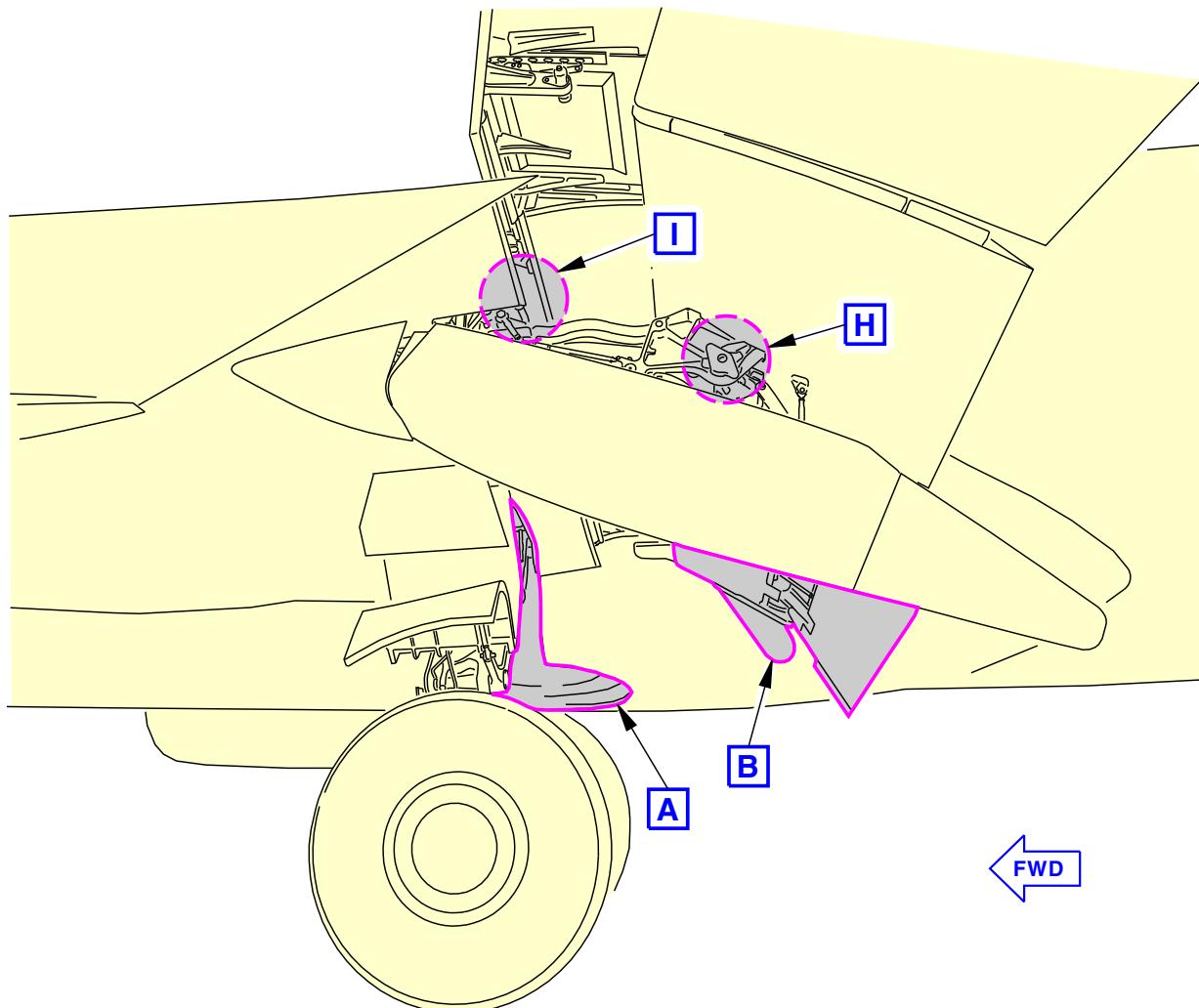
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LEFT WING
(RIGHT WING IS OPPOSITE)

G29304 S0006561551_V3

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 1 of 7)

EFFECTIVITY
LOM ALL

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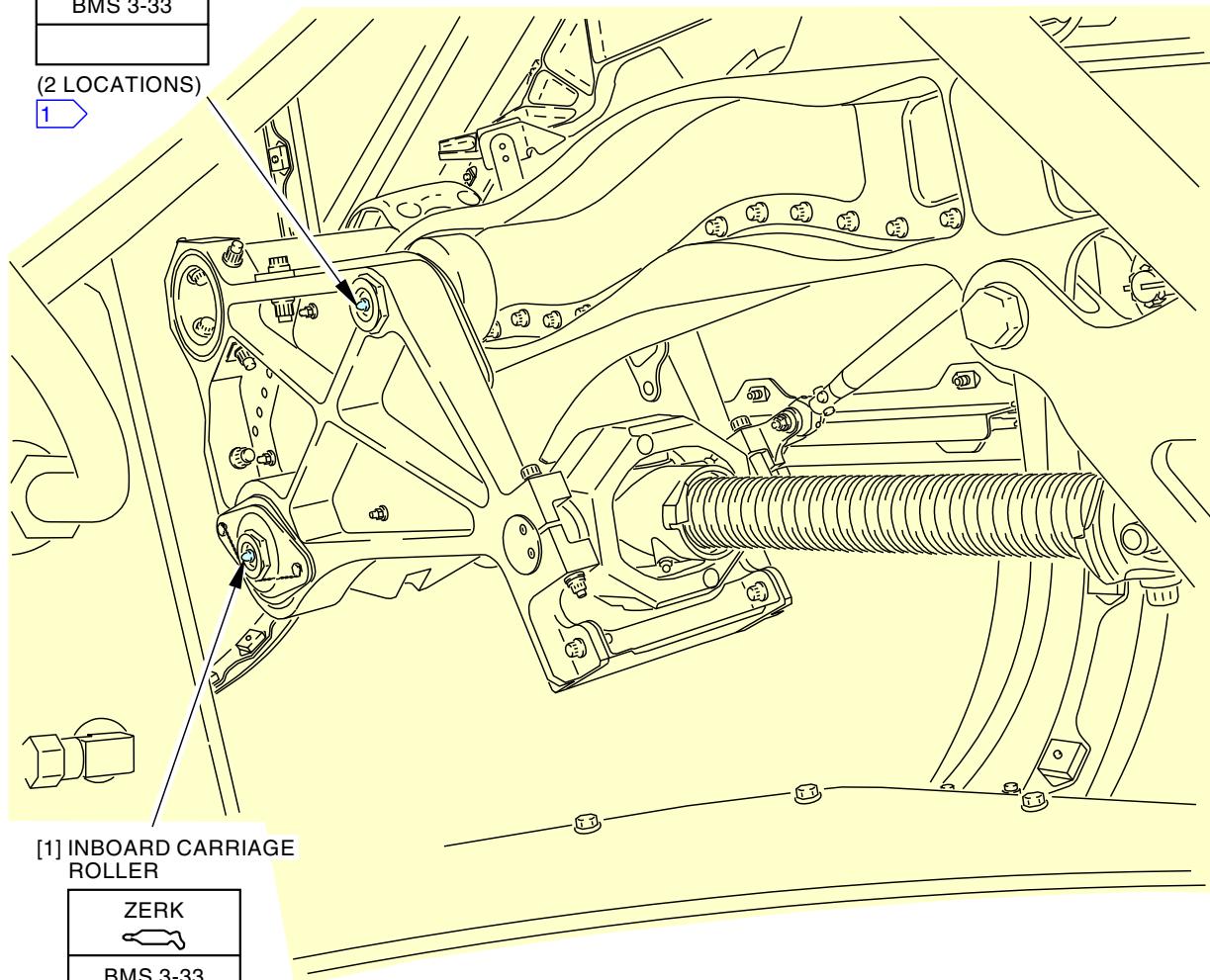
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[1] INBOARD CARRIAGE ROLLER

ZERK
BMS 3-33

(2 LOCATIONS)

1



[1] INBOARD CARRIAGE ROLLER

ZERK
BMS 3-33

(2 LOCATIONS)

1



4 POINTS

A

1 ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

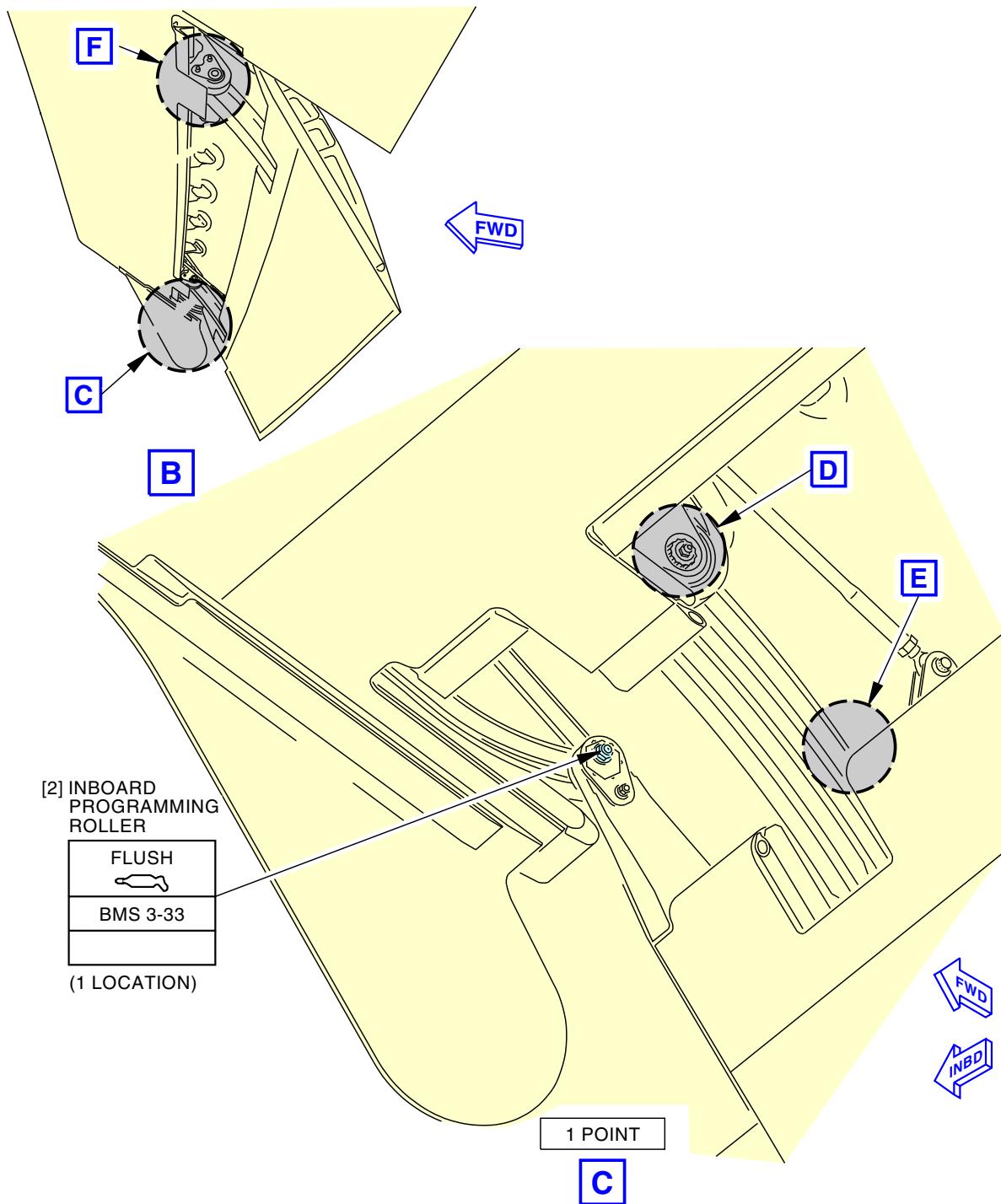
G29305 S0006561552_V2

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 2 of 7)

EFFECTIVITY
LOM ALL

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G29306 S0006561553_V2

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 3 of 7)

EFFECTIVITY
LOM ALL

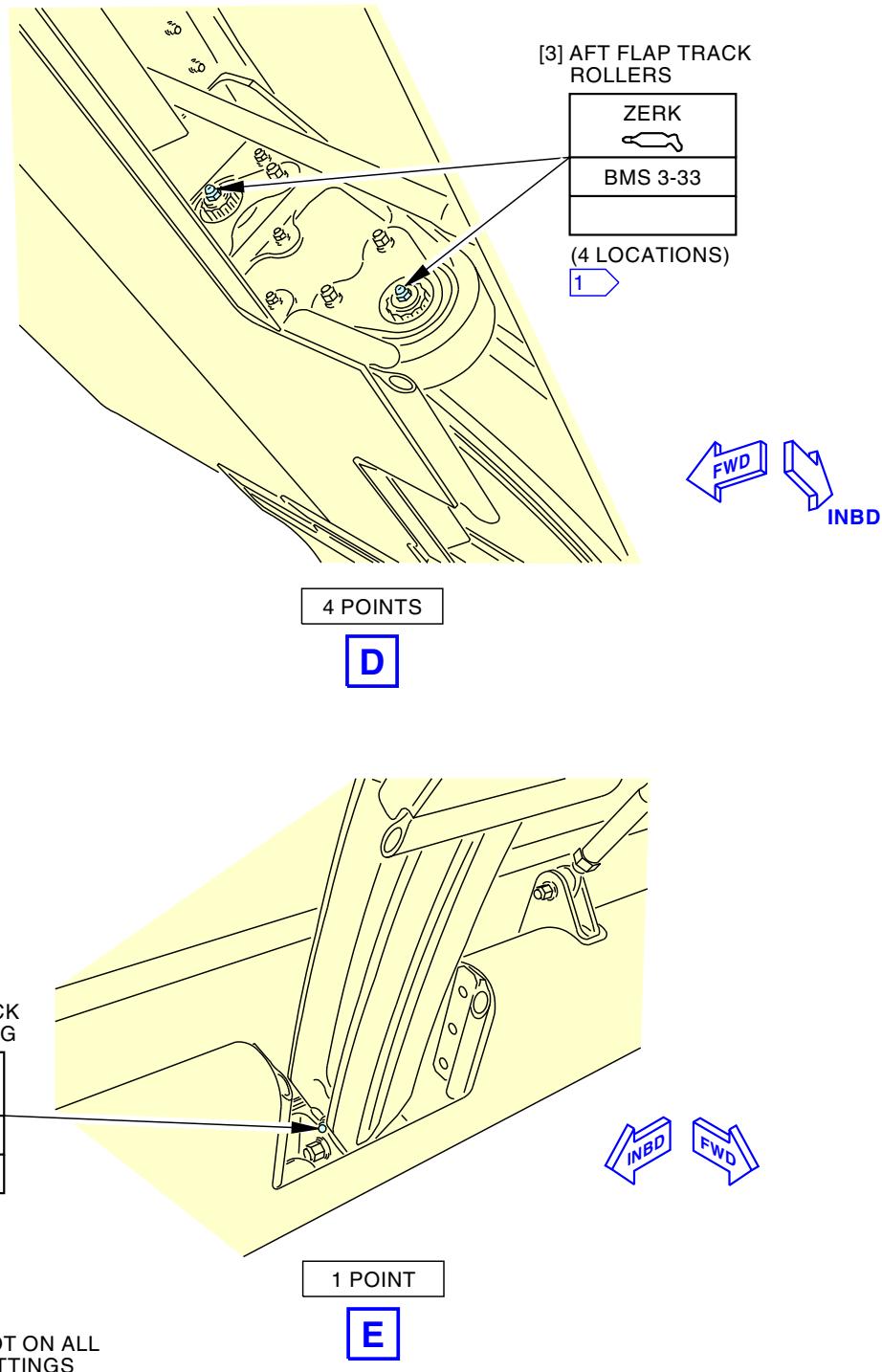
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G29421 S0006561554_V3

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 4 of 7)

EFFECTIVITY
LOM ALL

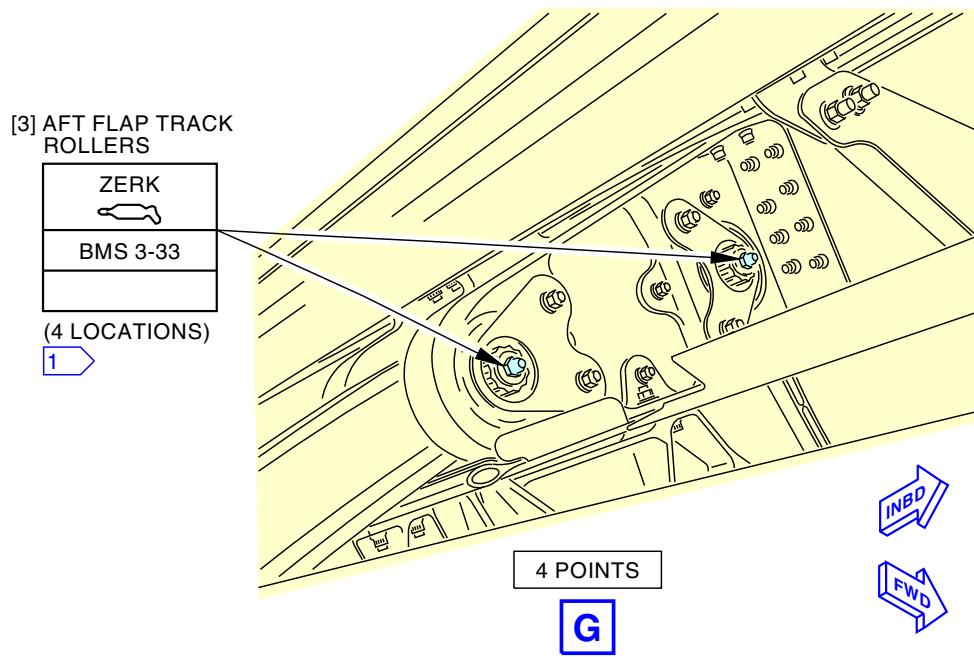
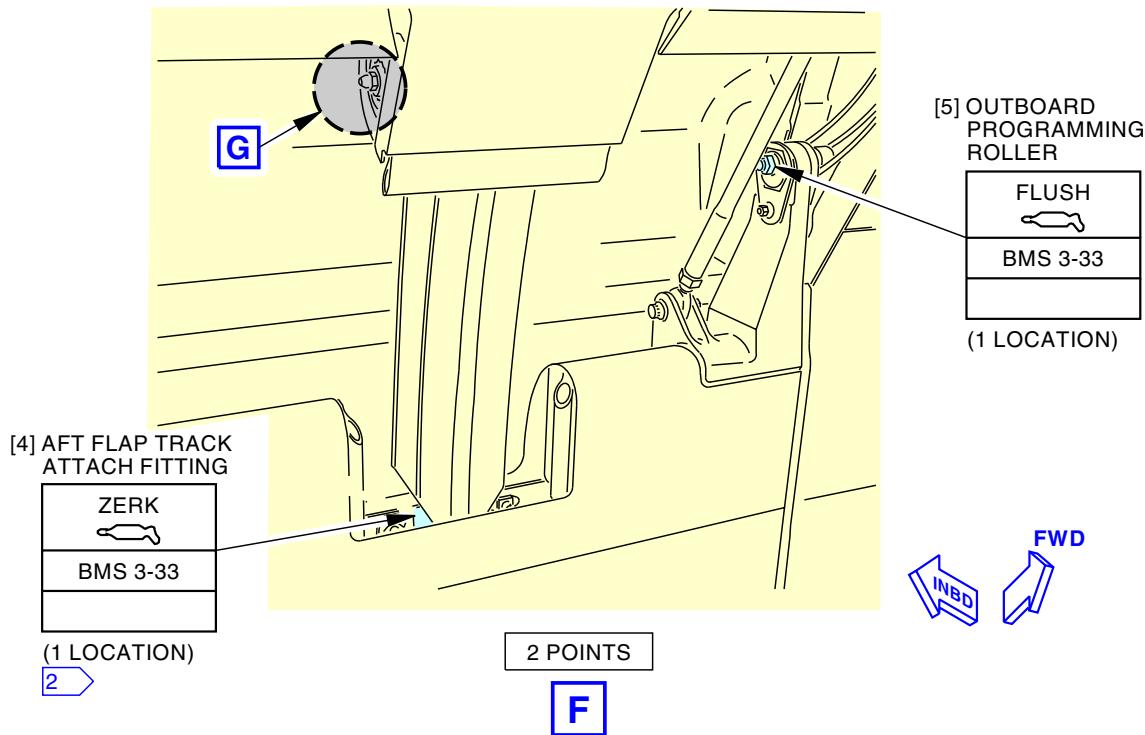
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G29431 S0006561555_V3

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 5 of 7)

EFFECTIVITY
LOM ALL

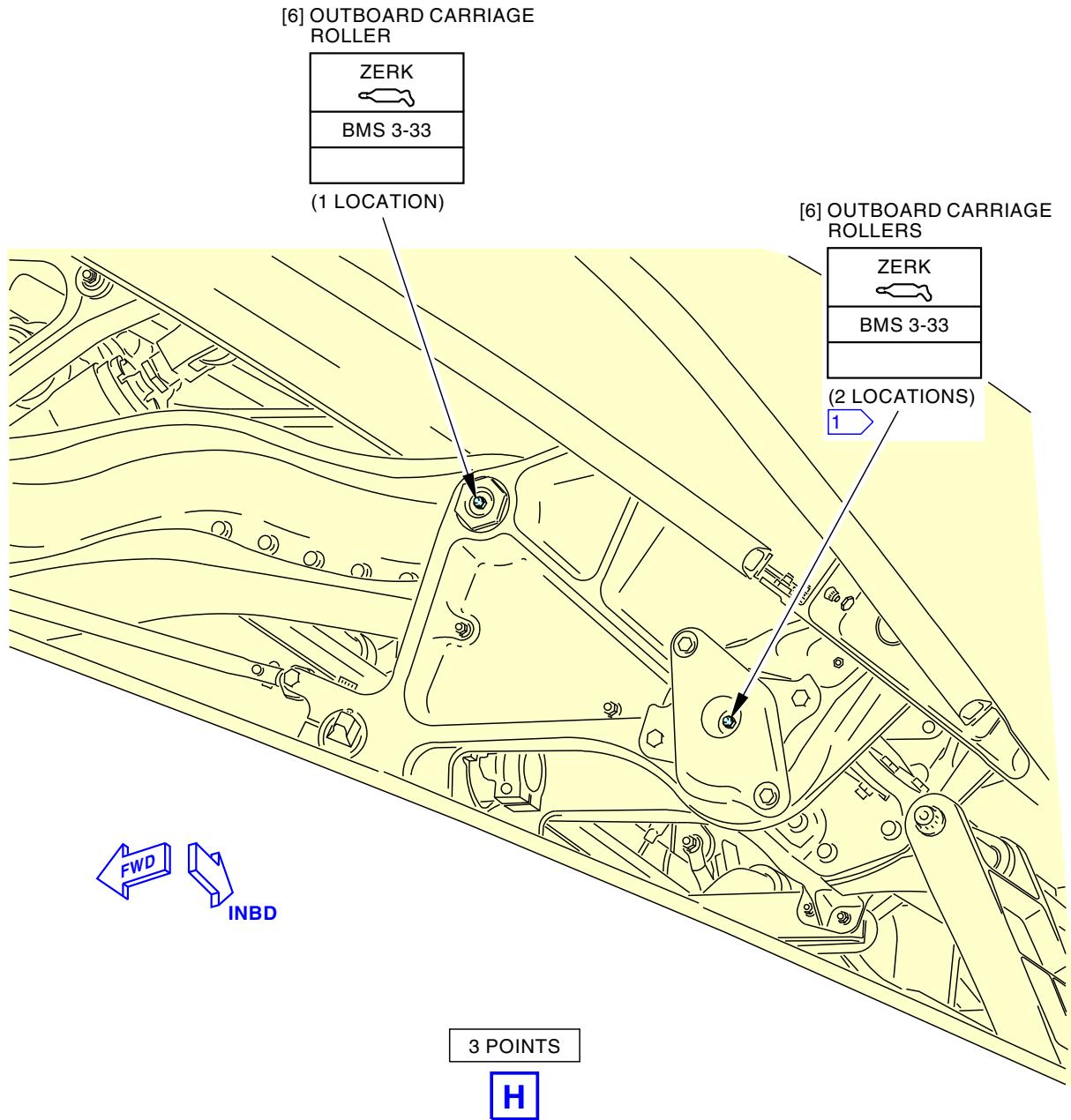
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G29440 S0006561556_V2

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 6 of 7)

EFFECTIVITY
LOM ALL

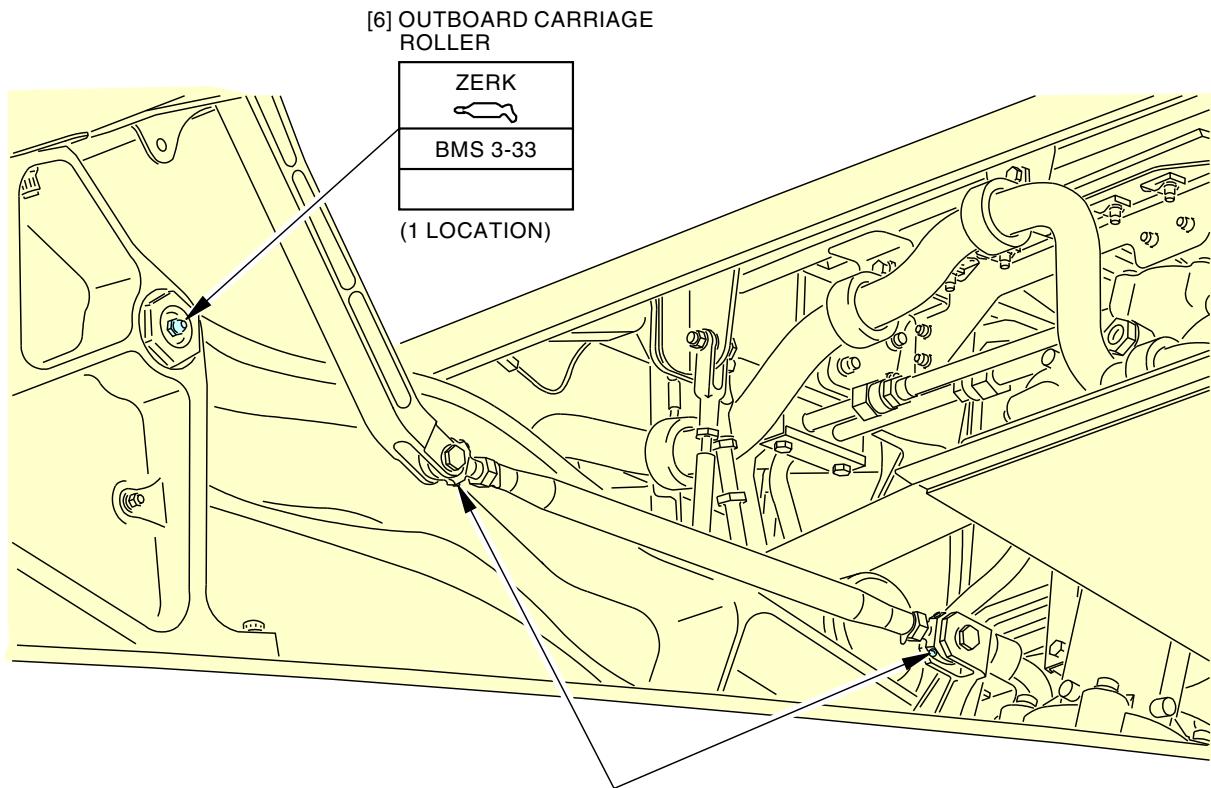
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[7] AFT FLAP
DRIVE ROD



(2 LOCATIONS)

3 POINTS



G29456 S0006561557_V2

Inboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 312/12-22-51-990-811 (Sheet 7 of 7)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-640-812

13. Outboard Main Flap and Aft Flap Roller and Linkage Lubrication

(Figure 313)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-51-24-000-802	Outboard Aft Flap Actuating Mechanism - Removal (P/B 401)
27-51-24-400-802	Outboard Aft Flap Actuating Mechanism - Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
543	Left Wing - Fairing Flap Support No. 2
544	Left Wing - Fairing Flap Support No. 1
567	Left Wing - Outboard Flap
643	Right Wing - Fairing Flap Support No. 7
644	Right Wing - Fairing Flap Support No. 8
667	Right Wing - Outboard Flap

E. Prepare for the Lubrication

SUBTASK 12-22-51-860-017

- (1) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-51-040-012

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Outboard Main Flap and Aft Flap Roller and Linkage Lubrication

SUBTASK 12-22-51-640-047

- (1) This table supplies data for the subsequent lubrication steps (Table 312):

Table 312/12-22-51-993-832 Outboard Main Flap and Aft Flap Roller and Linkage Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Aft Flap Drive Rod	grease, D00633	Flush	4
2	Aft Flap Pushrod	grease, D00633	Flush	4

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LOM ALL

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Table 312/12-22-51-993-832 Outboard Main Flap and Aft Flap Roller and Linkage Servicing (Continued)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
3	Inboard Carriage Roller	grease, D00633	Zerk	4
4	Bellcrank	grease, D00633	Zerk	2
5	Inboard Carriage Forward Attach Fitting	grease, D00633	Zerk	1
6	Inboard Carriage Attach Link	grease, D00633	Zerk	2
7	Outboard Carriage Roller	grease, D00633	Zerk	4
8	Outboard Carriage Forward Attach Fitting	grease, D00633	Zerk	1
9	Outboard Carriage Attach Link	grease, D00633	Zerk	2
10	Inboard Programming Roller	grease, D00633	Flush	1
11	Aft Flap Track Attach Fitting	grease, D00633	Flush	4
12	Aft Flap Track Roller	grease, D00633	Flush	16
13	Outboard Programming Roller	grease, D00633	Flush	1

SUBTASK 12-22-51-640-069



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-029

- (3) Lubricate the inboard main flap carriage.

- (a) Lubricate the main flap carriage rollers with grease, D00633.
 - 1) Remove excess grease, D00633, from the flap carriages and linkages.
 - 2) Make sure that there is no grease, D00633, on the flap track flange surfaces.
- (b) Lubricate the carriage attach fittings and links with grease, D00633.
 - 1) Remove excess grease, D00633, from the flap carriages and linkages.
- (c) Lubricate the aft flap drive mechanism with grease, D00633.

NOTE: The rod ends on the drive rod and pushrod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

- (d) Remove the rubcap [14] (TASK 27-51-24-000-802).
 - 1) Examine the condition of the seal retainer [15] for movement.
 - 2) Restore the seal retainer [15] to the normal position if necessary.
- (e) Install the rubcap [14] (TASK 27-51-24-400-802).
- (f) Lubricate the bellcrank [4] with grease, D00633.

SUBTASK 12-22-51-640-030

- (4) Lubricate the outboard main flap carriage.

- (a) Lubricate the main flap carriage rollers with grease, D00633.

EFFECTIVITY
LOM ALL

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- 1) Remove excess grease, D00633, from the flap carriages and linkages.
- 2) Make sure that there is no grease, D00633, on the flap track flange surfaces.
- (b) Lubricate the carriage attach fittings and links with grease, D00633.
 - 1) Remove excess grease, D00633, from the flap carriages and linkages.
- (c) Lubricate the aft flap drive mechanism with grease, D00633.

NOTE: The rod ends on the drive rod and pushrod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.
- (d) Remove the rubcap [14] (TASK 27-51-24-000-802).
 - 1) Examine the condition of the seal retainer [15] for movement.
 - 2) Restore the seal retainer [15] to the normal position if necessary.
- (e) Install the rubcap [14] (TASK 27-51-24-400-802).
- (f) Lubricate the bellcrank [4] with grease, D00633.

SUBTASK 12-22-51-640-031

- (5) Lubricate the rollers on the aft flap tracks and aft flap track attachment fittings with grease, D00633.
 - (a) Make sure that there is no grease, D00633, on the flap track flange surfaces.

SUBTASK 12-22-51-640-032

- (6) Lubricate the inboard and outboard aft flap programming rollers with grease, D00633.
 - (a) Make sure that there is no grease, D00633, on the programming track flange surfaces.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-012

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-018

- (2) Retract the trailing edge flaps to the UP position, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

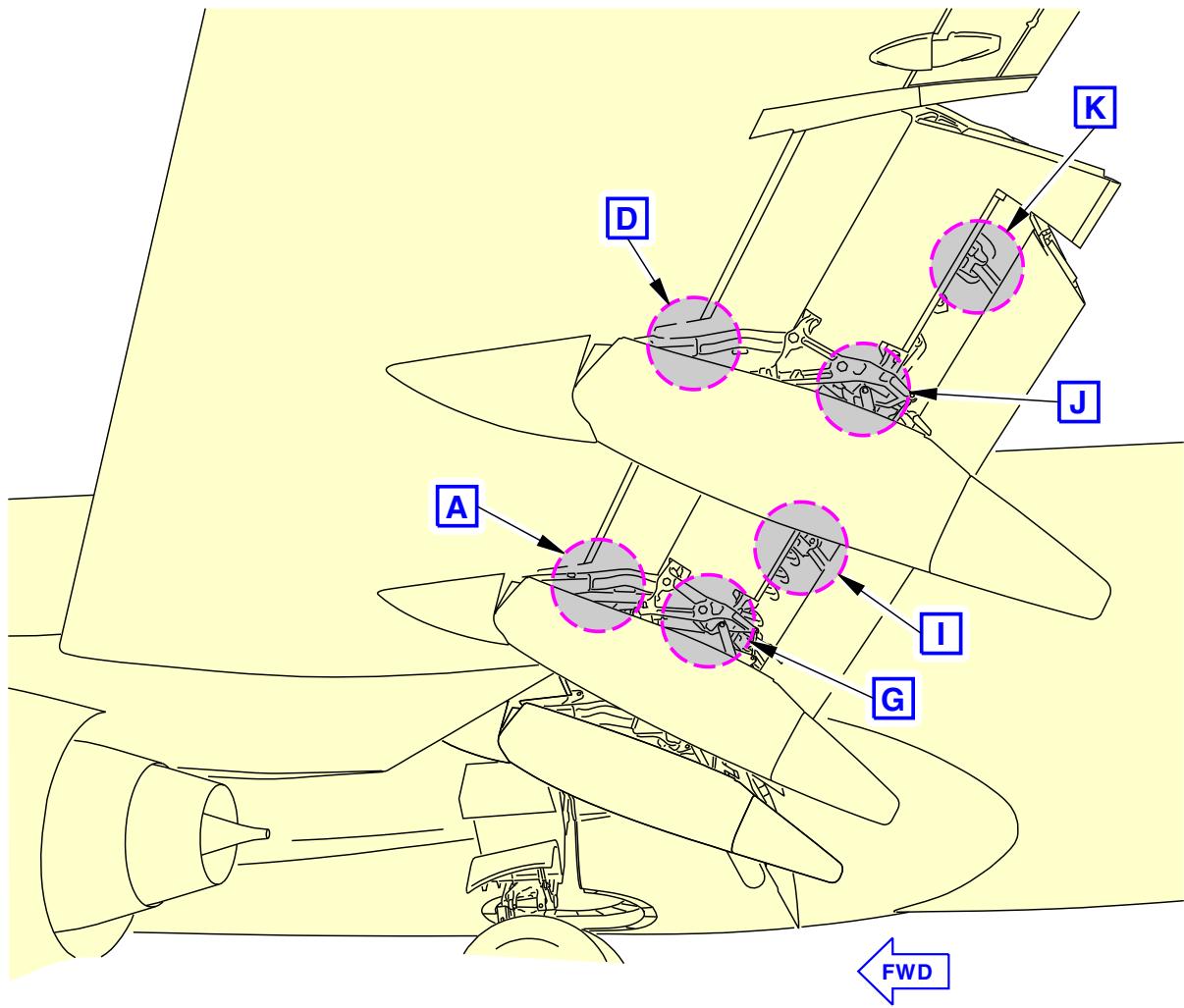
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EFFECTIVITY
LOM ALL

12-22-51



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LEFT WING
(RIGHT WING IS OPPOSITE)

G29559 S0006561560_V3

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 1 of 12)

EFFECTIVITY
LOM ALL

12-22-51

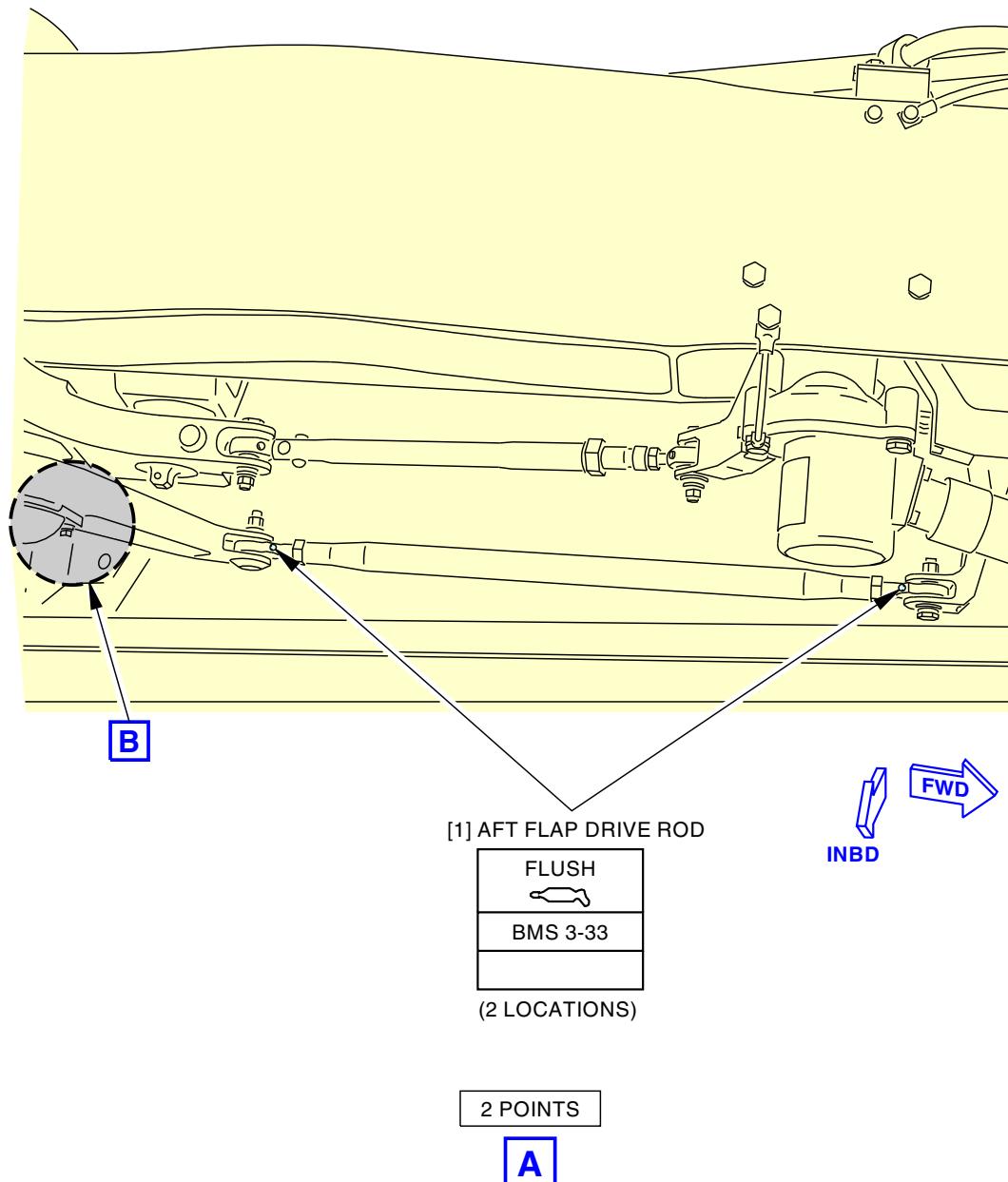
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G29560 S0006561561_V2

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 2 of 12)

EFFECTIVITY
LOM ALL

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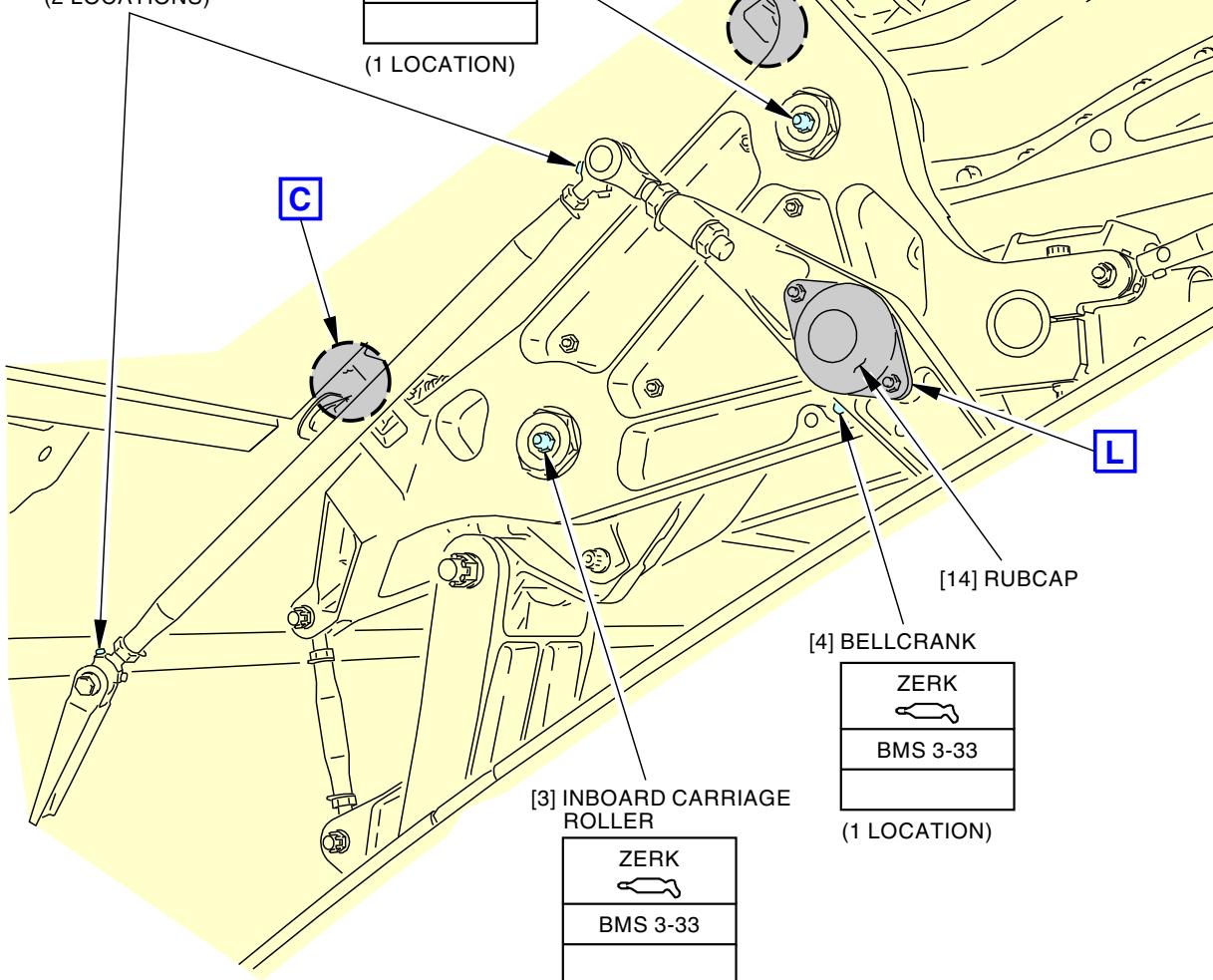
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**737-600/700/800/900
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[2] AFT FLAP PUSHROD

FLUSH
BMS 3-33
(2 LOCATIONS)

[3] INBOARD CARRIAGE ROLLER

ZERK
BMS 3-33
(1 LOCATION)

C
(2 LOCATIONS)
(1 LOCATION)


ZERK
BMS 3-33
(1 LOCATION)

ZERK
BMS 3-33
(1 LOCATION)

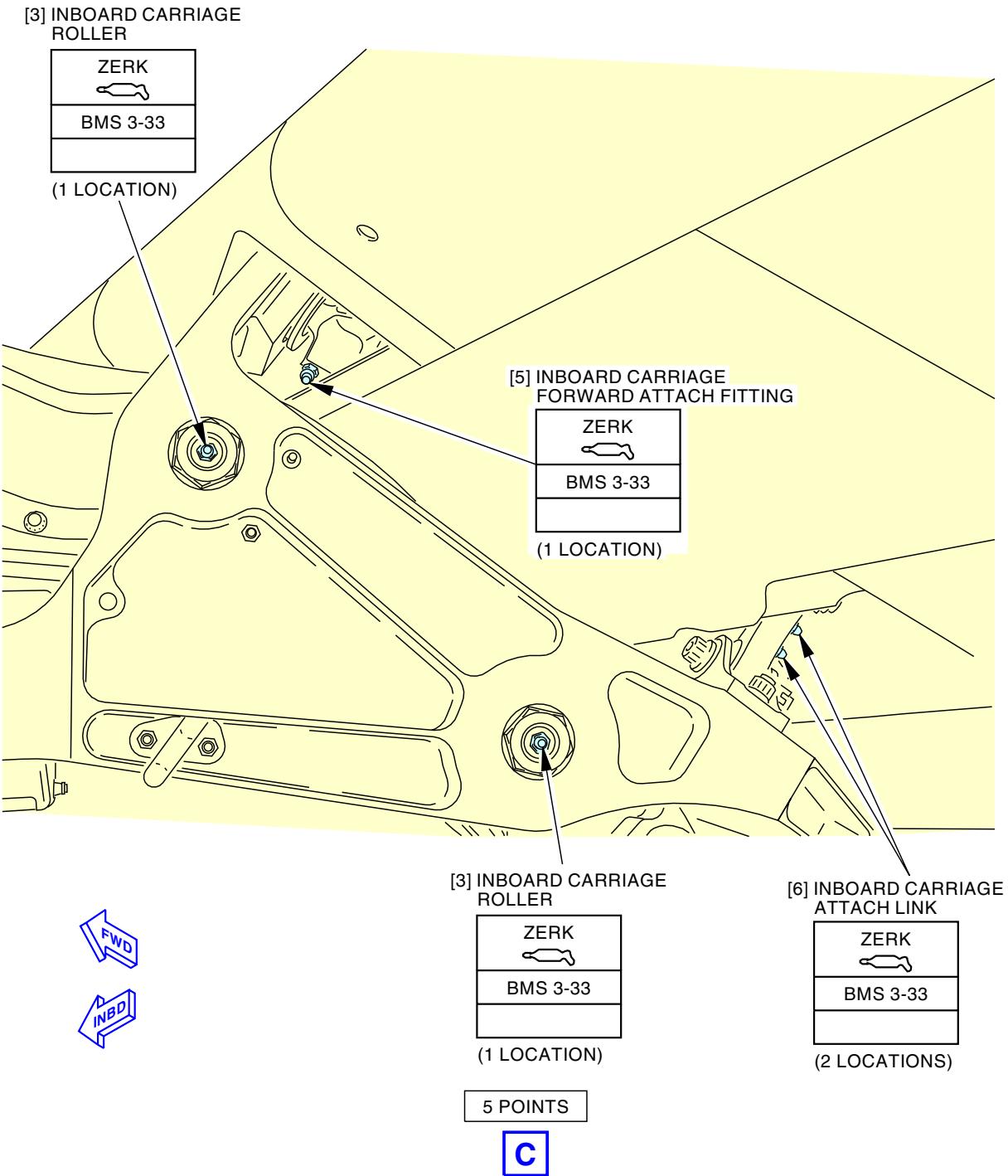
[3] INBOARD CARRIAGE ROLLER
ZERK
BMS 3-33
(1 LOCATION)

INBD
5 POINTS
B

G29561 S0006561562_V5

**Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 3 of 12)**
**EFFECTIVITY
LOM ALL**
12-22-51

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G29562 S0006561563_V2

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 4 of 12)

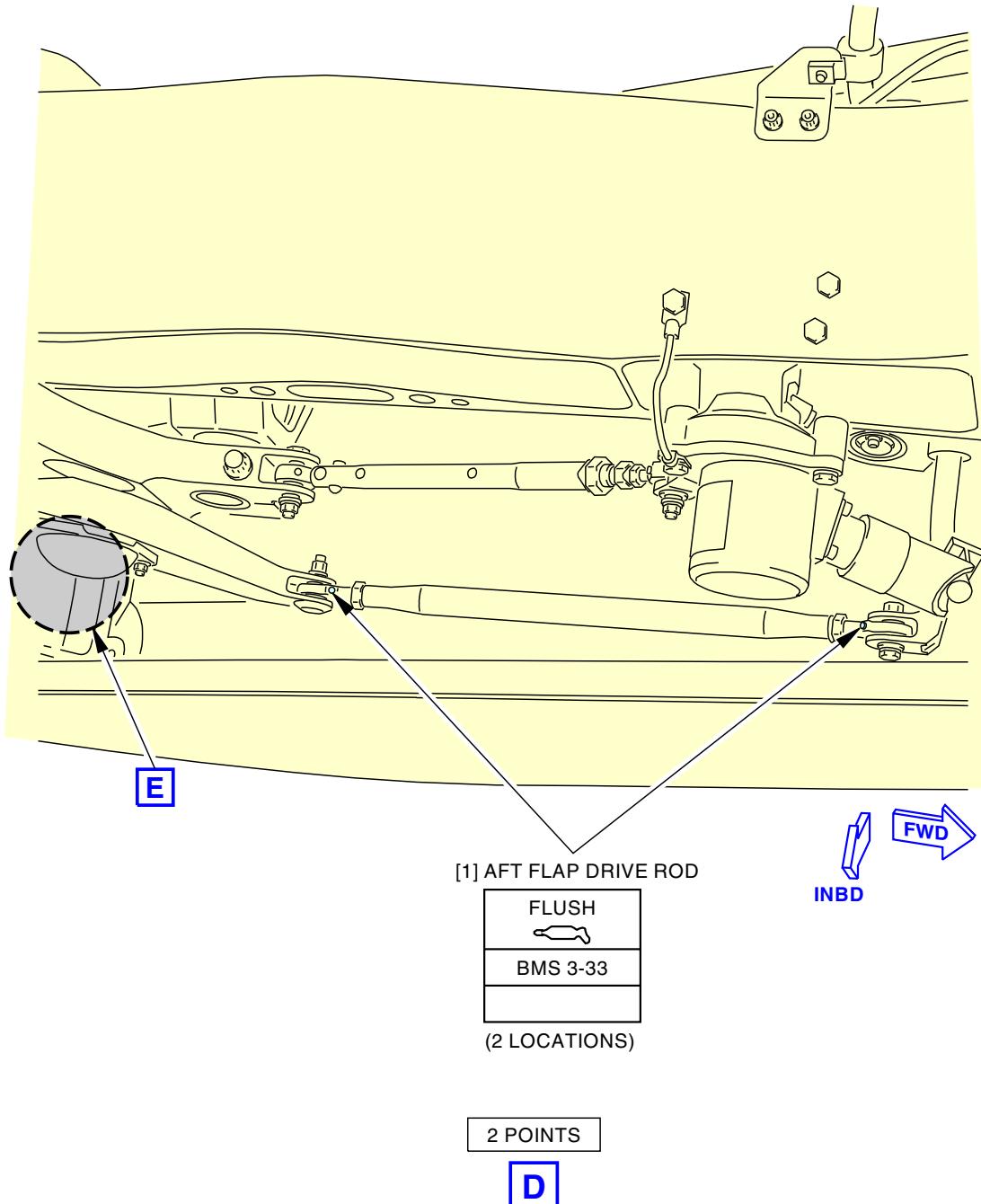
EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL



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Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 5 of 12)

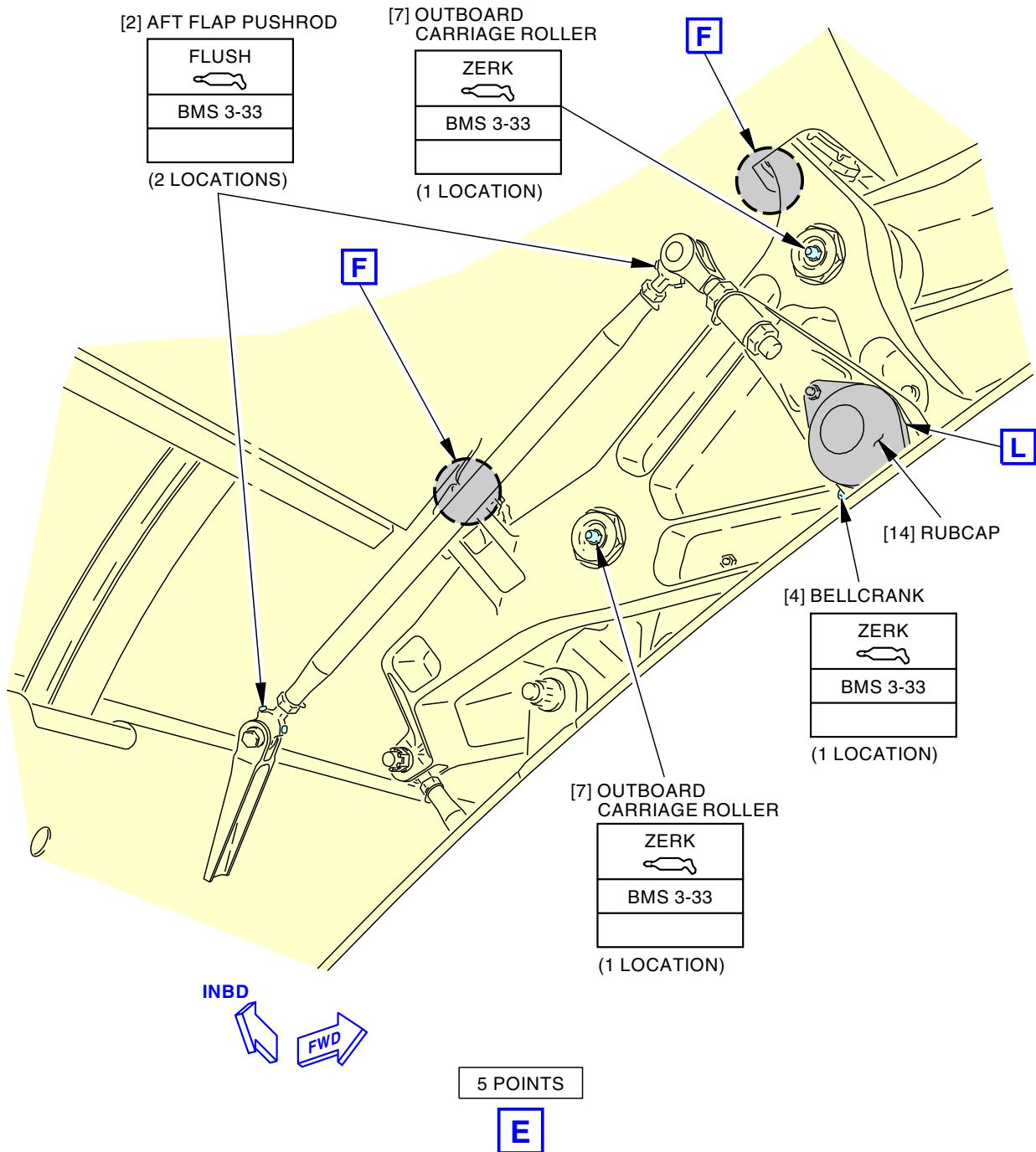
EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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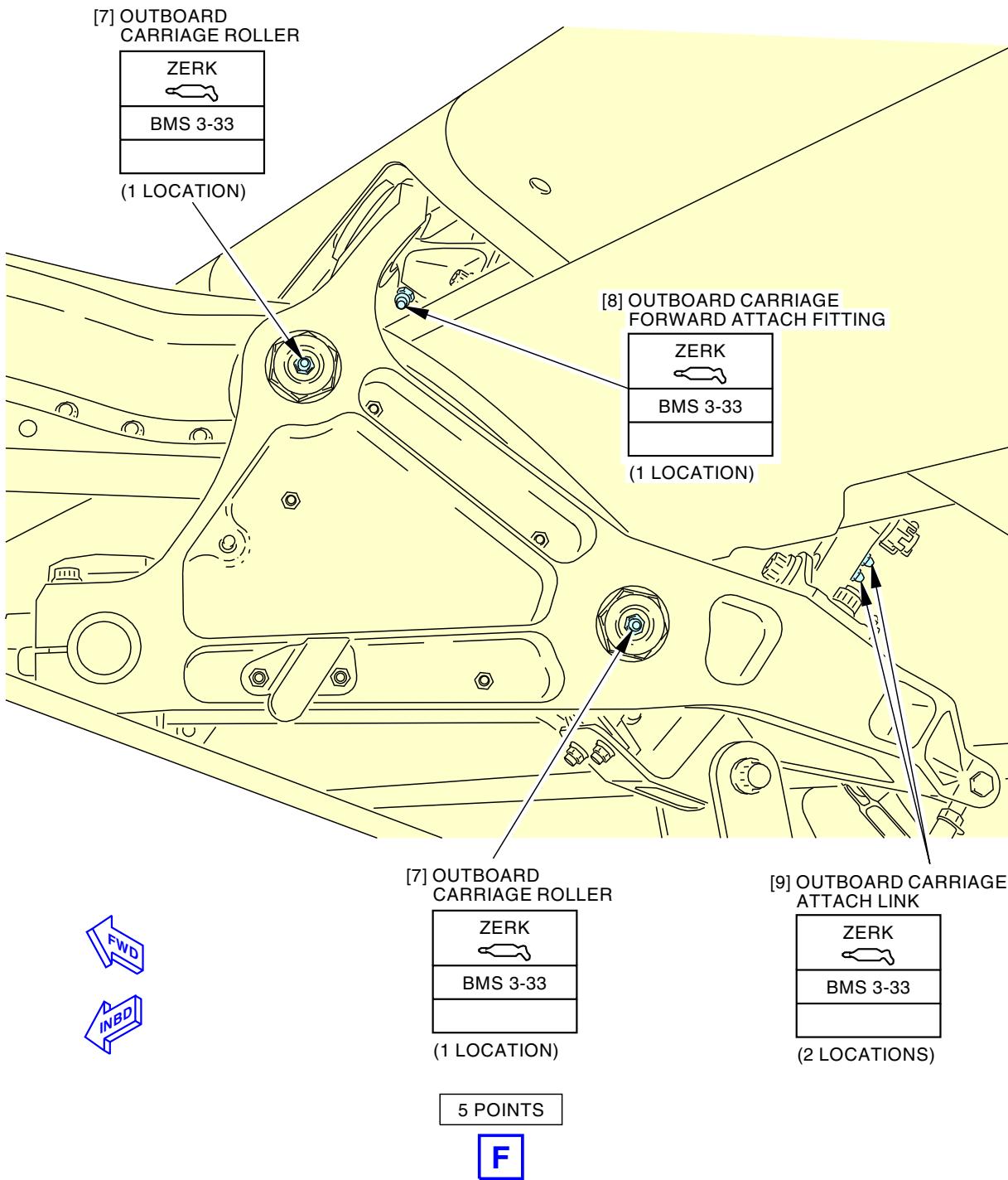
G29912 S0006561565_V5

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 6 of 12)

 EFFECTIVITY
 LOM ALL

12-22-51

D633A101-LOM



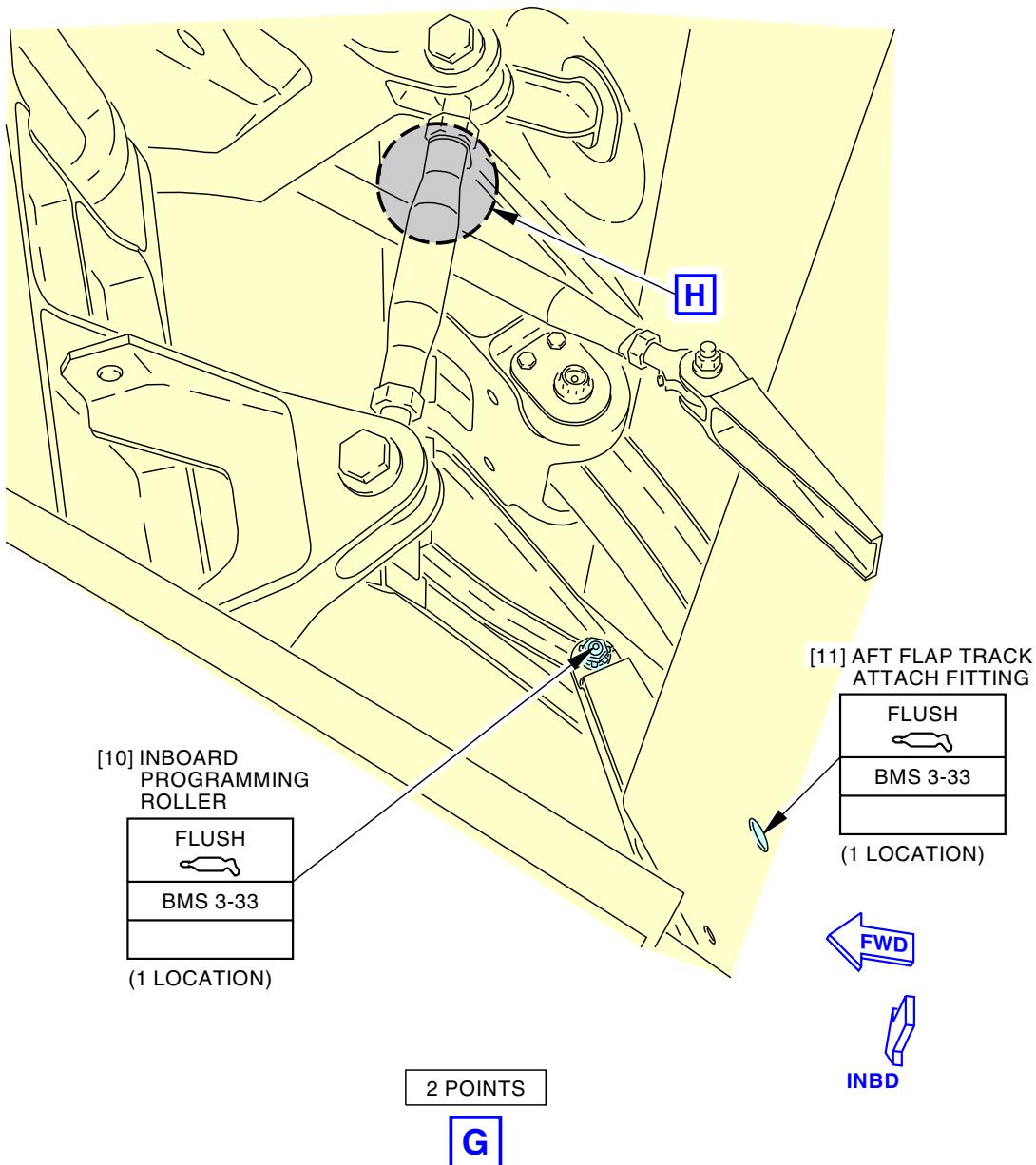
G29920 S0006561566_V2

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 7 of 12)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM



G29936 S0006561567_V2

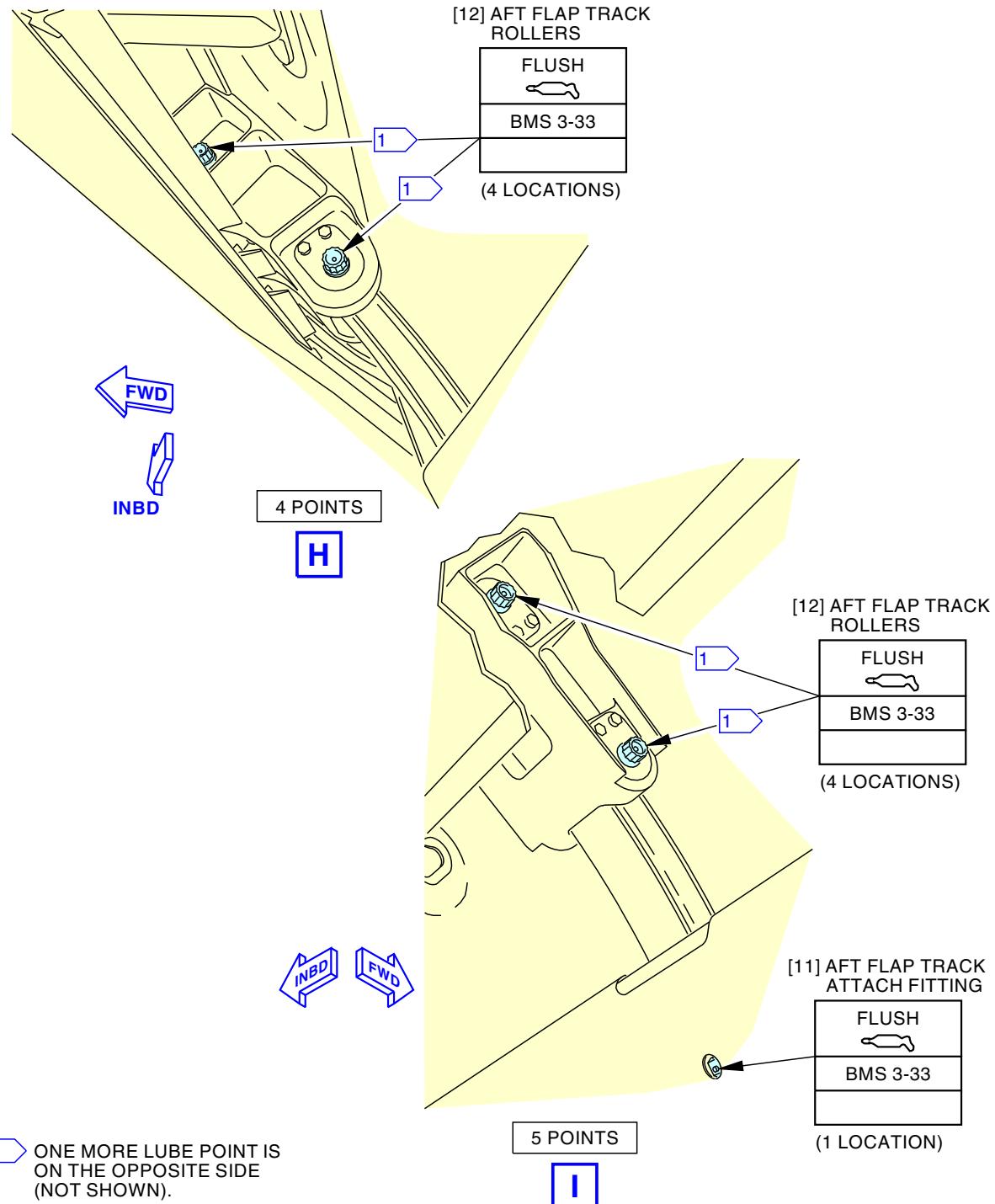
Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 8 of 12)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL**


G29948 S0006561568_V2

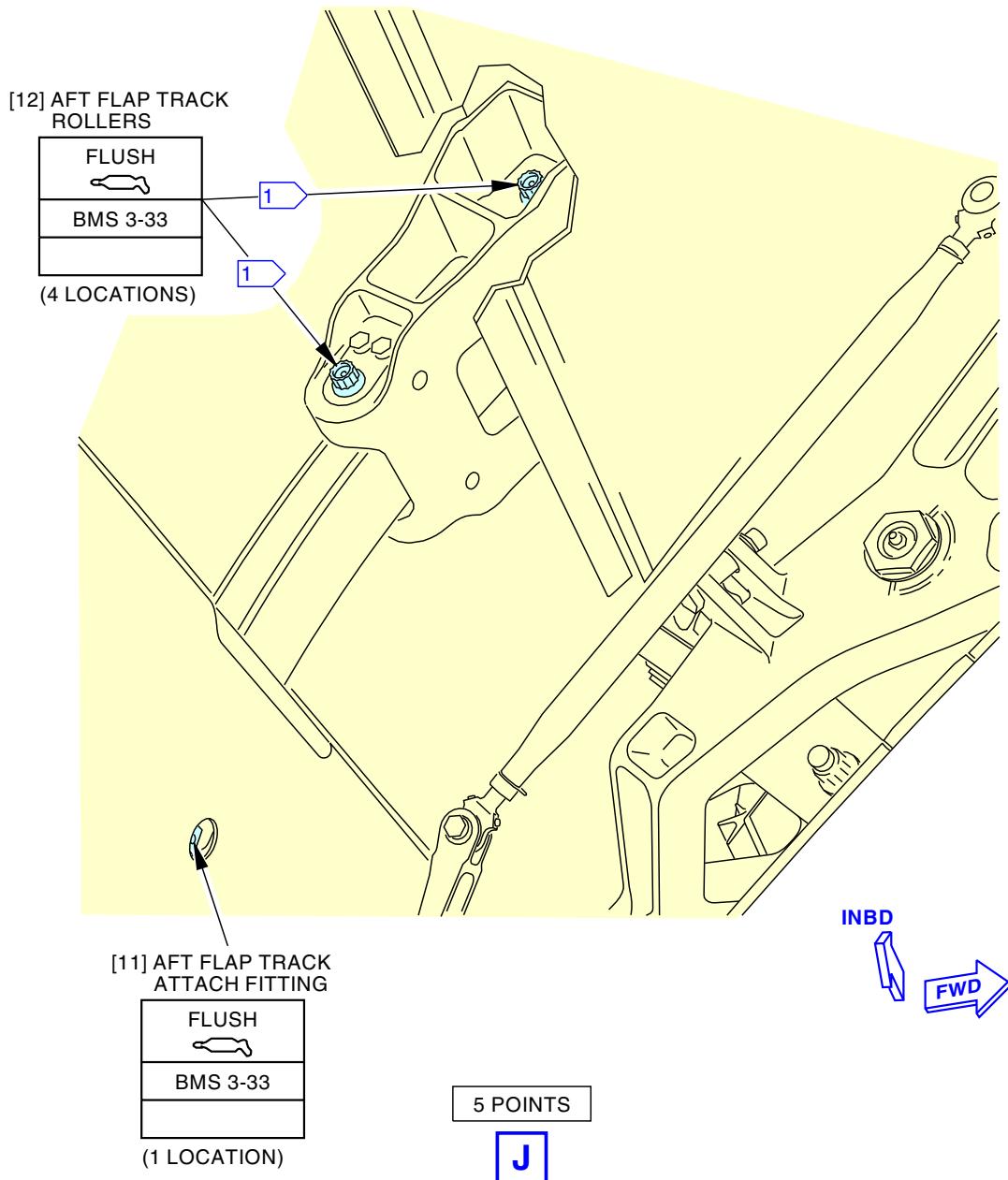
Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 9 of 12)

EFFECTIVITY
LOM ALL

12-22-51



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G29952 S0006561569_V2

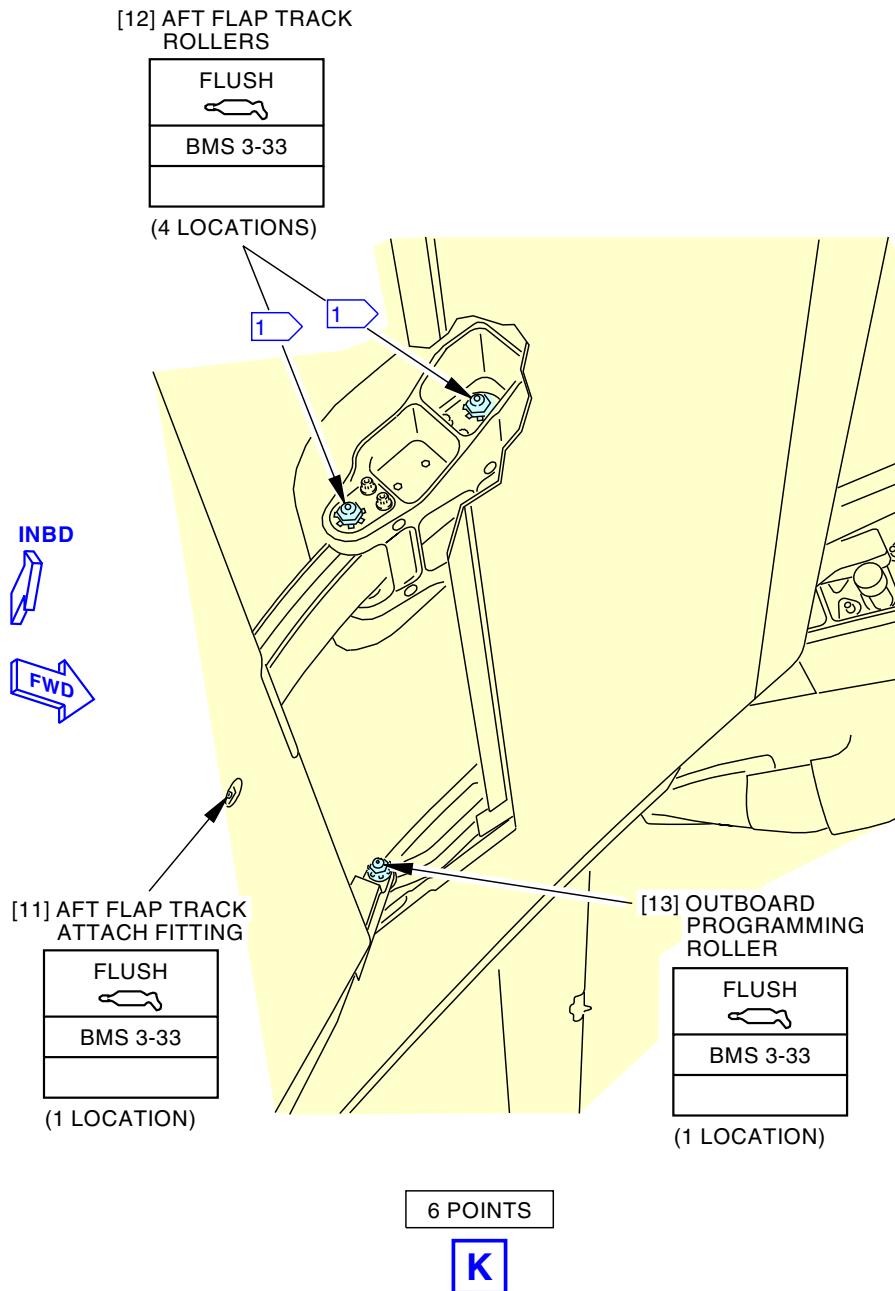
Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 10 of 12)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



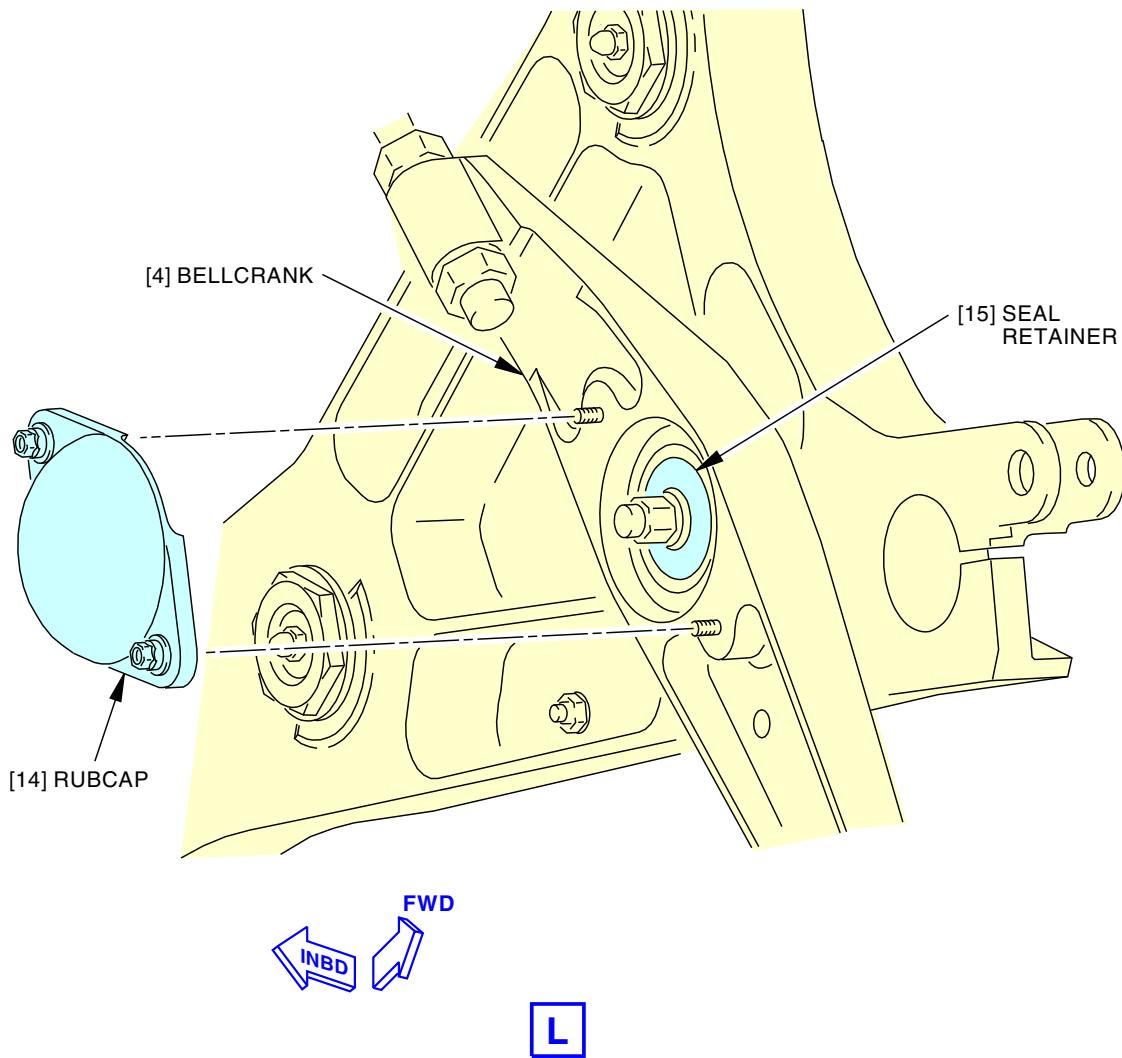
G29953 S0006561570_V2

Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 11 of 12)

 EFFECTIVITY
 LOM ALL

12-22-51

D633A101-LOM



2926803 S0000706854_V2

**Outboard Main Flap and Aft Flap Roller and Linkage Servicing
Figure 313/12-22-51-990-812 (Sheet 12 of 12)**EFFECTIVITY
LOM ALL**12-22-51**

D633A101-LOM



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-813

14. Inboard Flap Inboard Flap Track Lubrication

(Figure 314)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-013

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Inboard Flap Inboard Flap Track Lubrication

(Table 313)

SUBTASK 12-22-51-640-048

- (1) This table supplies data for the subsequent lubrication steps:

Table 313/12-22-51-993-833 Inboard Flap Inboard Flap Track Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Flap Track Attach Link	grease, D00633	Zerk	2
2	Flap Track Forward Attach Fitting	grease, D00633	Zerk	1

SUBTASK 12-22-51-640-070



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-033

- (3) Lubricate the flap track attachment link with grease, D00633.

SUBTASK 12-22-51-640-034

- (4) Lubricate the flap track forward attach fitting with grease, D00633.

EFFECTIVITY
LOM ALL

12-22-51



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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-013

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

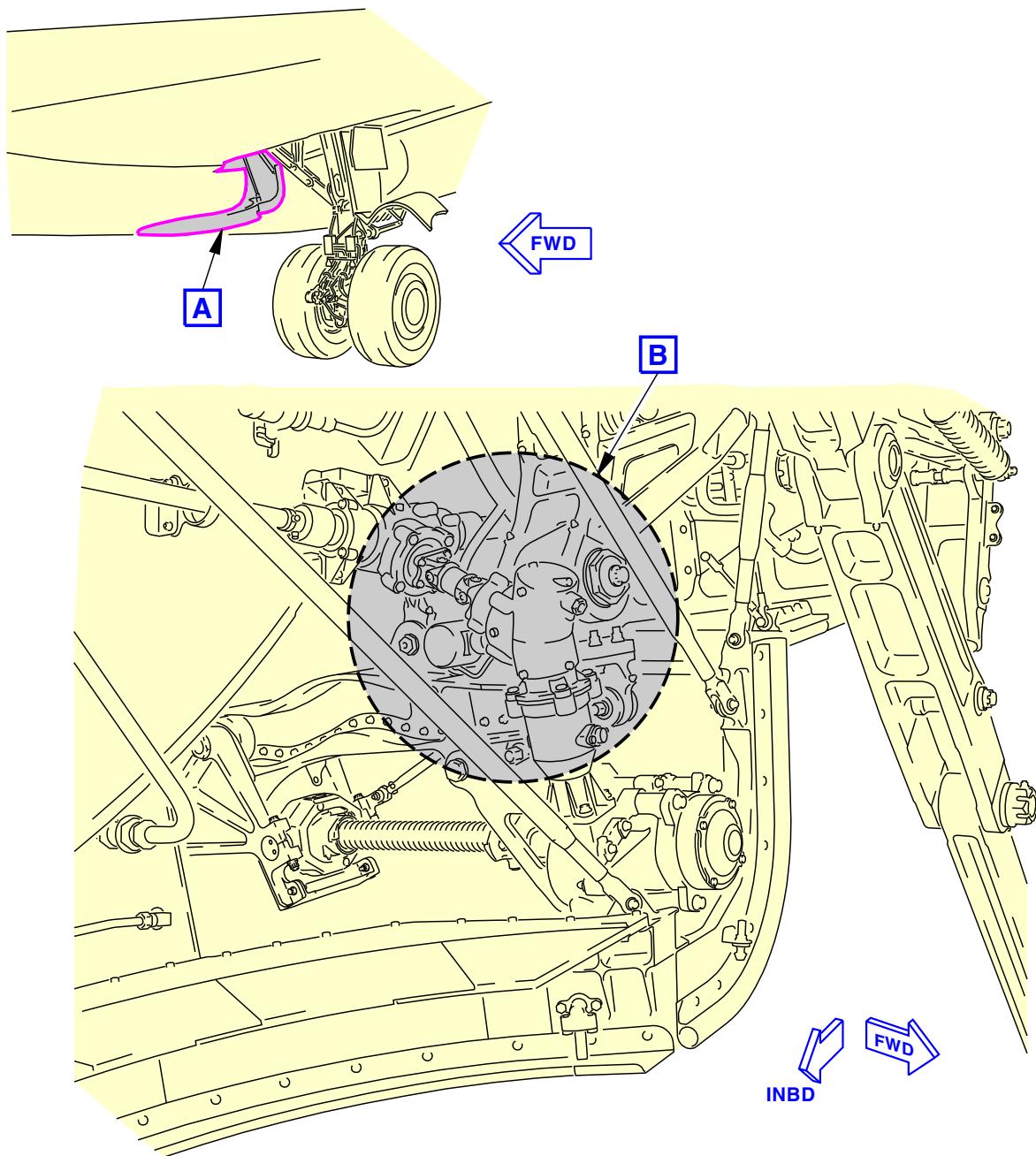
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



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

A

G30015 S0006561573_V2

Inboard Flap Inboard Flap Track Servicing
Figure 314/12-22-51-990-813 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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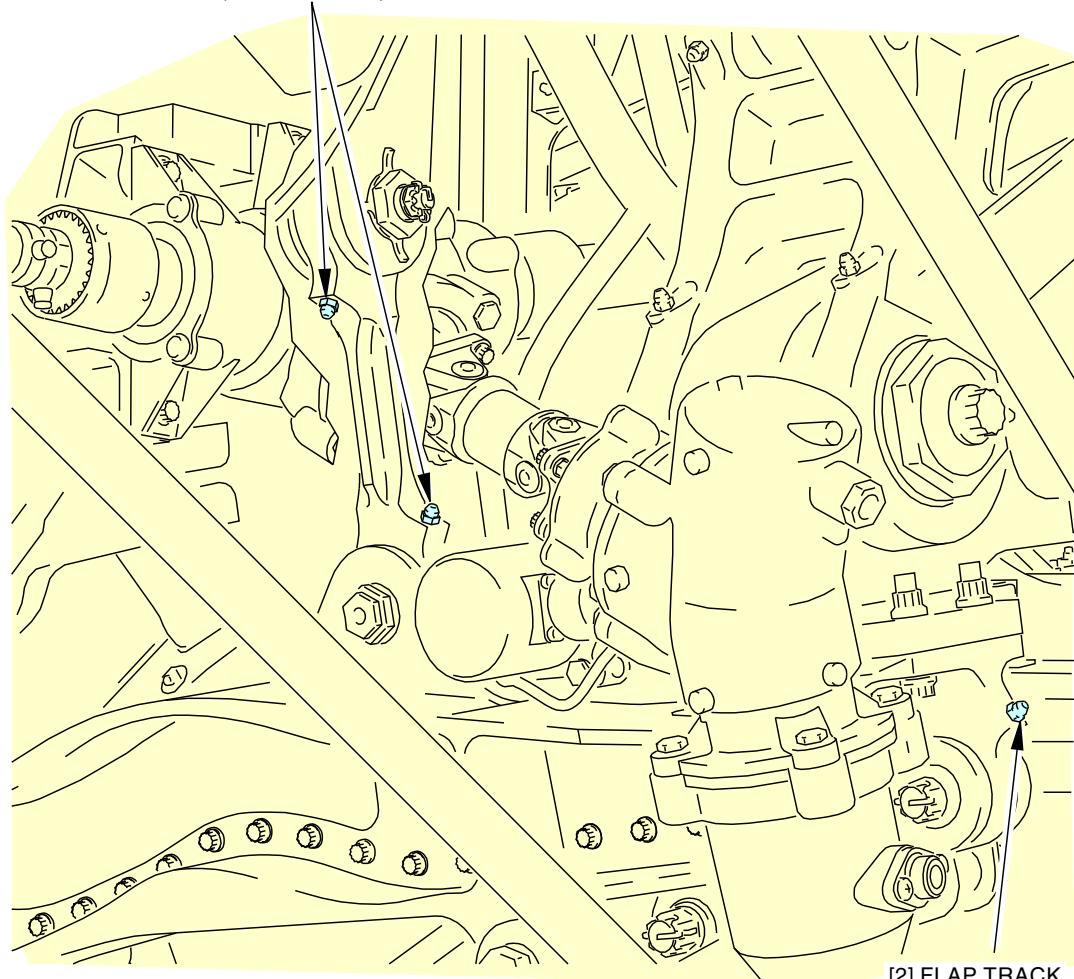


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[1] FLAP TRACK ATTACH LINK

ZERK
BMS 3-33

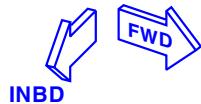
(2 LOCATIONS)



[2] FLAP TRACK FORWARD ATTACH FITTING

ZERK
BMS 3-33

(1 LOCATION)



3 POINTS



G30236 S0006561574_V2

Inboard Flap Inboard Flap Track Servicing
Figure 314/12-22-51-990-813 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL

TASK 12-22-51-640-814

15. Inboard Flap Outboard Flap Track Lubrication

(Figure 315)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-18-000-801	Inboard Flap Support Forward Fairing Removal (P/B 401)
27-51-18-400-801	Inboard Flap Support Forward Fairing Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
542	Left Wing - Fairing Flap Support No. 3
642	Right Wing - Fairing Flap Support No. 6

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-014

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-51-010-001

- (2) Do this task: Inboard Flap Support Forward Fairing Removal, TASK 27-51-18-000-801.

F. Inboard Flap Outboard Flap Track Lubrication

SUBTASK 12-22-51-640-049

- (1) This table supplies data for the subsequent lubrication step (Table 314):

Table 314/12-22-51-993-834 Inboard Flap Outboard Flap Track Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Flap Track Forward Attach Fitting	grease, D00633	Zerk	1

SUBTASK 12-22-51-640-071



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-035

- (3) Lubricate the flap track forward attach fitting with grease, D00633.

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-410-001

- (1) Do this task: Inboard Flap Support Forward Fairing Installation, TASK 27-51-18-400-801.

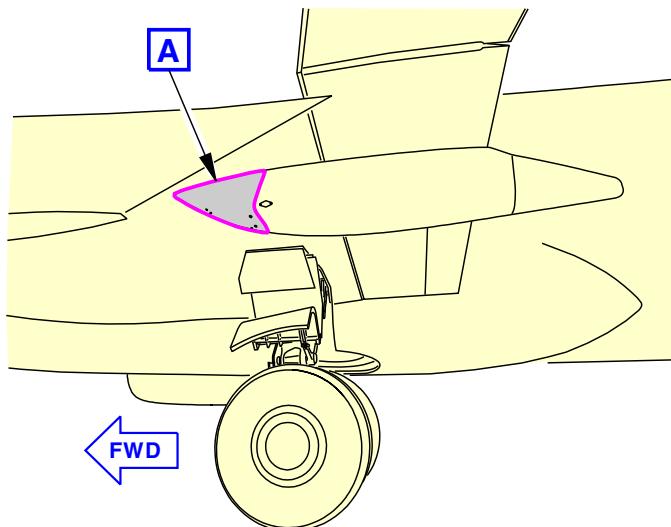
SUBTASK 12-22-51-440-014

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

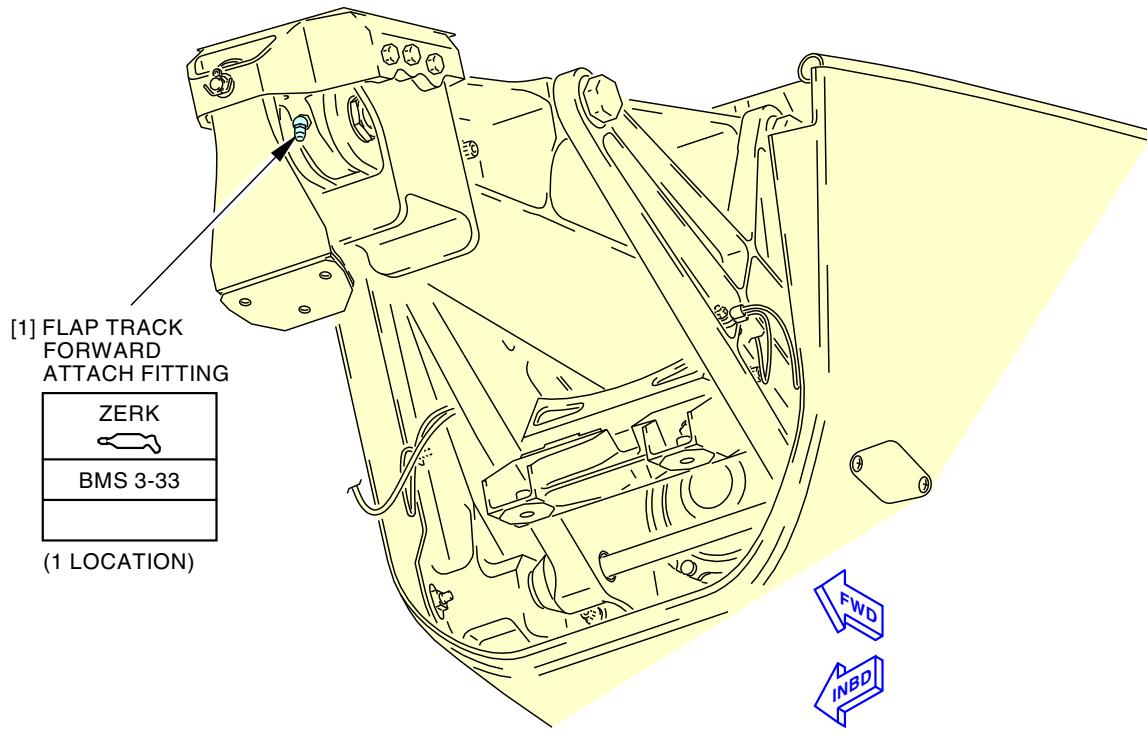
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



LEFT WING
(RIGHT WING IS OPPOSITE)



G30661 S0006561577_V3

Inboard Flap Outboard Flap Track Servicing
Figure 315/12-22-51-990-814

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM



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TASK 12-22-51-640-815

16. Outboard Flap Inboard Flap Track Lubrication

(Figure 316)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-28-000-803	Outboard Flap Inboard Support Forward Fairing Removal (P/B 401)
27-51-28-400-803	Outboard Flap Inboard Support Forward Fairing Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
543	Left Wing - Fairing Flap Support No. 2
643	Right Wing - Fairing Flap Support No. 7

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-015

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-51-010-002

- (2) Do this task: Outboard Flap Inboard Support Forward Fairing Removal, TASK 27-51-28-000-803.

F. Outboard Flap Inboard Flap Track Lubrication

SUBTASK 12-22-51-640-050

- (1) This table supplies data for the subsequent lubrication step (Table 315):

Table 315/12-22-51-993-835 Outboard Flap Inboard Flap Track Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Flap Track Forward Attach Fitting	grease, D00633	Zerk	1

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-51-640-072



WARNING USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

SUBTASK 12-22-51-640-036

- (3) Lubricate the flap track forward attach fitting with grease, D00633.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-410-002

- (1) Do this task: Outboard Flap Inboard Support Forward Fairing Installation, TASK 27-51-28-400-803.

SUBTASK 12-22-51-440-015

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

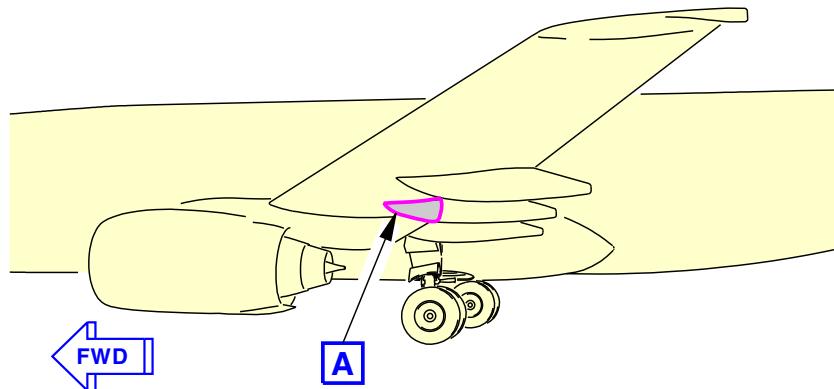
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EFFECTIVITY
LOM ALL

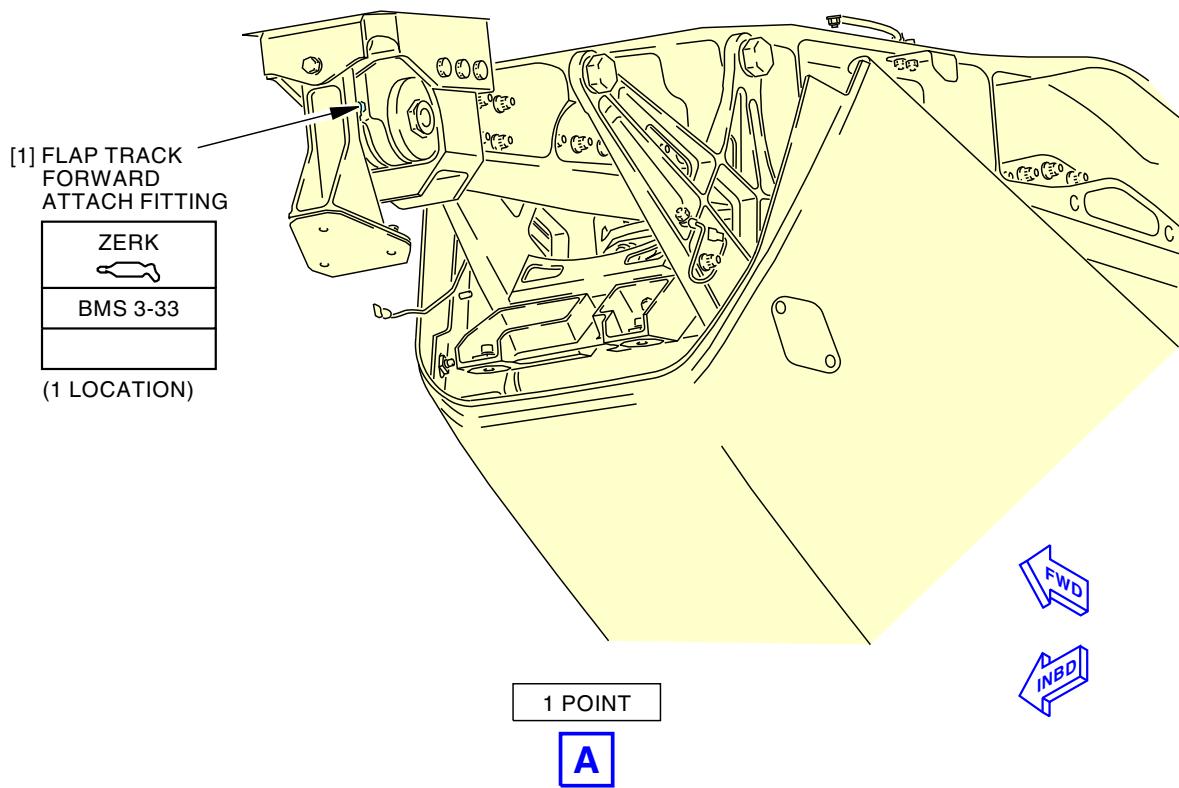
12-22-51



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AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)



G31085 S0006561580_V3

Outboard Flap Inboard Flap Track Servicing
Figure 316/12-22-51-990-815

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

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TASK 12-22-51-640-816

17. Outboard Flap Outboard Flap Track Lubrication

(Figure 317)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-28-000-801	Outboard Flap Outboard Support Forward Fairing Removal (P/B 401)
27-51-28-400-801	Outboard Flap Outboard Support Forward Fairing Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-6517	Gloves, Neoprene or Nitrile

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
544	Left Wing - Fairing Flap Support No. 1
644	Right Wing - Fairing Flap Support No. 8

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-016

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-51-010-003

- (2) Do this task: Outboard Flap Outboard Support Forward Fairing Removal, TASK 27-51-28-000-801.

F. Outboard Flap Outboard Flap Track Lubrication

SUBTASK 12-22-51-640-051

- (1) This table supplies data for the subsequent lubrication step (Table 316):

Table 316/12-22-51-993-836 Outboard Flap Outboard Flap Track Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Flap Track Forward Attach Fitting	grease, D00633	Zerk	1

SUBTASK 12-22-51-640-073



USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (2) Put on the neoprene or nitrile glove, STD-6517, and eye protection goggles, STD-421.

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 12-22-51-640-037

- (3) Lubricate the flap track forward attach fitting with grease, D00633.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-410-003

- (1) Do this task: Outboard Flap Outboard Support Forward Fairing Installation, TASK 27-51-28-400-801.

SUBTASK 12-22-51-440-016

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

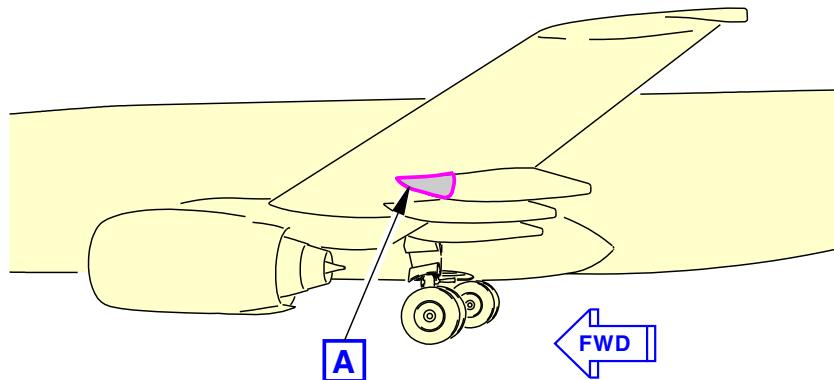
———— END OF TASK ————

EFFECTIVITY
LOM ALL

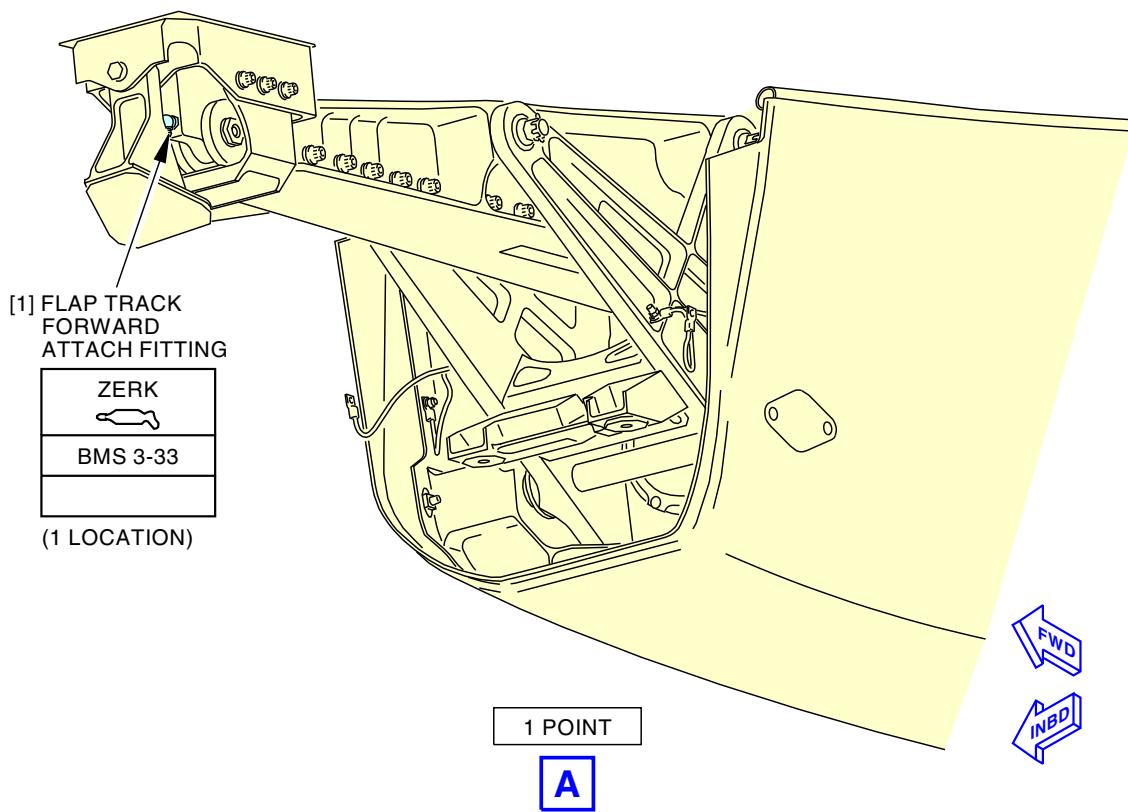
12-22-51



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)



G31162 S0006561583_V3

Outboard Flap Outboard Flap Track Servicing
Figure 317/12-22-51-990-816

EFFECTIVITY
LOM ALL

12-22-51

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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TASK 12-22-51-610-801

18. Trailing Edge Flap Power Drive Unit Servicing

(Figure 318)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
102	Packing	27-51-55-02-440	LOM ALL

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-017

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Trailing Edge Flap Power Drive Unit Servicing

(Table 317)

SUBTASK 12-22-51-640-052

- (1) This table supplies data for the subsequent servicing steps:

Table 317/12-22-51-993-837 Trailing Edge Flap Power Drive Unit Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Power Drive Unit	fluid, D00467	Fill	1

SUBTASK 12-22-51-610-001

- (2) Do a check of the fluid level in the Power Drive Unit [1].
- Remove the lockwire from the fill plug [101]
 - Remove the fill plug [101] and packing [102] from the fill port.
 - Discard the packing [102].
 - Make sure that the fluid is at the level of the fill port.
 - If the fluid is not at the level of the fill port, fill the Power Drive Unit [1] with fluid, D00467, to the level of the fill port.
 - Lubricate the new packing [102] with fluid, D00467.
 - Install the fill plug [101] and packing [102] in the fill port.

EFFECTIVITY
LOM ALL

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- (g) Tighten the fill plug [101] to 110 in-lb (12.43 N·m) - 130 in-lb (14.69 N·m) above the run-on torque.
- (h) Install MS20995C32 lockwire, G01048, on the fill plug [101] with the double twist method.

G. Put the Airplane Back to Its Usual Condition

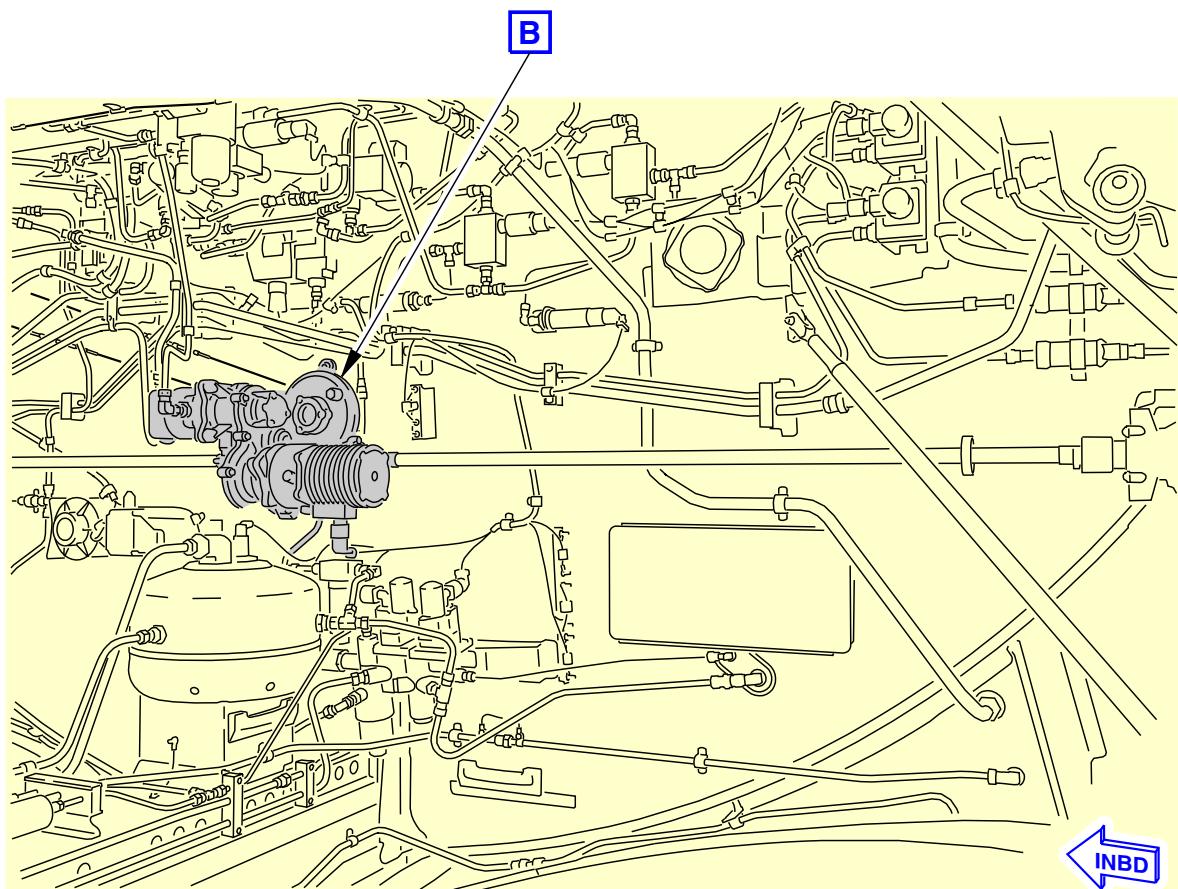
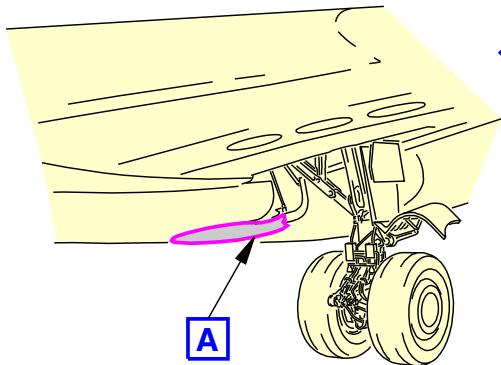
SUBTASK 12-22-51-440-017

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**



FWD

G31239 S0006561586_V2

**Trailing Edge Flap Power Drive Unit Servicing
Figure 318/12-22-51-990-817 (Sheet 1 of 2)**

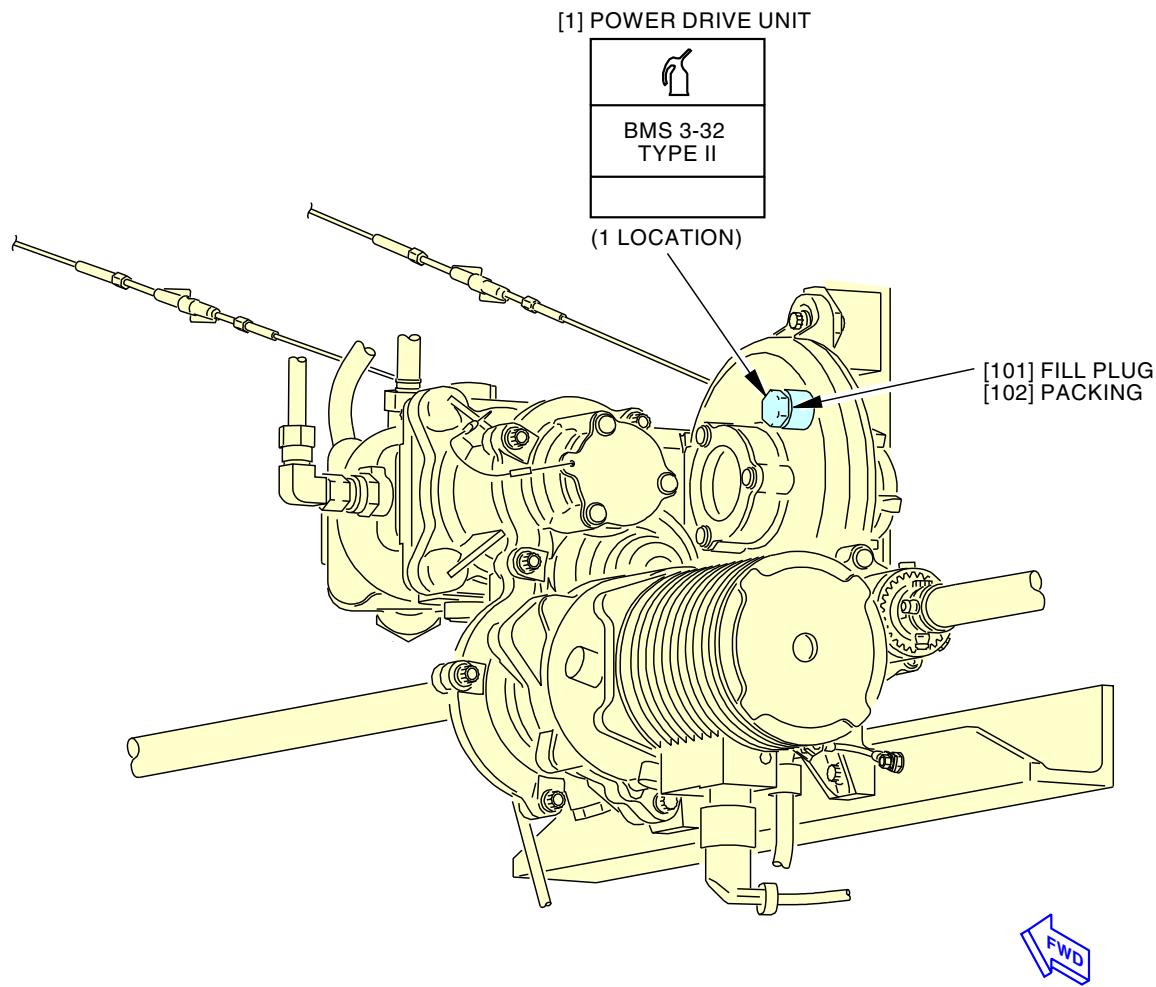
EFFECTIVITY
LOM ALL

12-22-51

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G31303 S0006561587_V2

Trailing Edge Flap Power Drive Unit Servicing
Figure 318/12-22-51-990-817 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-610-802

19. Trailing Edge Flap Power Drive Unit Fluid Replacement

(Figure 319)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3938	Container - Oil Resistant, 10 U.S. Gallon (38 Liter)

C. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
122	Packing	27-51-55-02-440	LOM ALL
124	Packing	27-51-55-02-440	LOM ALL

E. Location Zones

Zone	Area
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. Prepare for the Fluid Replacement

SUBTASK 12-22-51-040-018

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

G. Trailing Edge Flap Power Drive Unit Oil Replacement

SUBTASK 12-22-51-640-053

- (1) This table supplies data for the subsequent fluid replacement steps:

Table 318/12-22-51-993-838 Trailing Edge Flap Power Drive Unit Fluid Replacement

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Power Drive Unit	fluid, D00467	Fill	1

SUBTASK 12-22-51-480-001

- (2) Put an oil resistant container (10 gal), STD-3938, below the power drive unit to catch the fluid.

SUBTASK 12-22-51-680-001

- (3) Drain the fluid from the Power Drive Unit [1].

- (a) Remove the lockwire from the drain plug [123].
- (b) Remove the drain plug [123] and packing [124] from the drain port.
- (c) Discard the packing [124].

EFFECTIVITY
LOM ALL

12-22-51



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- (d) Wait for the fluid, D00467, to drain from the drain port.
- (e) Lubricate the new packing [124] with fluid.
- (f) Install the drain plug [123] and packing [124] in the drain port.
- (g) Tighten the drain plug [123] to 110 in-lb (12.43 N·m) - 130 in-lb (14.69 N·m) above the run-on torque.
- (h) Install MS20995C32 lockwire, G01048, on the drain plug [123] with the double twist method.

SUBTASK 12-22-51-610-002

- (4) Fill the Power Drive Unit [1] with fluid.
 - (a) Remove the lockwire from the fill plug [121].
 - (b) Remove the fill plug [121] and packing [122] from the fill port.
 - (c) Discard the packing [122].
 - (d) Add fluid, D00467, to the Power Drive Unit [1] until the fluid is at the level of the fill port.
 - (e) Lubricate the new packing [122] with fluid.
 - (f) Install the fill plug [121] and packing [122] in the fill port.
 - (g) Tighten the fill plug [121] to 110 in-lb (12.43 N·m) - 130 in-lb (14.69 N·m) above the run-on torque.
 - (h) Install MS20995C32 lockwire, G01048, on the fill plug [121] with the double twist method.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-018

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

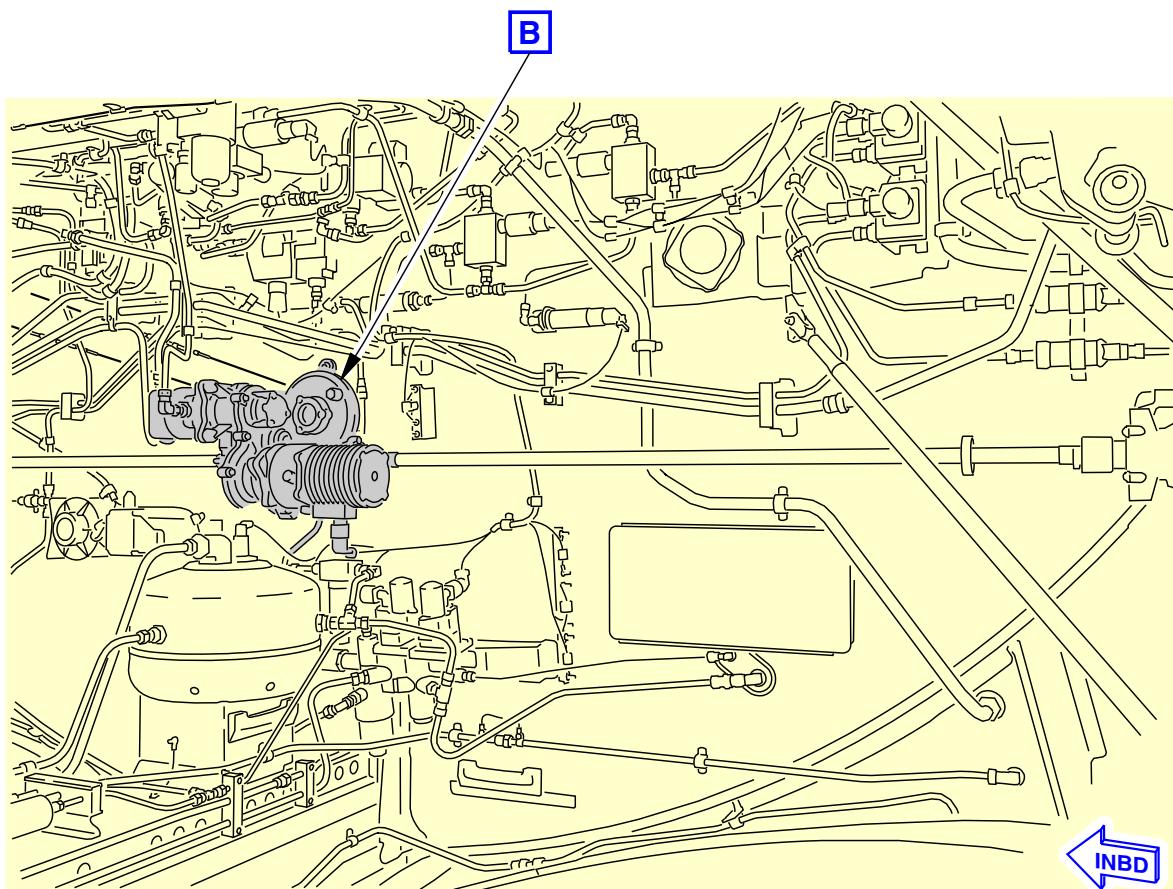
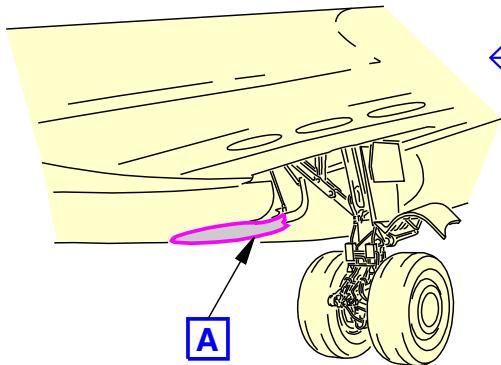
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EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)



FWD

G31381 S0006561590_V2

Trailing Edge Flap Power Drive Unit Fluid Replacement
Figure 319/12-22-51-990-818 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

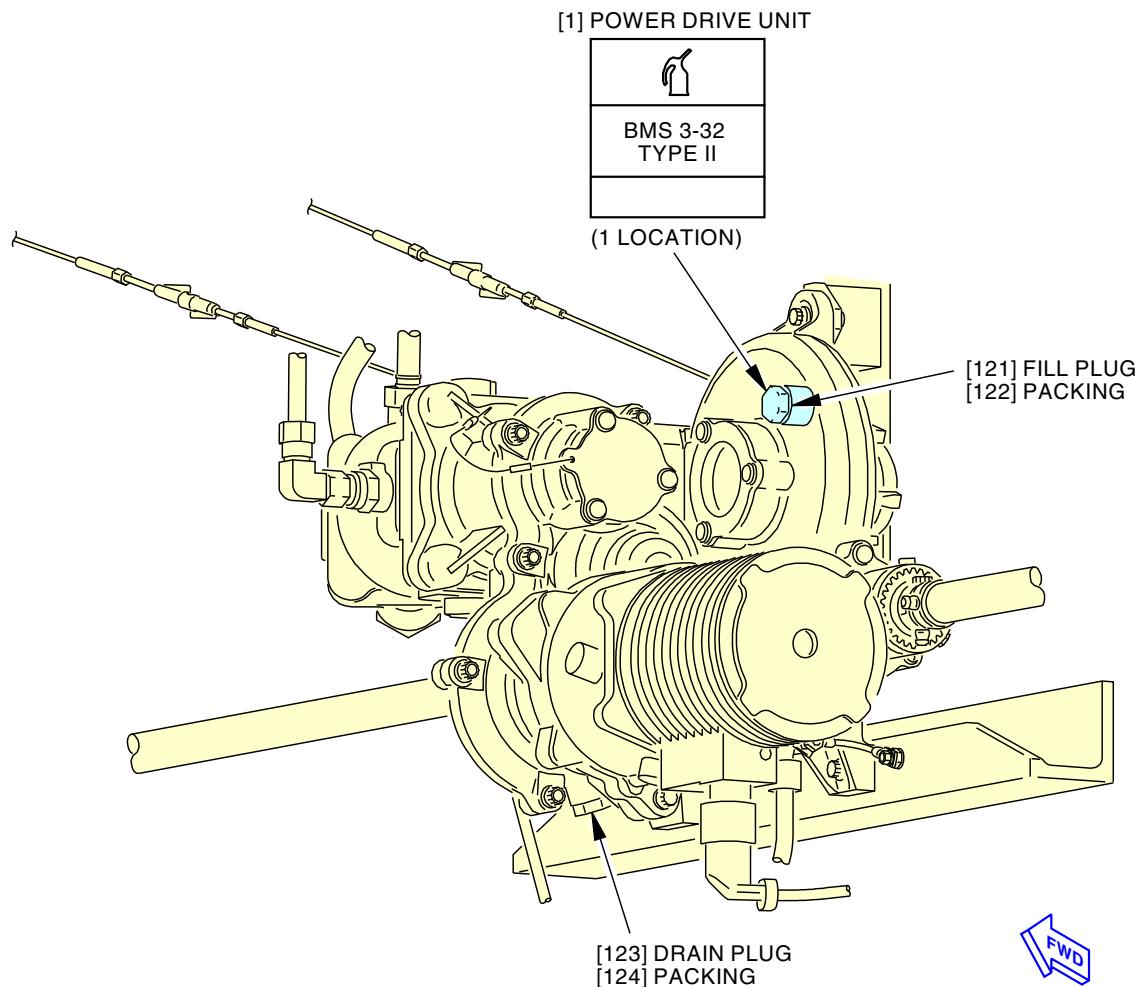
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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1 POINT

B

G31502 S0006561591_V2

Trailing Edge Flap Power Drive Unit Fluid Replacement
Figure 319/12-22-51-990-818 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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TASK 12-22-51-610-803

20. Trailing Edge Flap Transmission Servicing

(Figure 320)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is applicable to all of the transmissions on the trailing edge flaps.

B. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00590	Fluid - Flap Drive System - Brayco 795	
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
142	Packing	27-51-31-13-165	LOM ALL
		27-51-31-15-125	LOM ALL
		27-51-41-03-172	LOM ALL
		27-51-41-07-190	LOM ALL

E. Location Zones

Zone	Area
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
542	Left Wing - Fairing Flap Support No. 3
543	Left Wing - Fairing Flap Support No. 2
544	Left Wing - Fairing Flap Support No. 1
642	Right Wing - Fairing Flap Support No. 6
643	Right Wing - Fairing Flap Support No. 7
644	Right Wing - Fairing Flap Support No. 8

F. Prepare for the Lubrication

SUBTASK 12-22-51-860-019

- (1) Extend the trailing edge flaps to the 40-unit position (TASK 27-51-00-860-803).

SUBTASK 12-22-51-040-019

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

G. Trailing Edge Flap Transmission Servicing

SUBTASK 12-22-51-640-054

- (1) This table supplies data for the subsequent servicing steps (Table 319):

EFFECTIVITY	
LOM ALL	

12-22-51



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Table 319/12-22-51-993-839 Trailing Edge Flap Transmission Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Transmission No. 4 (Transmission No. 5 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
2	Transmission No. 3 (Transmission No. 6 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
3	Transmission No. 2 (Transmission No. 7 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
4	Transmission No. 1 (Transmission No. 8 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1

SUBTASK 12-22-51-610-003

- (2) Do a check of the fluid level transmission.
 - (a) Remove the lockwire from the fill plug [141].
 - (b) Remove the fill plug [141] and packing [142] from the fill port.
 - (c) Discard the packing [142].
 - (d) Make sure that the fluid is at the level of the fill port.

NOTE: BMS 3-32, Type II, can be red or yellow. The color of the BMS 3-32, Type II, changed from red to yellow, but they are interchangeable and you can mix them. Brayco 795 is red and you can mix it with BMS 3-32, Type II.

- (e) If the fluid is not at the level of the fill port, fill the transmission with Brayco 795 fluid, D00590, or fluid, D00467, to the level of the fill port.
- (f) Lubricate the new packing [142] with fluid.
- (g) Install the fill plug [141] and packing [142] in the fill port.
- (h) Tighten the fill plug [141] to 140 ± 10 in-lb (15.8 ± 1.1 N·m).
- (i) Install MS20995C32 lockwire, G01048, on the fill plug [141] with the double twist method.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-019

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-51-860-020

- (2) Retract the trailing edge flaps to the UP position (TASK 27-51-00-860-804).

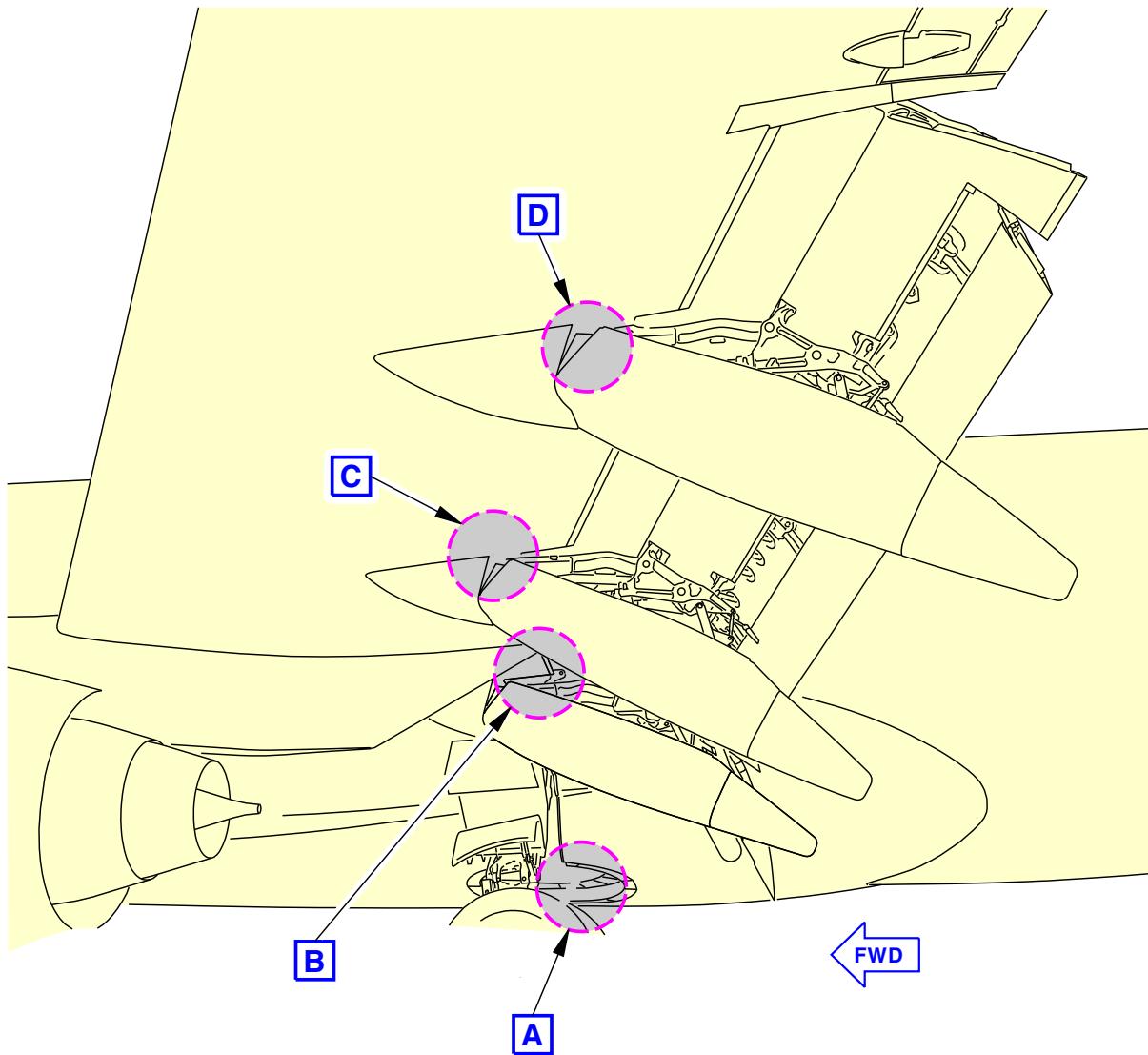
— END OF TASK —

EFFECTIVITY
LOM ALL

12-22-51



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AIRCRAFT MAINTENANCE MANUAL



LEFT WING
(RIGHT WING IS OPPOSITE)

G31620 S0006561594_V3

Trailing Edge Flap Transmission Servicing
Figure 320/12-22-51-990-819 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

12-22-51

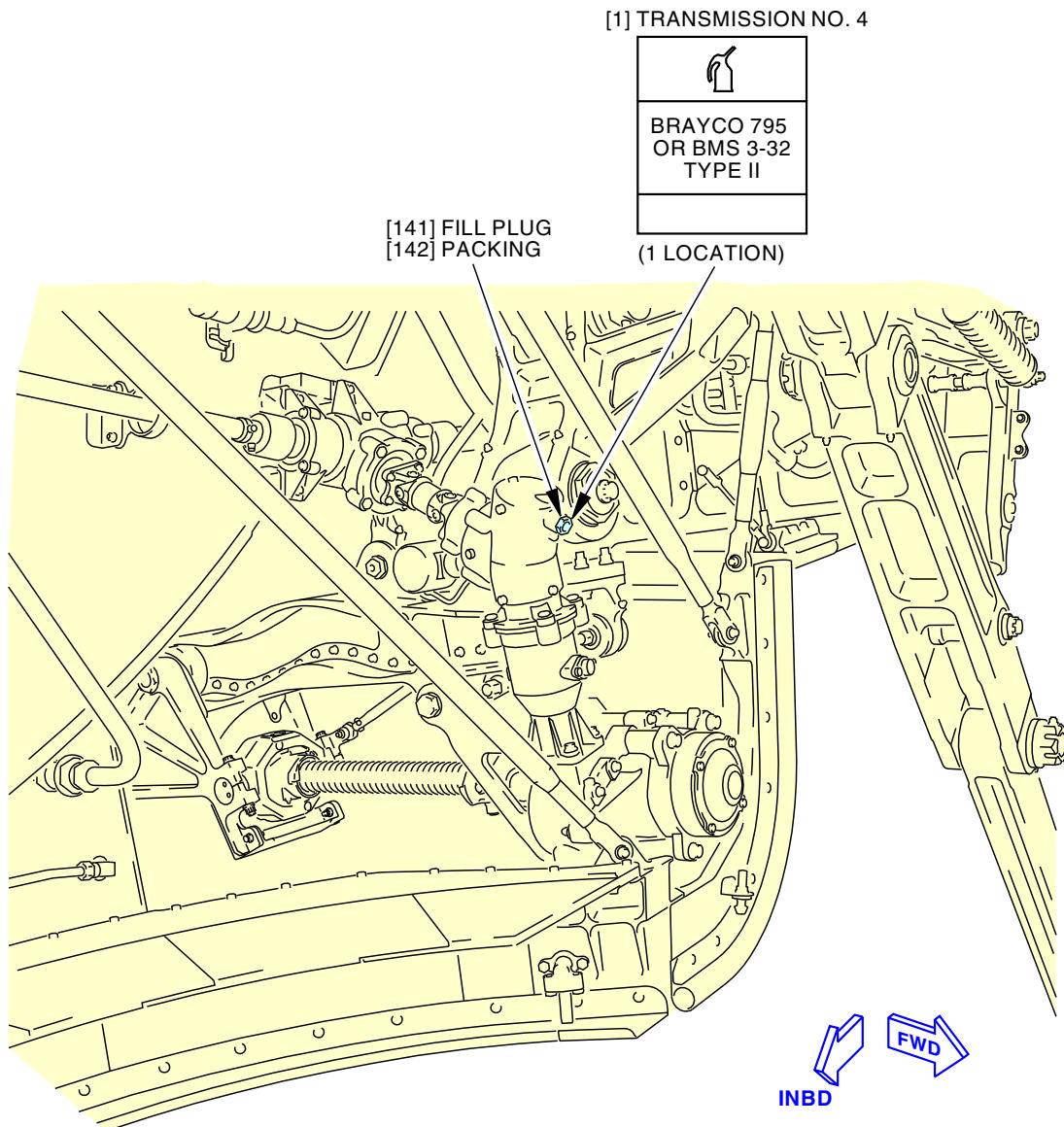
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G31722 S0006561595_V3

Trailing Edge Flap Transmission Servicing
Figure 320/12-22-51-990-819 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

12-22-51

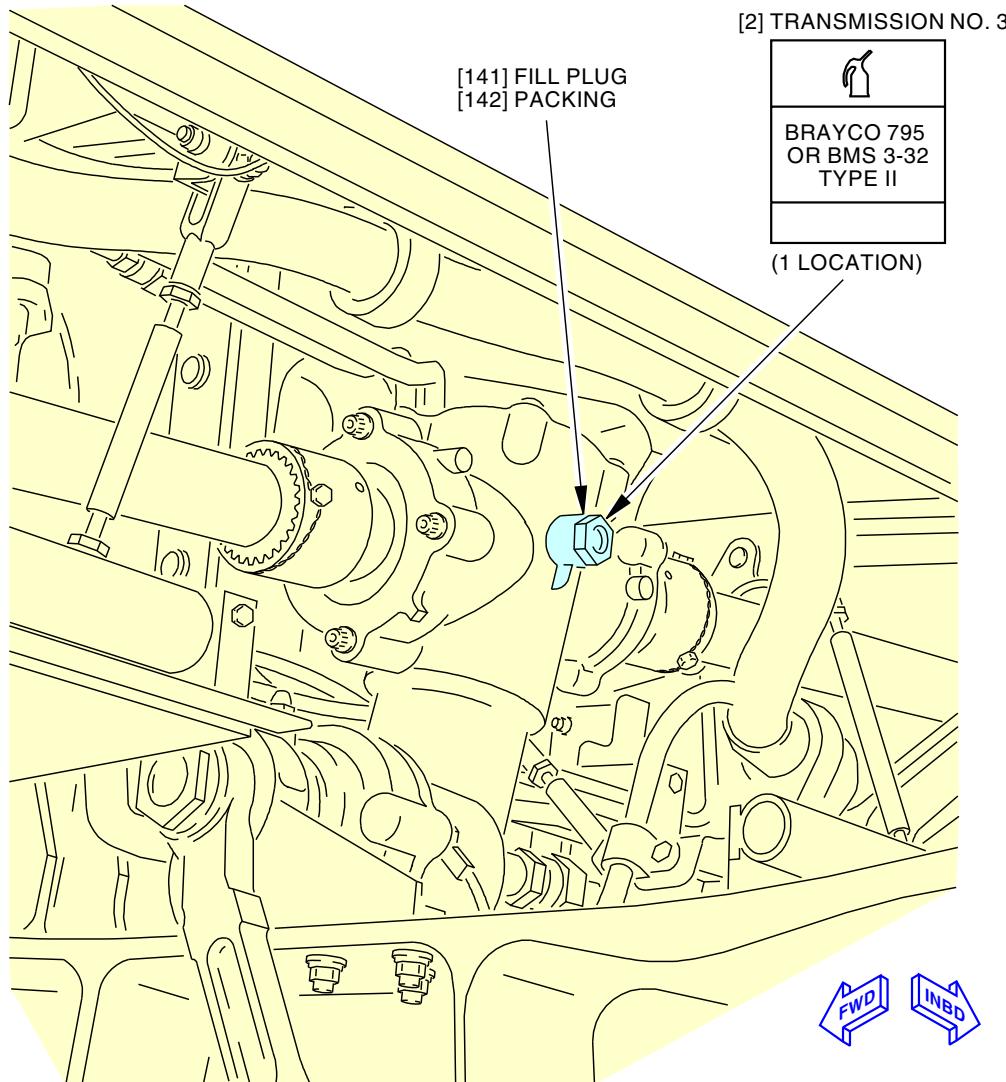
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G31789 S0006561596_V3

Trailing Edge Flap Transmission Servicing
Figure 320/12-22-51-990-819 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-22-51

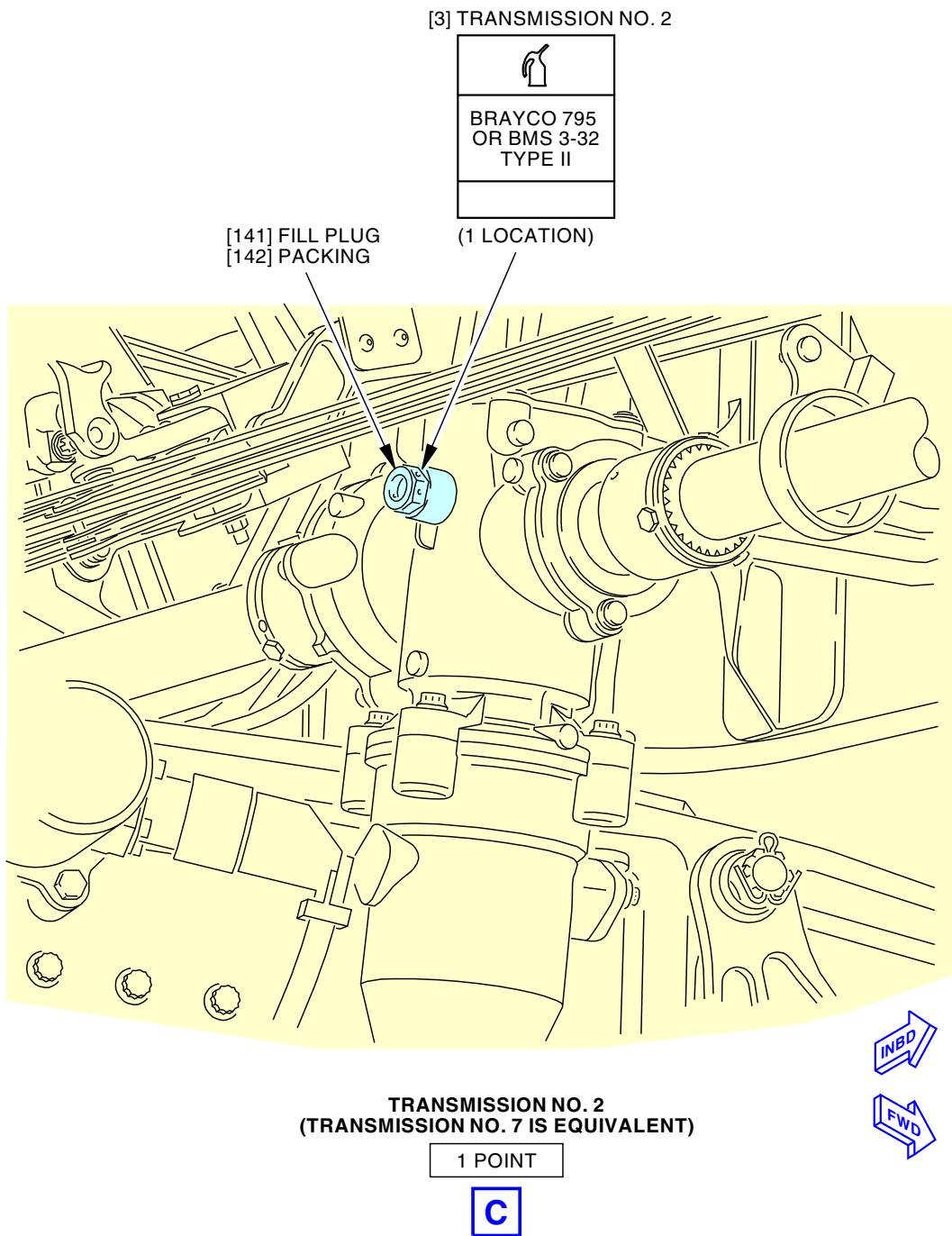
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G31821 S0006561597_V3

Trailing Edge Flap Transmission Servicing
Figure 320/12-22-51-990-819 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

12-22-51

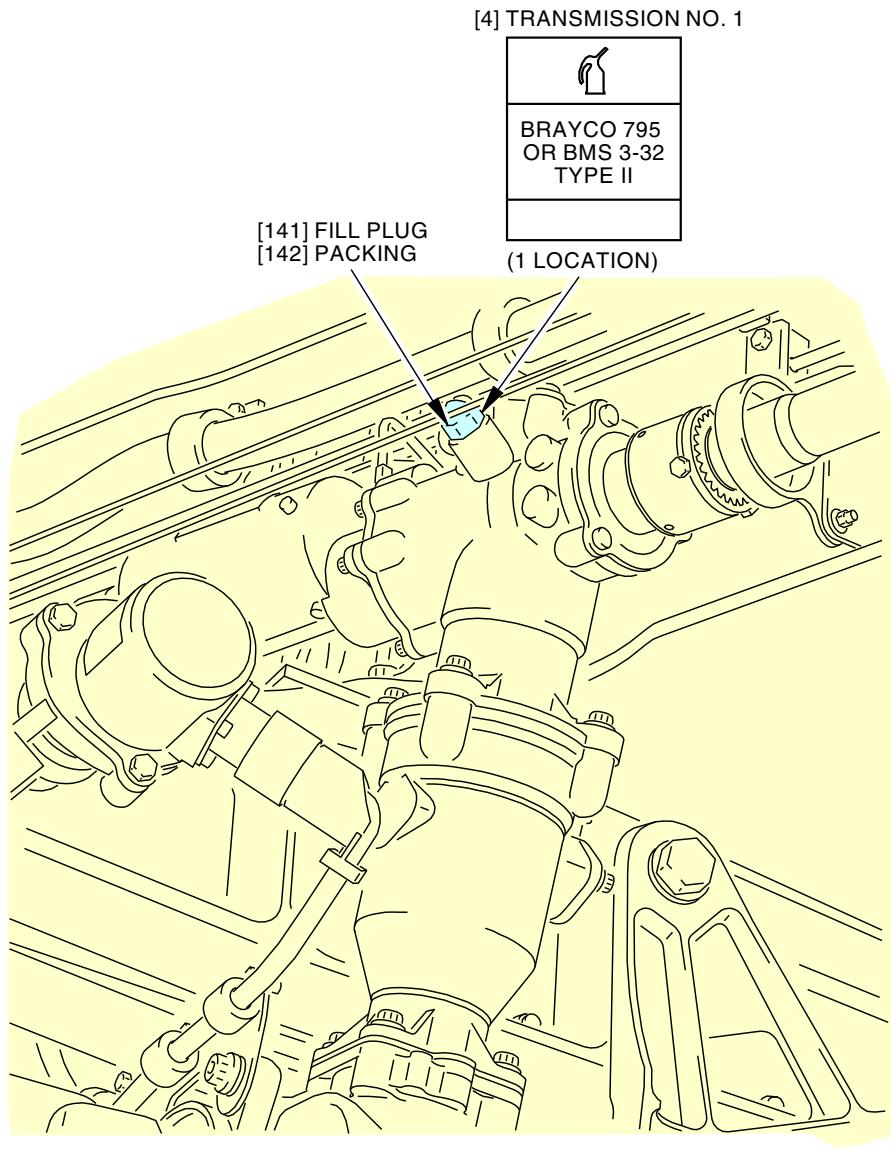
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D

G31861 S0006561598_V3

Trailing Edge Flap Transmission Servicing
Figure 320/12-22-51-990-819 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-610-804

21. Trailing Edge Flap Transmission Oil Replacement

(Figure 321)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is applicable to all of the transmissions on the trailing edge flaps.

B. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-51-18-000-802	Inboard Flap Support Aft Fairing Removal (P/B 401)
27-51-18-400-802	Inboard Flap Support Aft Fairing Installation (P/B 401)
27-51-28-000-802	Outboard Flap Outboard Support Aft Fairing Removal (P/B 401)
27-51-28-000-804	Outboard Flap Inboard Support Aft Fairing Removal (P/B 401)
27-51-28-400-802	Outboard Flap Outboard Support Aft Fairing Installation (P/B 401)
27-51-28-400-804	Outboard Flap Inboard Support Aft Fairing Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-3938	Container - Oil Resistant, 10 U.S. Gallon (38 Liter)

D. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00590	Fluid - Flap Drive System - Brayco 795	
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	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
162	Packing	27-51-31-13-165	LOM ALL
		27-51-31-15-125	LOM ALL
		27-51-41-03-172	LOM ALL
		27-51-41-07-190	LOM ALL
163	Packing	27-51-31-13-265	LOM ALL
		27-51-31-15-225	LOM ALL
		27-51-41-03-275	LOM ALL
		27-51-41-07-290	LOM ALL

EFFECTIVITY
LOM ALL

12-22-51



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F. Location Zones

Zone	Area
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
542	Left Wing - Fairing Flap Support No. 3
543	Left Wing - Fairing Flap Support No. 2
544	Left Wing - Fairing Flap Support No. 1
642	Right Wing - Fairing Flap Support No. 6
643	Right Wing - Fairing Flap Support No. 7
644	Right Wing - Fairing Flap Support No. 8

G. Prepare for the Fluid Replacement

SUBTASK 12-22-51-860-021

- (1) Extend the trailing edge flaps to the 40-unit position (TASK 27-51-00-860-803).

SUBTASK 12-22-51-040-020

- (2) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-51-010-004

- (3) Remove the aft fairings from the flap supports.

- (a) For flap supports Number 1 and 8, do this task: Outboard Flap Outboard Support Aft Fairing Removal, TASK 27-51-28-000-802.
- (b) For flap supports Number 2 and 7, do this task: Outboard Flap Inboard Support Aft Fairing Removal, TASK 27-51-28-000-804.
- (c) For flap supports Number 3 and 6, do this task: Inboard Flap Support Aft Fairing Removal, TASK 27-51-18-000-802.

H. Trailing Edge Flap Transmission Oil Replacement

SUBTASK 12-22-51-640-055

- (1) This table supplies data for the subsequent servicing steps (Table 320):

Table 320/12-22-51-993-840 Trailing Edge Flap Transmission Fluid Replacement

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Transmission No. 4 (Transmission No. 5 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
2	Transmission No. 3 (Transmission No. 6 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
3	Transmission No. 2 (Transmission No. 7 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1
4	Transmission No. 1 (Transmission No. 8 is Equivalent)	Brayco 795 fluid, D00590 or fluid, D00467	Fill	1

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-51-480-002

- (2) Put an oil resistant container (10 gal), STD-3938, below the applicable transmission to catch the fluid.

SUBTASK 12-22-51-680-002

- (3) Drain the fluid from the transmission.
 - (a) If it is necessary, remove lockwire from heads of the bolts [166].
 - (b) Remove the bolts [166] and washers [165] that attach the cap [164] to the transmission.
 - (c) Remove the cap [164] and packing [163] from the transmission.
 - (d) Discard the packing [163].
 - (e) Wait for Brayco 795 fluid, D00590, or fluid, D00467, to drain from the transmission.
 - (f) Clean the fluid from the mating surface of the cap [164].
 - (g) Apply Brayco 795 fluid, D00590, or fluid, D00467, to the new packing [163].



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.

- (h) Apply Cor-Ban 27L Compound, G50237 (preferred), or corrosion inhibiting material, G50136 (alternative), to the mating surface of the cap [164].
- (i) Install the cap [164] and packing [163] in the transmission.
- (j) Install the bolts [166] and washers [165] to hold the cap [164].
- (k) If it is necessary, install MS20995C32 lockwire, G01048, on the bolts [166] with the double twist method.

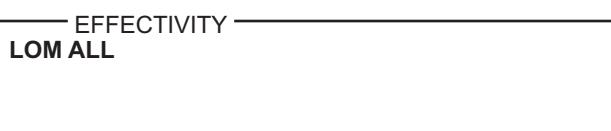
SUBTASK 12-22-51-610-004

- (4) Fill the transmission with fluid.
 - (a) Remove the lockwire from the fill plug [161].
 - (b) Remove the fill plug [161] and packing [162] from the fill port.
 - (c) Discard the packing [162].
 - (d) Add Brayco 795 fluid, D00590, or fluid, D00467, to the transmission until the fluid is at the level of the fill port.
 - (e) Lubricate the new packing [162] with fluid.
 - (f) Install the fill plug [161] and packing [162] in the fill port.
 - (g) Tighten the fill plug [161] to 140 ± 10 in-lb (15.8 ± 1.1 N·m).
 - (h) Install MS20995C32 lockwire, G01048, on the fill plug [161] with the double twist method.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-410-004

- (1) Install the aft fairings on the flap supports.
 - (a) For flap supports Number 1 and 8, do this task: Outboard Flap Outboard Support Aft Fairing Installation, TASK 27-51-28-400-802.
 - (b) For flap supports Number 2 and 7, do this task: Outboard Flap Inboard Support Aft Fairing Installation, TASK 27-51-28-400-804.



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- (c) For flap supports Number 3 and 6, do this task: Inboard Flap Support Aft Fairing Installation, TASK 27-51-18-400-802.

SUBTASK 12-22-51-440-020

- (2) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

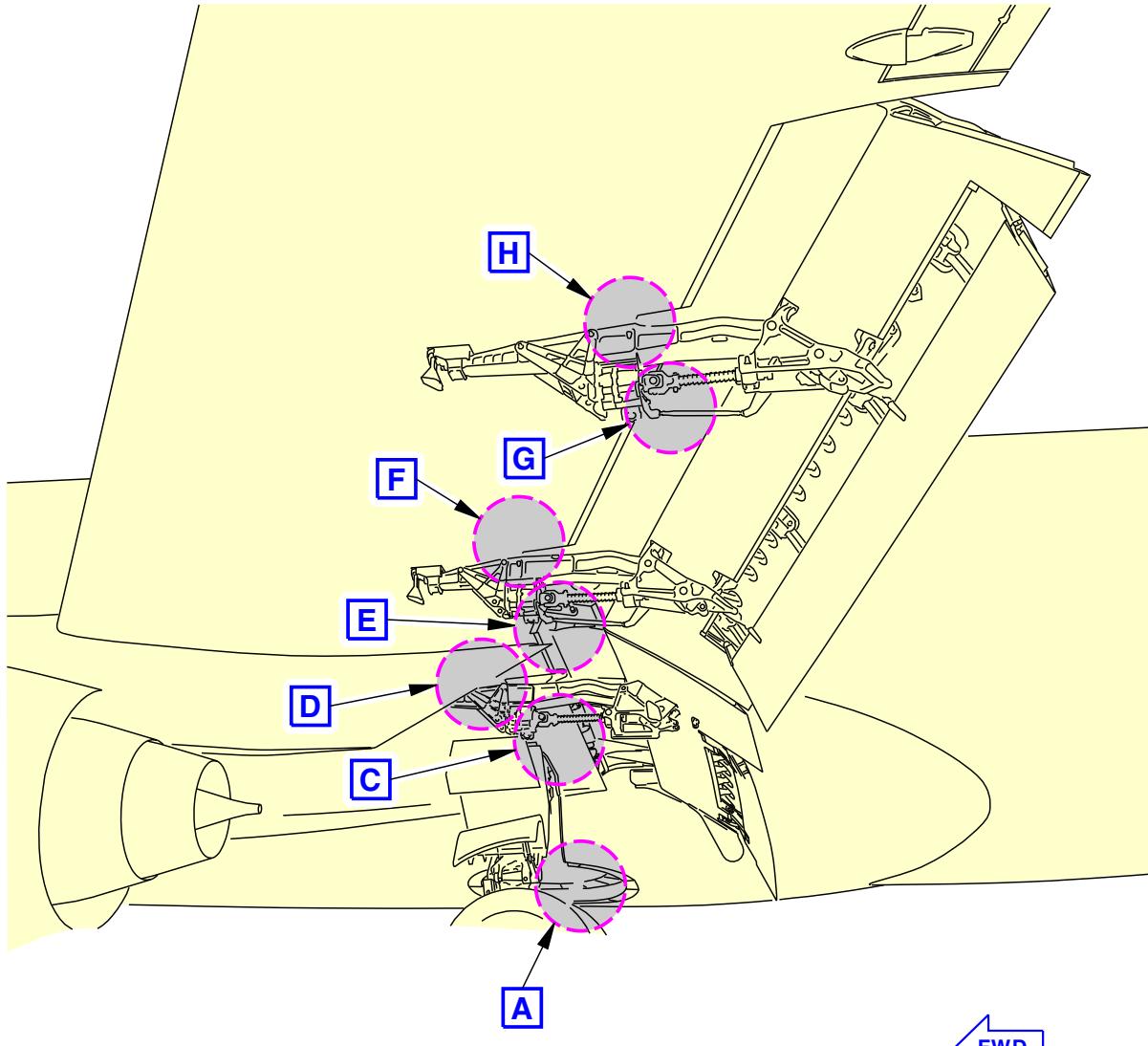
SUBTASK 12-22-51-860-022

- (3) Retract the trailing edge flaps to the UP position (TASK 27-51-00-860-804).

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-51



G32059 S0006561601_V3

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 1 of 9)

EFFECTIVITY
LOM ALL

12-22-51

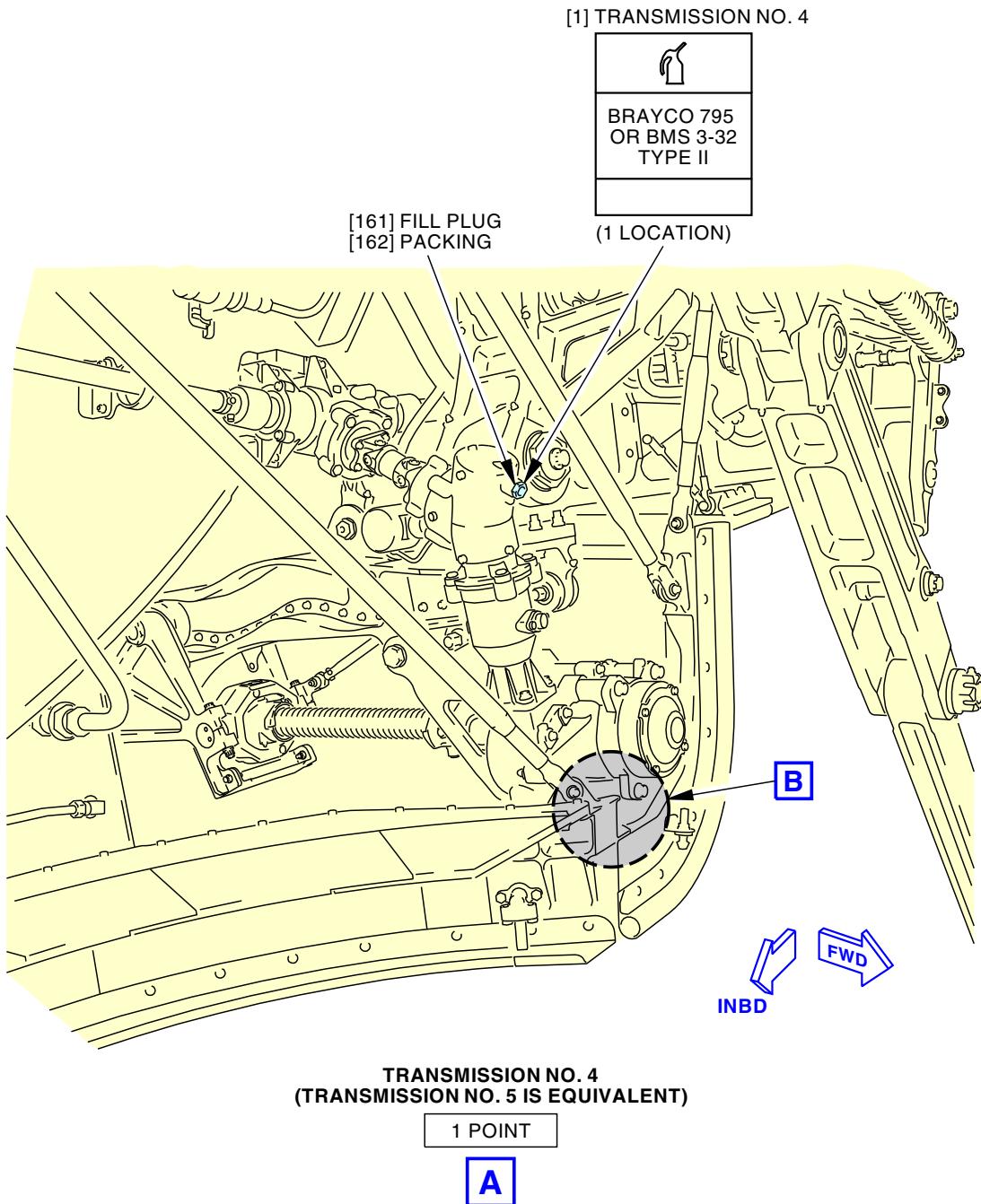
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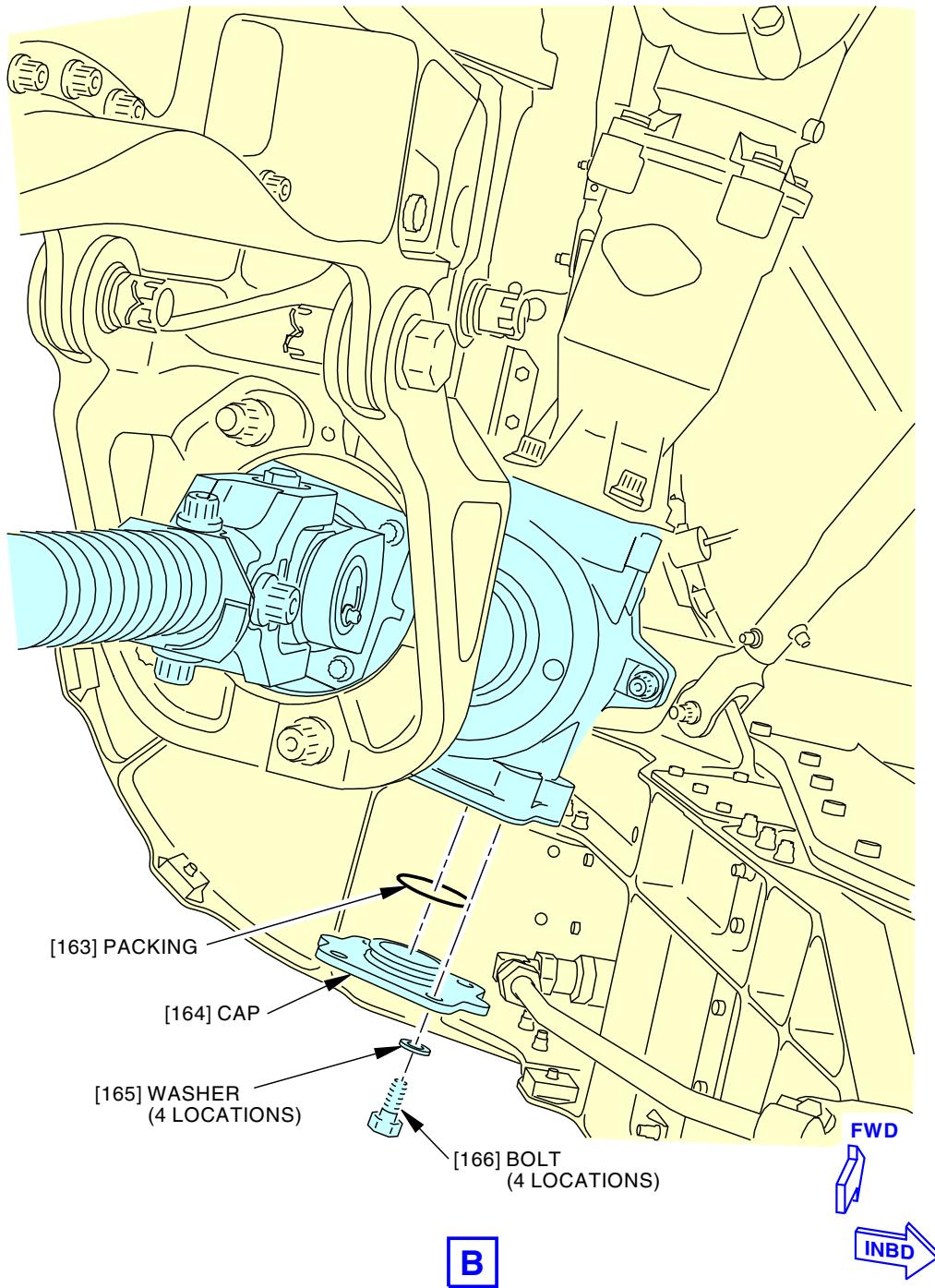


G32175 S0006561602_V3

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 2 of 9)

EFFECTIVITY
LOM ALL

12-22-51



G32296 S0006561603_V2

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 3 of 9)

EFFECTIVITY
LOM ALL

12-22-51

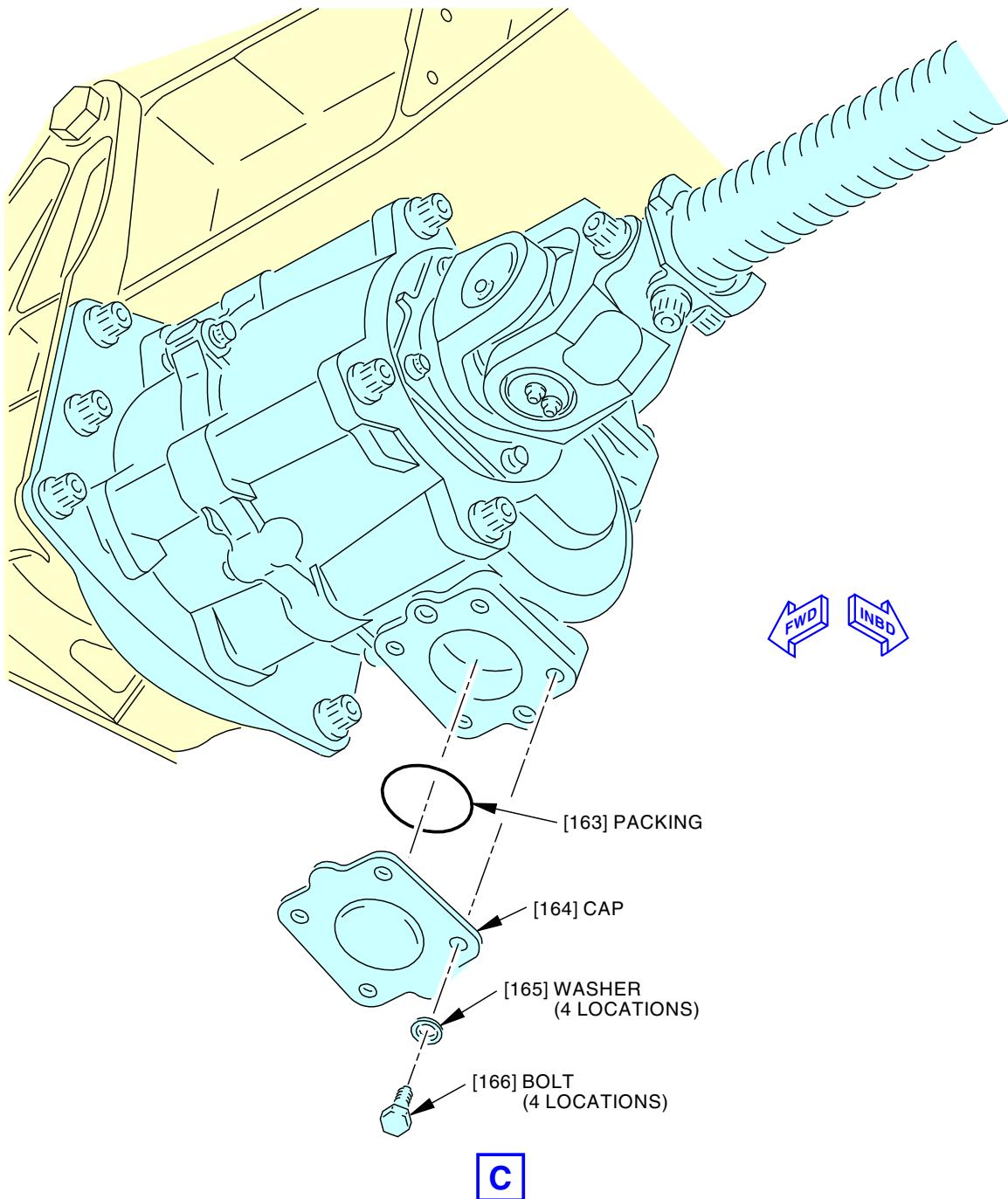
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G32395 S0006561604_V2

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 4 of 9)

EFFECTIVITY
LOM ALL

12-22-51

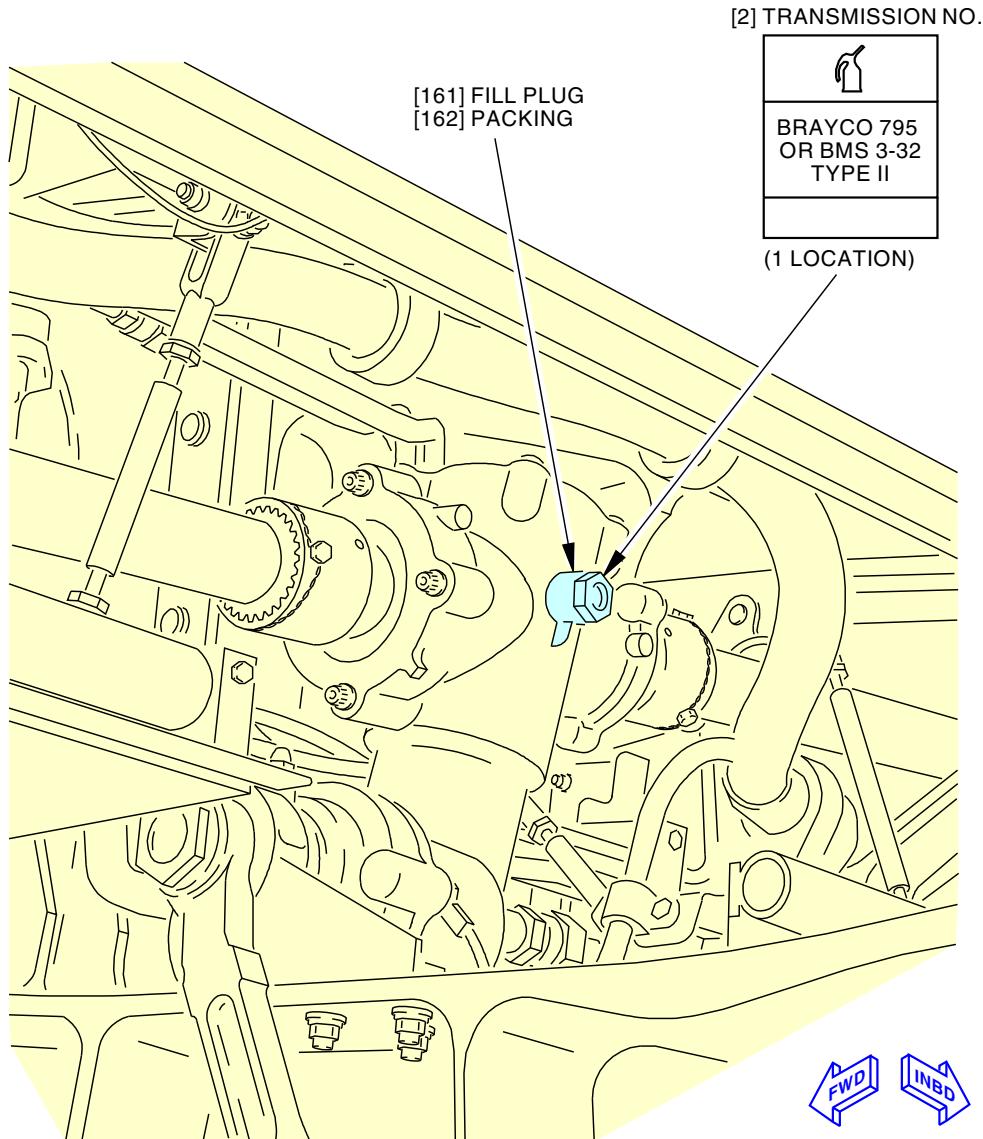
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TRANSMISSION NO. 3
(TRANSMISSION NO. 6 IS EQUIVALENT)

1 POINT

D

G32450 S0006561605_V3

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 5 of 9)

EFFECTIVITY
LOM ALL

12-22-51

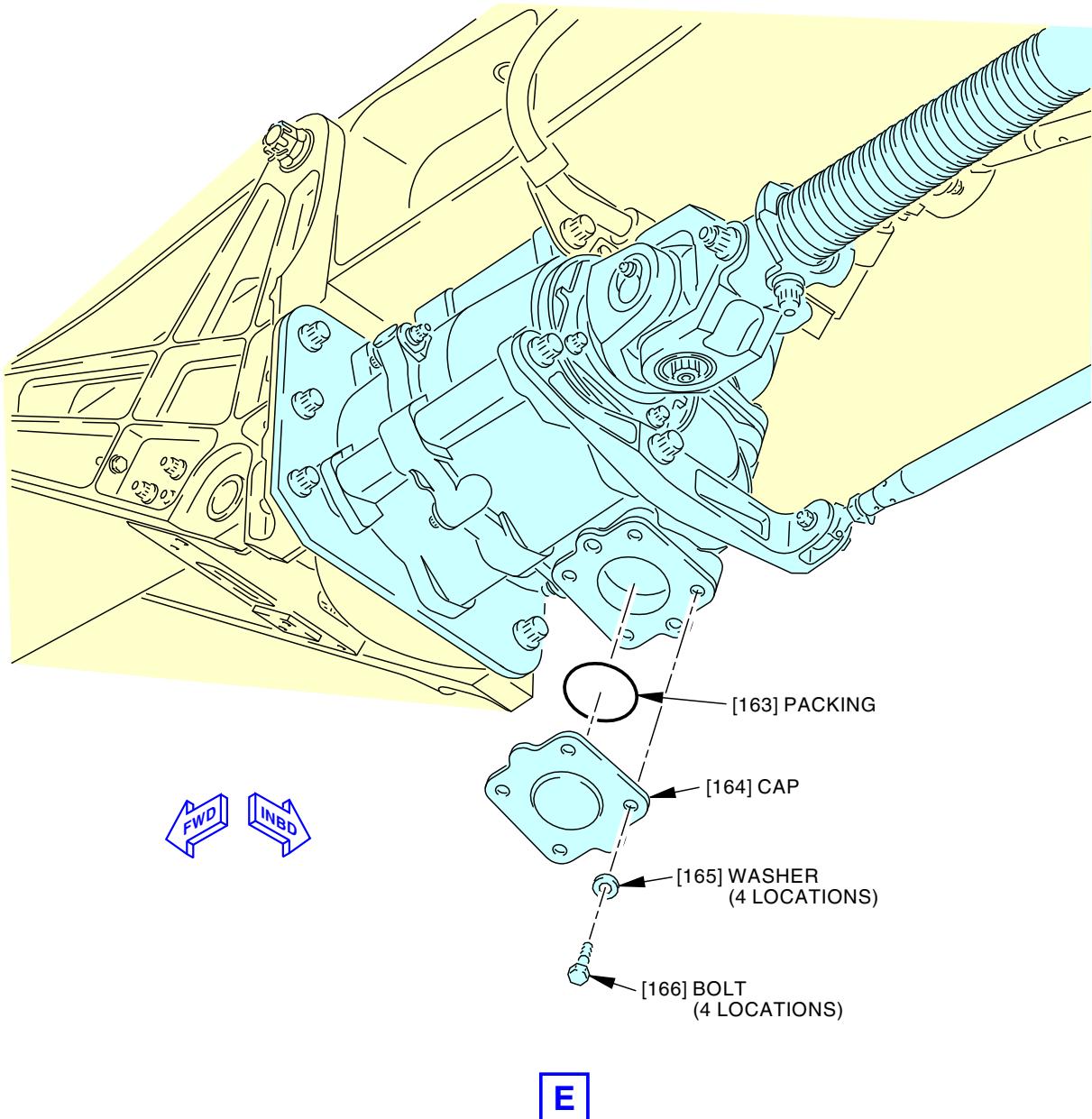
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G32517 S0006561606_V2

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 6 of 9)

EFFECTIVITY
LOM ALL

12-22-51

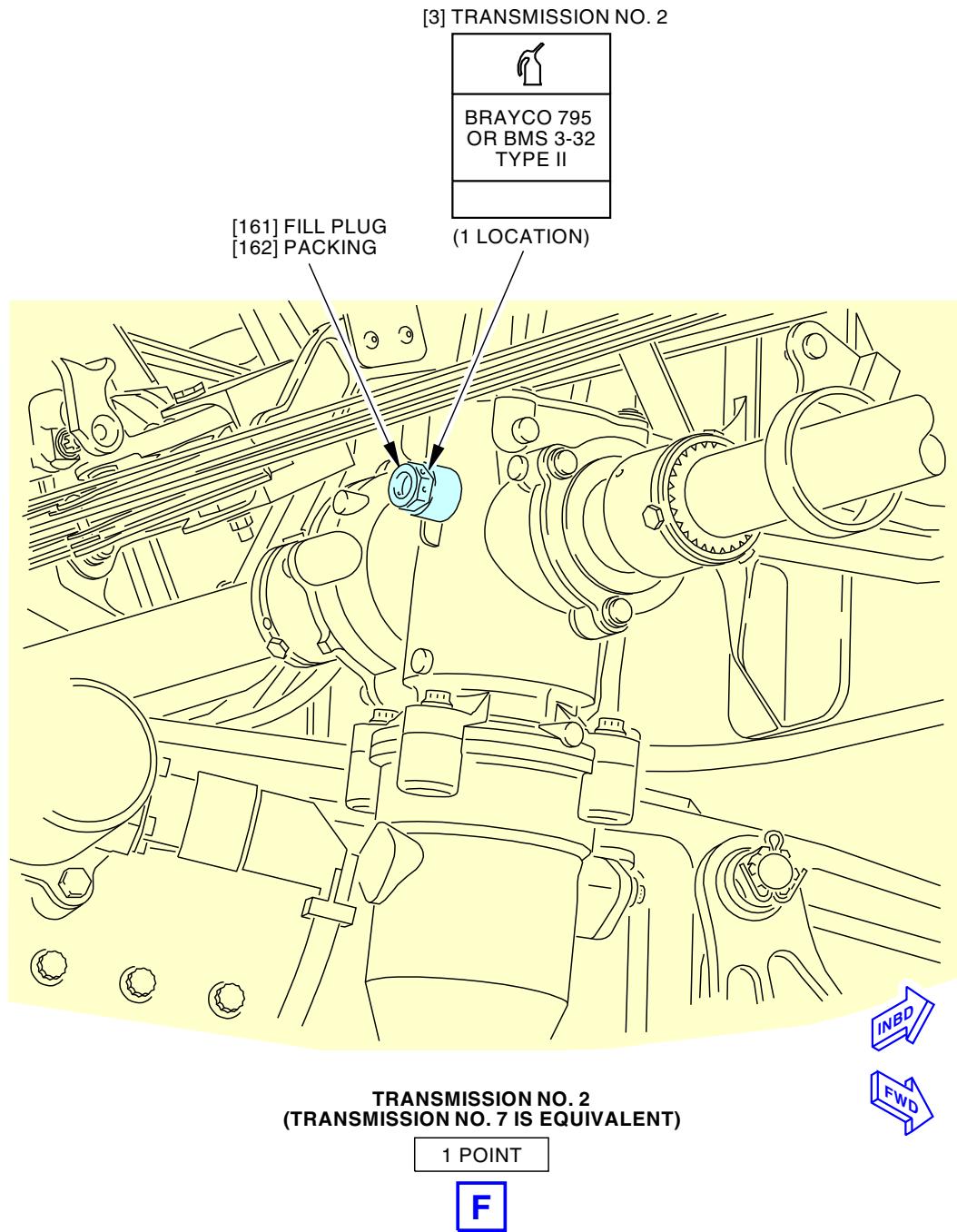
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G32550 S0006561607_V3

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 7 of 9)

EFFECTIVITY
LOM ALL

12-22-51

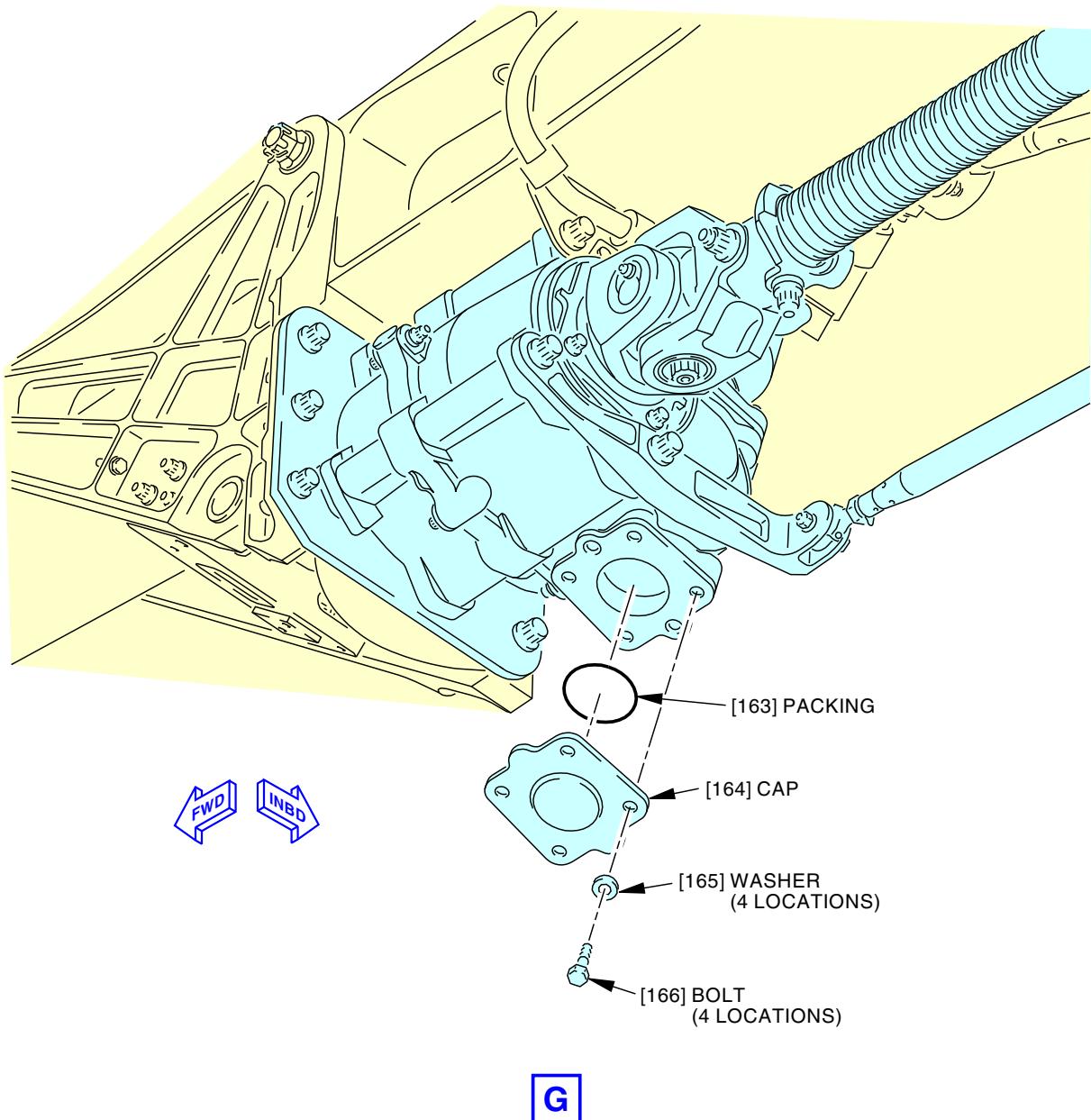
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G32569 S0006561608_V2

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 8 of 9)

EFFECTIVITY
LOM ALL

12-22-51

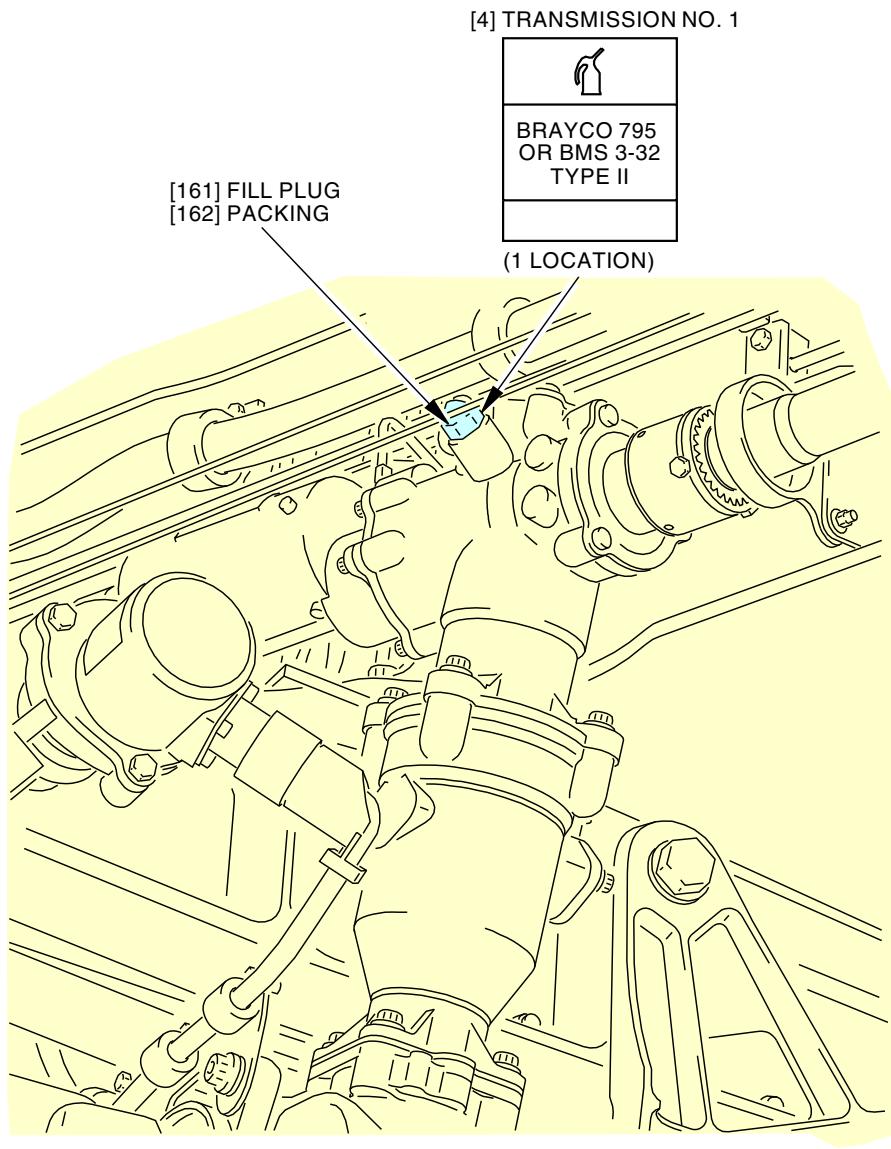
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TRANSMISSION NO. 1
(TRANSMISSION NO. 8 IS EQUIVALENT)

1 POINT

H



G32606 S0006561609_V3

Trailing Edge Flap Transmission Fluid Replacement
Figure 321/12-22-51-990-820 (Sheet 9 of 9)

EFFECTIVITY
LOM ALL

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TASK 12-22-51-610-805

22. Trailing Edge Flap Electric Motor Servicing

(Figure 322)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
G02392 [P05-262]	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8121 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
182	Packing	27-51-51-10-060	LOM ALL

D. Location Zones

Zone	Area
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

E. Prepare for the Lubrication

SUBTASK 12-22-51-040-021

- (1) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

F. Trailing Edge Flap Electric Motor Servicing

(Table 321)

SUBTASK 12-22-51-640-056

- (1) This table supplies data for the subsequent servicing steps:

Table 321/12-22-51-993-842 Trailing Edge Flap Electric Motor Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Flap Electric Motor	fluid, D00070	Fill	1

SUBTASK 12-22-51-610-005

- (2) Do a check of the fluid level in the flap electric motor:
 - (a) Remove the fill plug [181] and packing [182] from the fill port.
 - (b) Make sure the fluid is at the level of the fill port.
 - (c) If the fluid is not at the level of the fill port, fill the flap electric motor with fluid, D00070 to the level of the fill port.
 - (d) Lubricate the new packing [182] with fluid.
 - (e) Install the fill plug [181] and new packing [182] in the fill port.
 - (f) Tighten the fill plug [181] to 30 in-lb (3.39 N·m) - 35 in-lb (3.95 N·m).

EFFECTIVITY
LOM ALL

12-22-51



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- (g) Install MS20995C32 lockwire, G02392 [P05-262] on the fill plug [181].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-51-440-021

- (1) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

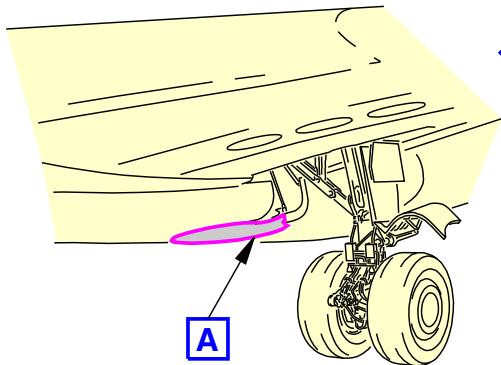
———— END OF TASK ————

EFFECTIVITY
LOM ALL

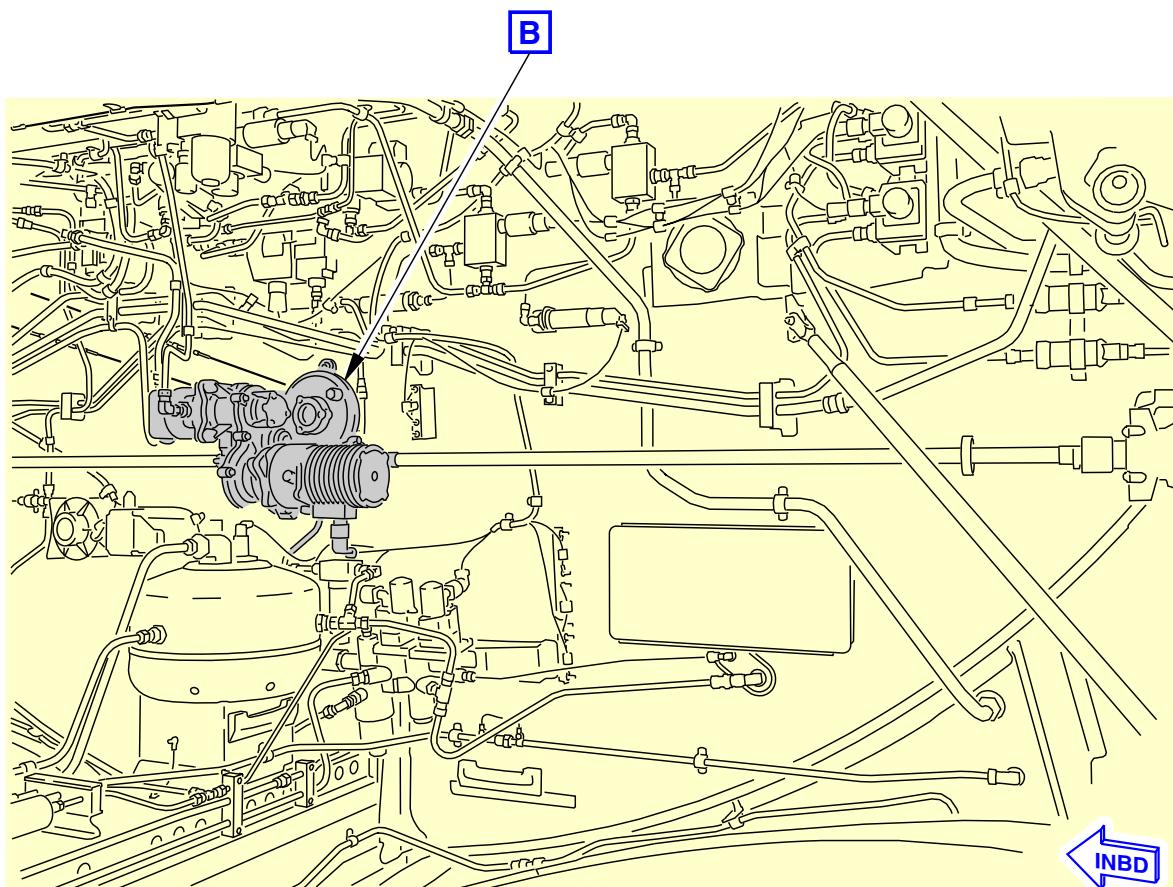
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FWD



B

INBD

MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)

A

FWD

G78875 S0006561612_V2

Trailing Edge Flap Electric Motor Servicing
Figure 322/12-22-51-990-841 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-51

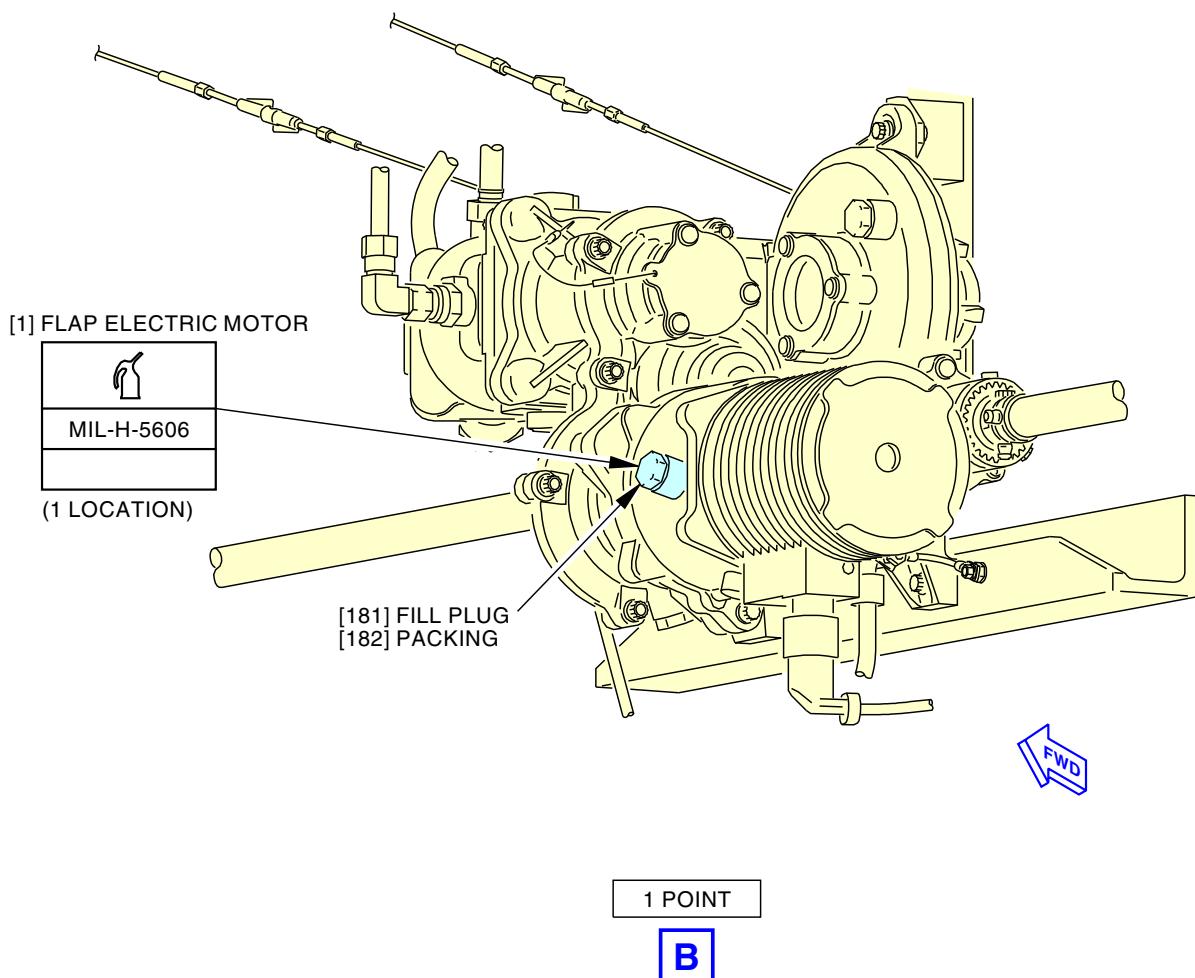
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AIRCRAFT MAINTENANCE MANUAL



G78646 S0006561613_V2

Trailing Edge Flap Electric Motor Servicing
Figure 322/12-22-51-990-841 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-51

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SPOILER CONTROL SYSTEM - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A lubrication of the spoiler mixer.
 - (2) A lubrication of the flight spoiler actuators quadrants and the actuator rod ends.
 - (3) A lubrication of the outboard ground spoiler actuators.

TASK 12-22-61-600-801

2. Spoiler Mixer Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
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

C. Spoiler Mixer Lubrication

(Table 301)

SUBTASK 12-22-61-640-004

- (1) This table supplies data for the subsequent lubrication steps:

Table 301/12-22-61-993-804 Spoiler Mixer Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Rollers	grease, D00633	Flush	2

SUBTASK 12-22-61-010-001

- (2) Remove the roller access covers [103] to get access to the rollers [1].
 - (a) Remove bolts [101] and washers [102].

SUBTASK 12-22-61-640-003

- (3) Lubricate the rollers [1] with grease, D00633.

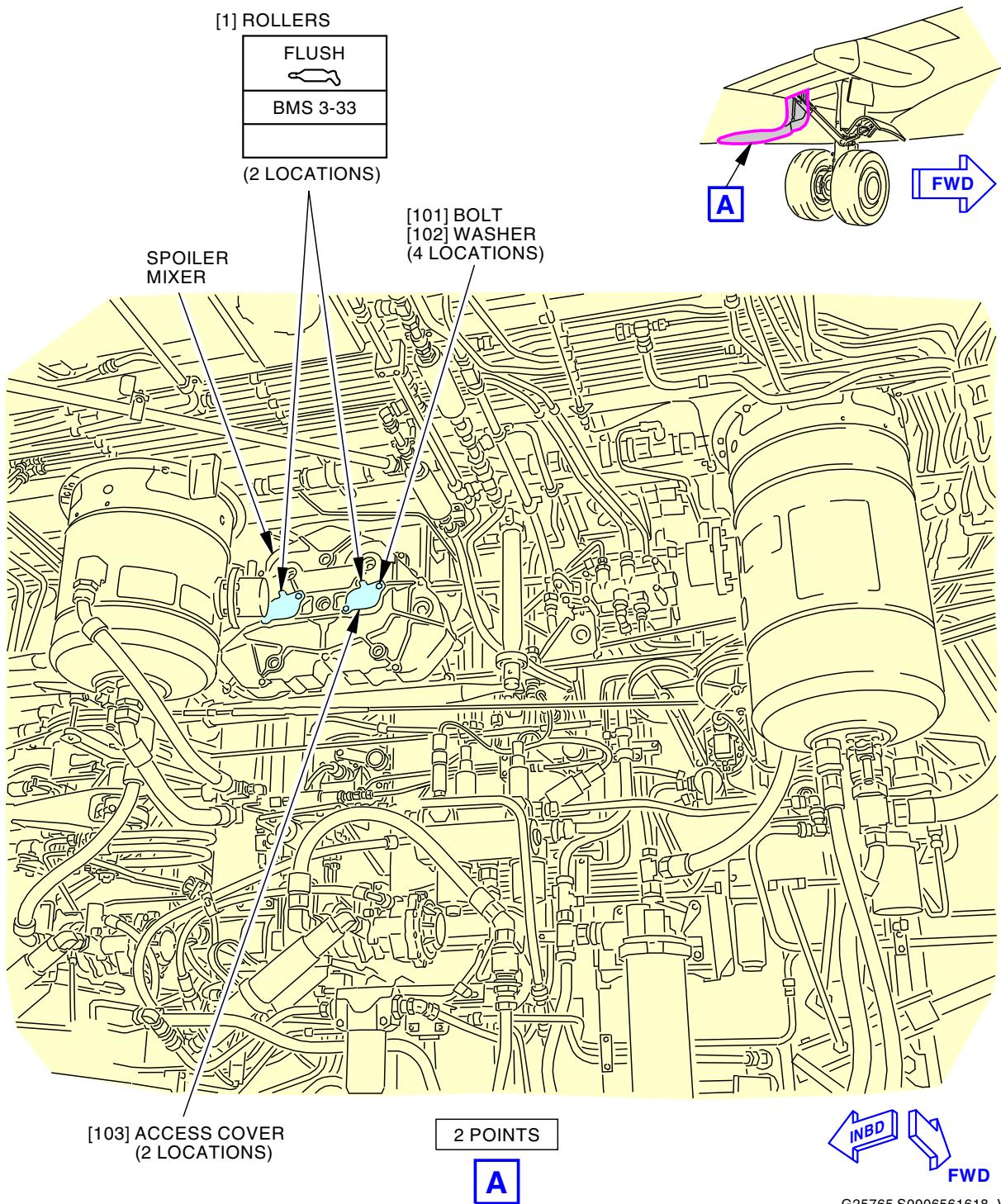
SUBTASK 12-22-61-410-001

- (4) Install the roller access covers [103].
 - (a) Install washers [102] and bolts [101].

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-61

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G25765 S0006561618_V3

**Spoiler Mixer Servicing
Figure 301/12-22-61-990-801**

 EFFECTIVITY
 LOM ALL

12-22-61

D633A101-LOM

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TASK 12-22-61-600-802

3. Flight Spoiler Actuator Quadrant and Rod End Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-61-00-800-801	Spoiler Hydraulic Systems A and B Pressurization (P/B 201)
27-61-00-840-801	Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization (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-1745	Set - Lock, Flight Spoiler Actuator (Contains 8 Lock Assys)(737NG before L/N 2040) Part #: C27047-41 Supplier: 81205 Opt Part #: C27047-19 Supplier: 81205
SPL-5586	Set - Lock, Flight Spoiler Actuator, 737 SFP (Short Field Performance) (Contains 8 Lock Assemblies) Part #: C27047-43 Supplier: 81205
SPL-14240	Set - Lock, Flight Spoiler Actuator (Contains 8 Lock Assemblies)(737NG after L/N 2040) Part #: C27047-41 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
210	Subzone - Control Compartment - Body Station 178.00 to Body Station 259.50
562	Left Wing - Spoiler No. 5
563	Left Wing - Spoiler No. 4
564	Left Wing - Spoiler No. 3
565	Left Wing - Spoiler No. 2
662	Right Wing - Spoiler No. 8
663	Right Wing - Spoiler No. 9
664	Right Wing - Spoiler No. 10
665	Right Wing - Spoiler No. 11

EFFECTIVITY
LOM ALL

12-22-61



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E. Prepare for Lubrication

SUBTASK 12-22-61-860-001

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

SUBTASK 12-22-61-860-002



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDER, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

SUBTASK 12-22-61-860-003

- (3) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-61-040-001

- (4) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-61-860-004

- (5) Move the speed brake lever to the UP position and install the DO NOT OPERATE tag, STD-858 on the lever.

SUBTASK 12-22-61-860-005

- (6) Do this task: Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-61-00-840-801.

LOM 402, 404, 406

SUBTASK 12-22-61-480-001

- (7) Install the set, SPL-1745 on the spoiler actuators.

NOTE: SPL-14240 may be used in place of SPL-1745 for future use.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 12-22-61-480-002

- (8) Install the lock set, SPL-5586 on the spoiler actuators.

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 12-22-61-480-006

- (9) Install the set, SPL-14240 on the spoiler actuators.

LOM ALL

F. Flight Spoiler Actuator Quadrant and Rod End Lubrication

(Table 302)

SUBTASK 12-22-61-640-005

- (1) This table supplies data for the subsequent lubrication step:

EFFECTIVITY
LOM ALL

12-22-61

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Table 302/12-22-61-993-805 Flight Spoiler Actuator Quadrant Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Rod End	grease, D00633	Flush	8
2	Actuator Rod End	grease, D00633	Flush	4
LOM 427-431, 433, 434, 440, 442, 450-454, 457, 464-999; LOM 411, 422, 425 POST SB 737-27-1303				
3	Hydraulic Journal	grease, D00633	Flush	4
4	Trunnion Block	grease, D00633	Flush	4
LOM ALL				

SUBTASK 12-22-61-610-001

- (2) Lubricate the quadrant rod ends [1] with grease, D00633.

SUBTASK 12-22-61-610-003

- (3) Lubricate the actuator rod end [2] with grease, D00633.

LOM 402, 404, 406

NOTE: If necessary, temporary removal of the set, SPL-1745 to lubricate the actuator rod end [2].

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

NOTE: If necessary, temporary removal of the lock set, SPL-5586 to lubricate the actuator rod end [2].

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

NOTE: If necessary, temporary removal of the set, SPL-14240 to lubricate the actuator rod end [2].

LOM 427-431, 433, 434, 440, 442, 450-454, 457, 464-999; LOM 411, 422, 425 POST SB 737-27-1303

SUBTASK 12-22-61-610-004

- (4) Lubricate the hydraulic journal [3] with grease, D00633.

SUBTASK 12-22-61-610-005

- (5) Lubricate the trunnion block [4] with grease, D00633.

LOM ALL

G. Put the Airplane Back to Its Usual Condition.

LOM 402, 404, 406

SUBTASK 12-22-61-080-001

- (1) Remove the set, SPL-1745 from the spoiler actuators.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 12-22-61-080-002

- (2) Remove the lock set, SPL-5586 from the spoiler actuators.

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 12-22-61-860-020

- (3) Remove the set, SPL-14240 from the spoiler actuators.

LOM ALL

EFFECTIVITY
LOM ALL

12-22-61



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SUBTASK 12-22-61-860-006



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDER, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

SUBTASK 12-22-61-440-001

- (5) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-22-61-860-007

- (6) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-22-61-860-019

- (7) Move the speed brake lever to the DOWN position.

SUBTASK 12-22-61-860-008

- (8) Do this task: Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-61-00-840-801.

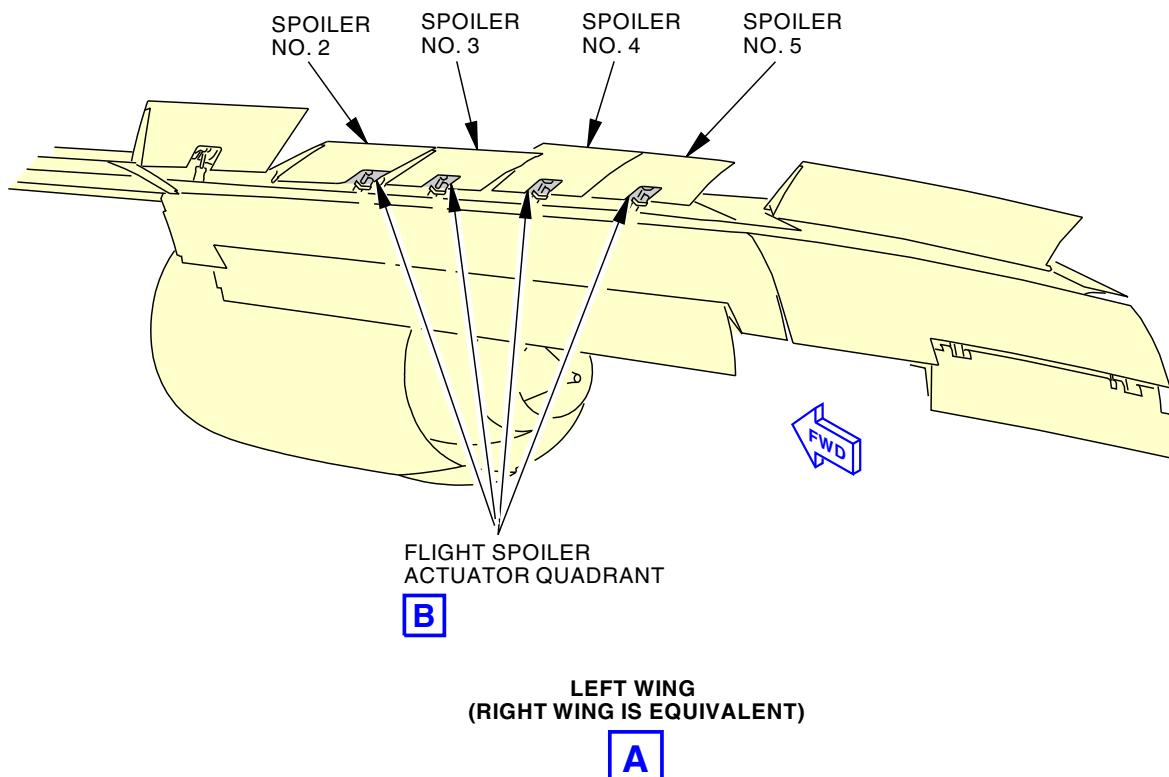
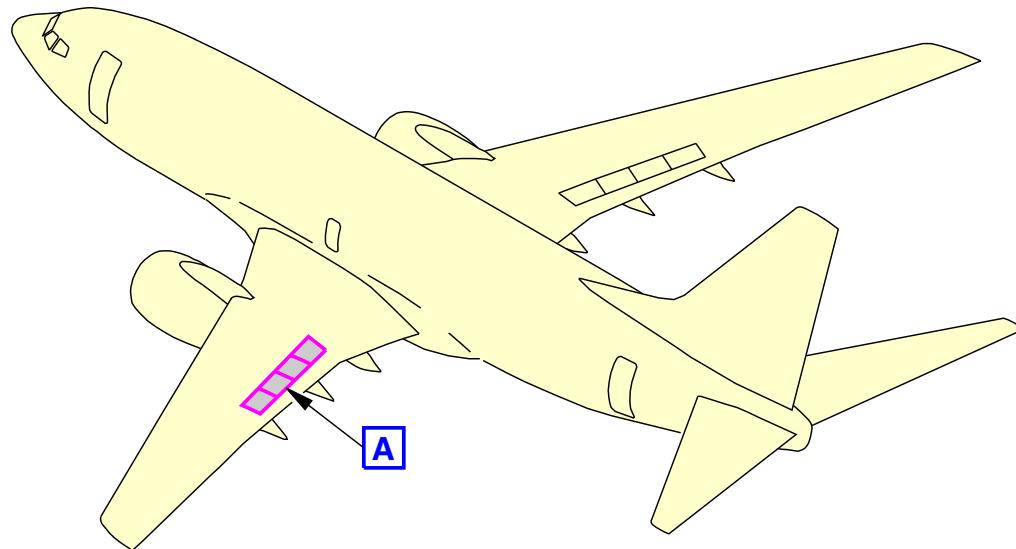
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-61



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G25767 S0006561621_V2

Flight Spoiler Actuator Quadrant and Rod End Servicing
Figure 302/12-22-61-990-802 (Sheet 1 of 4)

EFFECTIVITY	LOM ALL
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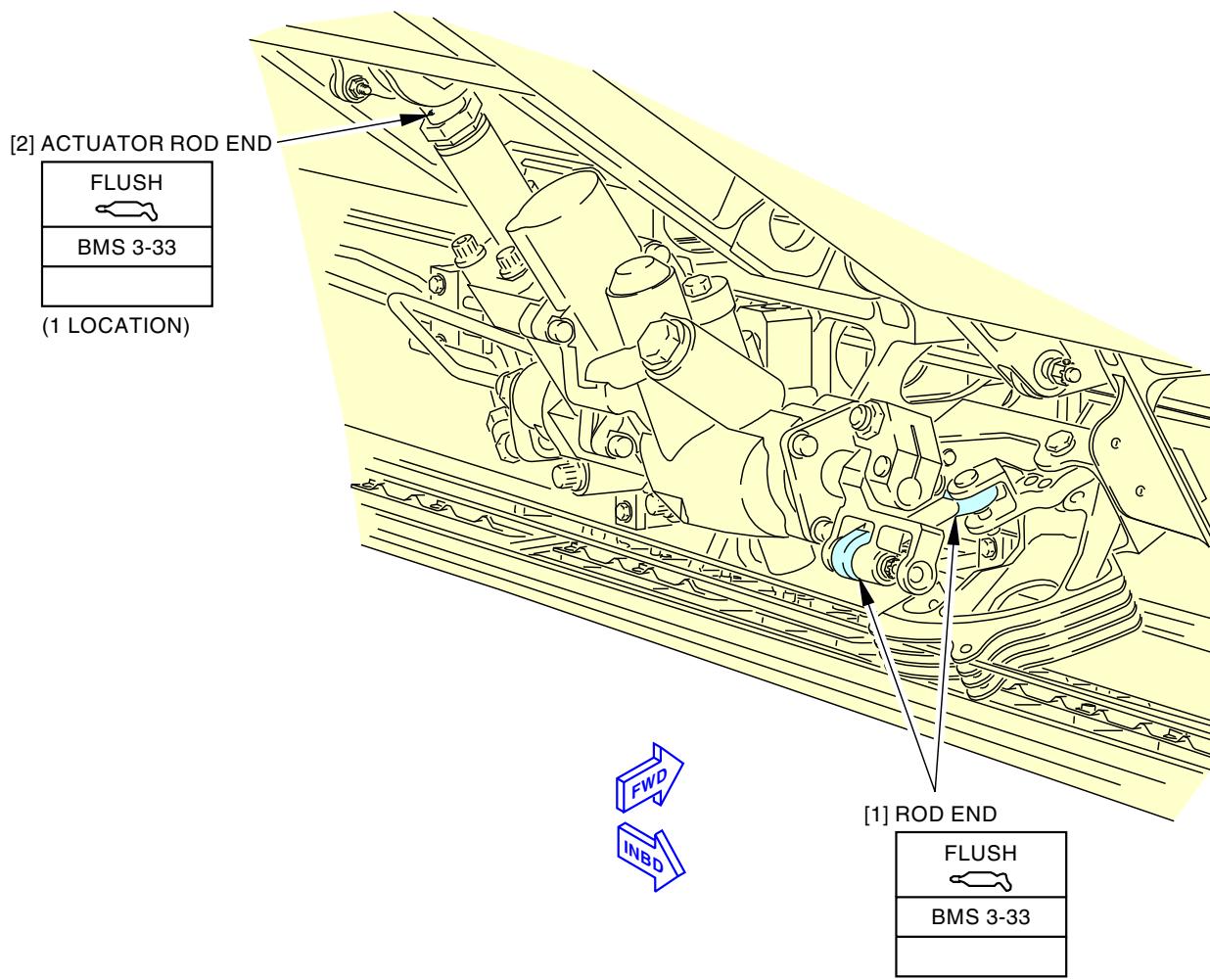
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FLIGHT SPOILER ACTUATOR
(EXAMPLE, 4 LOCATIONS)

3 POINTS

B

3028475 S0000799839_V1

Flight Spoiler Actuator Quadrant and Rod End Servicing
Figure 302/12-22-61-990-802 (Sheet 2 of 4)

EFFECTIVITY
LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424,
426, 432, 437-439, 441, 443-447, 455, 456, 458-463;
LOM 411, 422, 425 PRE SB 737-27-1303

12-22-61

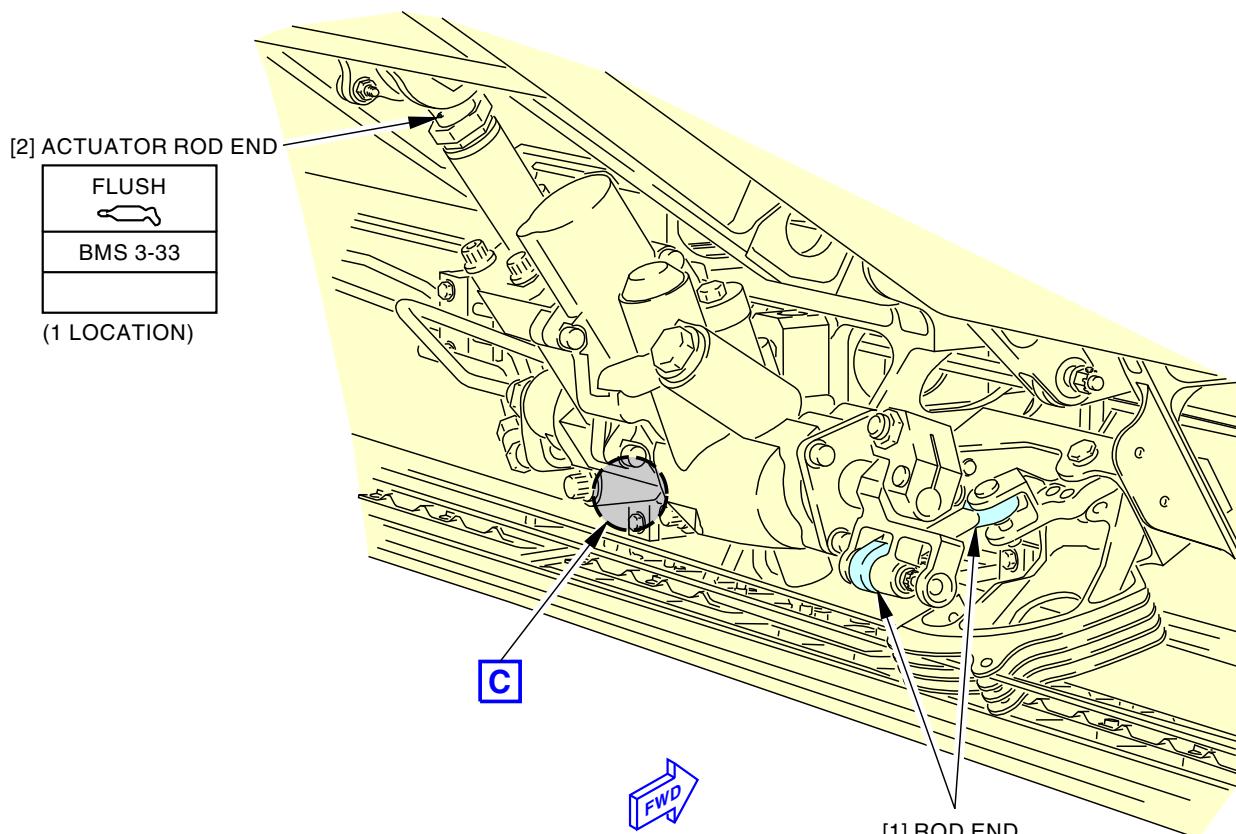
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FLIGHT SPOILER ACTUATOR
(EXAMPLE, 4 LOCATIONS)

3 POINTS

B

2120934 S0000456379_V4

Flight Spoiler Actuator Quadrant and Rod End Servicing
Figure 302/12-22-61-990-802 (Sheet 3 of 4)

EFFECTIVITY
LOM 427-431, 433, 434, 440, 442, 450-454, 457,
464-999; LOM 411, 422, 425 POST SB 737-27-1303

12-22-61

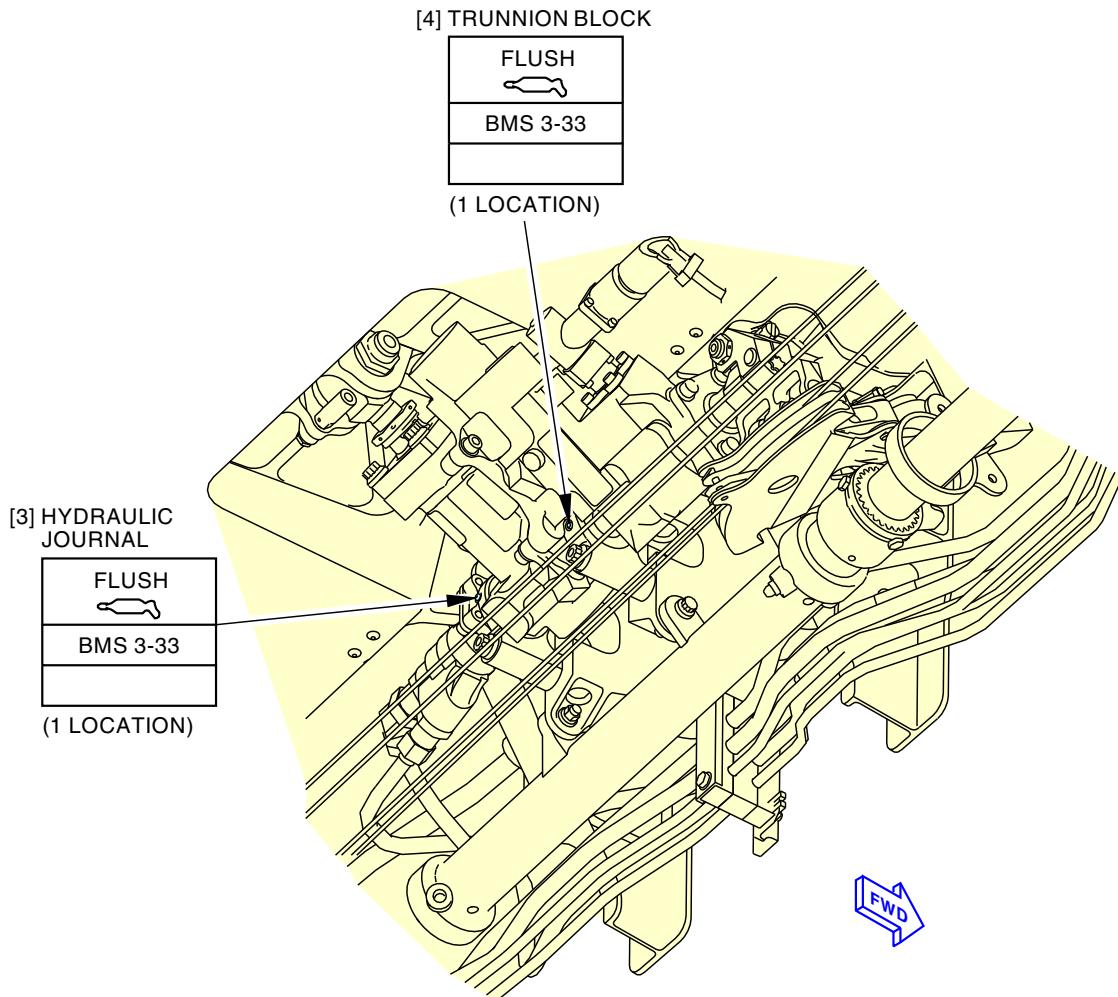
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2120939 S0000456380_V2

Flight Spoiler Actuator Quadrant and Rod End Servicing
Figure 302/12-22-61-990-802 (Sheet 4 of 4)

EFFECTIVITY
LOM 427-431, 433, 434, 440, 442, 450-454, 457,
464-999; LOM 411, 422, 425 POST SB 737-27-1303

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TASK 12-22-61-640-801

4. Outboard Ground Spoiler Actuator Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap System Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap System Reactivation (P/B 201)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-61-00-800-801	Spoiler Hydraulic Systems A and B Pressurization (P/B 201)
27-61-00-840-801	Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization (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-1743	Ground Lock Set - Outboard Spoiler Actuators Part #: C27001-51 Supplier: 81205 Opt Part #: C27001-42 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
210	Subzone - Control Compartment - Body Station 178.00 to Body Station 259.50
566	Left Wing - Spoiler No. 1
666	Right Wing - Spoiler No. 12

E. Prepare for the Lubrication

SUBTASK 12-22-61-860-009

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

SUBTASK 12-22-61-860-010



MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

EFFECTIVITY
LOM ALL

12-22-61



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SUBTASK 12-22-61-860-011

- (3) Put the SPOILER A and B switches to the OFF position to remove the hydraulic power from the flight spoilers.

NOTE: SPOILER A and B switches are on the flight control panel (P5-3).

- (a) Install the DO NOT OPERATE tag, STD-858 on the spoiler A and B switches.

SUBTASK 12-22-61-860-012

- (4) Extend the trailing edge flaps to the 40-unit position, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 12-22-61-040-002

- (5) Do this task: Trailing Edge Flap System Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-22-61-860-013

- (6) Move the speed brake lever to the UP position and install the DO NOT OPERATE tag, STD-858.

SUBTASK 12-22-61-860-014

- (7) Do this task: Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-61-00-840-801.

SUBTASK 12-22-61-480-003

- (8) Install ground lock ground lock set, SPL-1743.

F. Outboard Ground Spoiler Actuator Lubrication

(Table 303)

SUBTASK 12-22-61-640-006

- (1) This table supplies data for the subsequent lubrication step:

Table 303/12-22-61-993-806 Outboard Ground Spoiler Actuator Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Pillow Blocks	grease, D00633	Flush	2

SUBTASK 12-22-61-610-002

- (2) Lubricate the pillow blocks [1] for the outboard ground spoiler actuators with grease, D00633.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-61-080-003

- (1) Remove ground lock ground lock set, SPL-1743.

SUBTASK 12-22-61-860-015



MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

SUBTASK 12-22-61-440-002

- (3) Do this task: Trailing Edge Flap System Reactivation, TASK 27-51-00-440-801.

EFFECTIVITY
LOM ALL

12-22-61



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SUBTASK 12-22-61-860-016

- (4) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-22-61-860-017

- (5) Move the speed brake lever to the DOWN position.

SUBTASK 12-22-61-860-018

- (6) Do this task: Put the Spoiler Hydraulic systems A and B Back to the Condition Before the Pressurization, TASK 27-61-00-840-801.

SUBTASK 12-22-61-640-002

- (7) Put the SPOILER A and B switches to the ON position.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

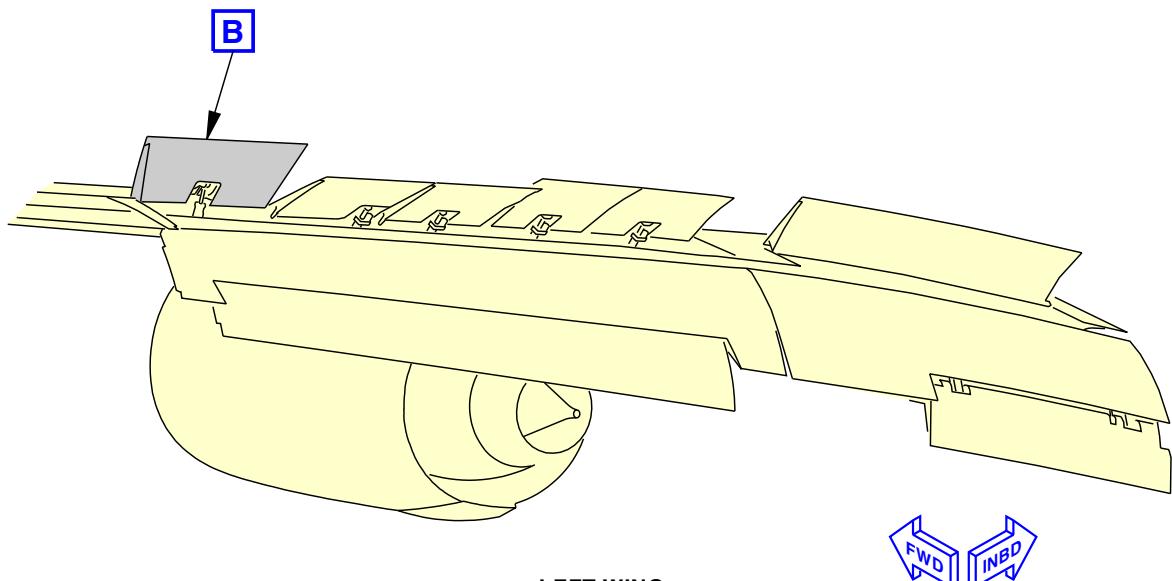
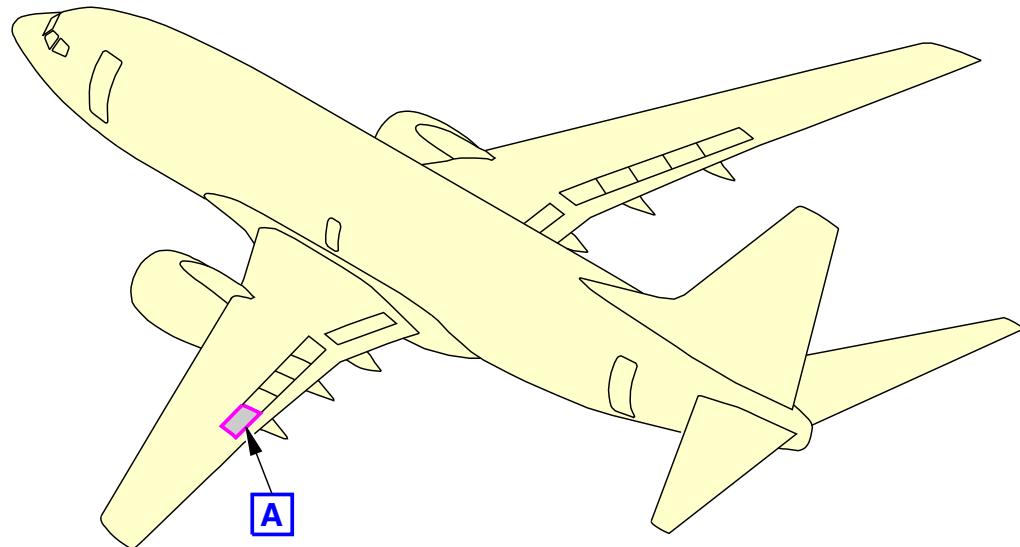
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A

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Outboard Ground Spoiler Actuator Lubrication
Figure 303/12-22-61-990-803 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-61

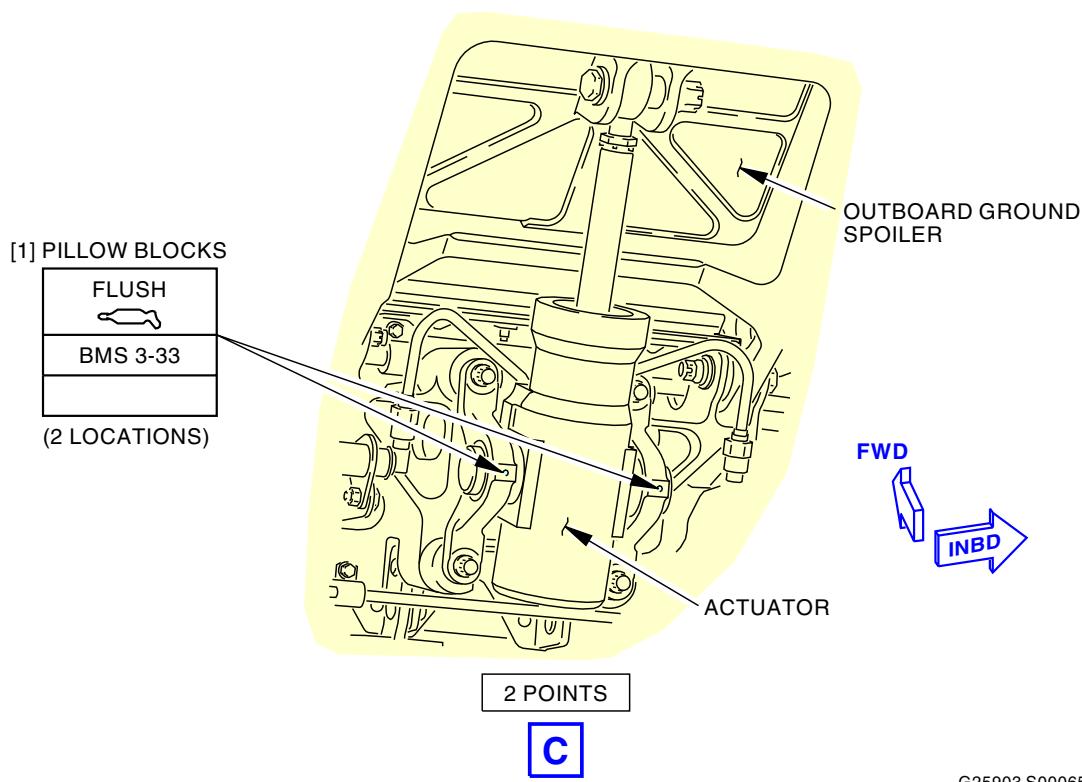
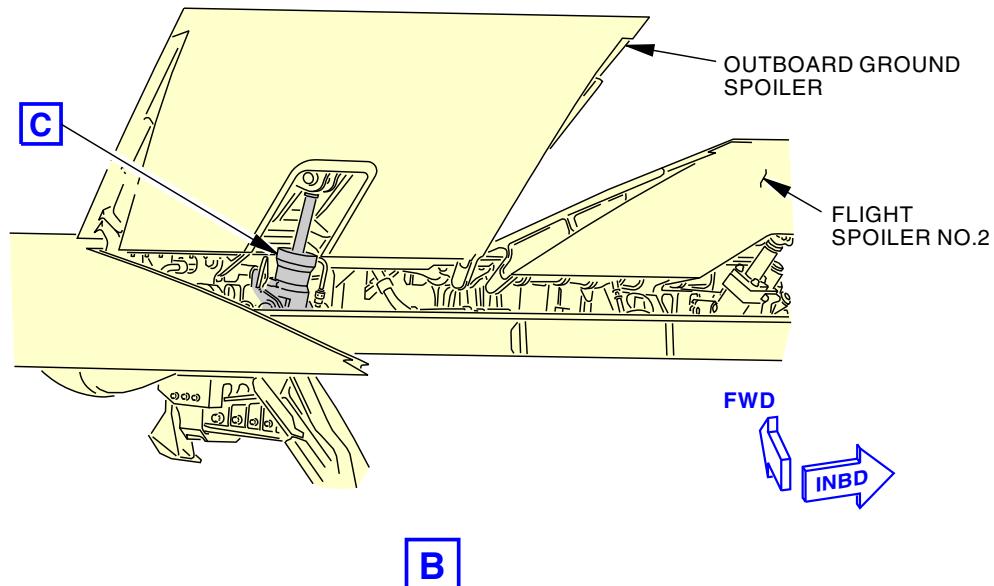
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G25903 S0006561626_V2

Outboard Ground Spoiler Actuator Lubrication
Figure 303/12-22-61-990-803 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-61

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



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LEADING EDGE SLAT - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A task to lubricate the leading edge slat main slat rollers
 - (2) A task to lubricate the leading edge slat track.

TASK 12-22-71-600-801

2. Leading Edge Slat Main Track Rollers Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

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)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
521	Left Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar

D. Access Panels

Number	Name/Location
521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05
621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18

EFFECTIVITY
LOM ALL

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(Continued)

Number	Name/Location
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79
621YB	Lower Leading Edge Access Panel - Slat Station 488.04

E. Prepare for the Lubrication

SUBTASK 12-22-71-200-001



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (1) Keep the housing (can) assemblies of the slat main tracks clean and free of all unwanted objects (FOD), at all time.

SUBTASK 12-22-71-860-001



WARNING

MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize hydraulic system B. Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 12-22-71-860-002



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE FLAPS AND FLAP DRIVE MECHANISMS BEFORE YOU MOVE THE FLAP CONTROL LEVER. WITH HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRICAL POWER WHEN YOU MOVE THE FLAP CONTROL LEVER.

- (3) Move the flap control lever to the 10-unit detent to fully extend the leading edge slats.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 12-22-71-860-014



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE FLAPS AND FLAP DRIVE MECHANISMS BEFORE YOU MOVE THE FLAP CONTROL LEVER. WITH HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRICAL POWER WHEN YOU MOVE THE FLAP CONTROL LEVER.

- (4) Move the flap control lever to the 30-unit detent to fully extend the leading edge slats.

LOM ALL

SUBTASK 12-22-71-860-003

- (5) Remove hydraulic pressure. Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.



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SUBTASK 12-22-71-480-001



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.

- (6) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801

SUBTASK 12-22-71-010-001

- (7) To remove the applicable lower leading edge access panels for the left wing, refer to TASK 57-41-02-000-801.

Open these access panels:

Number Name/Location

521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05

SUBTASK 12-22-71-010-002

- (8) To remove the applicable lower leading edge access panels for the right wing, refer to TASK 57-41-02-000-801.

Open these access panels:

Number Name/Location

621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79
621YB	Lower Leading Edge Access Panel - Slat Station 488.04

F. Leading Edge Slat Main Track Rollers Lubrication

(Table 301)

SUBTASK 12-22-71-640-003

- (1) This table supplies data for the subsequent lubrication step:

Table 301/12-22-71-993-805 Leading Edge Slat Main Track Rollers Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Main track roller bearings	grease, D00633	Zerk	32

SUBTASK 12-22-71-640-001

- (2) Lubricate the main track rollers on the leading edge slats with grease, D00633.

EFFECTIVITY
LOM ALL

12-22-71



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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-71-200-002



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (1) Keep the housing (can) assemblies of the slat main tracks clean and free of all unwanted objects (FOD), at all time.

SUBTASK 12-22-71-410-005

- (2) To install the applicable lower leading edge access panels on the left wing, refer to TASK 57-41-02-400-801.

Close these access panels:

Number **Name/Location**

521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05

SUBTASK 12-22-71-410-006

- (3) To install the applicable lower leading edge access panels on the right wing, refer to TASK 57-41-02-400-801.

Close these access panels:

Number **Name/Location**

621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79
621YB	Lower Leading Edge Access Panel - Slat Station 488.04

SUBTASK 12-22-71-080-001

- (4) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

SUBTASK 12-22-71-860-004



WARNING

MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Pressurize hydraulic system B. Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-71-860-005

- (6) Move the flap control lever to the UP position to fully retract the leading edge slats.

SUBTASK 12-22-71-860-006

- (7) Remove hydraulic pressure. Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

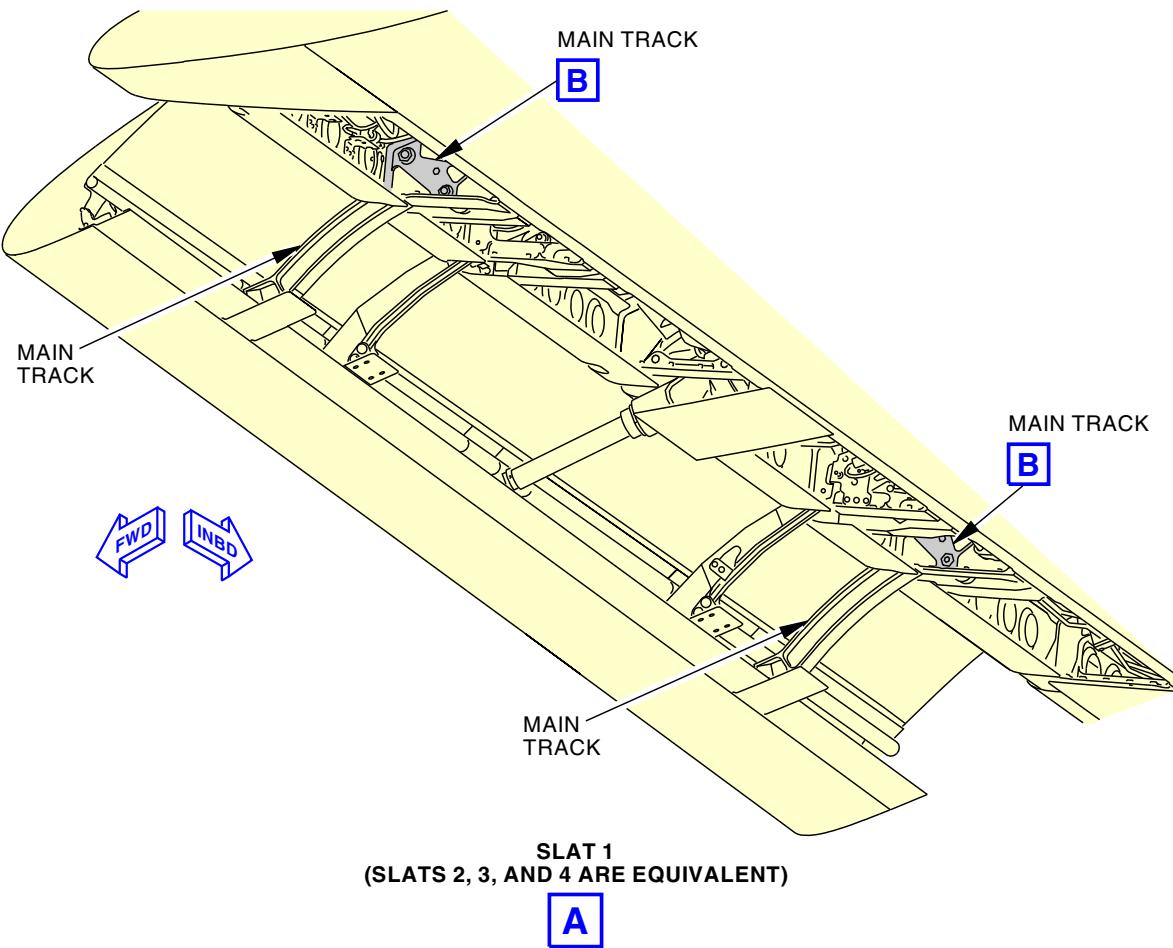
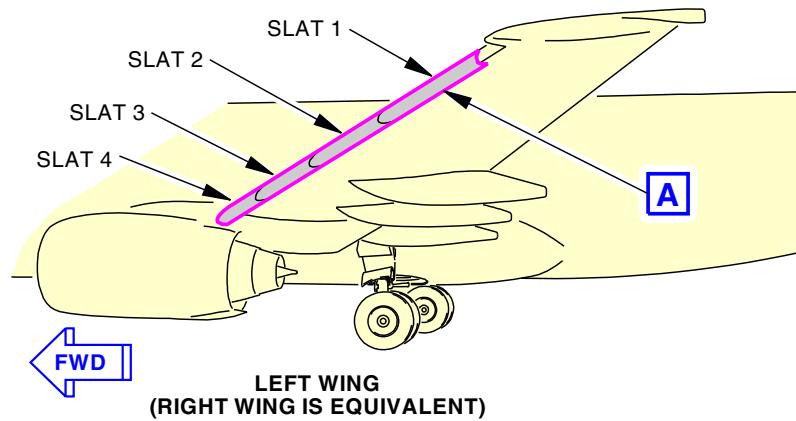
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Leading Edge Slat Main Track Rollers Servicing
Figure 301/12-22-71-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

12-22-71

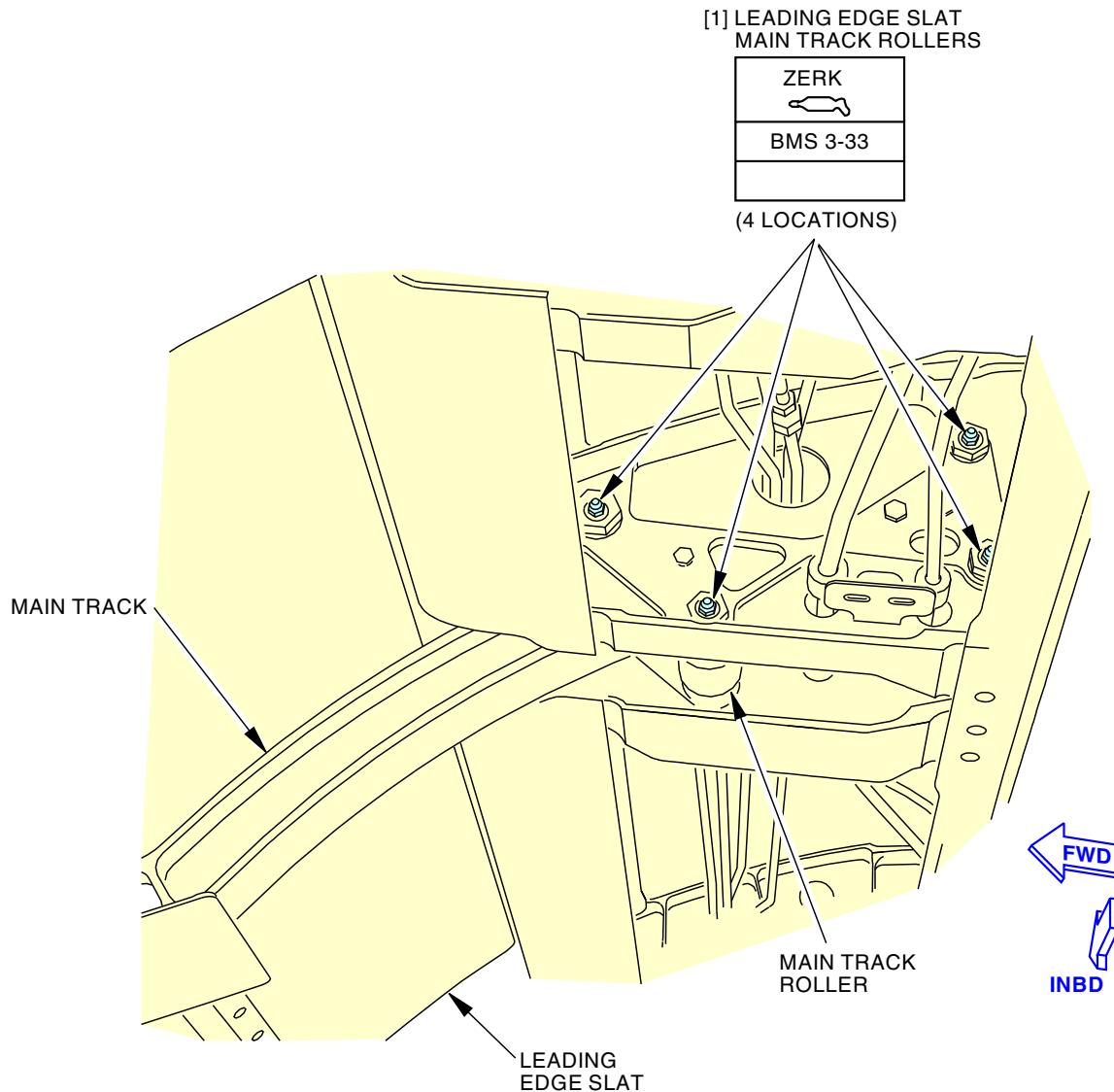
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INBOARD MAIN TRACK
(OUTBOARD MAIN TRACK IS OPPOSITE)
(SLAT 1 IS SHOWN, SLATS 2, 3, AND 4 ARE EQUIVALENT)

4 POINTS

B

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Leading Edge Slat Main Track Rollers Servicing
Figure 301/12-22-71-990-801 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

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TASK 12-22-71-640-801

3. Leading Edge Main and Auxiliary Tracks Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

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)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
522	Left Wing - Slat No. 4
523	Left Wing - Slat No. 3
524	Left Wing - Slat No. 2
525	Left Wing - Slat No. 1
622	Right Wing - Slat No. 5
623	Right Wing - Slat No. 6
624	Right Wing - Slat No. 7
625	Right Wing - Slat No. 8

D. Access Panels

Number	Name/Location
521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05
621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79

EFFECTIVITY
LOM ALL

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(Continued)

Number Name/Location

621YB Lower Leading Edge Access Panel - Slat Station 488.04

E. Prepare for the Lubrication

SUBTASK 12-22-71-200-003



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks [1], at all time.

SUBTASK 12-22-71-860-007



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL FLIGHT CONTROL SURFACES, THE THRUST REVERSERS AND THE LANDING GEAR. FLIGHT CONTROL SURFACES, THE THRUST REVERSERS AND THE LANDING GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) To pressurize hydraulic system B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 12-22-71-860-008



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE FLAPS AND FLAP DRIVE MECHANISMS BEFORE YOU MOVE THE FLAP CONTROL LEVER. WITH HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRICAL POWER WHEN YOU MOVE THE FLAP CONTROL LEVER.

- (3) Move the flap control lever to the 10-unit detent to fully extend the leading edge slats.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 12-22-71-860-013



WARNING

MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE FLAPS AND FLAP DRIVE MECHANISMS BEFORE YOU MOVE THE FLAP CONTROL LEVER. WITH HYDRAULIC POWER REMOVED, THE FLAPS WILL MOVE AUTOMATICALLY BY ELECTRICAL POWER WHEN YOU MOVE THE FLAP CONTROL LEVER.

- (4) Move the flap control lever to the 30-unit detent to fully extend the leading edge slats.

LOM ALL

SUBTASK 12-22-71-860-009

- (5) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

EFFECTIVITY
LOM ALL

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SUBTASK 12-22-71-480-002



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.

- (6) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 12-22-71-010-005

- (7) To remove the applicable lower leading edge access panels on the left wing, refer to TASK 57-41-02-000-801.

Open these access panels:

Number Name/Location

521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05

SUBTASK 12-22-71-010-006

- (8) To remove the applicable lower leading edge access panels on the right wing, refer to TASK 57-41-02-000-801.

Open these access panels:

Number Name/Location

621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79
621YB	Lower Leading Edge Access Panel - Slat Station 488.04

F. Leading Edge Main and Auxiliary Tracks Lubrication

(Table 302)

SUBTASK 12-22-71-640-004

- (1) This table supplies data for the subsequent lubrication step:

Table 302/12-22-71-993-806 Leading Edge Main and Auxiliary Tracks Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Main track	grease, D00633	Hand	8
2	Auxiliary track	grease, D00633	Hand	8

EFFECTIVITY
LOM ALL

12-22-71



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SUBTASK 12-22-71-640-002

- (2) Lubricate the rub strip (side) surfaces of the main tracks [1], wear paths of the auxiliary tracks [2] and rub strip (side) surfaces of the auxiliary tracks [2] with grease, D00633.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-71-200-004



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks [1], at all time.

SUBTASK 12-22-71-410-007

- (2) To install the applicable lower leading edge access panels on the left wing, refer to TASK 57-41-02-400-801.

Close these access panels:

Number Name/Location

521CB	Lower Leading Edge Access Panel - Slat Station 53.95
521FB	Lower Leading Edge Access Panel - Slat Station 116.32
521JB	Lower Leading Edge Access Panel - Slat Station 170.20
521MB	Lower Leading Edge Access Panel - Slat Station 234.65
521QB	Lower Leading Edge Access Panel - Slat Station 289.17
521TB	Lower Leading Edge Access Panel - Slat Station 356.14
521WB	Lower Leading Edge Access Panel - Slat Station 415.79
521ZB	Lower Leading Edge Access Panel - Slat Station 488.05

SUBTASK 12-22-71-410-008

- (3) To install the applicable access panels on the right wing, refer to TASK 57-41-02-400-801.

Close these access panels:

Number Name/Location

621CB	Lower Leading Edge Access Panel - Slat Station 53.95
621FB	Lower Leading Edge Access Panel - Slat Station 112.52
621HB	Lower Leading Edge Access Panel - Slat Station 170.21
621LB	Lower Leading Edge Access Panel - Slat Station 234.59
621PB	Lower Leading Edge Access Panel - Slat Station 289.18
621SB	Lower Leading Edge Access Panel - Slat Station 356.15
621VB	Lower Leading Edge Access Panel - Slat Station 415.79
621YB	Lower Leading Edge Access Panel - Slat Station 488.04

SUBTASK 12-22-71-080-002

- (4) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.



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SUBTASK 12-22-71-860-010



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL FLIGHT CONTROL SURFACES, THE THRUST REVERSERS AND THE LANDING GEAR. FLIGHT CONTROL SURFACES, THE THRUST REVERSERS AND THE LANDING GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) To pressurize hydraulic system B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-22-71-860-011

- (6) Move the flap control lever to the UP position to fully retract the leading edge slats.

SUBTASK 12-22-71-860-012

- (7) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

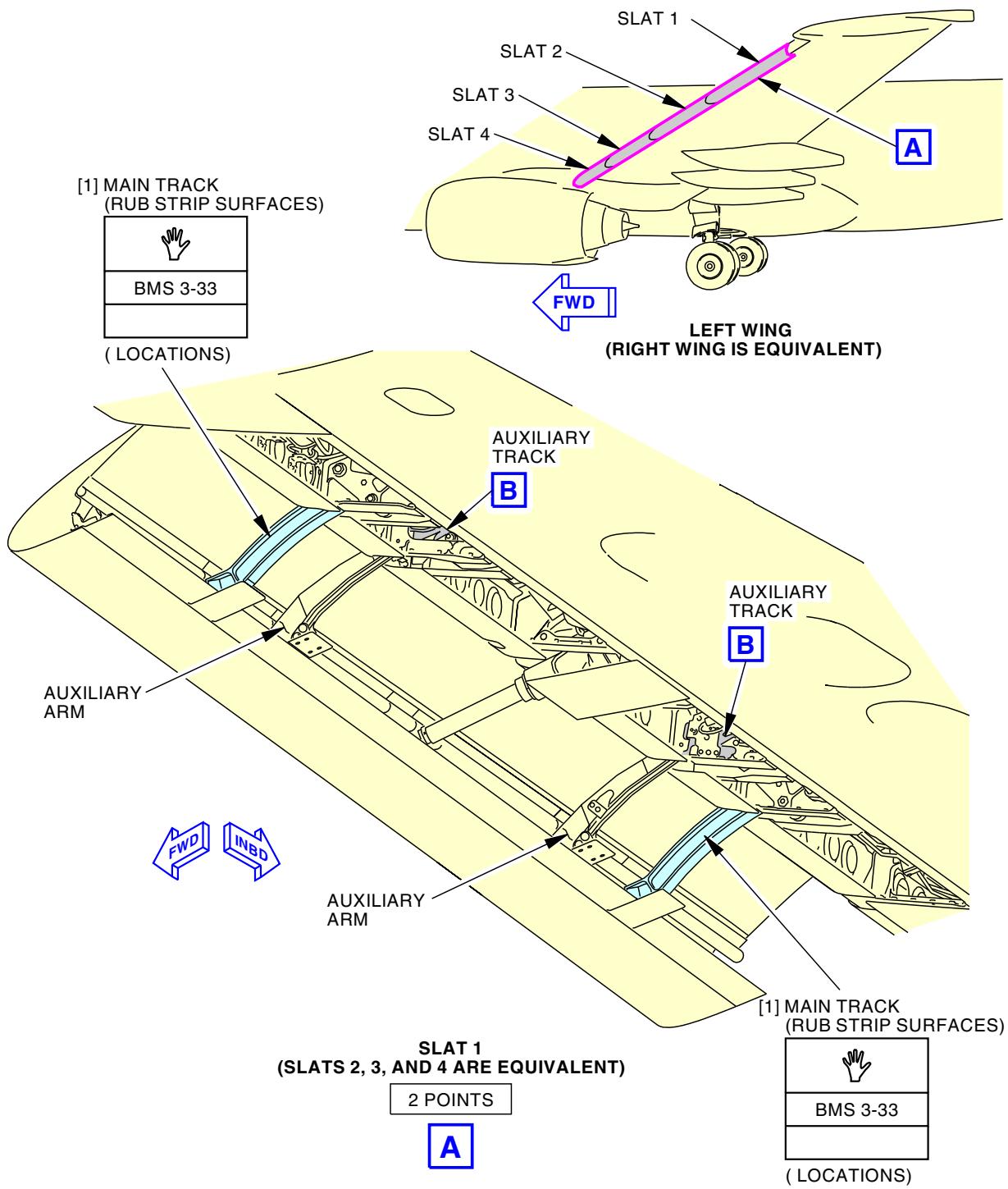
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-71



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



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Leading Edge Main and Auxiliary Tracks Servicing
Figure 302/12-22-71-990-802 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

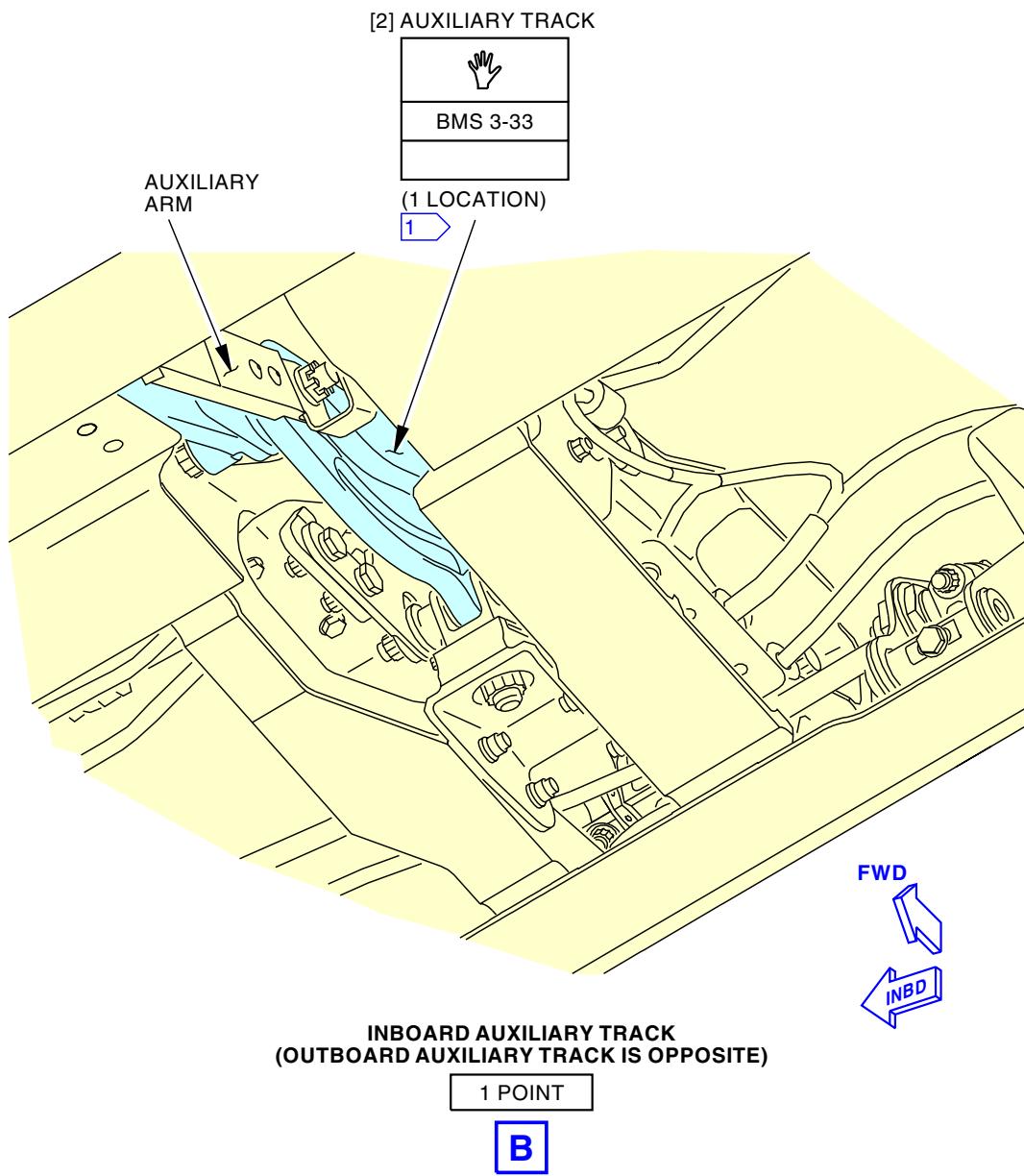
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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- 1 APPLY GREASE TO THE WEAR PATHS ON THE
AUXILIARY TRACKS AND ON THE RUB STRIP
SURFACES.

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Leading Edge Main and Auxiliary Tracks Servicing
Figure 302/12-22-71-990-802 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

12-22-71

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AIRCRAFT MAINTENANCE MANUAL
SPEED BRAKE LUBRICATION - SERVICING

1. General

- A. This procedure has a task to lubricate the speed brake lever brake assembly.

TASK 12-22-81-600-801

2. Speed Brake Lever Brake Assembly Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-62-00-800-802	Speed Brake Hydraulic Systems A and B - Pressure Removal (P/B 201)
27-62-00-840-802	Put the Speed Brake Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
112A	Forward Access Door

E. Prepare for the Lubrication

SUBTASK 12-22-81-860-001

- (1) Make sure that the systems A and B hydraulic power is off, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 12-22-81-040-001

- (2) Remove the hydraulic pressure, do this task: Speed Brake Hydraulic Systems A and B - Pressure Removal, TASK 27-62-00-800-802.

SUBTASK 12-22-81-860-002

- (3) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 12-22-81-860-003

- (4) Put the speed brake lever in the UP position.

EFFECTIVITY
LOM ALL

12-22-81



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SUBTASK 12-22-81-010-001

- (5) Open this access panel to get access the auto speed brake actuator lever brake mechanism [1]:

Number Name/Location

112A Forward Access Door

F. Speed Brake Lever Brake Assembly Lubrication

SUBTASK 12-22-81-640-002

- (1) This table supplies data for the subsequent lubrication step.

Table 301/12-22-81-993-802 Auto Speed Brake Actuator Lever Brake Servicing

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Lever Brake Mechanism	grease, D00633 (preferred), or grease, D00013 (alternate)	Hand	4

SUBTASK 12-22-81-640-001

- (2) Apply a thin layer of grease, D00633 (preferred), or grease, D00013 (alternate), to the sides and upper and lower surfaces of the speed brake lever brake mechanism [1].

SUBTASK 12-22-81-860-006

- (3) Put the speed brake lever from UP to DOWN position a few times.

NOTE: This will help to better lubricate the lever brake mechanism and remove excess grease.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-81-860-007

- (1) Put the speed brake lever to the DOWN position.

SUBTASK 12-22-81-860-004

- (2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row Col Number Name

B 9 C00440 FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 12-22-81-840-001

- (3) Do this task: Put the Speed Brake Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-62-00-840-802.

SUBTASK 12-22-81-860-005

- (4) Close this access panel:

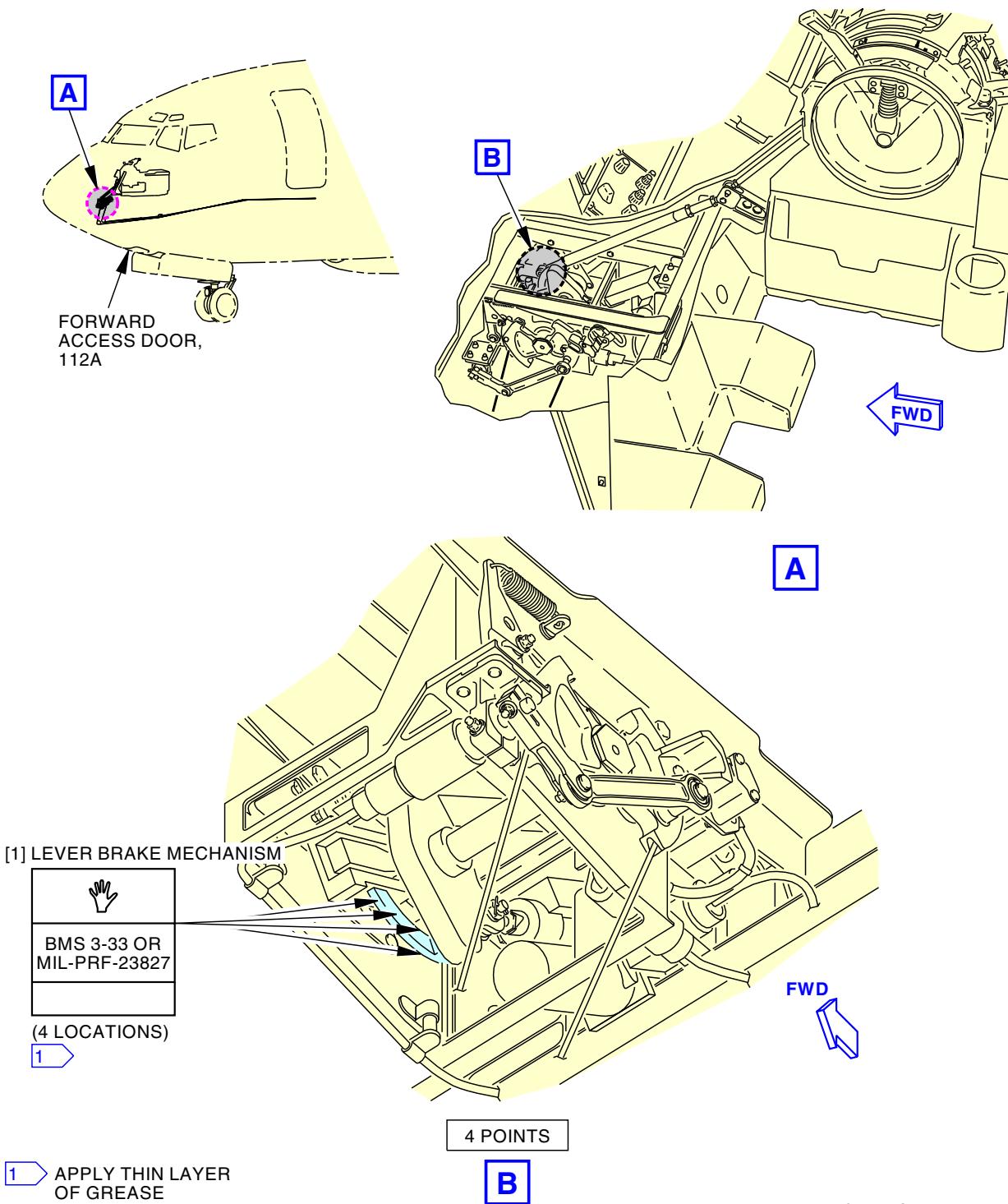
Number Name/Location

112A Forward Access Door

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-22-81



G25566 S0006561641_V5

**Auto Speed Brake Actuator Lever Brake Servicing
Figure 301/12-22-81-990-801**

 EFFECTIVITY
LOM ALL

12-22-81

D633A101-LOM



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MAIN LANDING GEAR SUPPORT BEAM - SERVICING

1. General

- A. This procedure contains one task:
- (1) Lubricate the Support Beam Assembly of the Main Landing Gear.

TASK 12-25-07-600-801

2. Lubricate the Support Beam Assembly of the Main Landing Gear

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-24-420-801	Lubrication Fitting Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
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. Prepare to Lubricate the Support Beam Assembly.

SUBTASK 12-25-07-490-001



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 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.

E. Lubricate the Support Beam Assembly

SUBTASK 12-25-07-840-001



WARNING

USE GLOVES AND EYE PROTECTION WHEN YOU LUBRICATE WITH A GREASE GUN. LUBRICANT AT HIGH PRESSURE CAN CAUSE INJURIES TO PERSONNEL.

- (1) Put on protective gloves and eye protection.

SUBTASK 12-25-07-640-002



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

EFFECTIVITY
LOM ALL

12-25-07



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(CAUTION PRECEDES)



CAUTION

CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

- (2) Lubricate the support beam assembly with grease, D00633, in the locations shown in (Figure 301 and Table 301).

Table 301/12-25-07-993-803 Main Landing Gear Support Beam Assembly Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	OUTBOARD STABILIZER LINK	grease, D00633	Zerk	2
2	INBOARD STABILIZER LINK (FWD)	grease, D00633	Zerk	1
3	OUTBOARD PIN	grease, D00633	Zerk	1
4	MLG BEAM	grease, D00633	Zerk	1
5	INBOARD STABILIZER LINK (AFT)	grease, D00633	Zerk	2
6	FRAME FITTING ASSEMBLY	grease, D00633	Zerk	2
7	HANGER LINK	grease, D00633	Zerk	5

SUBTASK 12-25-07-430-001

- (3) If a fitting blows off, do these steps:
- Make sure there is not a blockage in the lubrication path.
 - Do this task: Lubrication Fitting Installation, TASK 20-10-24-420-801.

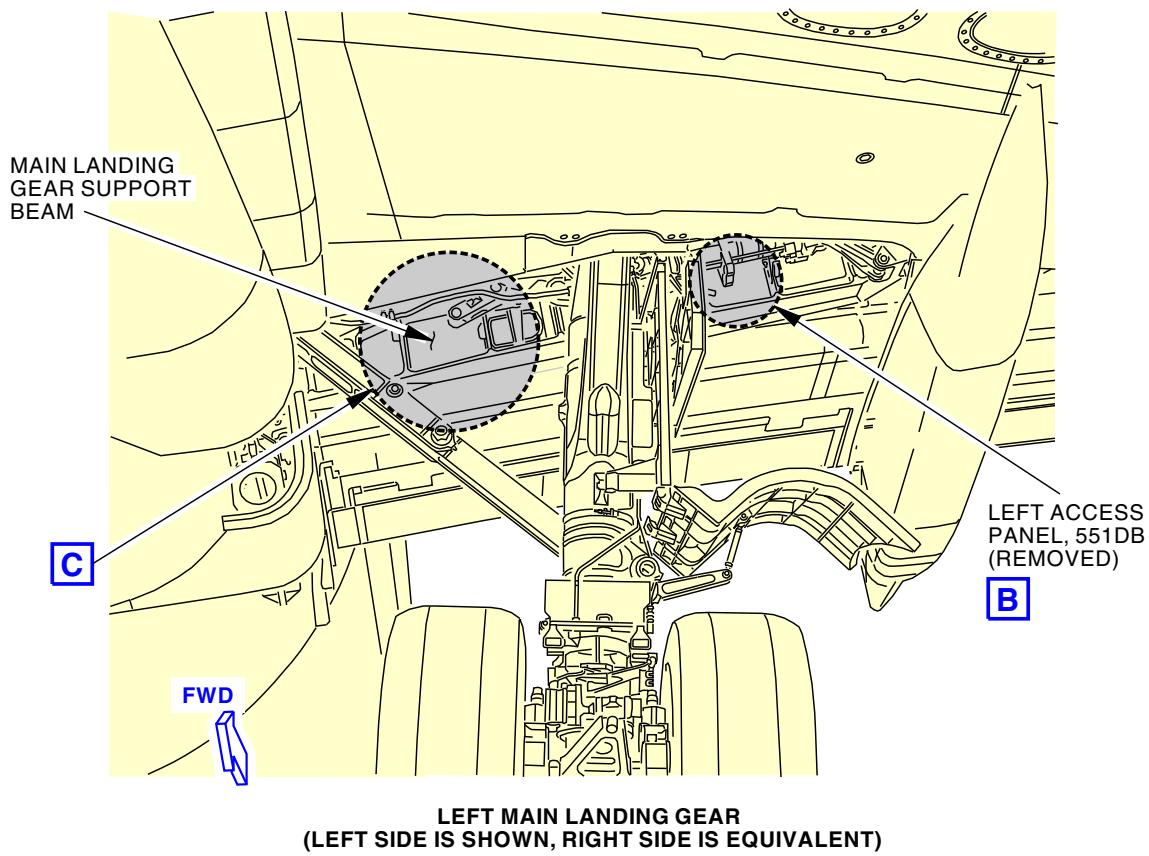
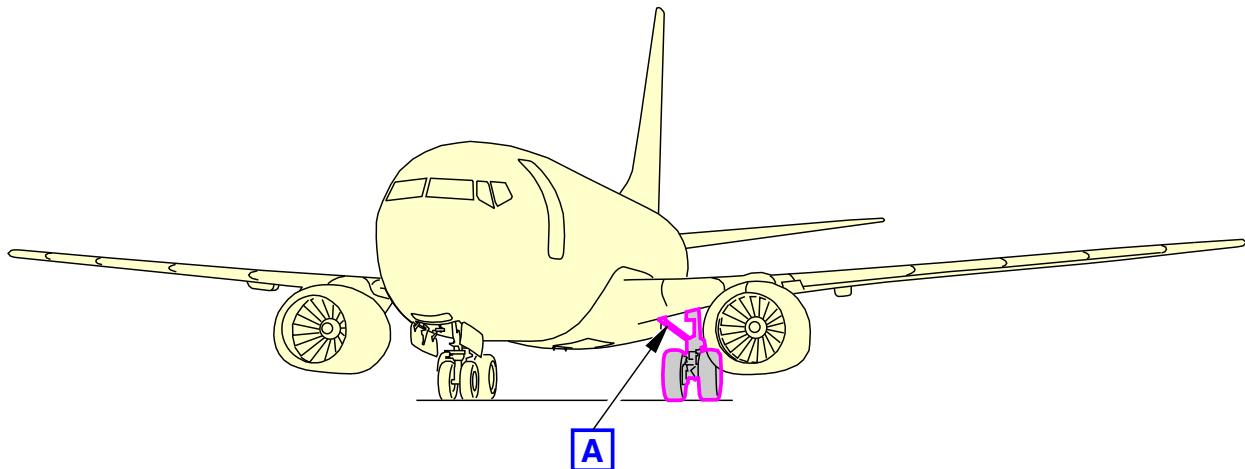
———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-25-07



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F71049 S0006561647_V2

Main Landing Gear Support Beam Lubrication
Figure 301/12-25-07-990-801 (Sheet 1 of 4)

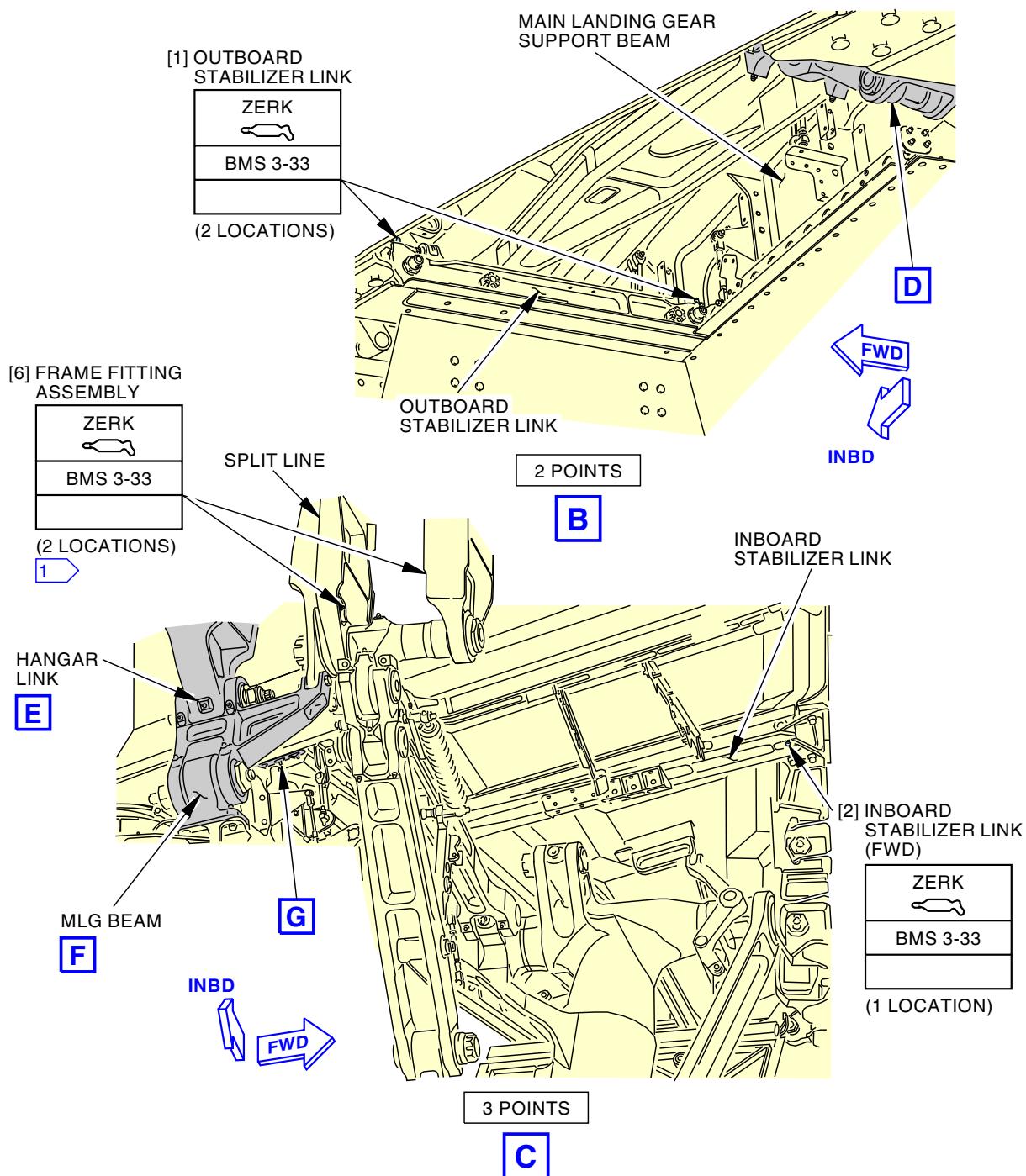
EFFECTIVITY
LOM ALL

12-25-07

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- 1** IF YOU SEE GREASE EXTRUDE FROM THE SPLIT LINE OF THE AFT FITTING HALVES, THEN LUBRICATE THE FITTING UNTIL ADDITIONAL GREASE EXTRUDES OUT.

F71219 S0006561648_V6

**Main Landing Gear Support Beam Lubrication
Figure 301/12-25-07-990-801 (Sheet 2 of 4)**

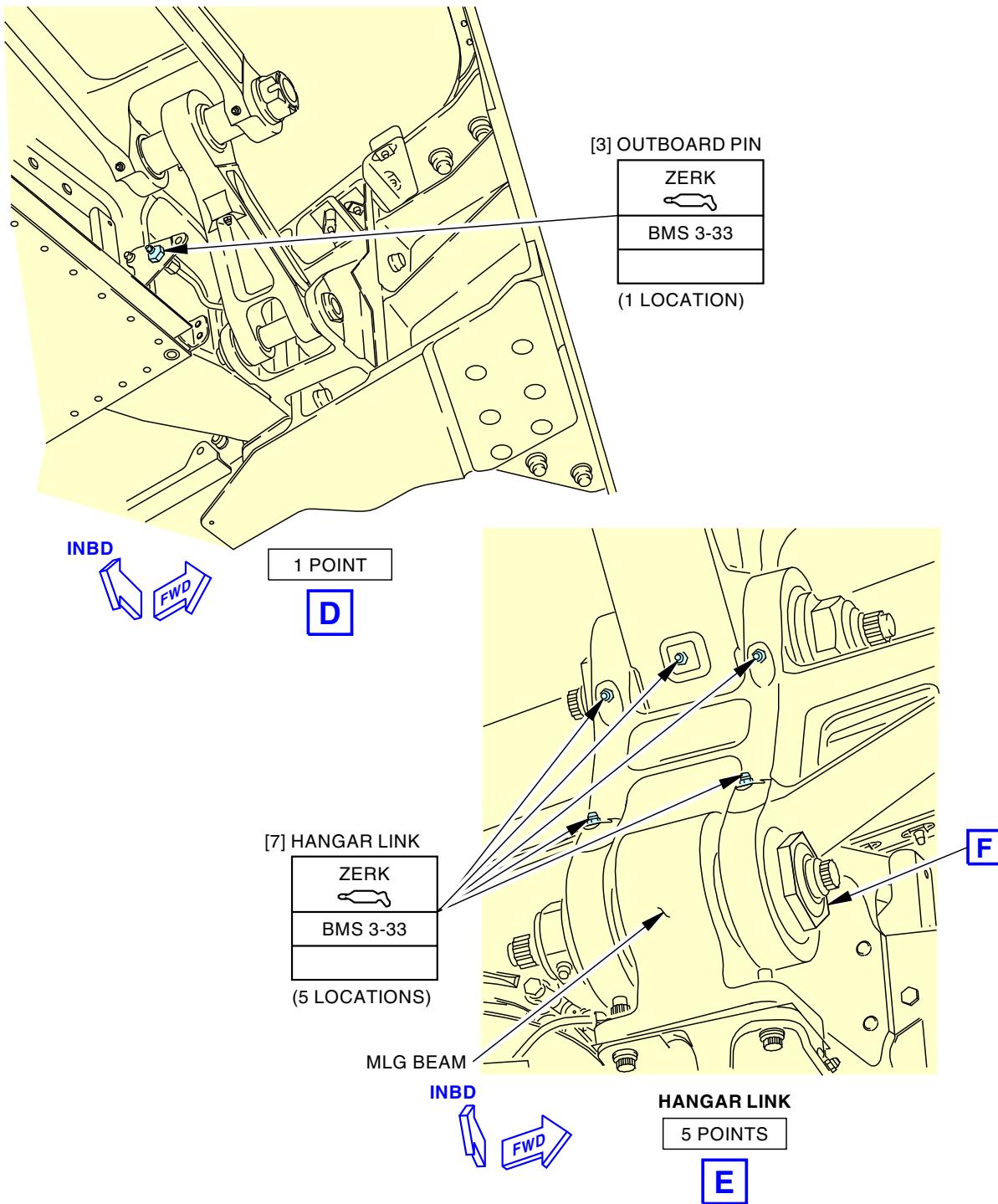
 EFFECTIVITY
LOM ALL

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F71220 S0006561649_V4

Main Landing Gear Support Beam Lubrication
Figure 301/12-25-07-990-801 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

12-25-07

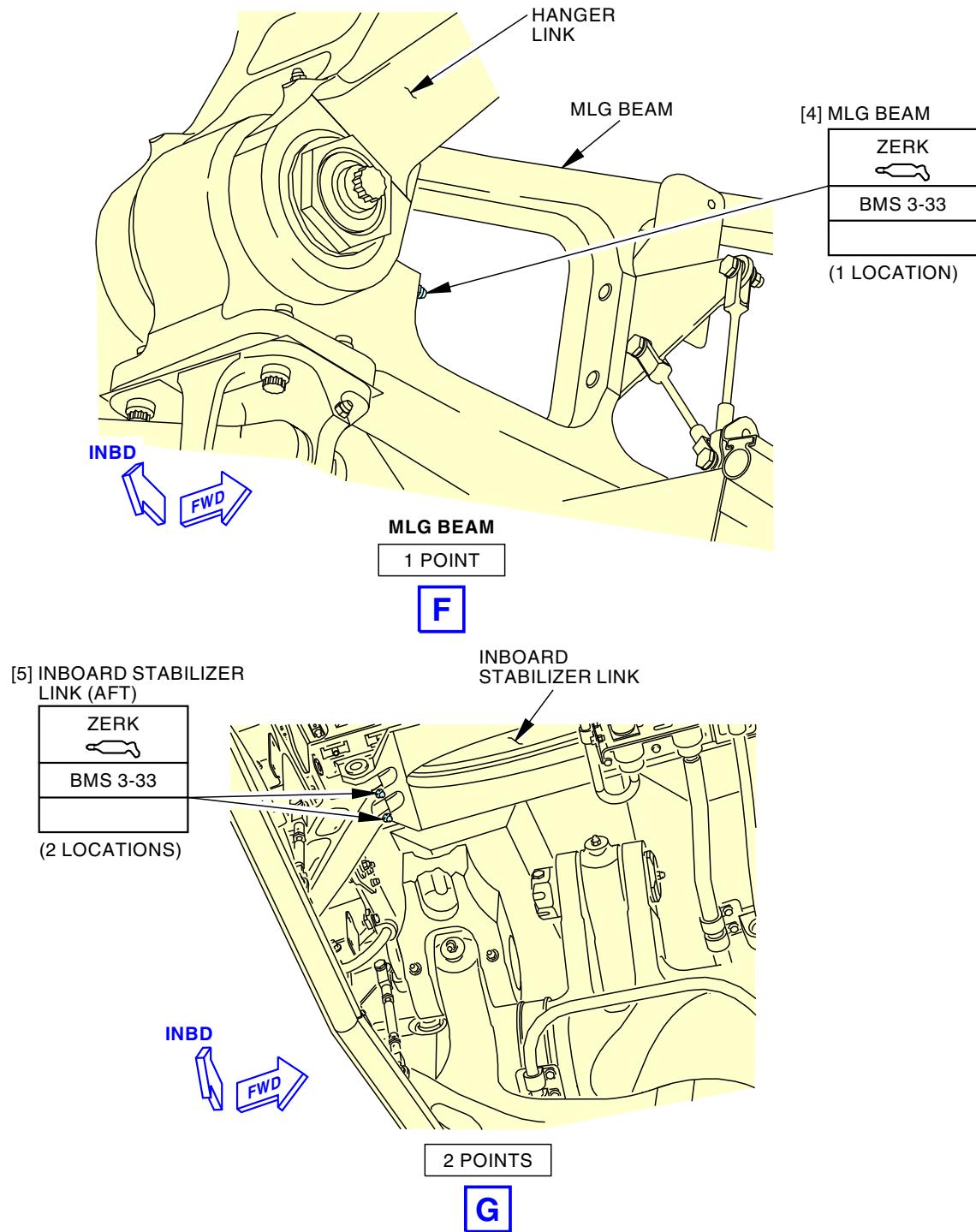
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AIRCRAFT MAINTENANCE MANUAL



G27232 S0006561650_V4

Main Landing Gear Support Beam Lubrication
Figure 301/12-25-07-990-801 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

12-25-07

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FORWARD ENTRY DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the forward entry door components.
 - (2) The servicing of the forward entry door mechanism.

TASK 12-25-11-640-801

2. Forward Entry Door Servicing - Components

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-11-00 P/B 201	FORWARD ENTRY DOOR - MAINTENANCE PRACTICES

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
D50101	Lubricating Oil - General Purpose, Preservative (Water-Displacing, Low Temperature)	MIL-PRF-32033 (NATO O-190)

C. Location Zones

Zone	Area
831	Forward Entry Door

D. Prepare for the Servicing

SUBTASK 12-25-11-010-001

- (1) Get access to the door components as follows:
 - (a) Open the door, refer to: FORWARD ENTRY DOOR - MAINTENANCE PRACTICES, PAGEBLOCK 52-11-00/201.
 - (b) Move the door to the correct position to get access to the door components.

E. Forward Entry Door Components Servicing

(Figure 301)

SUBTASK 12-25-11-640-003

- (1) Lubricate the gate hinge pins with MIL-PRF-32033 oil, D50101 or grease, D00633.
NOTE: MIL-PRF-32033 oil, D50101 is the preferred lubricant, while grease, D00633 is an alternate.

SUBTASK 12-25-11-640-001

- (2) Lubricate the other components on the forward entry door with grease, D00633.

EFFECTIVITY
LOM ALL

12-25-11



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Table 301/12-25-11-993-807 Forward Entry Door Servicing - Components

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Gate Hinge Pins	MIL-PRF-32033 oil, D50101 or grease, D00633	Oil Can, Hand	2
2	Guide Plate Tracks	grease, D00633	Hand	2
3	Upper Fuselage Hinge Torque Tube Bearing	grease, D00633	Flush	1
4	Guide Arm Rod End Bearing	grease, D00633	Flush	1
5	Guide Arm Rod End Threads	grease, D00633	Hand	1
6	Upper Hinge Arm Bushing	grease, D00633	Flush	1
7	Lower Fuselage Hinge Torque Tube Bearing	grease, D00633	Flush	1
8	Lower Hinge Arm Bushing	grease, D00633	Flush	1
9	Latch Torque Tube Bearing	grease, D00633	Flush	4

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-11-410-001

- (1) Close and latch the forward entry door as required, refer to: FORWARD ENTRY DOOR - MAINTENANCE PRACTICES, PAGEBLOCK 52-11-00/201.

———— END OF TASK ————

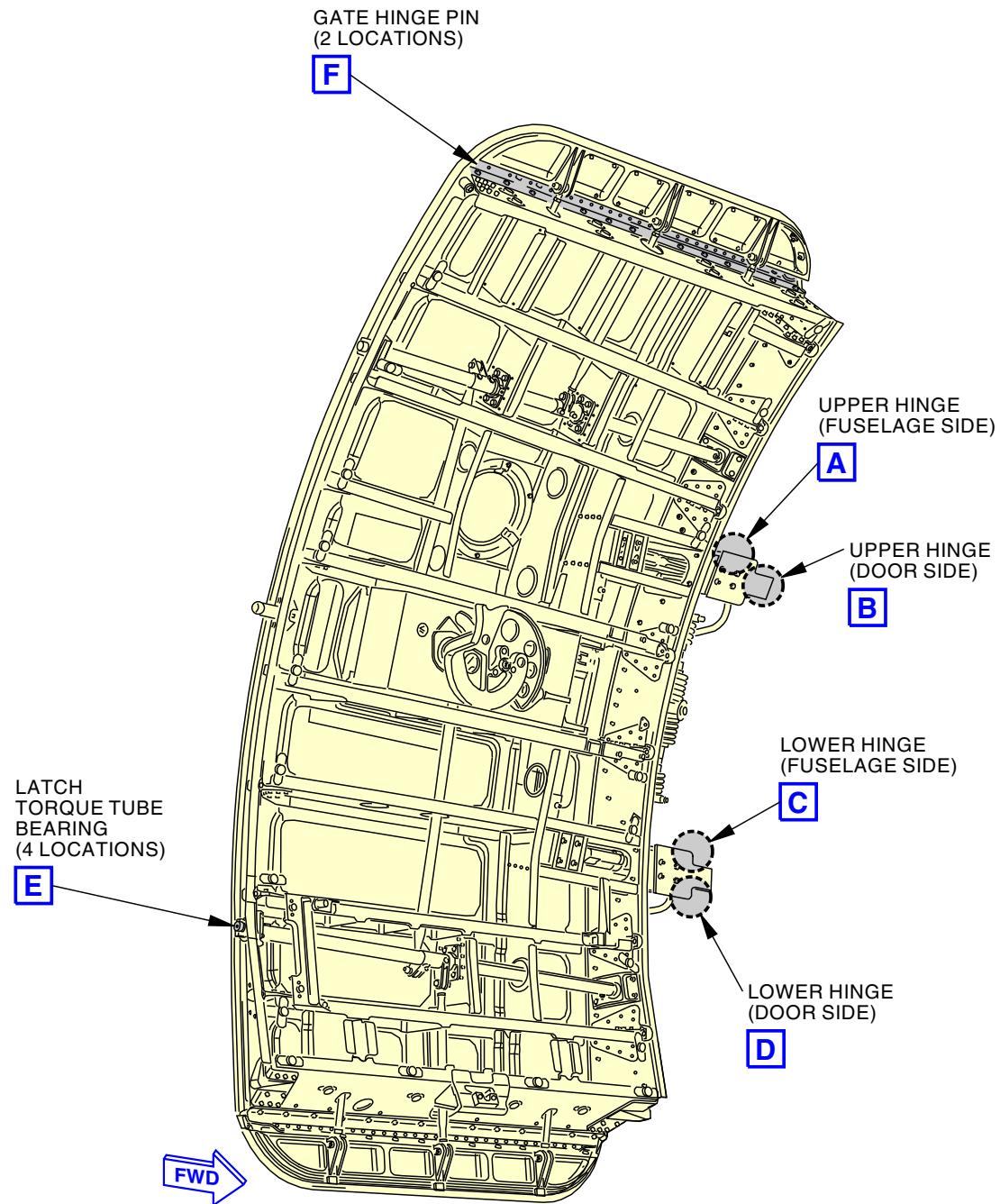
— EFFECTIVITY —
LOM ALL

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D633A101-LOM



FORWARD ENTRY DOOR
(INNER SKIN AND PANELS NOT SHOWN)

G27145 S0006561657_V2

Forward Entry Door Servicing - Components
Figure 301/12-25-11-990-803 (Sheet 1 of 4)

EFFECTIVITY
LOM ALL

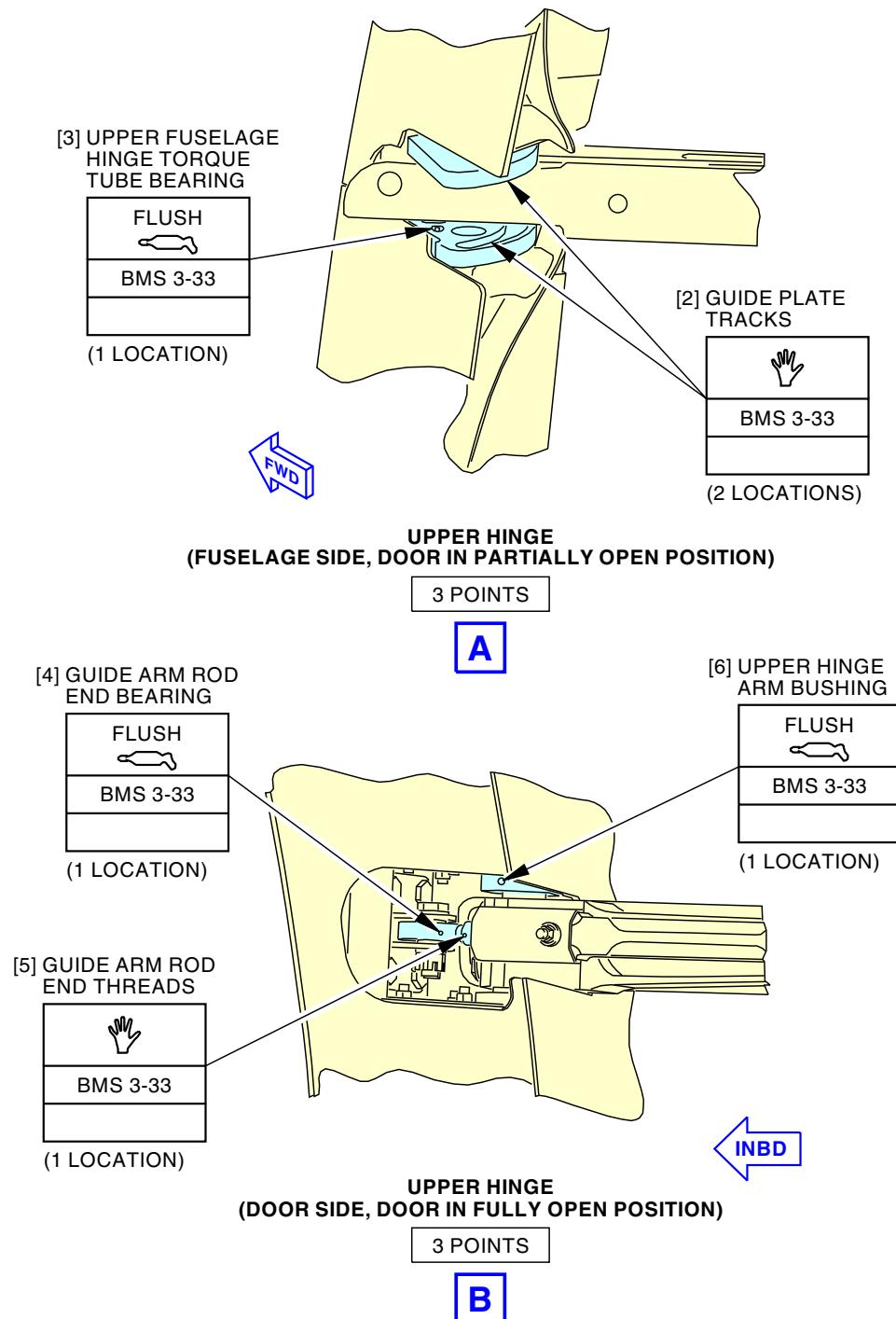
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G27338 S0006561658_V2

Forward Entry Door Servicing - Components
Figure 301/12-25-11-990-803 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

12-25-11

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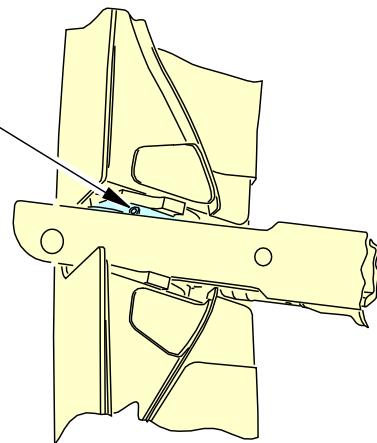
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[7] LOWER FUSELAGE
HINGE TORQUE
TUBE BEARING

FLUSH
BMS 3-33
(1 LOCATION)



FWD
LOWER HINGE
(FUSELAGE SIDE,
DOOR IN PARTIALLY OPEN POSITION)

1 POINT

C

[8] LOWER HINGE
ARM BUSHING

FLUSH
BMS 3-33
(1 LOCATION)



INBD
LOWER HINGE
(DOOR SIDE, DOOR IN PARTIALLY OPEN POSITION)

1 POINT

D

G27564 S0006561659_V2

Forward Entry Door Servicing - Components
Figure 301/12-25-11-990-803 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

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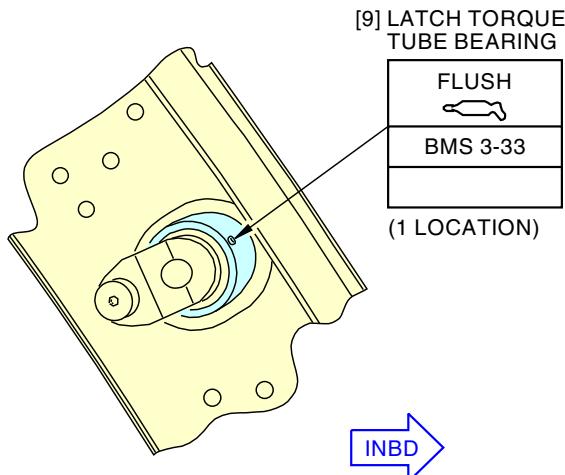
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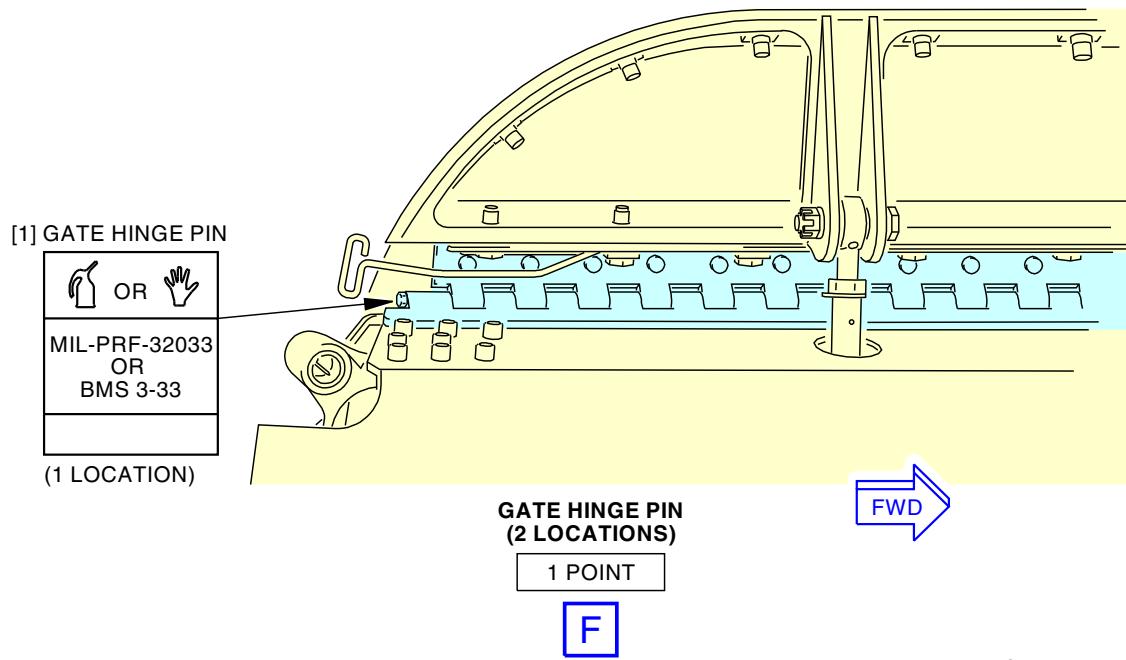
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LATCH TORQUE TUBE BEARING
(EXAMPLE, 4 LOCATIONS)

1 POINT

E



L34954 S0006561660_V3

Forward Entry Door Servicing - Components
Figure 301/12-25-11-990-803 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

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TASK 12-25-11-640-802

3. Forward Entry Door Servicing - Mechanism

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-11-31-000-802	Forward Entry Door Lining - Removal (P/B 401)
52-11-31-400-802	Forward Entry Door Lining - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
831	Forward Entry Door

D. Access Panels

Number	Name/Location
831AZ	Forward Entry Door - Torque Tube Access
831BZ	Forward Entry Door - Handle Box and Cam for Handle Box Access
831CZ	Forward Entry Door - Handle Box Access
831DZ	Forward Entry Door - Gate Hinge Pin Access
831EZ	Forward Entry Door - Gate Hinge Pin Access

E. Prepare for the Servicing

SUBTASK 12-25-11-010-002

- (1) Get access to the door mechanism as follows:

- Do this task: Forward Entry Door Lining - Removal, TASK 52-11-31-000-802.
- Open these access panels:

Number	Name/Location
831AZ	Forward Entry Door - Torque Tube Access
831BZ	Forward Entry Door - Handle Box and Cam for Handle Box Access
831CZ	Forward Entry Door - Handle Box Access
831DZ	Forward Entry Door - Gate Hinge Pin Access
831EZ	Forward Entry Door - Gate Hinge Pin Access

- To get access to the door components, move the door to the correct position.

F. Forward Entry Door Mechanism Servicing

(Table 302 and Figure 302)

SUBTASK 12-25-11-640-002

- (1) Lubricate the mechanism on the forward entry door with grease, D00633.

- For the lubrication of the handle, operate the handle to move the grease, D00633 on the handle shaft.

EFFECTIVITY
LOM ALL

12-25-11



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Table 302/12-25-11-993-808 Forward Entry Door Servicing - Mechanism

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Gate Control Rods	grease, D00633	Flush	4
2	Door Hinge Torque Tube	grease, D00633	Hand	2
3	Lower Latch Torque Tube Bearing	grease, D00633	Flush	1
4	Latch Control Rods	grease, D00633	Flush	2
5	Handle	grease, D00633	Hand	1
6	Upper Latch Torque Tube Bearings	grease, D00633	Flush	2
7	Gate Stop Rods	grease, D00633	Flush	8
8	Cam Follower Bearings	grease, D00633	Flush	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-11-410-002

- (1) Close access to the door as follows:

- (a) Close these access panels:

Number Name/Location

831AZ	Forward Entry Door - Torque Tube Access
831BZ	Forward Entry Door - Handle Box and Cam for Handle Box Access
831CZ	Forward Entry Door - Handle Box Access
831DZ	Forward Entry Door - Gate Hinge Pin Access
831EZ	Forward Entry Door - Gate Hinge Pin Access

- (b) Do this task: Forward Entry Door Lining - Installation, TASK 52-11-31-400-802.

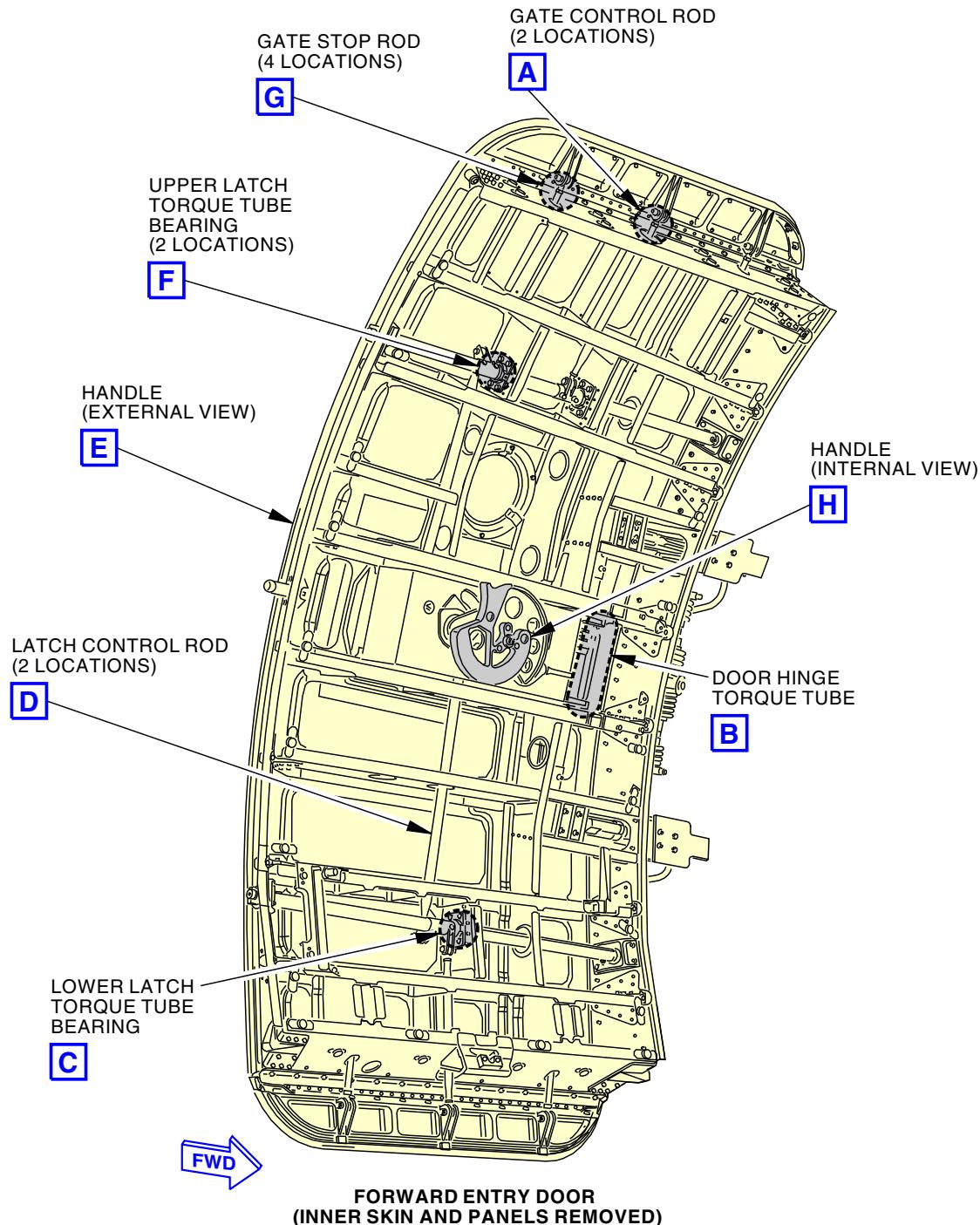
— END OF TASK —

EFFECTIVITY
LOM ALL

12-25-11



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G70802 S0006561661_V2

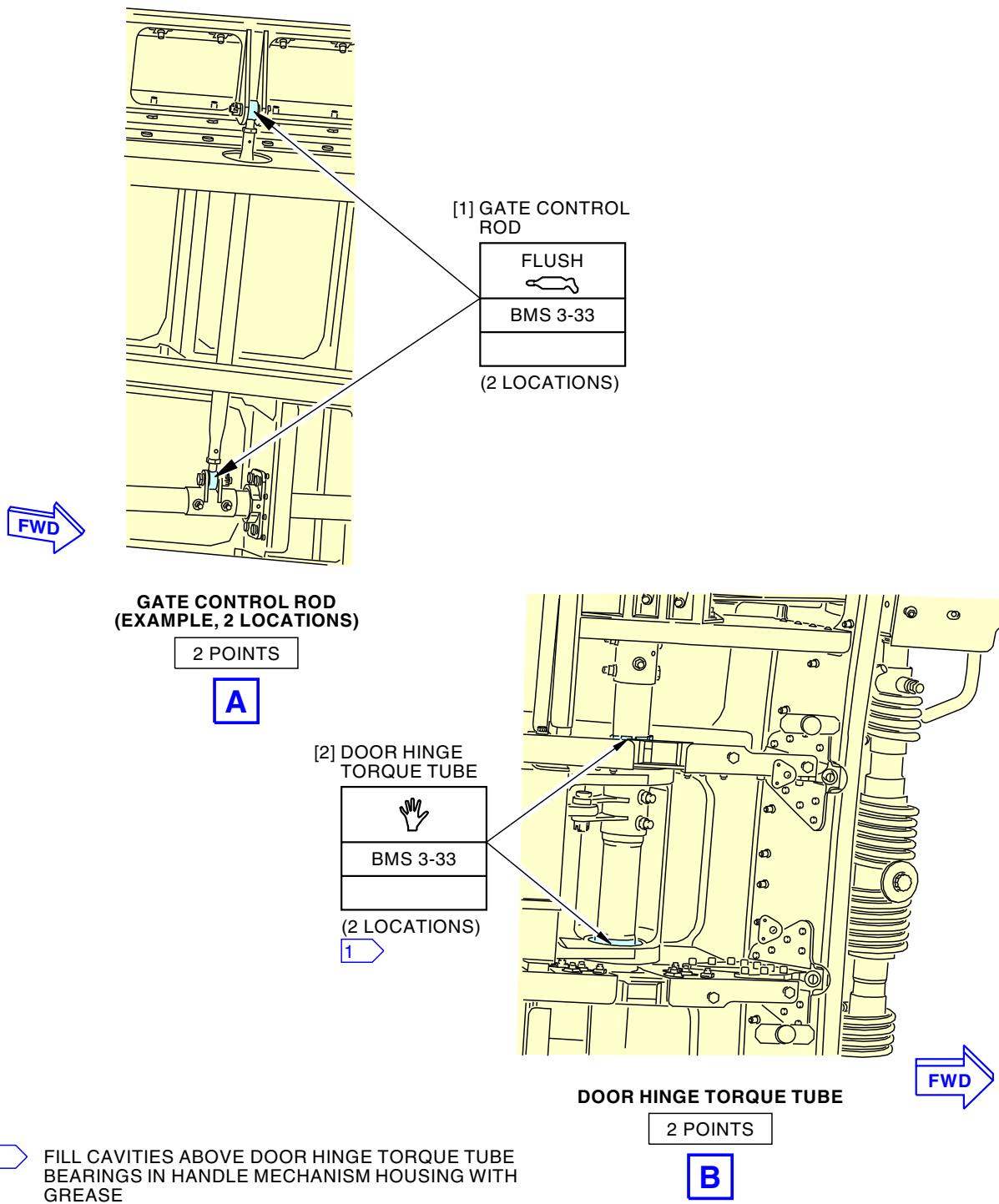
Forward Entry Door Servicing - Mechanism
Figure 302/12-25-11-990-802 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

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G70805 S0006561662_V3

Forward Entry Door Servicing - Mechanism
Figure 302/12-25-11-990-802 (Sheet 2 of 5)

 EFFECTIVITY
 LOM ALL

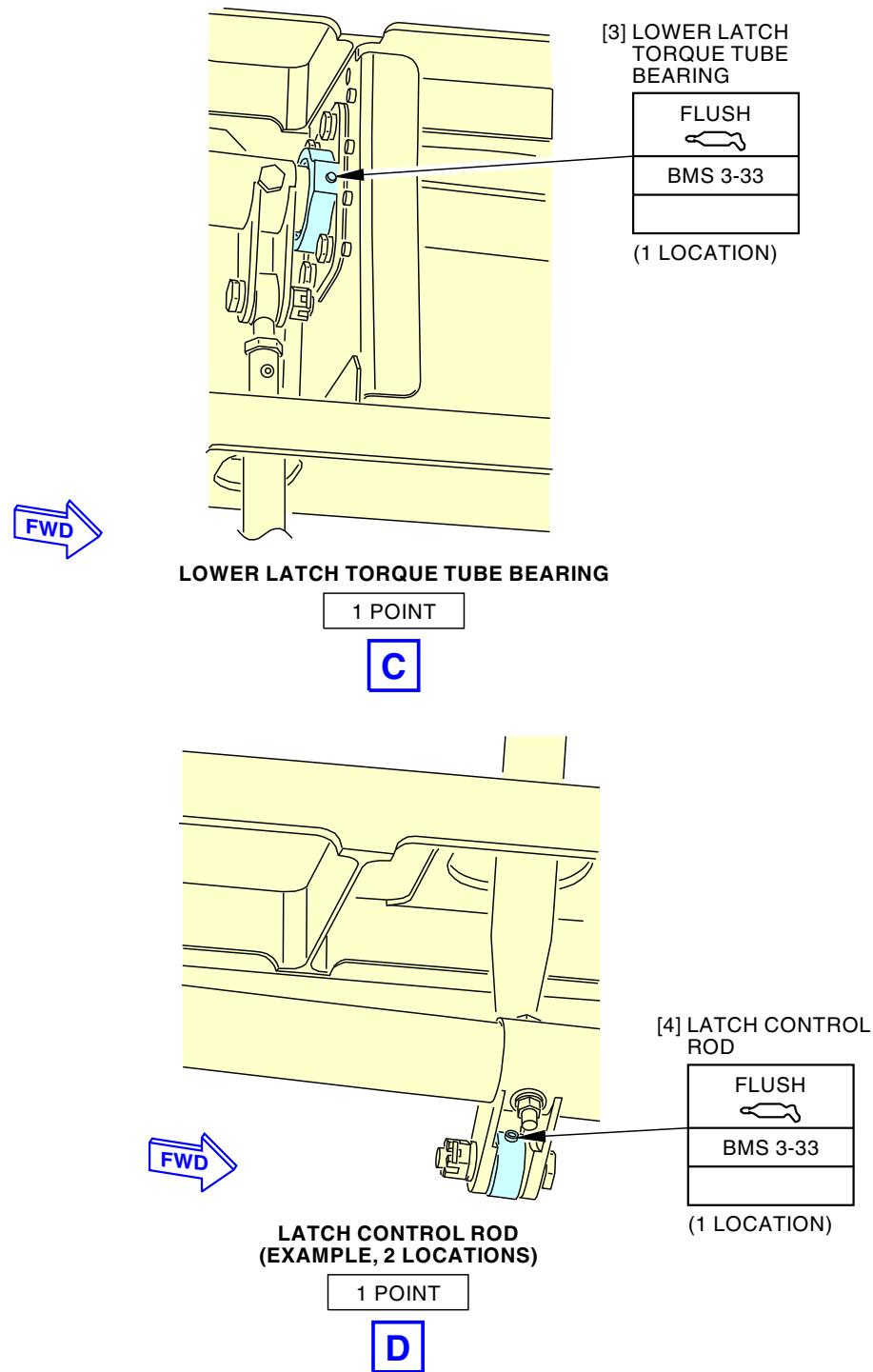
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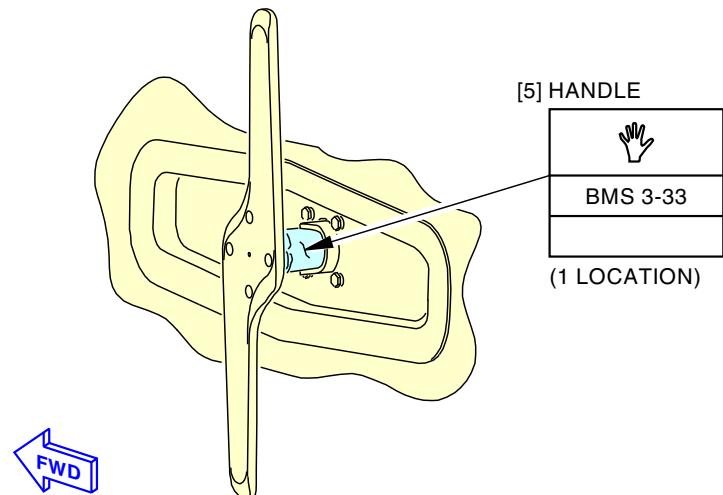
Forward Entry Door Servicing - Mechanism
Figure 302/12-25-11-990-802 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-25-11



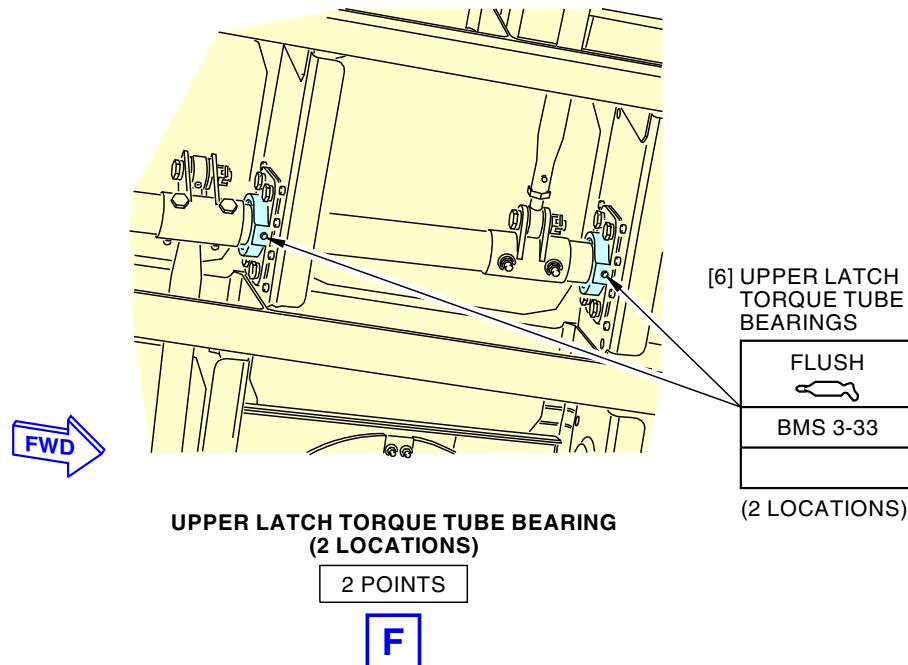
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HANDLE
(EXTERNAL VIEW, HANDLE EXTENDED
AND TURNED 90 DEGREES)

1 POINT

E



G70934 S0006561664_V2

Forward Entry Door Servicing - Mechanism
Figure 302/12-25-11-990-802 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

12-25-11

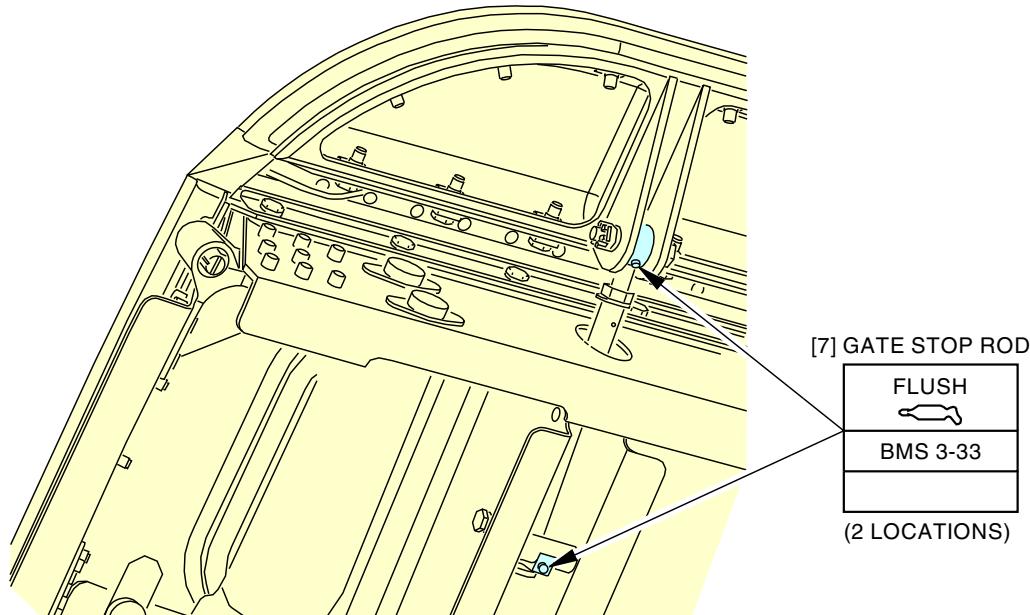
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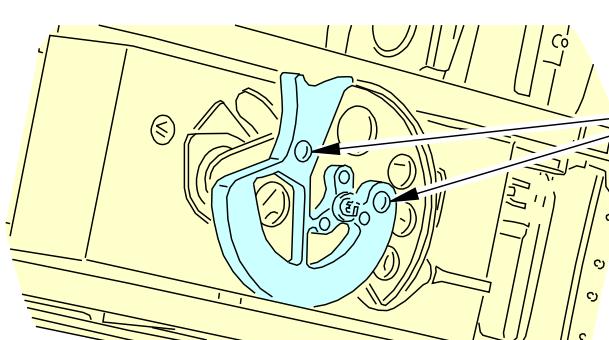


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GATE STOP ROD
(4 LOCATIONS)

2 POINTS



HANDLE
(INTERNAL VIEW)

2 POINTS



G70940 S0006561665_V2

Forward Entry Door Servicing - Mechanism
Figure 302/12-25-11-990-802 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

12-25-11

D633A101-LOM

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BOEING
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AFT ENTRY DOOR - SERVICING

1. General

- A. This procedure contains the following tasks:
 - (1) The servicing of the aft entry door components
 - (2) The servicing of the aft entry door mechanism.

TASK 12-25-12-640-801

2. Aft Entry Door Lubrication - Components

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-13-00 P/B 201	AFT ENTRY DOOR - MAINTENANCE PRACTICES

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
D50101	Lubricating Oil - General Purpose, Preservative (Water-Displacing, Low Temperature)	MIL-PRF-32033 (NATO O-190)

C. Location Zones

Zone	Area
834	Left Aft Entry Door

D. Prepare for the Servicing

SUBTASK 12-25-12-010-001

- (1) Get access to the door components as follows:
 - (a) Open the aft entry door, refer to: AFT ENTRY DOOR - MAINTENANCE PRACTICES, PAGEBLOCK 52-13-00/201.
 - (b) Move the door to the correct position to get access to the door components.

E. Aft Entry Door Components Servicing

SUBTASK 12-25-12-640-003

- (1) Lubricate the gate hinges [1] with MIL-PRF-32033 oil, D50101, or grease, D00633.

NOTE: MIL-PRF-32033 oil, D50101 is the preferred lubricant, while grease, D00633, is an alternate.

SUBTASK 12-25-12-640-001

- (2) Lubricate the other components on the aft entry door with grease, D00633, (Table 301).

Table 301/12-25-12-993-807 Aft Entry Door Servicing - Components

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Gate Hinges	MIL-PRF-32033 oil, D50101, or grease, D00633	Oil Can, Hand	2

EFFECTIVITY
LOM ALL

12-25-12



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Table 301/12-25-12-993-807 Aft Entry Door Servicing - Components (Continued)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
2	Guide Arm Rod End Bearing	grease, D00633	Flush	1
3	Guide Arm Roller	grease, D00633	Hand	1
4	Guide Plate Tracks	grease, D00633	Hand	2
5	Latch Rollers	grease, D00633	Flush	4
6	Latch Torque Tube Bearings	grease, D00633	Flush	4
7	Hinge Link Bearings	grease, D00633	Flush	2

F. Put the Airplane Back to Its Usual Condition

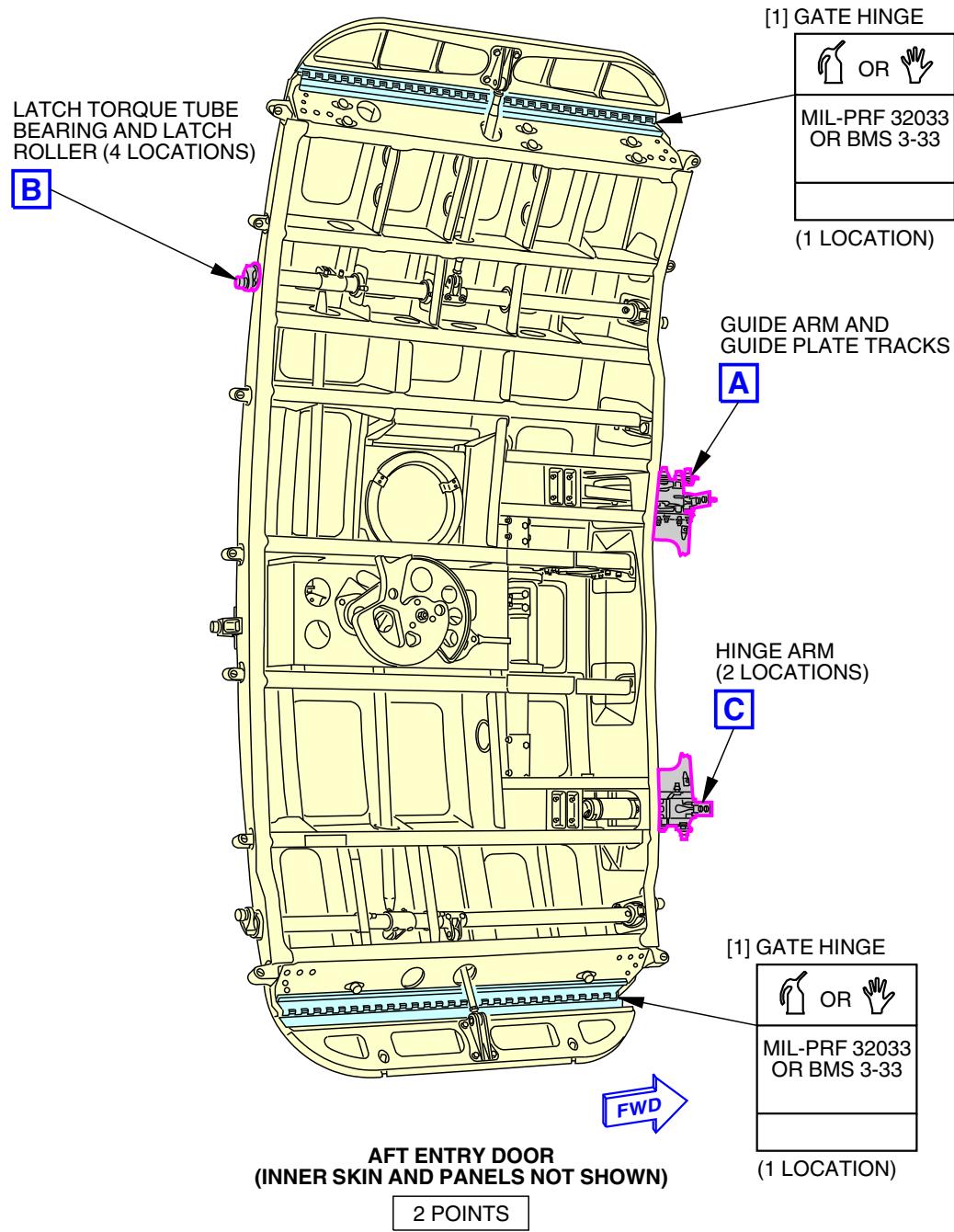
SUBTASK 12-25-12-410-001

- (1) Close and latch the aft entry door as required, refer to: AFT ENTRY DOOR - MAINTENANCE PRACTICES, PAGEBLOCK 52-13-00/201.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-25-12



F91423 S0006561672_V4

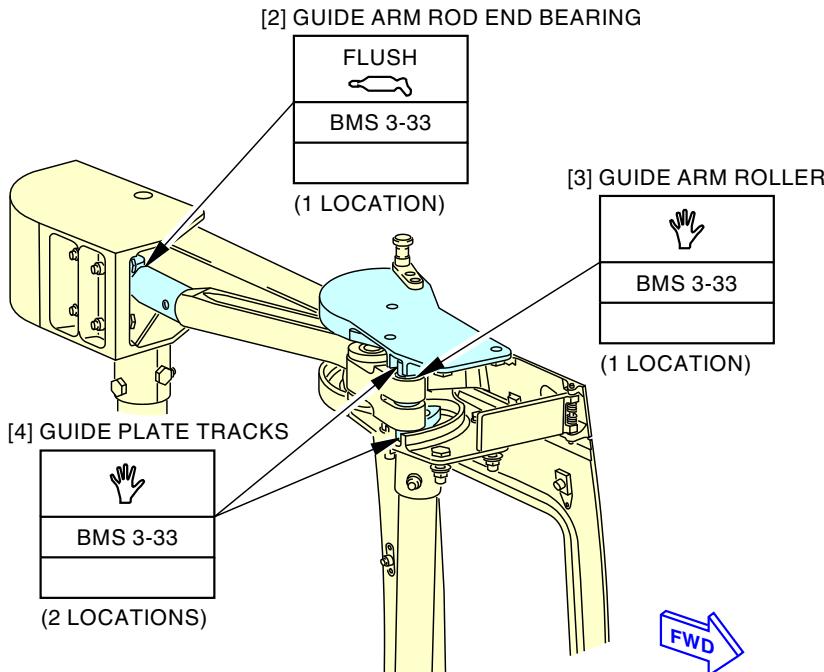
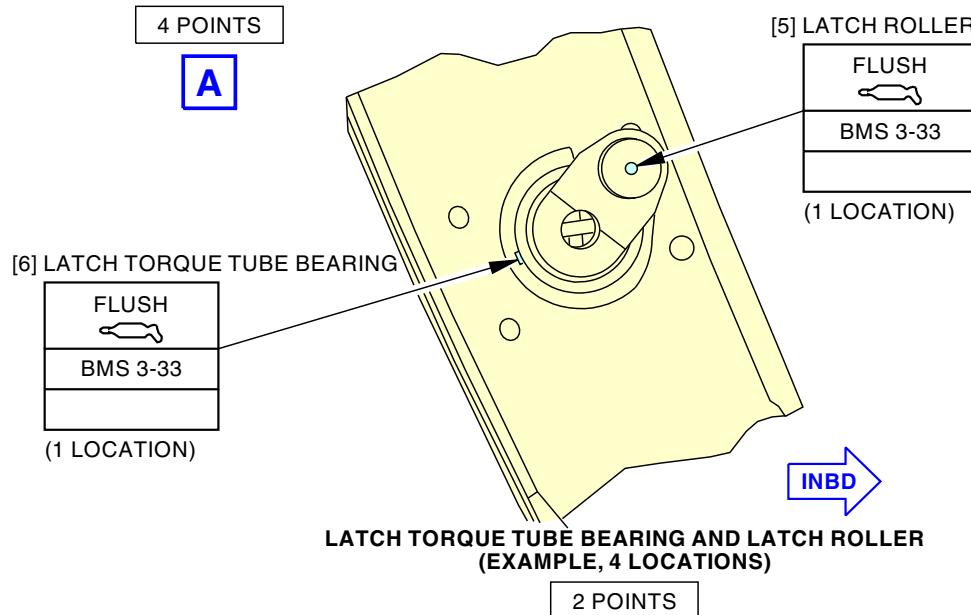
Aft Entry Door Servicing - Components
Figure 301/12-25-12-990-804 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

12-25-12

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details


GUIDE ARM AND GUIDE PLATE TRACKS


F91517 S0006561673_V2

Aft Entry Door Servicing - Components
Figure 301/12-25-12-990-804 (Sheet 2 of 3)

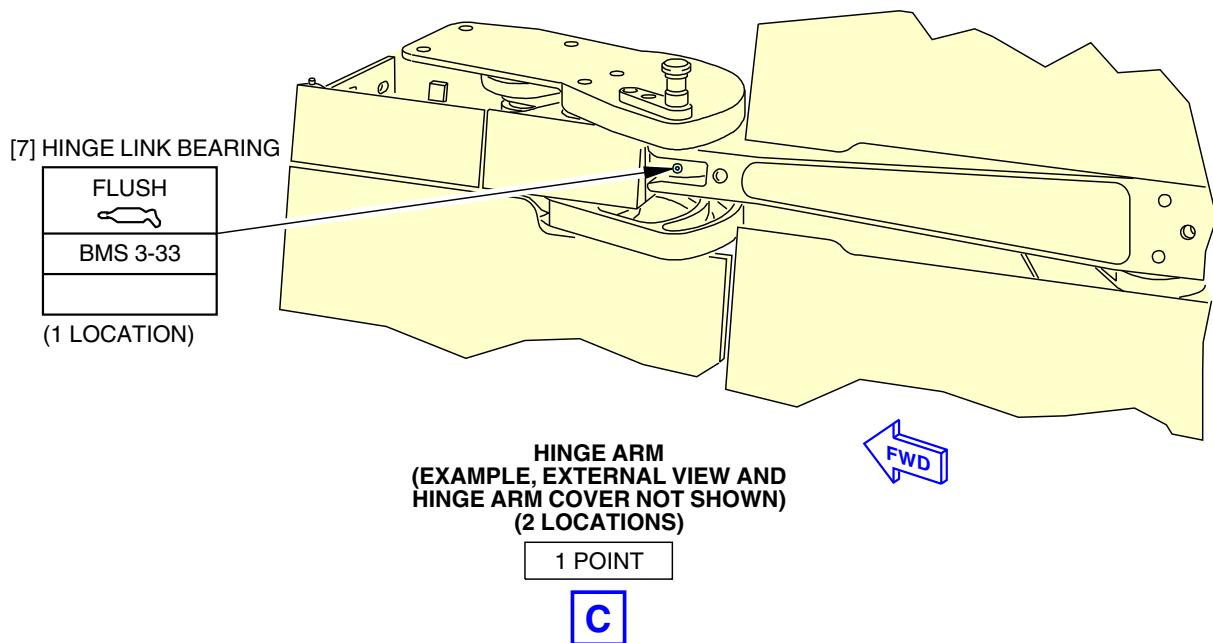
 EFFECTIVITY
 LOM ALL

12-25-12

D633A101-LOM



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



3075352 S0000833933_V1

Aft Entry Door Servicing - Components
Figure 301/12-25-12-990-804 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

12-25-12

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL

TASK 12-25-12-640-802

3. Aft Entry Door Servicing - Mechanism

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-13-31-000-802	Aft Entry Door Lining Removal (P/B 401)
52-13-31-400-802	Aft Entry Door Lining Installation (P/B 401)
SOPM 20-50-19	General Sealing

B. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
834	Left Aft Entry Door

D. Access Panels

Number	Name/Location
834AZ	Aft Entry Door - Torque Tube Access
834BZ	Aft Entry Door - Handle Box and Cam for Handle Box Access
834CZ	Aft Entry Door - Handle Box Access
834DZ	Aft Entry Door - Lower Hinge Access
834EZ	Aft Entry Door - Upper Hinge Access
834FZ	Aft Entry Door - Torque Tube Access
834GZ	AFT Entry Door - Torque Tube Access

E. Prepare for the Servicing

SUBTASK 12-25-12-010-002

(1) Get access to the door mechanism as follows:

- (a) Do this task: Aft Entry Door Lining Removal, TASK 52-13-31-000-802.
- (b) Open these access doors:

Number	Name/Location
834AZ	Aft Entry Door - Torque Tube Access
834BZ	Aft Entry Door - Handle Box and Cam for Handle Box Access
834CZ	Aft Entry Door - Handle Box Access
834DZ	Aft Entry Door - Lower Hinge Access
834EZ	Aft Entry Door - Upper Hinge Access

- (c) Remove these access doors:

Number	Name/Location
834FZ	Aft Entry Door - Torque Tube Access
834GZ	AFT Entry Door - Torque Tube Access

- 1) Remove a pressure fay surface seal that was previously applied between the mating surfaces of the cover plate and the inner skin (SOPM 20-50-19).

EFFECTIVITY
LOM ALL

12-25-12



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

- 2) Remove a parting agent that was previously applied to the mating surfaces of the cover plate (SOPM 20-50-19).
 - (d) To get access to the door components, move the door to the correct position.

F. Aft Entry Door Mechanism Servicing

SUBTASK 12-25-12-640-002

- (1) Lubricate the mechanism on the aft entry door with grease, D00633 (Table 302).

Table 302/12-25-12-993-808 Aft Entry Door Servicing - Mechanism

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Door Hinge Torque Tube	grease, D00633	Hand	2
2	Handle	grease, D00633	Flush	1
3	Latch Control Rods	grease, D00633	Flush	2
4	Gate Control Rods	grease, D00633	Flush	4
5	Latch Torque Tube Bearings	grease, D00633	Zerk	4
6	Cam Follower Bearings	grease, D00633	Hand	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-12-410-002

- (1) Close access to the door as follows:

- (a) Install these access doors:

Number Name/Location

834FZ Aft Entry Door - Torque Tube Access

834GZ AFT Entry Door - Torque Tube Access

- 1) Apply a parting agent to the mating surfaces of the cover plate (SOPM 20-50-19).
 - 2) Apply a pressure fay surface seal with sealant, A00247, between the mating surfaces of the cover plate and the inner skin (SOPM 20-50-19).
 - 3) Install the cover plate onto the door structure with the bolts and the washers.
 - a) If a new bolt is to be used, make sure that the grip length is the same as the original bolt.

NOTE: Grip length is important.

- (b) Close these access doors:

Number Name/Location

834AZ Aft Entry Door - Torque Tube Access

834BZ Aft Entry Door - Handle Box and Cam for Handle Box Access

834CZ Aft Entry Door - Handle Box Access

834DZ Aft Entry Door - Lower Hinge Access

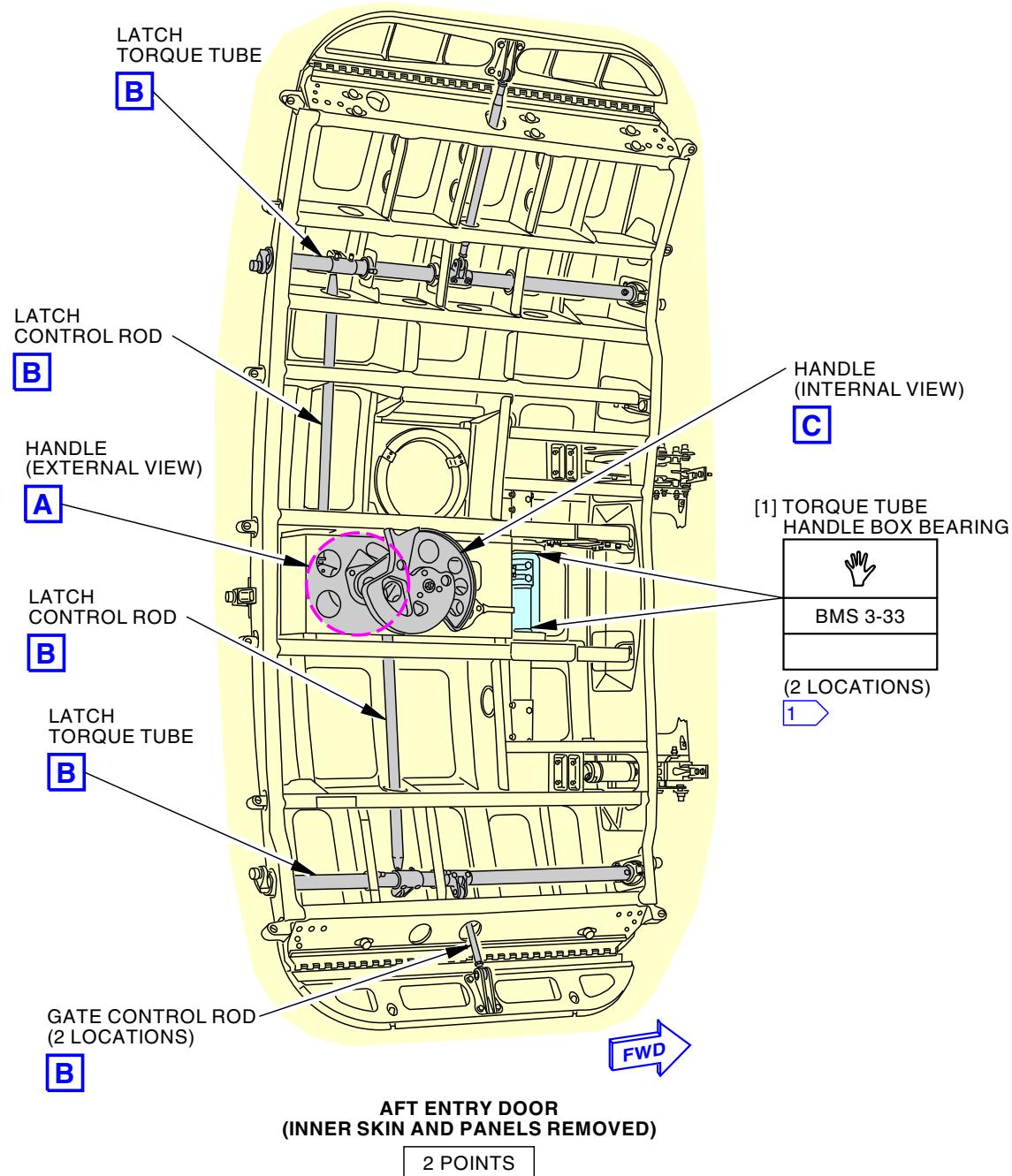
834EZ Aft Entry Door - Upper Hinge Access

- (c) Do this task: Aft Entry Door Lining Installation, TASK 52-13-31-400-802.

———— END OF TASK ————

— EFFECTIVITY —
LOM ALL

12-25-12



- 1** FILL CAVITIES ABOVE DOOR HINGE TORQUE TUBE BEARINGS IN HANDLES MECHANISM HOUSING WITH GREASE.

G70742 S0006561674_V4

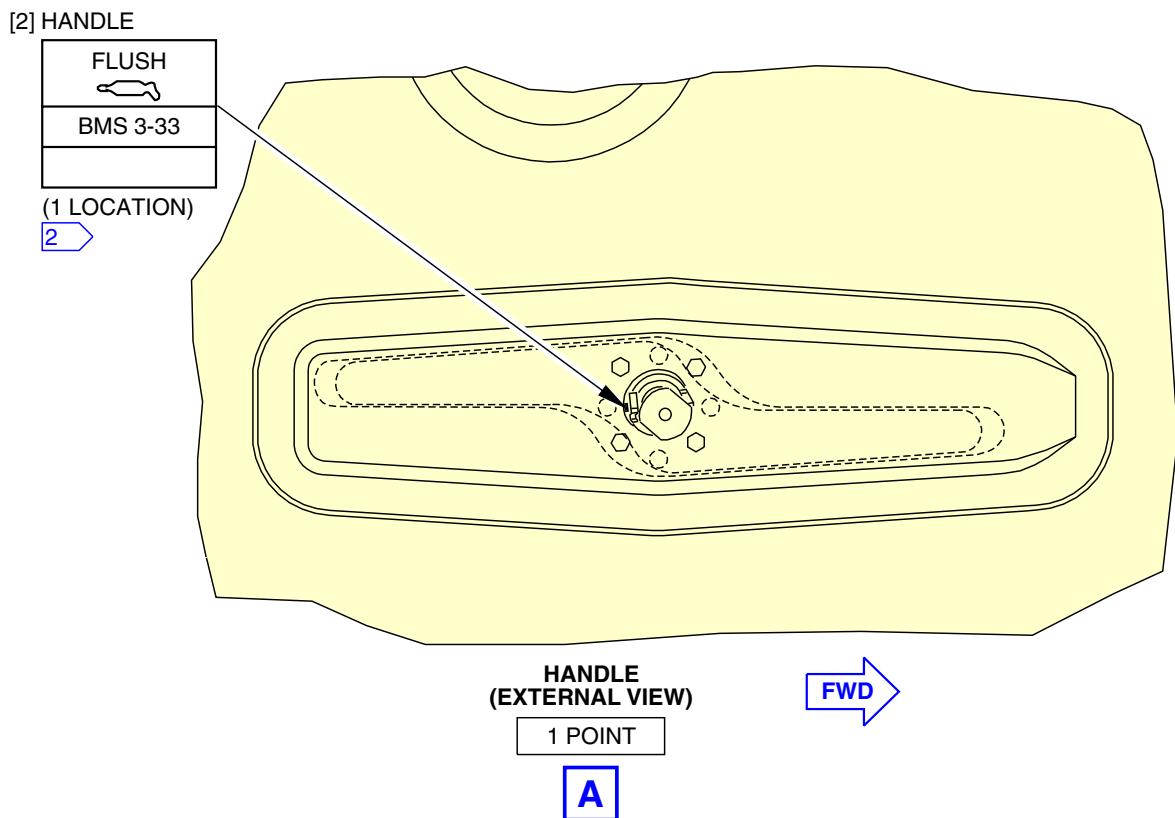
Aft Entry Door Servicing - Mechanism
Figure 302/12-25-12-990-803 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

12-25-12



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AIRCRAFT MAINTENANCE MANUAL



2 GREASE FITTING LOCATED ON THE
INSIDE OF THE SHAFT HOUSING

G11057 S0006561675_V3

Aft Entry Door Servicing - Mechanism
Figure 302/12-25-12-990-803 (Sheet 2 of 3)

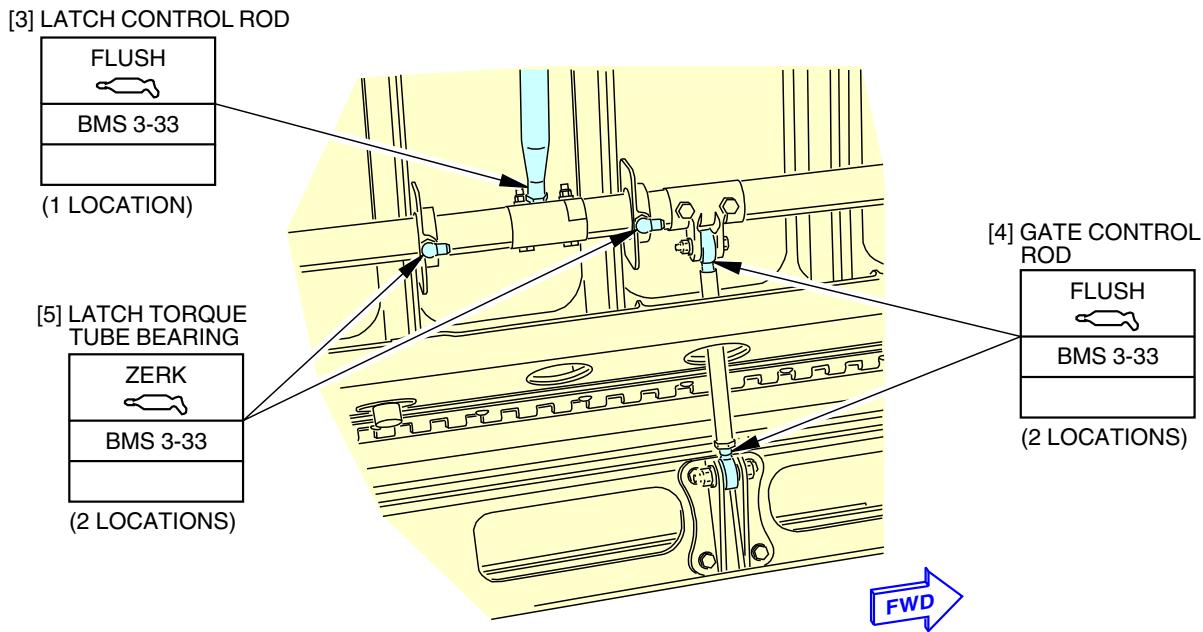
EFFECTIVITY
LOM ALL

12-25-12

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

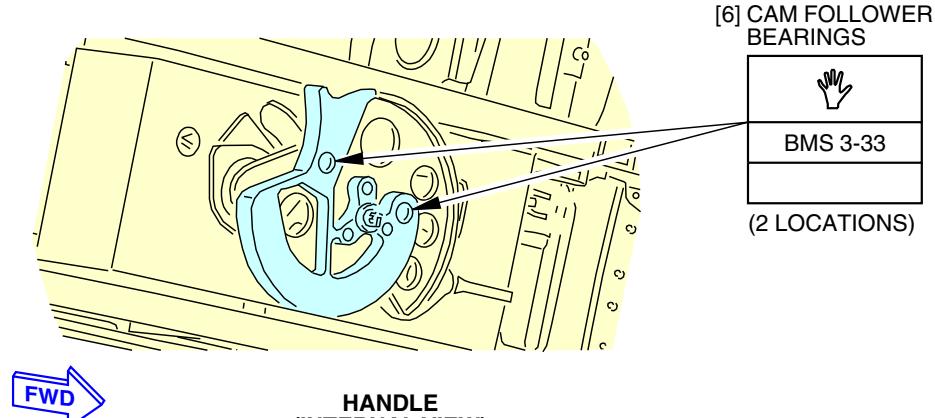
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LATCH CONTROL ROD, GATE CONTROL ROD, AND LATCH TORQUE TUBE
 (LOWER GATE IS SHOWN, UPPER GATE IS EQUIVALENT)
 (EXAMPLE)

5 POINTS

B



HANDLE
 (INTERNAL VIEW)

2 POINTS

C

G20148 S0006561676_V6

Aft Entry Door Servicing - Mechanism
 Figure 302/12-25-12-990-803 (Sheet 3 of 3)

EFFECTIVITY
 LOM ALL

12-25-12

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL

GALLEY SERVICE DOORS - SERVICING

1. General

- A. This procedure contains the following tasks:
- (1) The servicing of the forward galley service door components
 - (2) The servicing of the aft galley service door components
 - (3) The servicing of the forward galley service door mechanism
 - (4) The servicing of the aft galley service door mechanism.

TASK 12-25-13-640-801

2. Forward Galley Service Door Servicing - Components

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-41-00 P/B 201	GALLEY SERVICE DOORS - MAINTENANCE PRACTICES

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
D50101	Lubricating Oil - General Purpose, Preservative (Water-Displacing, Low Temperature)	MIL-PRF-32033 (NATO O-190)

C. Location Zones

Zone	Area
841	Forward Galley Service Door

D. Prepare for the Servicing

SUBTASK 12-25-13-010-001

- (1) Get access to the door components as follows:
 - (a) Open the forward galley service door, refer to: GALLEY SERVICE DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 52-41-00/201.
 - (b) Move the door to the correct position to get access to the door components.

E. Forward Galley Service Door Components Servicing

SUBTASK 12-25-13-640-003

- (1) Lubricate the gate hinges [1] with MIL-PRF-32033 oil, D50101, or grease, D00633.

NOTE: MIL-PRF-32033 oil, D50101, is the preferred lubricant, while grease, D00633, is an alternate.

SUBTASK 12-25-13-640-001

- (2) Lubricate the other components of the galley service door with grease, D00633, (Table 301).





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AIRCRAFT MAINTENANCE MANUAL

Table 301/12-25-13-993-807 Galley Service Door Servicing - Components

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Gate Hinges	MIL-PRF-32033 oil, D50101 or grease, D00633	Oil Can, Hand	2
2	Guide Arm Roller	grease, D00633	Hand	1
3	Guide Arm Rod End Bearing	grease, D00633	Flush	1
4	Guide Plate Tracks	grease, D00633	Hand	2
5	Latch Torque Tube Bearings	grease, D00633	Flush	4
6	Latch Rollers	grease, D00633	Flush	4
7	Hinge Link Bearings	grease, D00633	Flush	2

F. Put the Airplane Back to Its Usual Condition

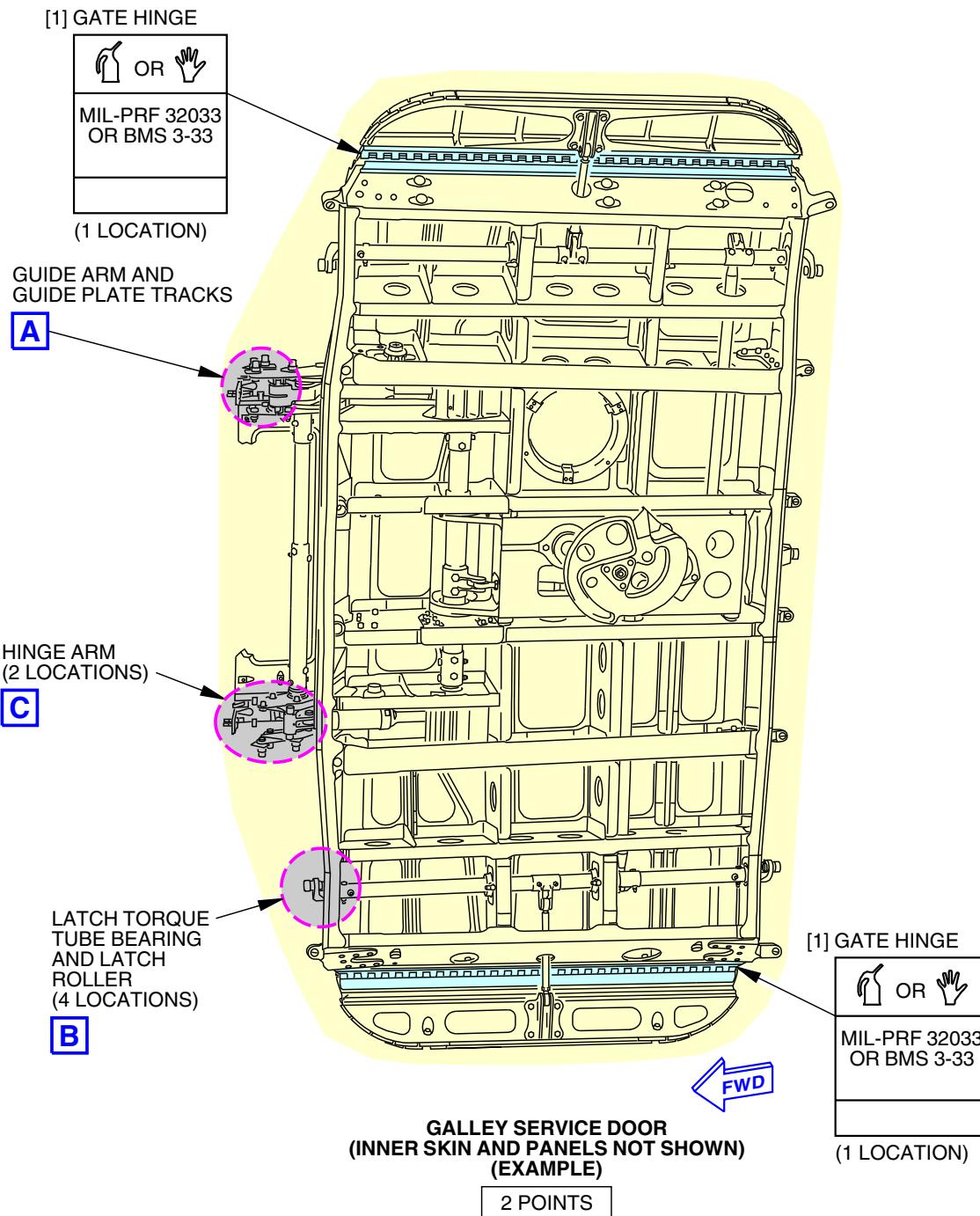
SUBTASK 12-25-13-410-001

- (1) Close and latch the forward galley service door as required, refer to: GALLEY SERVICE DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 52-41-00/201.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

12-25-13

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AIRCRAFT MAINTENANCE MANUAL**


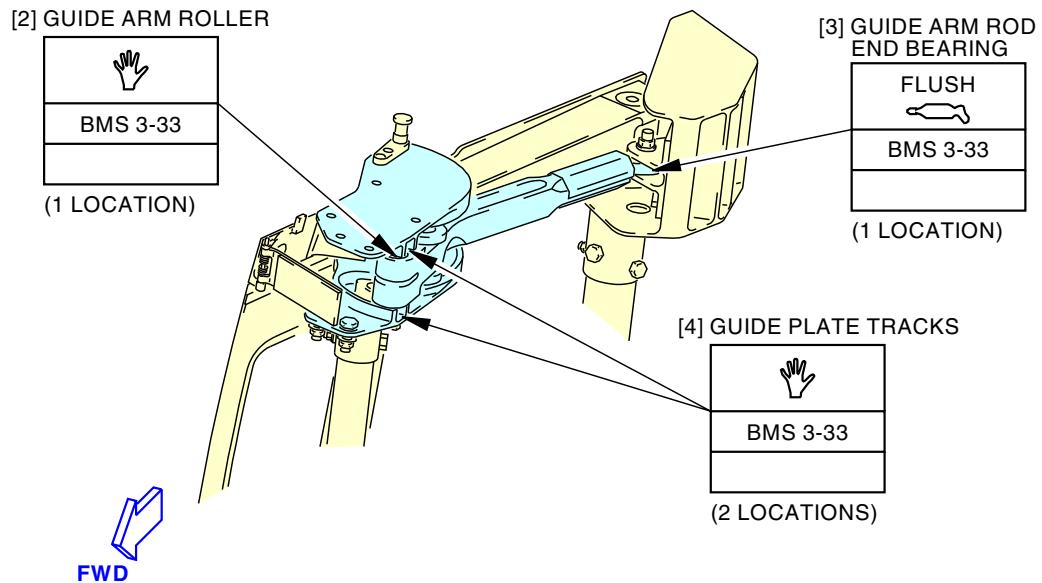
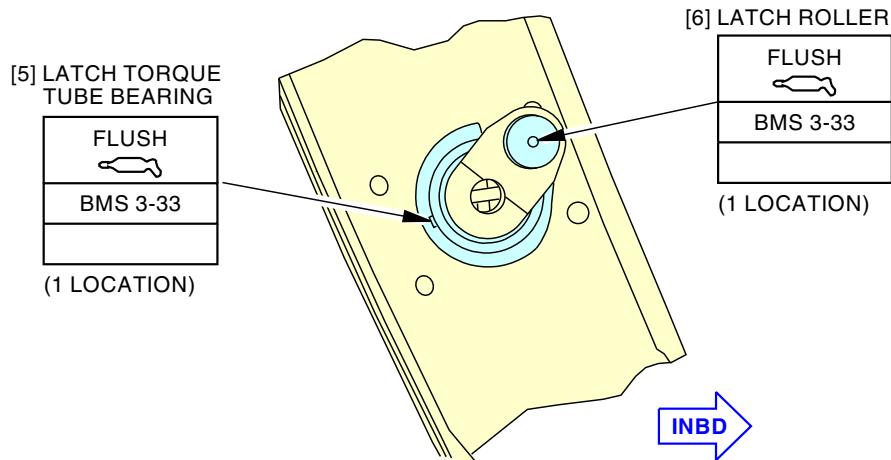
F93924 S0006561683_V6

**Galley Service Door Servicing - Components
Figure 301/12-25-13-990-804 (Sheet 1 of 3)**

 EFFECTIVITY
LOM ALL

12-25-13

D633A101-LOM

**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**

GUIDE ARM AND GUIDE PLATE TRACKS
4 POINTS
A

**LATCH TORQUE TUBE BEARING AND LATCH ROLLER
(EXAMPLE, 4 LOCATIONS)**
2 POINTS
B

F93928 S0006561684_V3

Galley Service Door Servicing - Components
Figure 301/12-25-13-990-804 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

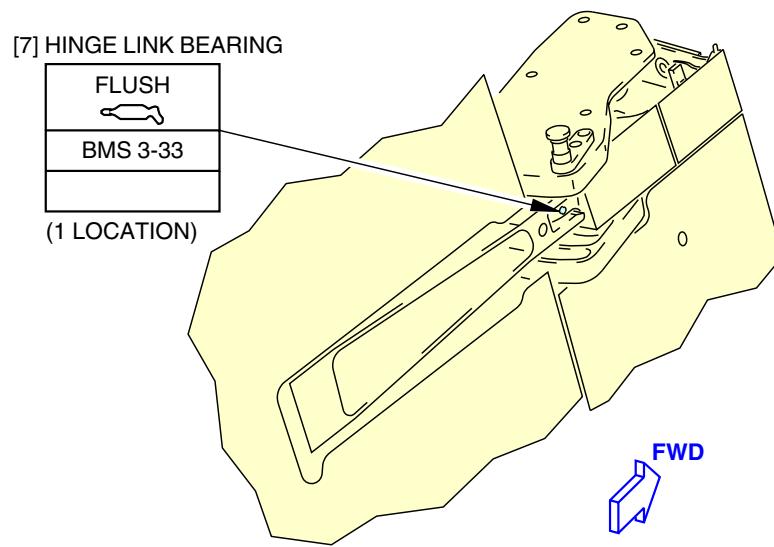
12-25-13

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



HINGE ARM (EXAMPLE, EXTERNAL
VIEW AND HINGE COVER NOT SHOWN)
(2 LOCATIONS)

1 POINT

C

3075350 S0000833968_V1

Galley Service Door Servicing - Components
Figure 301/12-25-13-990-804 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

12-25-13

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

TASK 12-25-13-640-803

3. Aft Galley Service Door Servicing - Components

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-41-00 P/B 201	GALLEY SERVICE DOORS - MAINTENANCE PRACTICES

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
D50101	Lubricating Oil - General Purpose, Preservative (Water-Displacing, Low Temperature)	MIL-PRF-32033 (NATO O-190)

C. Location Zones

Zone	Area
844	Aft Galley Service Door

D. Prepare for the Servicing

SUBTASK 12-25-13-010-003

- (1) Get access to the door components as follows:

- (a) Open the aft galley service door, refer to: GALLEY SERVICE DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 52-41-00/201.
- (b) Move the door to the correct position to get access to the door components.

E. Aft Galley Service Door Components Servicing

SUBTASK 12-25-13-640-004

- (1) Lubricate the gate hinges [1] with MIL-PRF-32033 oil, D50101, or grease, D00633.

NOTE: MIL-PRF-32033 oil, D50101, is the preferred lubricant, while grease, D00633, is an alternate.

SUBTASK 12-25-13-640-005

- (2) Lubricate the other components of the galley service door with grease, D00633 (Table 302).

Table 302/12-25-13-993-810 Galley Service Door Servicing - Components

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Gate Hinges	MIL-PRF-32033 oil, D50101 or grease, D00633	Oil Can, Hand	2
2	Guide Arm Roller	grease, D00633	Hand	1
3	Guide Arm Rod End Bearing	grease, D00633	Flush	1
4	Guide Plate Tracks	grease, D00633	Hand	2
5	Latch Torque Tube Bearings	grease, D00633	Flush	4
6	Latch Rollers	grease, D00633	Flush	4
7	Hinge Link Bearings	grease, D00633	Flush	2

EFFECTIVITY
LOM ALL

12-25-13



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AIRCRAFT MAINTENANCE MANUAL

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-13-410-003

- (1) Close and latch the aft galley service door as required, refer to: GALLEY SERVICE DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 52-41-00/201.

———— END OF TASK ————

TASK 12-25-13-640-802

4. Forward Galley Service Door Lubrication - Mechanism

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-41-31-000-802	Galley Service Door Lining Removal (P/B 401)
52-41-31-400-802	Galley Service Door Lining Installation (P/B 401)
SOPM 20-50-19	General Sealing

B. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
841	Forward Galley Service Door

D. Access Panels

Number	Name/Location
841AZ	Forward Galley Service Door - Torque Tube Access
841BZ	Forward Galley Service Door - Handle Box and Cam for Handle Box Access
841CZ	Forward Galley Service Door - Handle Box Access
841DZ	Forward Galley Service Door - Lower Hinge Access
841EZ	Forward Galley Service Door - Upper Hinge Access
841FZ	Forward Galley Service Door - Torque Tube Access
841GZ	Forward Galley Service Door - Torque Tube Access

E. Prepare for the Servicing

SUBTASK 12-25-13-010-002

- (1) Get access to the door mechanism as follows:
- Do this task: Galley Service Door Lining Removal, TASK 52-41-31-000-802.
 - Open the access doors for the applicable galley service door being serviced:

Number	Name/Location
841AZ	Forward Galley Service Door - Torque Tube Access
841BZ	Forward Galley Service Door - Handle Box and Cam for Handle Box Access
841CZ	Forward Galley Service Door - Handle Box Access
841DZ	Forward Galley Service Door - Lower Hinge Access

EFFECTIVITY
LOM ALL

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AIRCRAFT MAINTENANCE MANUAL

(Continued)

- | <u>Number</u> | <u>Name/Location</u> |
|---------------|--|
| 841EZ | Forward Galley Service Door - Upper Hinge Access |
- (c) Remove the access doors for the applicable galley service door being serviced:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|--|
| 841FZ | Forward Galley Service Door - Torque Tube Access |
| 841GZ | Forward Galley Service Door - Torque Tube Access |
- 1) Remove the pressure fay surface seal between the mating surfaces of the coverplate and inner skin (SOPM 20-50-19).
 - 2) Remove the parting agent from the mating surfaces of the coverplate (SOPM 20-50-19).
- (d) To get access to the door components, move the door to the correct position.

F. Forward Galley Service Door Mechanism Servicing

SUBTASK 12-25-13-640-002

- (1) Lubricate the mechanism of the forward galley service door with grease, D00633 (Table 303).

Table 303/12-25-13-993-808 Galley Service Door Servicing - Mechanism

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Door Hinge Torque Tube	grease, D00633	Hand	2
2	Handle	grease, D00633	Flush	1
3	Latch Torque Tube Bearings	grease, D00633	Zerk	4
4	Latch Control Rods	grease, D00633	Flush	2
5	Gate Control Rods	grease, D00633	Flush	4
6	Cam Follower Bearings	grease, D00633	Hand	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-13-410-002

- (1) Close access to the door as follows:

- (a) Close the doors that were opened:

<u>Number</u>	<u>Name/Location</u>
841AZ	Forward Galley Service Door - Torque Tube Access
841BZ	Forward Galley Service Door - Handle Box and Cam for Handle Box Access
841CZ	Forward Galley Service Door - Handle Box Access
841DZ	Forward Galley Service Door - Lower Hinge Access
841EZ	Forward Galley Service Door - Upper Hinge Access

- (b) Install the access doors that were removed:

<u>Number</u>	<u>Name/Location</u>
841FZ	Forward Galley Service Door - Torque Tube Access
841GZ	Forward Galley Service Door - Torque Tube Access

- 1) Apply parting agent to the mating surfaces of the coverplate (SOPM 20-50-19).

EFFECTIVITY
LOM ALL

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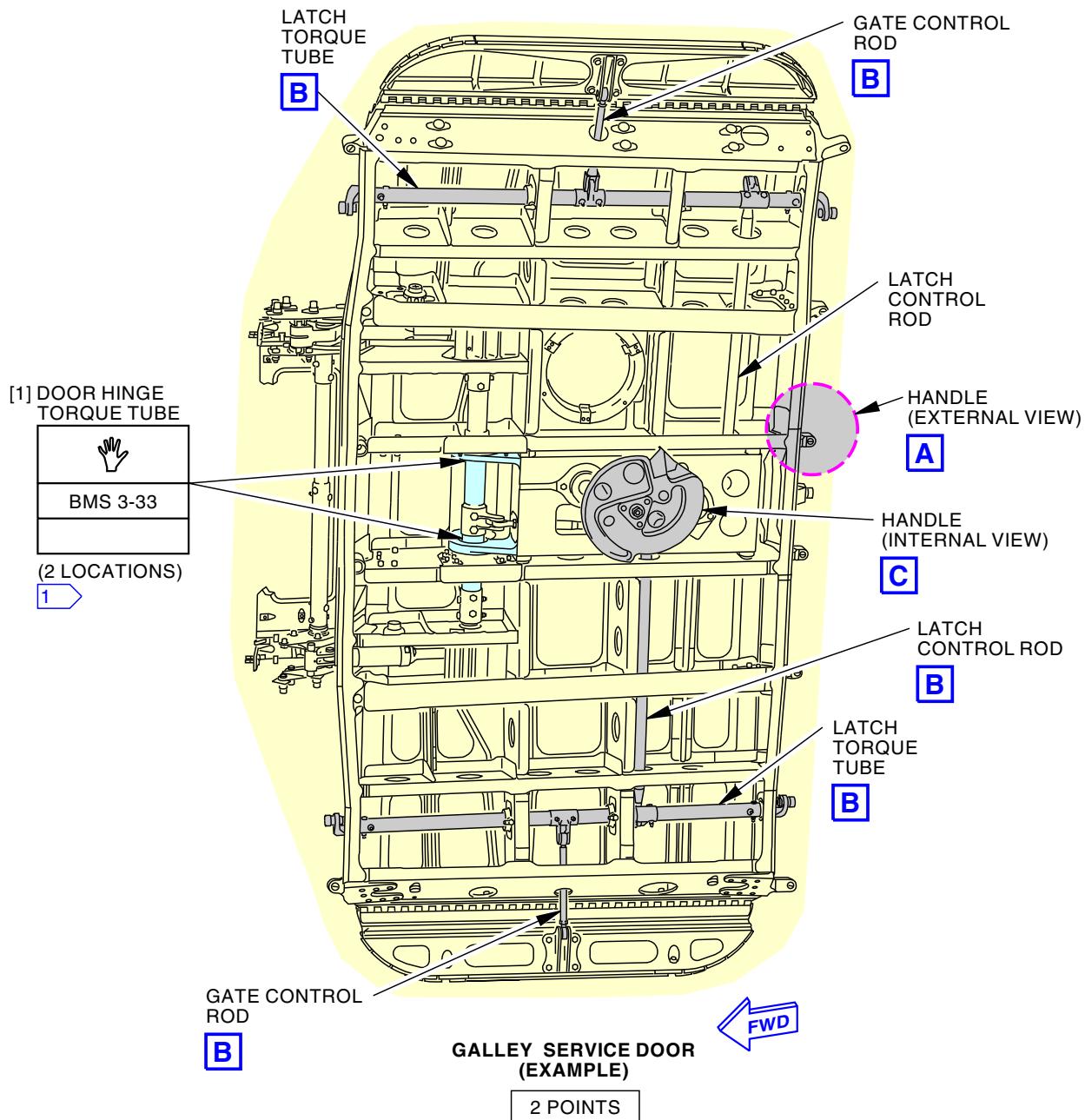
- 2) Apply a pressure fay surface seal with sealant, A00247, between the mating surfaces of the coverplate and inner skin (SOPM 20-50-19).
 - 3) Install the coverplate onto the door structure with the bolts and washers.
 - a) If a new bolt is to be used, make sure that the grip length is the same as the original bolt.

NOTE: Grip length is important.
- (c) Do this task: Galley Service Door Lining Installation, TASK 52-41-31-400-802.

———— END OF TASK ———

— EFFECTIVITY —
LOM ALL

12-25-13



- 1 FILL CAVITIES ABOVE DOOR HINGE TORQUE TUBE BEARINGS IN HANDLE MECHANISM HOUSING WITH GREASE.

G72034 S0006561685_V6

Galley Service Door Servicing - Mechanism
Figure 302/12-25-13-990-803 (Sheet 1 of 3)

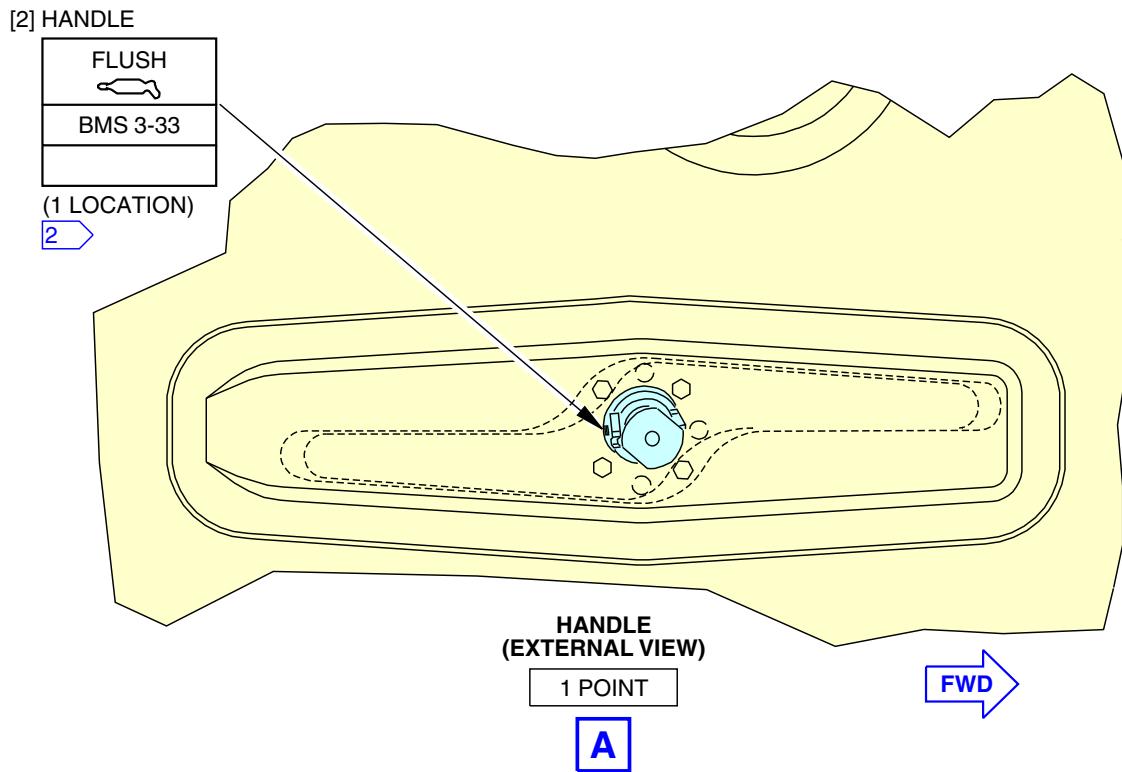
EFFECTIVITY
LOM ALL

12-25-13

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL



② GREASE FITTING LOCATED ON THE
INSIDE OF THE SHAFT HOUSING

G72041 S0006561686_V7

Galley Service Door Servicing - Mechanism
Figure 302/12-25-13-990-803 (Sheet 2 of 3)

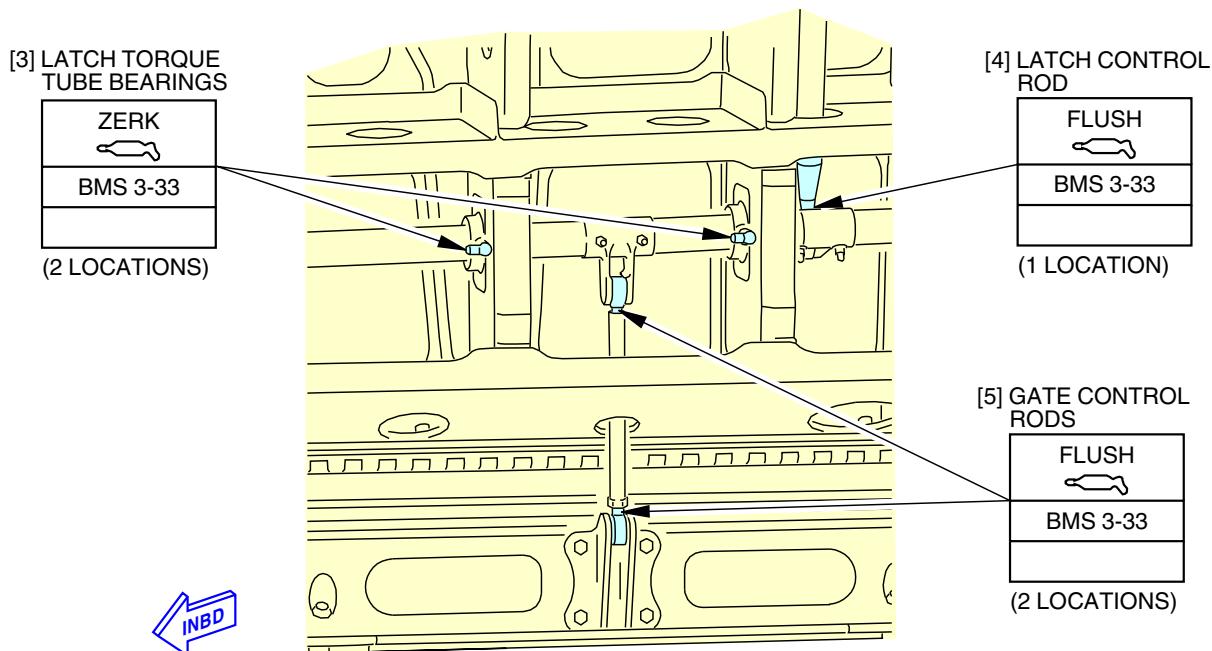
EFFECTIVITY
LOM ALL

12-25-13

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

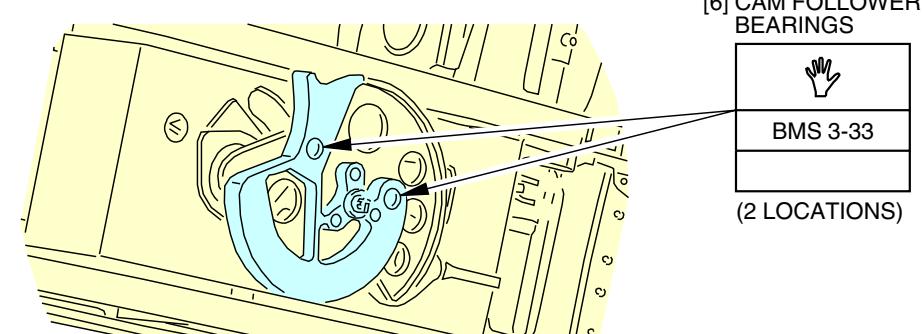
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LATCH CONTROL ROD, GATE CONTROL ROD, AND LATCH TORQUE TUBE
 (LOWER GATE IS SHOWN, UPPER GATE IS EQUIVALENT)
 (EXAMPLE)

5 POINTS

B



FWD

HANDLE
 (INTERNAL VIEW)

2 POINTS

C

G72098 S0006561687_V8

Galley Service Door Servicing - Mechanism
 Figure 302/12-25-13-990-803 (Sheet 3 of 3)

EFFECTIVITY
 LOM ALL

12-25-13

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

TASK 12-25-13-640-804

5. Aft Galley Service Door Lubrication - Mechanism

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
52-41-31-000-802	Galley Service Door Lining Removal (P/B 401)
52-41-31-400-802	Galley Service Door Lining Installation (P/B 401)
SOPM 20-50-19	General Sealing

B. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
844	Aft Galley Service Door

D. Access Panels

Number	Name/Location
844AZ	Aft Galley Service Door - Torque Tube Access
844BZ	Aft Galley Service Door - Handle Box and Cam for Handle Box Access
844CZ	Aft Galley Service Door - Handle Box Access
844DZ	Aft Galley Service Door - Lower Hinge Access
844EZ	Aft Galley Service Door - Upper Hinge Access
844FZ	Aft Galley Service Door - Torque Tube Access
844GZ	Aft Galley Service Door - Torque Tube Access

E. Prepare for the Servicing

SUBTASK 12-25-13-010-004

(1) Get access to the door mechanism as follows:

- (a) Do this task: Galley Service Door Lining Removal, TASK 52-41-31-000-802.
- (b) Open the access doors for the applicable galley service door being serviced:

Number	Name/Location
844AZ	Aft Galley Service Door - Torque Tube Access
844BZ	Aft Galley Service Door - Handle Box and Cam for Handle Box Access
844CZ	Aft Galley Service Door - Handle Box Access
844DZ	Aft Galley Service Door - Lower Hinge Access
844EZ	Aft Galley Service Door - Upper Hinge Access

- (c) Remove the access doors for the applicable galley service door being serviced:

Number	Name/Location
844FZ	Aft Galley Service Door - Torque Tube Access
844GZ	Aft Galley Service Door - Torque Tube Access

- 1) Remove the pressure fay surface seal between the mating surfaces of the

EFFECTIVITY
LOM ALL

12-25-13



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

coverplate and inner skin (SOPM 20-50-19).

- 2) Remove the parting agent from the mating surfaces of the coverplate (SOPM 20-50-19).
- (d) To get access to the door components, move the door to the correct position.

F. Aft Galley Service Door Mechanism Servicing

SUBTASK 12-25-13-640-006

- (1) Lubricate the mechanism of the aft galley service door with grease, D00633 (Table 304).

Table 304/12-25-13-993-809 Galley Service Door Servicing - Mechanism

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Door Hinge Torque Tube	grease, D00633	Hand	2
2	Handle	grease, D00633	Flush	1
3	Latch Torque Tube Bearings	grease, D00633	Zerk	4
4	Latch Control Rods	grease, D00633	Flush	2
5	Gate Control Rods	grease, D00633	Flush	4
6	Cam Follower Bearings	grease, D00633	Hand	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-13-410-004

- (1) Close access to the door as follows:

- (a) Close the doors that were opened:

Number **Name/Location**

844AZ	Aft Galley Service Door - Torque Tube Access
844BZ	Aft Galley Service Door - Handle Box and Cam for Handle Box Access
844CZ	Aft Galley Service Door - Handle Box Access
844DZ	Aft Galley Service Door - Lower Hinge Access
844EZ	Aft Galley Service Door - Upper Hinge Access

- (b) Install the access doors that were removed:

Number **Name/Location**

844FZ	Aft Galley Service Door - Torque Tube Access
844GZ	Aft Galley Service Door - Torque Tube Access

- 1) Apply parting agent to the mating surfaces of the coverplate (SOPM 20-50-19).
- 2) Apply a pressure fay surface seal with sealant, A00247, between the mating surfaces of the coverplate and inner skin (SOPM 20-50-19).
- 3) Install the coverplate onto the door structure with the bolts and washers.

- a) If a new bolt is to be used, make sure that the grip length is the same as the original bolt.

NOTE: Grip length is important.

- (c) Do this task: Galley Service Door Lining Installation, TASK 52-41-31-400-802.

———— END OF TASK ————

EFFECTIVITY
LOM ALL

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EMERGENCY EXIT DOOR - SERVICING

1. General

- A. This procedure has this task:
- (1) The servicing of the emergency exit door.

TASK 12-25-22-640-801

2. Emergency Exit Door Servicing

(Figure 301)

A. References

Reference	Title
52-22-00 P/B 201	EMERGENCY EXIT DOOR - MAINTENANCE PRACTICES

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
832	Left Forward Emergency Exit
833	Left Emergency Exit (STA 627.5)
842	Right Forward Emergency Exit
843	Right Emergency Exit (STA 627.5)

D. Access Panels

Number	Name/Location
832	Emergency Exit
833	Emergency Exit
842	Emergency Exit
843	Emergency Exit

E. Prepare for the Servicing

SUBTASK 12-25-22-010-001



MAKE SURE THAT THE DOOR OPENING PATH IS CLEAR BEFORE YOU
RELEASE THE DOOR HANDLE. THE DOOR IS SPRING-LOADED TO OPEN
AUTOMATICALLY AND INJURIES COULD OCCUR.

- (1) To get access to the lubrication points, open the applicable emergency exit door:

- (a) Open these access panels:
(PAGEBLOCK 52-22-00/201)

Number	Name/Location
832	Emergency Exit
833	Emergency Exit
842	Emergency Exit
843	Emergency Exit

EFFECTIVITY
LOM ALL

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F. Emergency Exit Door Servicing

SUBTASK 12-25-22-640-001

- (1) Lubricate all surface of the stop track [1], including the stop pads, with grease, D00633, by hand.

SUBTASK 12-25-22-640-002

- (2) Lubricate the torsion springs [2] with grease, D00633, by hand.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-22-410-001

- (1) Close and latch the applicable emergency exit door:

- (a) Close these access panels:

(PAGEBLOCK 52-22-00/201)

Number	Name/Location
832	Emergency Exit
833	Emergency Exit
842	Emergency Exit
843	Emergency Exit

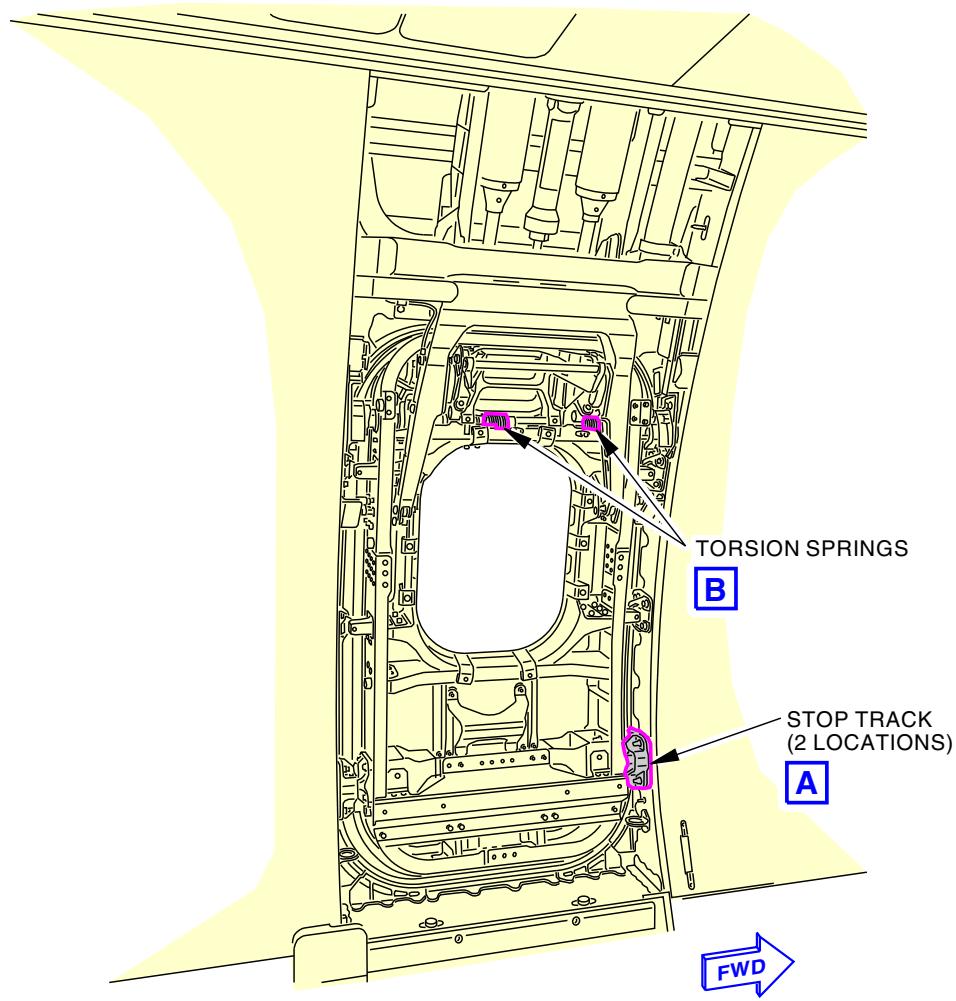
———— END OF TASK ————

EFFECTIVITY
LOM ALL

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EMERGENCY EXIT DOOR
(DOOR IN THE CLOSED POSITION
WITH DOOR LINING REMOVED)
(EXAMPLE)

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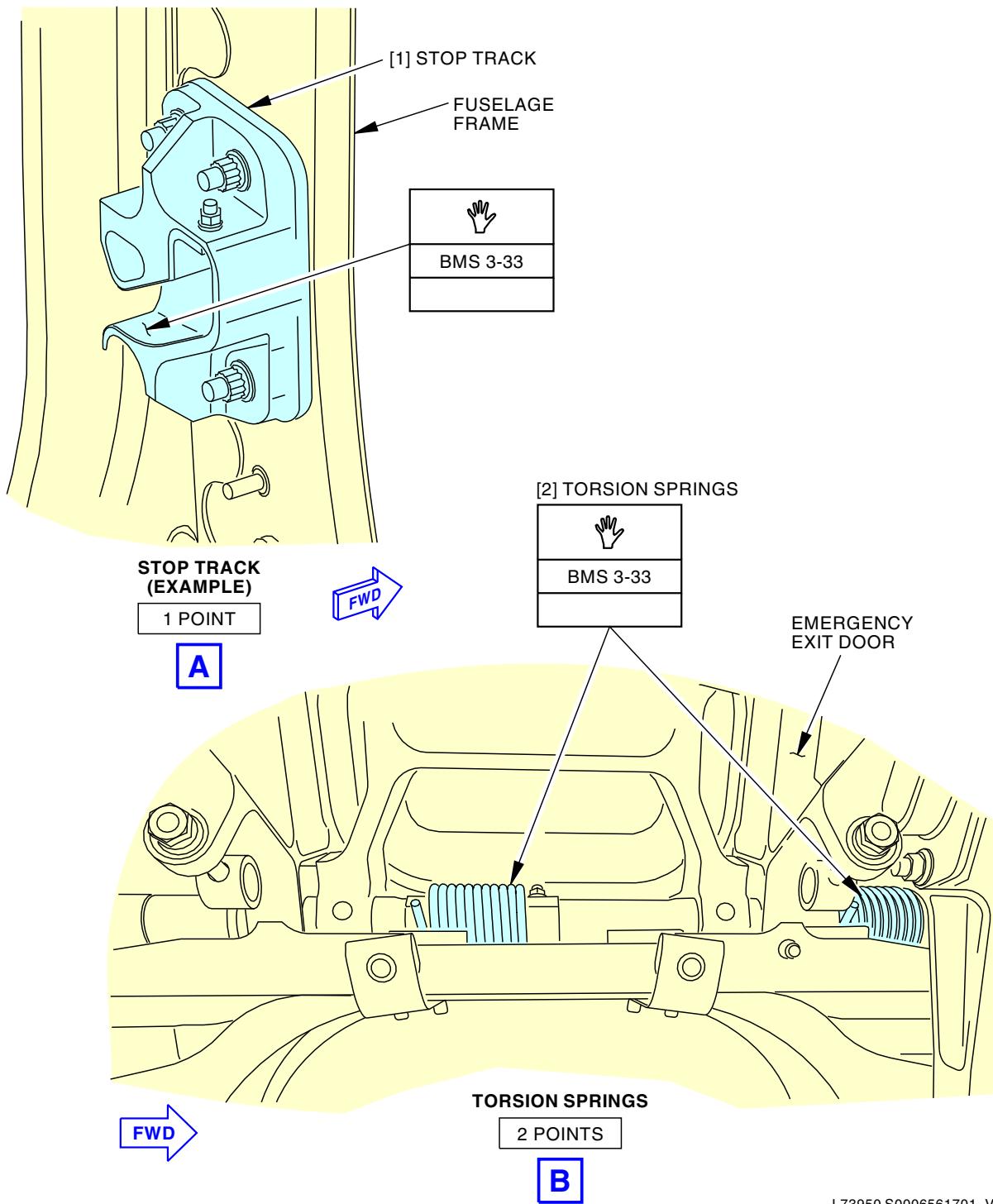
Emergency Exit Door Servicing
Figure 301/12-25-22-990-801 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

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Emergency Exit Door Servicing
Figure 301/12-25-22-990-801 (Sheet 2 of 2)

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 LOM ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL

CARGO DOORS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the cargo door.
- C. This procedure is the same for the forward or aft cargo door.

TASK 12-25-31-640-801

2. Cargo Door Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
821	Forward Cargo Door
822	Aft Cargo Door

C. Access Panels

Number	Name/Location
821AZ	Panel Assy - Forward Cargo Door - Protective Pad Liner
822AZ	Panel Assy - Aft Cargo Door - Protective Pad Liner

D. Prepare for the Servicing

SUBTASK 12-25-31-010-001

- (1) Get access to the door as follows:

- (a) Open these access panels:

Number	Name/Location
821AZ	Panel Assy - Forward Cargo Door - Protective Pad Liner
822AZ	Panel Assy - Aft Cargo Door - Protective Pad Liner

NOTE: Only open the panels for the applicable door being serviced.

SUBTASK 12-25-31-010-004

- (2) Remove the access panel [101] for the latch torque tube as follows:

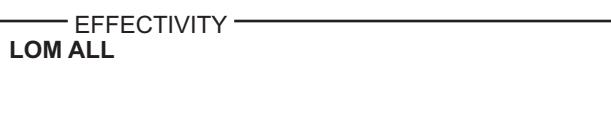
- (a) Remove the bolts [102] and washers [103] that attach the access panel [101] to the door.

E. Cargo Door Servicing

(Table 301)

SUBTASK 12-25-31-640-001

- (1) Lubricate the components on the cargo door with grease, D00633.



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Table 301/12-25-31-993-804 Cargo Door Servicing (Fig. 301)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Idler Crank	grease, D00633	Flush	1
2	Latch Torque Tube	grease, D00633	Flush	1

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-31-410-002

- (1) Install the access panel [101] for the latch torque tube as follows:
 - (a) Put the access panel [101] in its correct position over the latch torque tube.
 - (b) Install the washers [103] and bolts [102] to attach the access panel [101] to the door.

SUBTASK 12-25-31-410-001

- (2) Close access to the door as follows:

- (a) Close these access panels:

Number Name/Location

821AZ Panel Assy - Forward Cargo Door - Protective Pad Liner

822AZ Panel Assy - Aft Cargo Door - Protective Pad Liner

NOTE: Only close the panels for the applicable door being serviced.

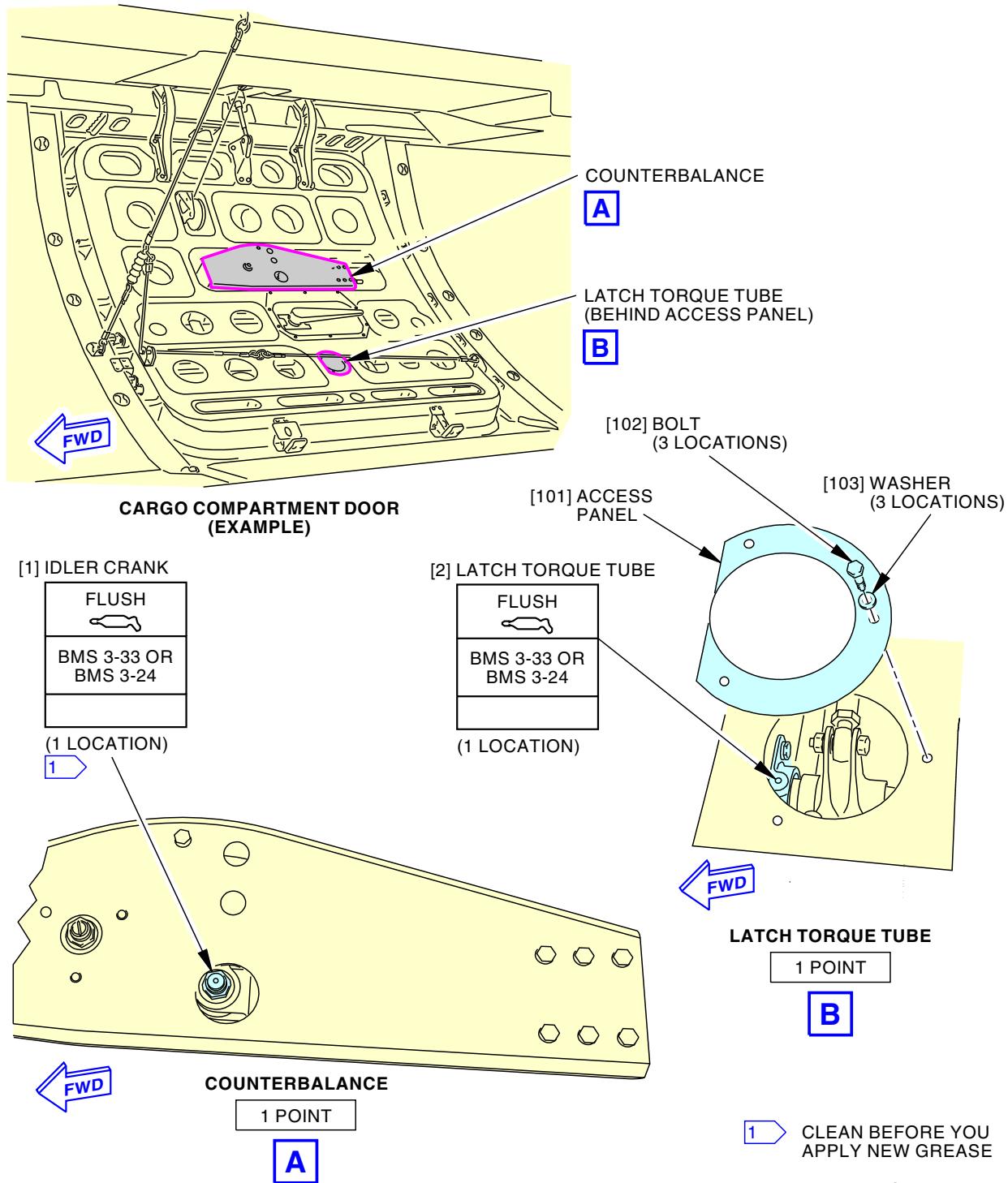
———— END OF TASK ————

EFFECTIVITY
LOM ALL

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Cargo Door Servicing
Figure 301/12-25-31-990-801
EFFECTIVITY
LOM ALL
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AIRCRAFT MAINTENANCE MANUAL
ACCESS AND SERVICE DOORS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the electronic equipment access door.
 - (2) The servicing of the forward access door.

TASK 12-25-41-640-801

2. Electronic Equipment Access Door Servicing

(Figure 301, Table 301)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
117AW	Equipment Access Door Cover

D. Prepare for Servicing

SUBTASK 12-25-41-010-005

- (1) Turn the latch handle to the closed position.

SUBTASK 12-25-41-010-007

- (2) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 12-25-41-010-002

- (3) Do the following to open this access panel:

Number	Name/Location
117AW	Equipment Access Door Cover

(Figure 301)

- (a) Remove the bolt [105], washer [106], and nut [107] that attach the collar [104] to the latch mechanism [2].
- (b) Remove the collar [104] and the washer [108].
- (c) Remove the screws [101] and the screws [102] that attach the cover [103] to the door.
- (d) Remove the cover [103].

SUBTASK 12-25-41-010-006

- (4) Remove the support plate [110] from the latch mechanism [2] as follows (Figure 301):

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- (a) Remove the screws [109] that attach the support plate [110] to the latch mechanism [2].
NOTE: After you remove the screws [109], the bearings [113] and the spacers [112, 114, 115, 116 and 117] are not held in position.
- (b) Remove the support plate [110] and the washer [111].

E. Procedure

SUBTASK 12-25-41-640-001

- (1) Lubricate the components with the applicable material shown in (Table 301, Figure 301):
 - (a) grease, D00633

Table 301/12-25-41-993-803 Electronic Equipment Access Door Lubrication (Fig. 301)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Points
1	Latch Pins (4)	grease, D00633	Hand	4
2	Latch Mechanism (1)	grease, D00633	Hand	1

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-41-410-003

- (1) Install the support plate [110] on the latch mechanism [2] as follows (Figure 301):
 - (a) Install the washer [111] on the latch mechanism [2].
 - (b) Put the support plate [110] in its correct position over the spacers [112, 114, 115, 116 and 117] and the bearings [113].
 - (c) Install the screws [109].

SUBTASK 12-25-41-010-003

- (2) Do the following to close this access panel:

Number Name/Location

117AW Equipment Access Door Cover

(Figure 301):

- (a) Put the cover [103] in its correct position over the latch mechanism [2].
- (b) Install the washer [108] and the collar [104] on the latch mechanism [2].
- (c) Install the bolt [105], washer [106], and nut [107] to attach the collar [104] to the latch mechanism [2].
- (d) Install the screws [101] and screws [102] to attach the cover [103] to the door.

SUBTASK 12-25-41-410-004

- (3) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

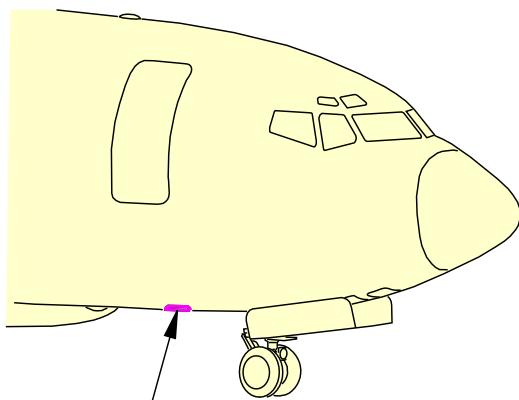
———— END OF TASK ————

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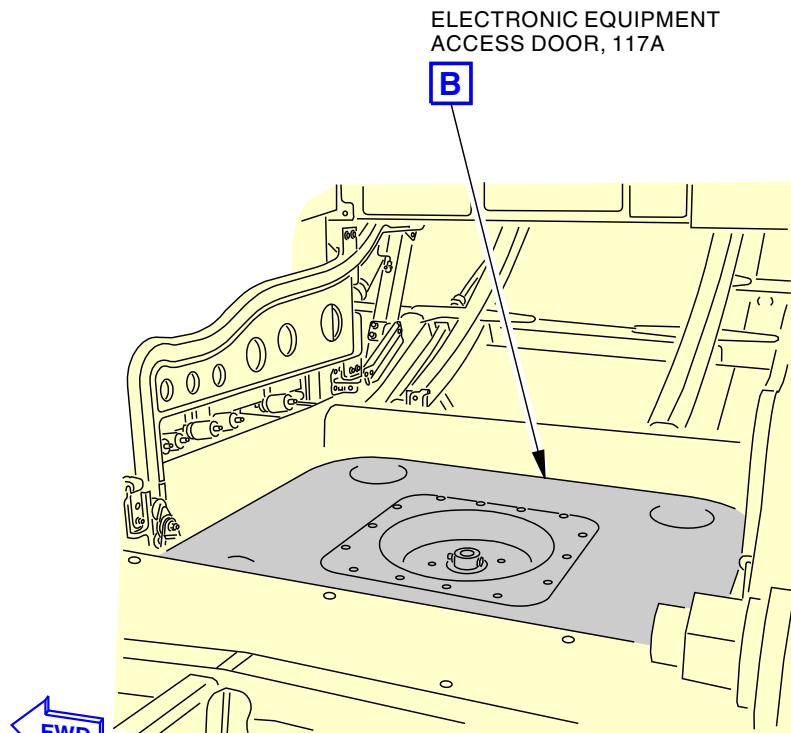


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ELECTRONIC
EQUIPMENT
ACCESS DOOR,
117A

A



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Electronic Equipment Access Door Servicing
Figure 301/12-25-41-990-803 (Sheet 1 of 4)

EFFECTIVITY
LOM ALL

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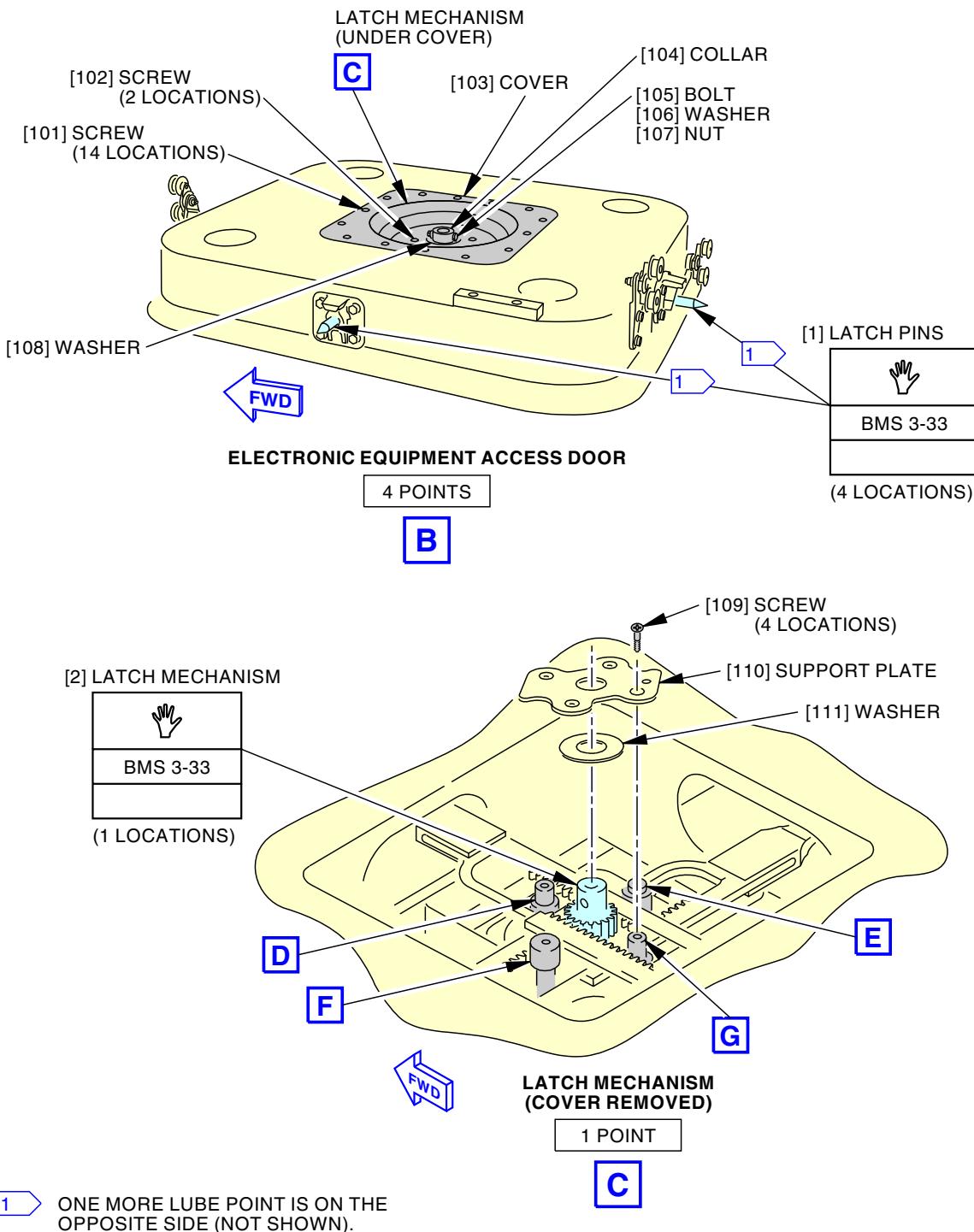
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Electronic Equipment Access Door Servicing
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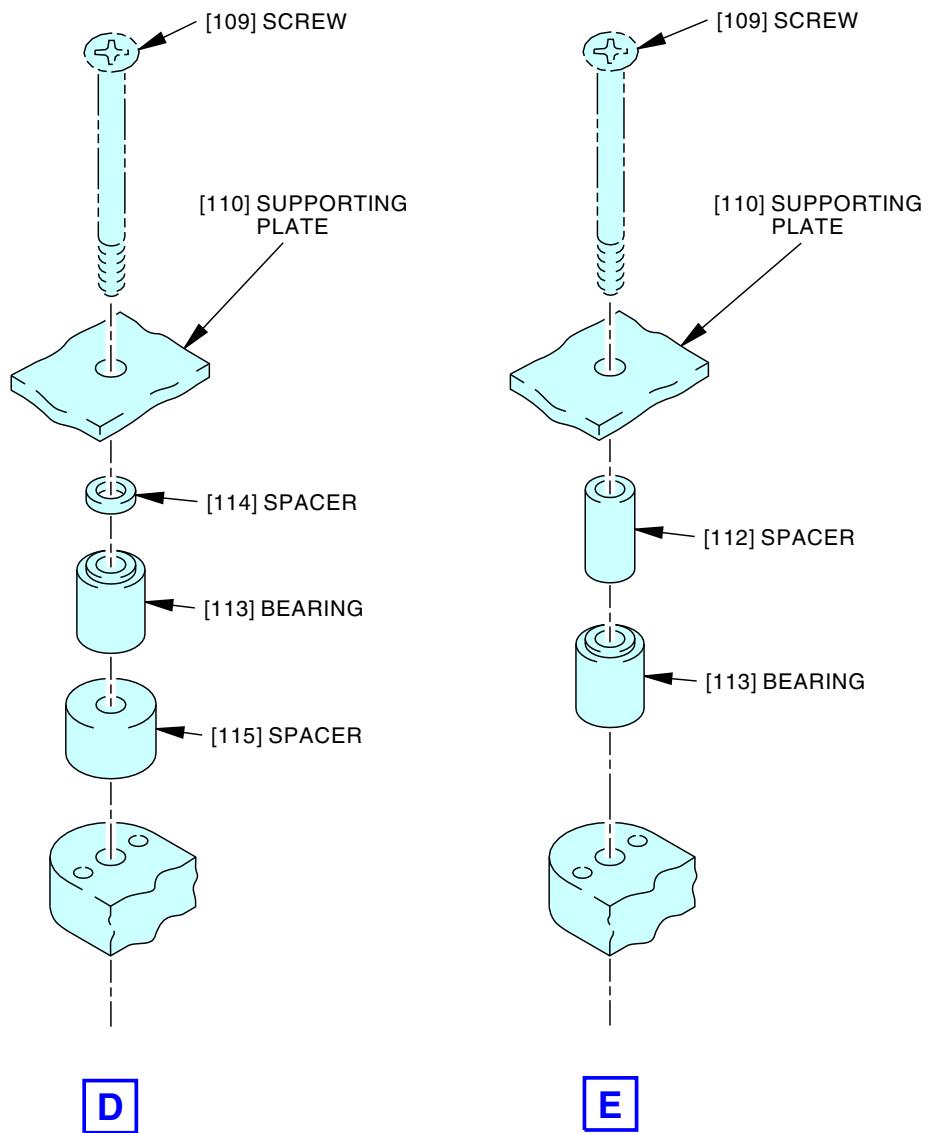
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LOM ALL

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Electronic Equipment Access Door Servicing
Figure 301/12-25-41-990-803 (Sheet 3 of 4)

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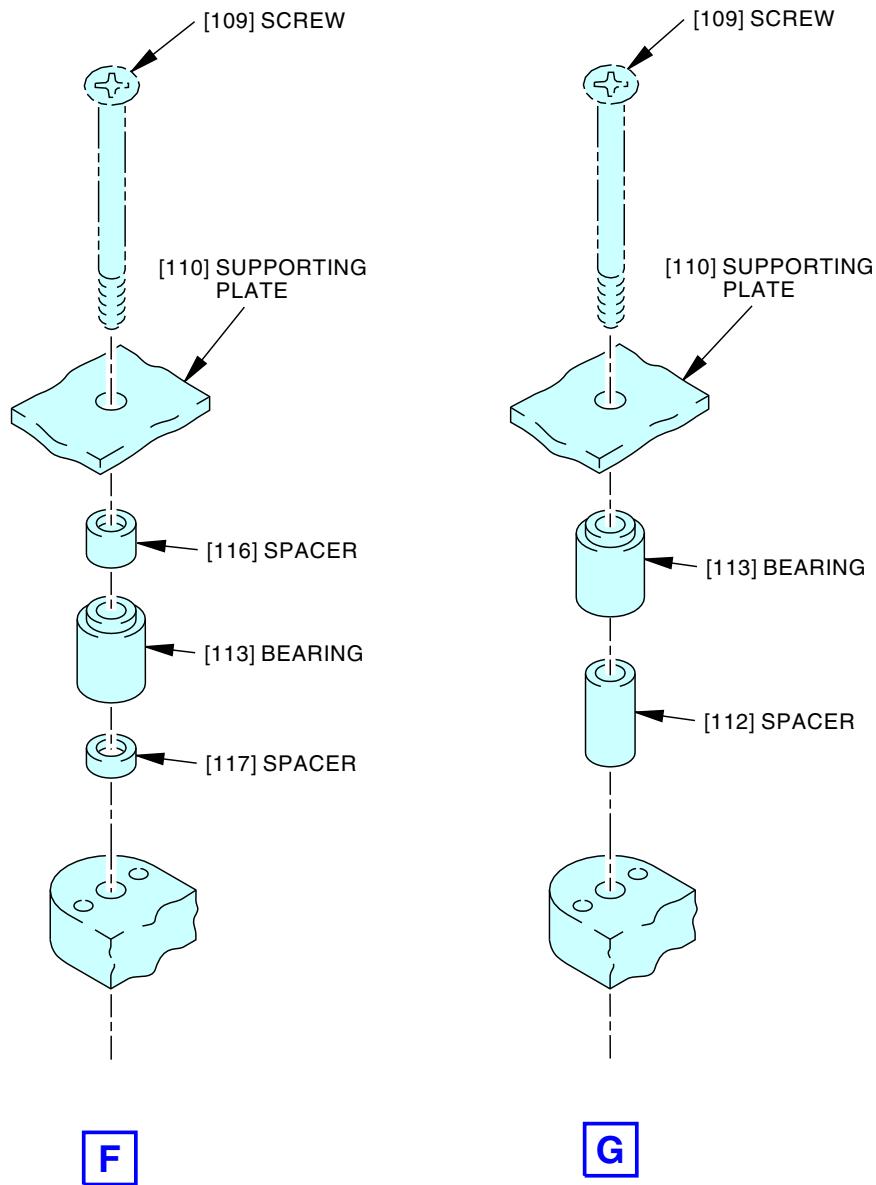
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Electronic Equipment Access Door Servicing
Figure 301/12-25-41-990-803 (Sheet 4 of 4)

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TASK 12-25-41-640-802

3. Forward Access Door Servicing

(Figure 302, Table 302)

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

C. Access Panels

Number	Name/Location
112A	Forward Access Door

D. Prepare for Servicing

SUBTASK 12-25-41-010-004

- (1) Open this access panel:

Number	Name/Location
112A	Forward Access Door

E. Procedure

SUBTASK 12-25-41-640-002

- (1) Lubricate the components with the applicable material shown in (Table 302):

- (a) grease, D00633

Table 302/12-25-41-993-804 Forward Access Door Lubrication (Fig. 302)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Points
1	Latch Mechanism (1)	grease, D00633	Hand	2

SUBTASK 12-25-41-640-003

- (2) Operate the handle to move the grease on the latch pin into the bushing.

SUBTASK 12-25-41-100-001

- (3) Remove the unwanted grease.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-41-410-002

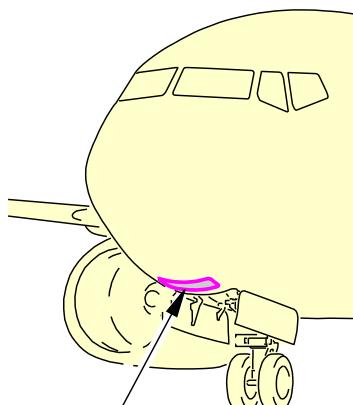
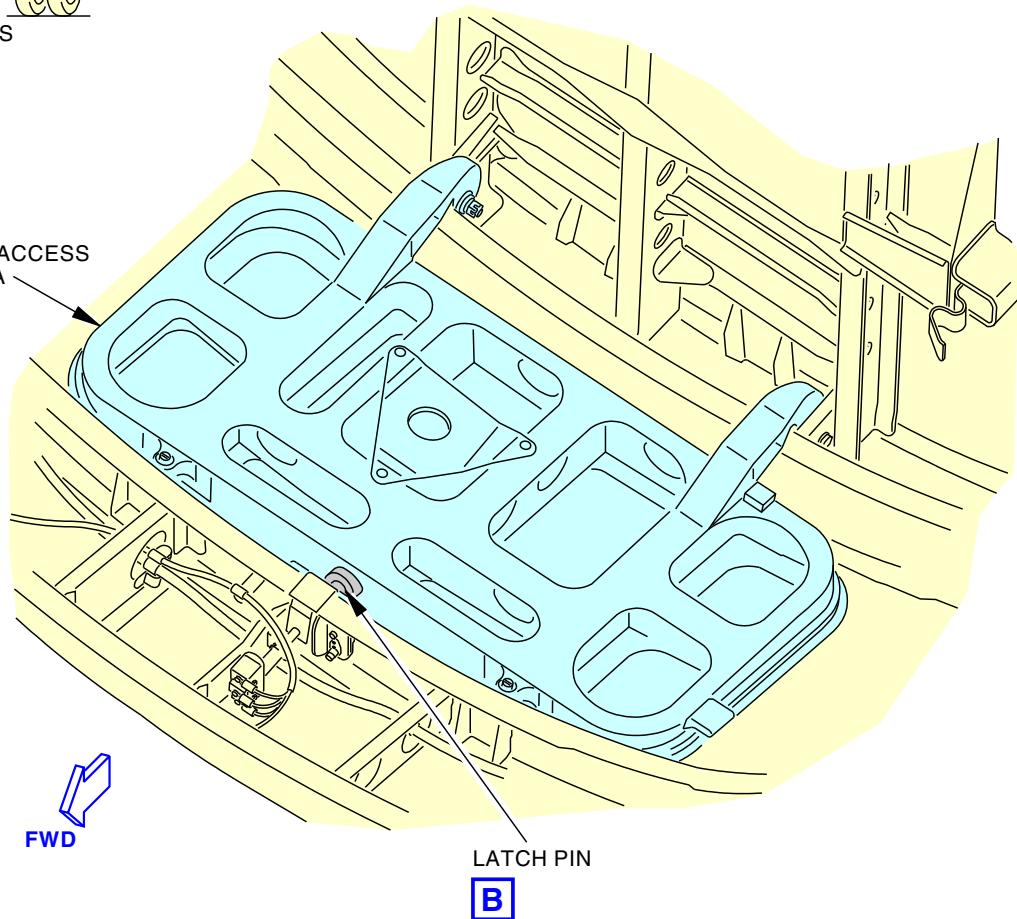
- (1) Close this access panel:

Number	Name/Location
112A	Forward Access Door

— END OF TASK —

EFFECTIVITY
LOM ALL

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FORWARD ACCESS
DOOR, 112A**A**

LATCH PIN

BFORWARD ACCESS DOOR, 112A
(INTERNAL VIEW, DOOR CLOSED POSITION)**A**

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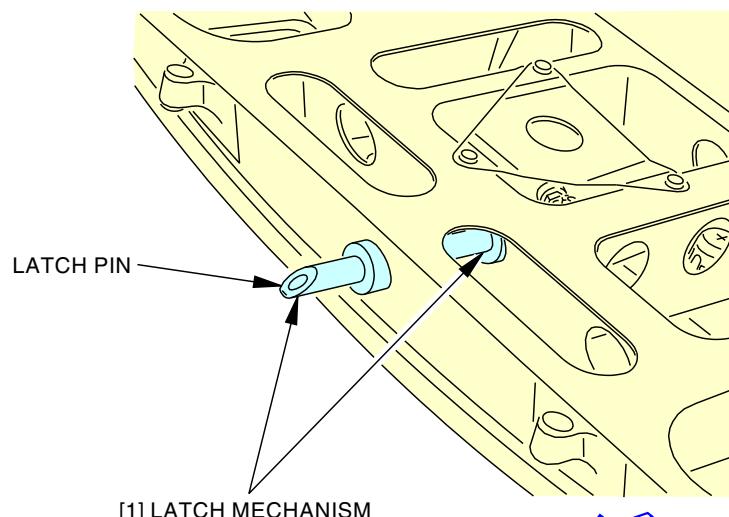
Forward Access Door Servicing
Figure 302/12-25-41-990-802 (Sheet 1 of 2)EFFECTIVITY
LOM ALL**12-25-41**

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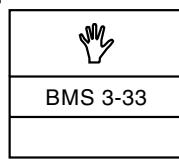
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[1] LATCH MECHANISM



(2 LOCATIONS)



LATCH PIN

2 POINTS



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Forward Access Door Servicing
Figure 302/12-25-41-990-802 (Sheet 2 of 2)

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NO. 2 SLIDING WINDOW LUBRICATION - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) Lubricate the No. 2 Sliding Window.

TASK 12-25-81-600-801

2. No. 2 Sliding Window Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
25-11-21-000-801	Flight Compartment Forward Ceiling Panel Removal (P/B 201)
25-11-21-000-805	Flight Compartment Forward Ceiling Panel Removal (P/B 201)
25-11-21-400-801	Flight Compartment Forward Ceiling Panel Installation (P/B 201)
25-11-21-400-805	Flight Compartment Forward Ceiling Panel Installation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00091	Oil - General Purpose, Low Temperature, Lubricating	MIL-PRF-7870 (NATO O-142)
D00113	Lubricant - Solid Film, Liquid Dispersed	BMS3-8

C. Location Zones

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

D. Access Panels

Number	Name/Location
211GW	Panel Assy - Flight Compartment Console - Edging
212HW	Panel Assy - Flight Compartment Console - Edging

E. Prepare for No. 2 Sliding Window Lubrication

SUBTASK 12-25-81-010-002

- (1) Remove these panels as necessary for access:

(Flight Compartment Forward Ceiling Panel Removal, TASK 25-11-21-000-801 or Flight Compartment Forward Ceiling Panel Removal, TASK 25-11-21-000-805)

Number Name/Location

211GW	Panel Assy - Flight Compartment Console - Edging
212HW	Panel Assy - Flight Compartment Console - Edging

SUBTASK 12-25-81-010-003

- (2) Remove the linings from the No.2 sliding window as necessary for access
(TASK 25-11-21-000-801 or TASK 25-11-21-000-805).

EFFECTIVITY
LOM ALL

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F. No. 2 Sliding Window Lubrication

SUBTASK 12-25-81-640-001

- (1) Lubricate the parts of the window with oil, D00091, or solid film lubricant, D00113, where noted (Figure 301):

Table 301/12-25-81-993-802 No. 2 Sliding Window Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Upper Bellcrank and Glide	oil, D00091	Oil Can	2
2	Upper Track Inside Surface (entire length)	oil, D00091 or solid film lubricant, D00113	Oil Can	1
3	Latch Mechanism Rod	oil, D00091	Paint Brush	1
4	Lower Bellcrank Rod End, Guide Roller and Shaft	oil, D00091	Oil Can	3
5	Window Open Latch	oil, D00091	Oil Can	2
6	Handle Pivot Area	oil, D00091	Oil Can	2
7	Window Release Guide Roller	oil, D00091	Paint Brush	1
8	Trigger Hinge Pin	oil, D00091	Oil Can	1
9	Guide Pin Track	oil, D00091	Paint Brush	1
10	Lower Forward and Bellcrank Rod End	oil, D00091	Paint Brush	1
11	Cam Shaft	oil, D00091	Oil Can	2
12	External Release Handle Linkage	oil, D00091	Oil Can	4
13	Lower Track Inside Surface (entire length)	oil, D00091 or solid film lubricant, D00113	Oil Can	1

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-25-81-410-003

- (1) Install the linings to the No. 2 sliding window as necessary (TASK 25-11-21-400-801 or TASK 25-11-21-400-805).

SUBTASK 12-25-81-410-002

- (2) Install these panels as necessary:

(Flight Compartment Forward Ceiling Panel Installation, TASK 25-11-21-400-801 or Flight Compartment Forward Ceiling Panel Installation, TASK 25-11-21-400-805)

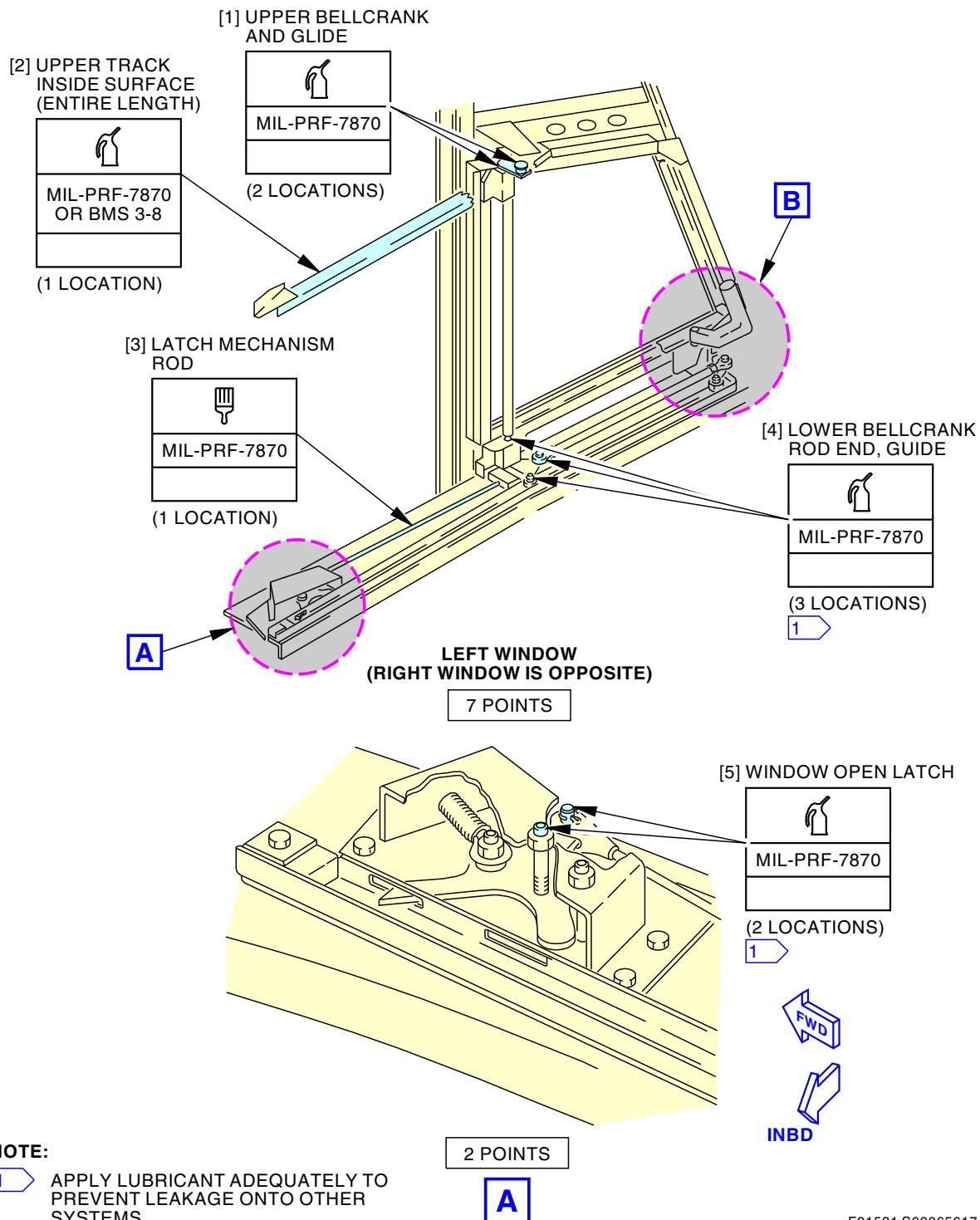
Number Name/Location

- 211GW Panel Assy - Flight Compartment Console - Edging
212HW Panel Assy - Flight Compartment Console - Edging

— END OF TASK —

EFFECTIVITY
LOM ALL

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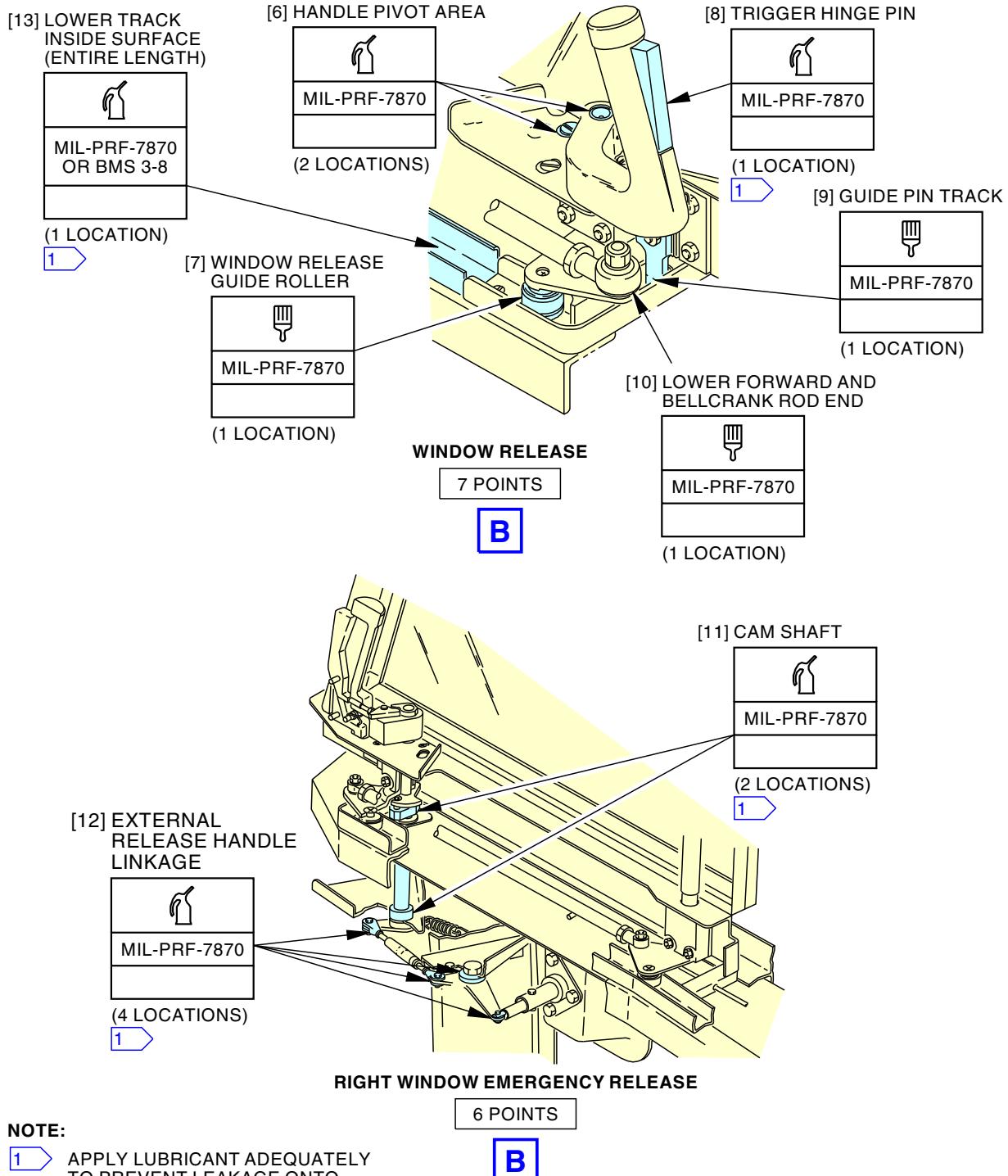
No. 2 Sliding Window Lubrication
Figure 301/12-25-81-990-801 (Sheet 1 of 2)

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LOM ALL

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No. 2 Sliding Window Lubrication
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EFFECTIVITY
LOM ALL

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CABLE LUBRICATION - SERVICING

1. General

- A. There is one task in this procedure, the lubrication of the control cables.

TASK 12-26-00-600-801

2. Control Cable Lubrication

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

B. Location Zones

Zone	Area
100	Lower Half of Fuselage
100	Lower Half of Fuselage
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing

C. Control Cable Lubrication

SUBTASK 12-26-00-640-001



DO NOT APPLY SOLVENTS, GREASE, OR OIL TO STAINLESS STEEL CONTROL CABLES. THESE MATERIALS CAN COLLECT CONTAMINATION THAT CAN CAUSE DAMAGE TO THE INTERNAL SURFACES OF THE CRES CABLE STRANDS. THIS CAN DECREASE THE SERVICE LIFE OF THE CABLE.

- (1) Do these steps to identify the carbon steel control cables:

- Refer to these figures for carbon steel control cables: Figure 301, Figure 302, Figure 303, Figure 304, Figure 305, Figure 306, Figure 307, Figure 308, Figure 309, Figure 311.
- Refer to this figure for corrosion resistant steel (CRES) control cables: Figure 312.
- Refer to these figures for carbon steel and/or corrosion resistant steel (CRES) control cables: Figure 310, Figure 313, Figure 314.

NOTE: All of the nose wheel steering cables are carbon steel with the exception of the NWSA/B loop. Refer to the referenced figure to verify the location and material type.

SUBTASK 12-26-00-160-001



DO NOT USE SOLVENT OR HEAT TO THIN GREASE. DO NOT USE SOLVENT TO CLEAN CABLES, SINCE SOLVENT DILUTES AND REMOVES GREASE FROM INSIDE CABLE STRANDS. DO NOT APPLY OR SPRAY BMS 3-23 ON CONTROL CABLES.

- (2) Use a lint-free cotton wiper, G00034, that is clean and dry to clean the control cables.

EFFECTIVITY
LOM ALL

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- (a) Remove the old grease and dirt from the surface of the control cable.
- (b) Clean the control cable for the full length of the cable for the full length of travel through fairleads, air pressure seals, over pulleys, quadrants, and drums.

SUBTASK 12-26-00-640-002

- (3) Do these steps to lubricate the carbon steel control cables only:



CAUTION

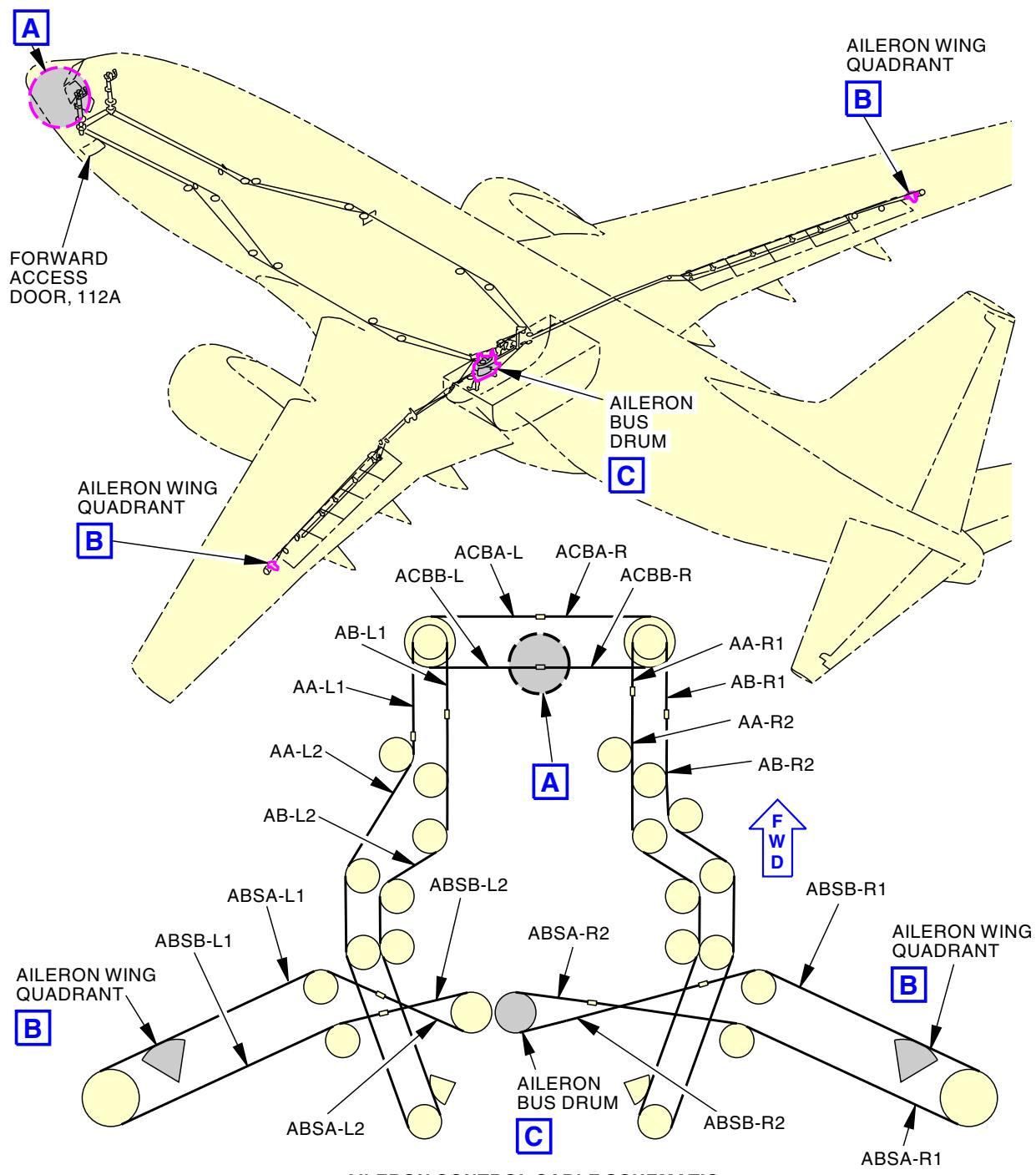
EXAMINE THE CONDITION OF THESE CONTROL CABLES AT MORE FREQUENT INTERVALS. THE CONTROL CABLES IN THE WING AND NACELLE AREA ARE NEAR HIGH-TEMPERATURE SOURCES. THIS DECREASES THE LIFE OF THE LUBRICANTS AT A FASTER RATE THAN LUBRICANTS ON OTHER CONTROL CABLES. DAMAGE TO THE CONTROL CABLES CAN OCCUR.

- (a) Apply a light even coat of grease, D00633, to the carbon steel control cable.
 - 1) Move the cable full travel to apply lubricant to full length of cable.
- (b) Do not apply grease directly to these areas because they will receive grease during cable movement:
 - 1) The clad areas.
 - 2) Through the fairleads.
 - 3) Through the air pressure seals.
 - 4) On the pulleys.
 - 5) On the quadrants.
 - 6) On the drums.
- (c) After application of grease on the cable, the cable should be wiped with a clean cloth to remove grease, but leave a thin visible film.

— END OF TASK —

EFFECTIVITY
LOM ALL

12-26-00



G28640 S0006568463_V4

Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 1 of 6)

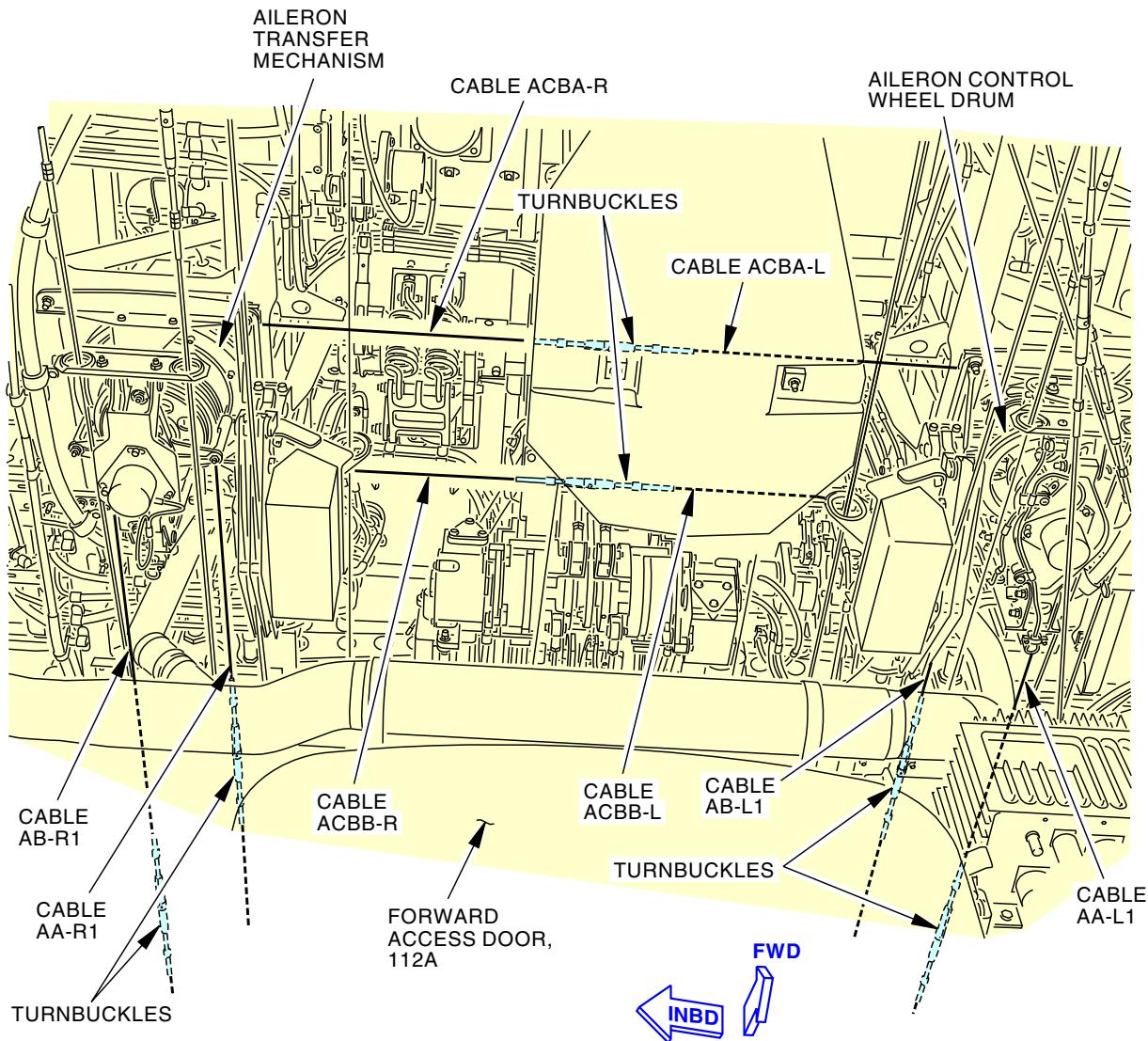
EFFECTIVITY
 LOM ALL

12-26-00

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL



G28679 S0006568464_V2

Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 2 of 6)

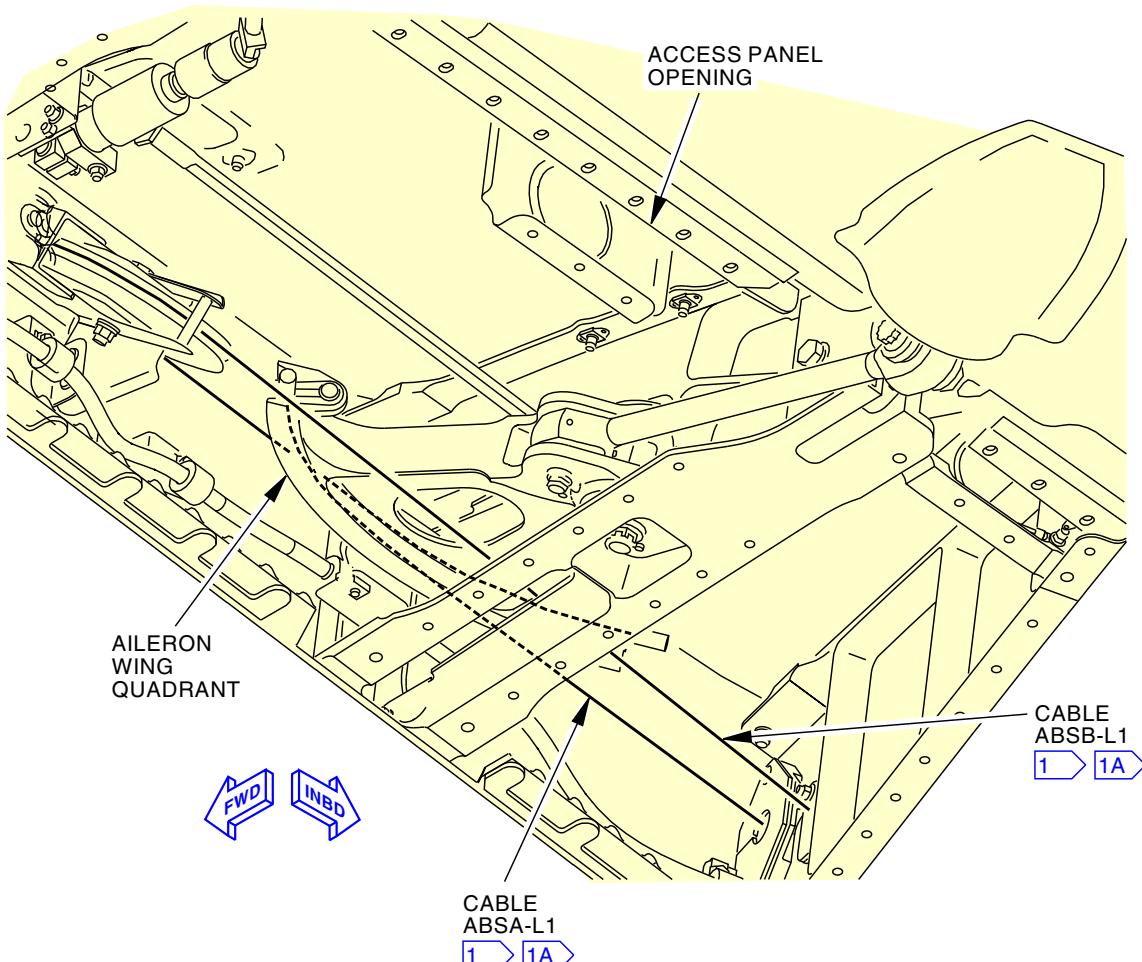
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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**LEFT AILERON WING QUADRANT
(RIGHT AILERON WING QUADRANT IS EQUIVALENT)**

B

- 1** FOR THE RIGHT AILERON WING QUADRANT, INSTALL CABLE ABSB-R1 BELOW CABLE ABSA-R1.
- 1A** FIT ABSA-L1 TO THE LOWER GROOVE OF THE QUADRANT FIT ABSB-L1 TO THE UPPER GROOVE OF THE QUADRANT.

G28673 S0006568465_V4

Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 3 of 6)

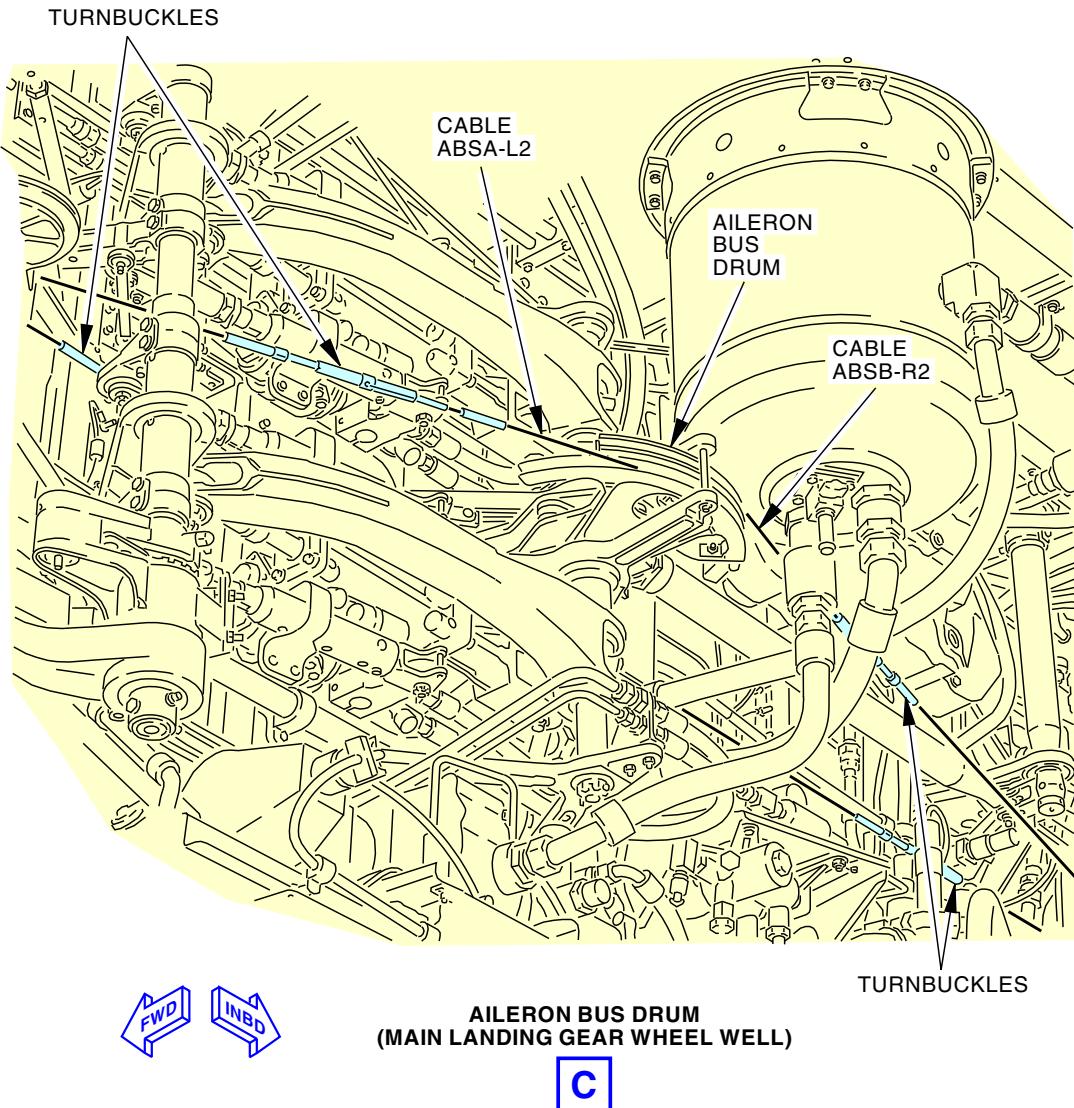
EFFECTIVITY
LOM ALL

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G28686 S0006568466_V3

Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 4 of 6)

EFFECTIVITY
LOM ALL

12-26-00

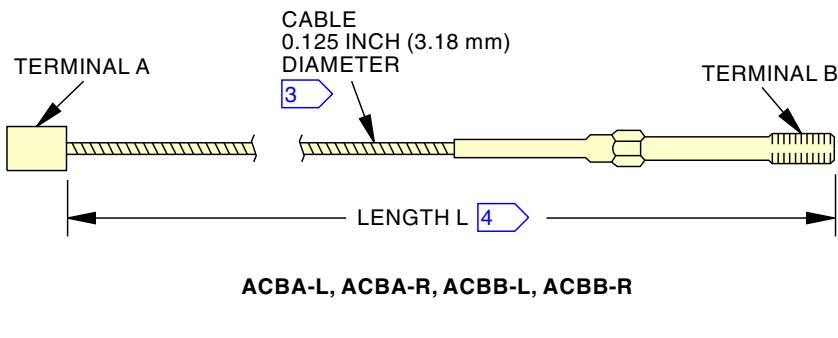
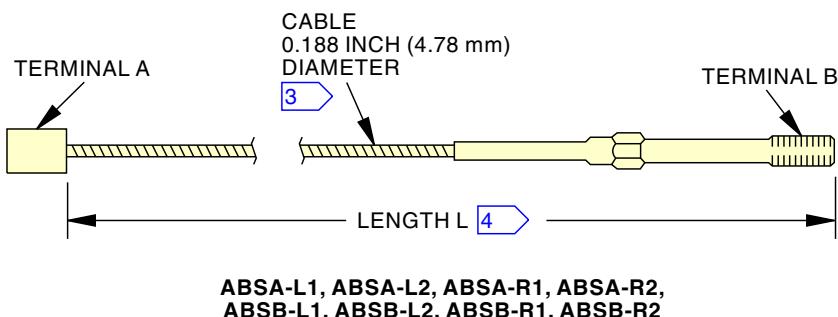
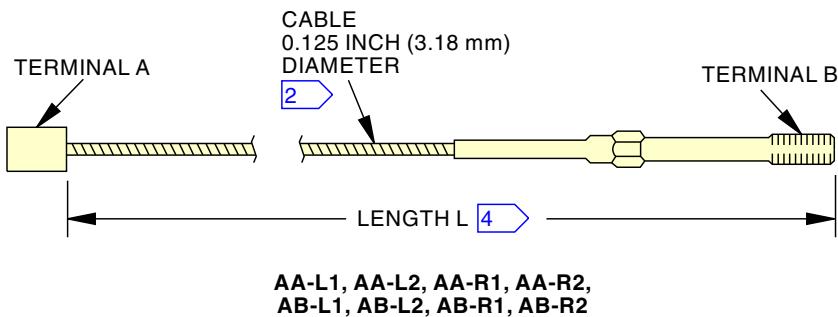
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AIRCRAFT MAINTENANCE MANUAL



- [2] CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 19
- [3] CABLE CONSTRUCTION IS CARBON STEEL: BMS 7-265,
COMPOSITION A (ZINC), 7 X 19
- [4] MEASURE CABLE WITH A LOAD OF 40 ± 3 POUNDS (178 ± 13 NEWTONS).

G31890 S0006568467_V4

Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 5 of 6)

EFFECTIVITY
LOM ALL

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CABLE NAME	LENGTH L INCHES (MILLIMETERS)	TERMINAL A	TERMINAL B
AA-L1 AA-L2	38.5 ± 0.12 (978 ± 3) 671.8 ± 0.25 (17,064 ± 6)	BACT14A BACT14A	MS21260L4RH MS21260L4LH
AA-R1 AA-R2	26.2 ± 0.12 (665 ± 3) 651.2 ± 0.25 (16,540 ± 6)	BACT14A BACT14A	MS21260L4LH MS21260L4RH
AB-L1 AB-L2	26.2 ± 0.12 (665 ± 3) 652.3 ± 0.25 (16,568 ± 6)	BACT14A BACT14A	MS21260L4LH MS21260L4RH
AB-R1 AB-R2	38.5 ± 0.12 (978 ± 3) 672.0 ± 0.25 (17,069 ± 6)	BACT14A BACT14A	MS21260L4RH MS21260L4LH
ABSA-L1 ABSA-L2	439.8 ± 0.20 (11,171 ± 5) 18.4 ± 0.12 (467 ± 3)	BACT14A BACT14A	MS21260L6LH MS21260L6RH
ABSA-R1 ABSA-R2	462.9 ± 0.20 (11,758 ± 5) 35.4 ± 0.12 (899 ± 3)	BACT14A BACT14A	MS21260L6LH MS21260L6RH
ABSB-L1 ABSB-L2	466.9 ± 0.20 (11,859 ± 5) 21.7 ± 0.12 (551 ± 3)	BACT14A BACT14A	MS21260L6RH MS21260L6LH
ABSB-R1 ABSB-R2	449.9 ± 0.20 (11,427 ± 5) 17.4 ± 0.12 (442 ± 3)	BACT14A BACT14A	MS21260L6RH MS21260L6LH
ACBA-L	32.1 ± 0.12 (815 ± 3)	BACT14A	MS21260S4LH
ACBA-R	32.1 ± 0.12 (815 ± 3)	BACT14A	MS21260S4RH
ACBB-L	32.1 ± 0.12 (815 ± 3)	BACT14A	MS21260S4RH
ACBB-R	32.1 ± 0.12 (815 ± 3)	BACT14A	MS21260S4LH

TABLE A

MEASURE CABLE WITH A LOAD OF 40 ± 3 POUNDS (178 ± 13 NEWTONS).

L82836 S0006568469_V1

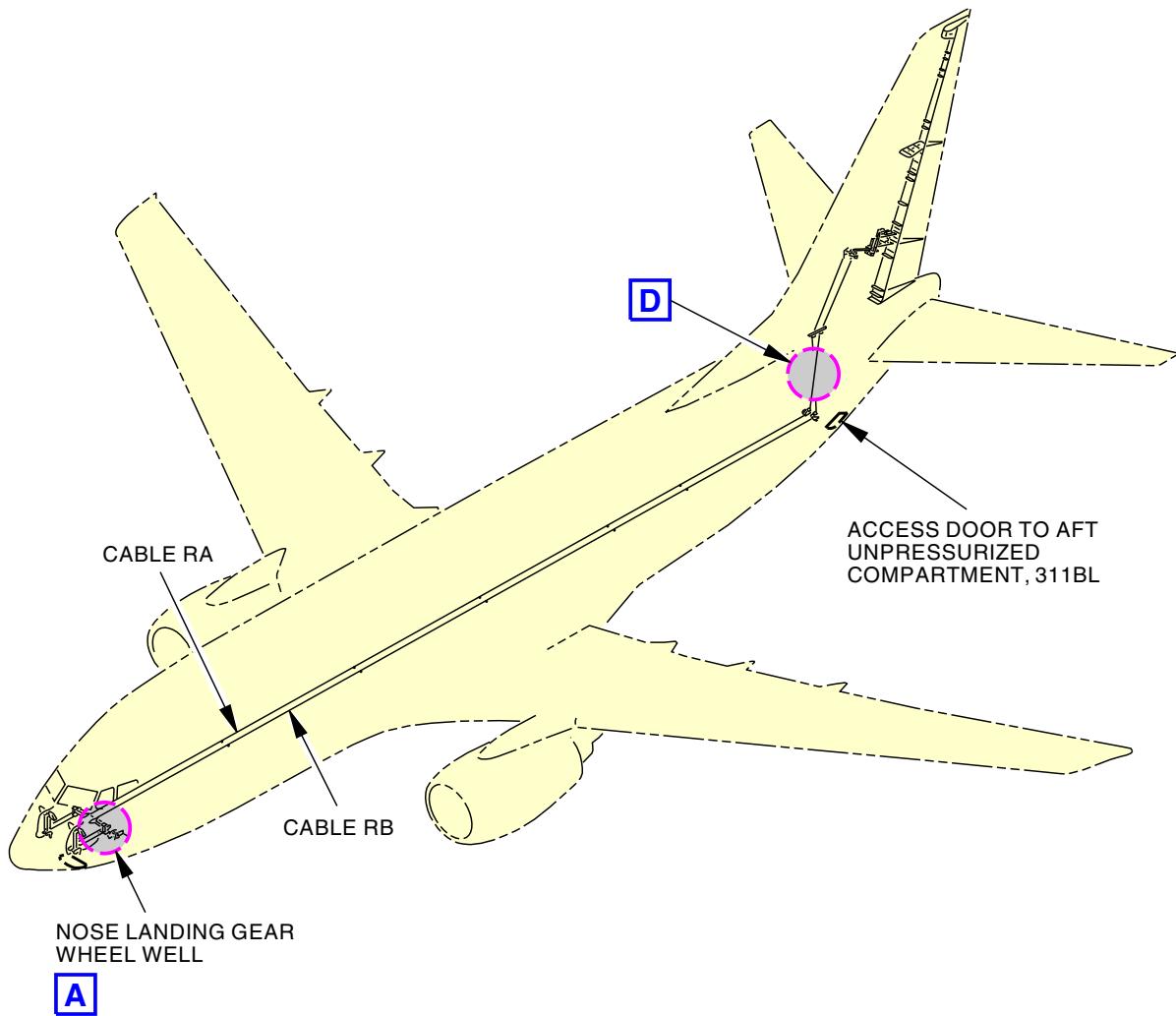
Aileron Control Cables
Figure 301/12-26-00-990-801 (Sheet 6 of 6)

EFFECTIVITY
 LOM ALL

12-26-00



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G28755 S0006568476_V2

Rudder Control Cables
Figure 302/12-26-00-990-802 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

12-26-00

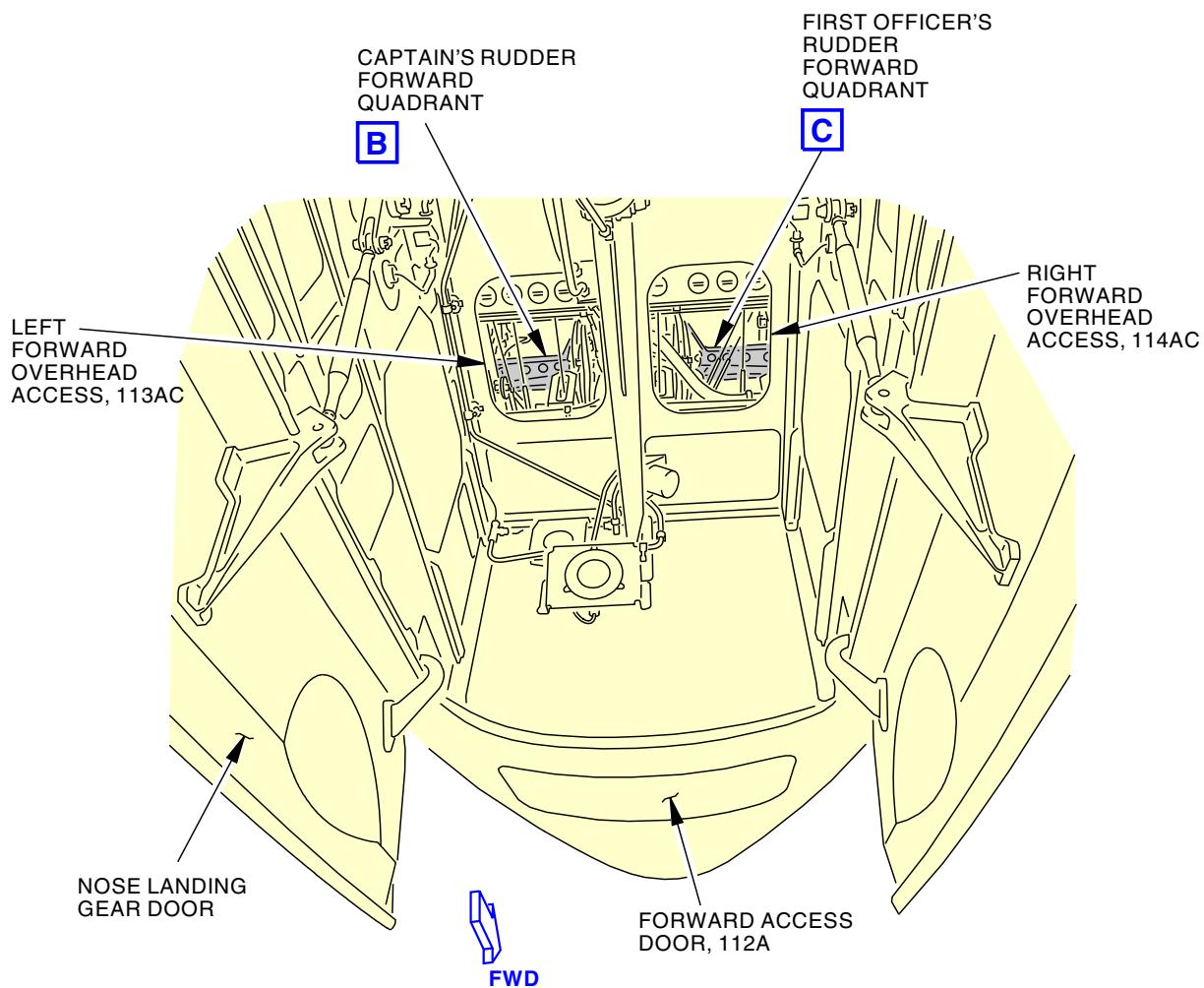
D633A101-LOM

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BOEING

**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**



NOSE LANDING GEAR WHEEL WELL

A

G28761 S0006568477_V2

Rudder Control Cables
Figure 302/12-26-00-990-802 (Sheet 2 of 5)

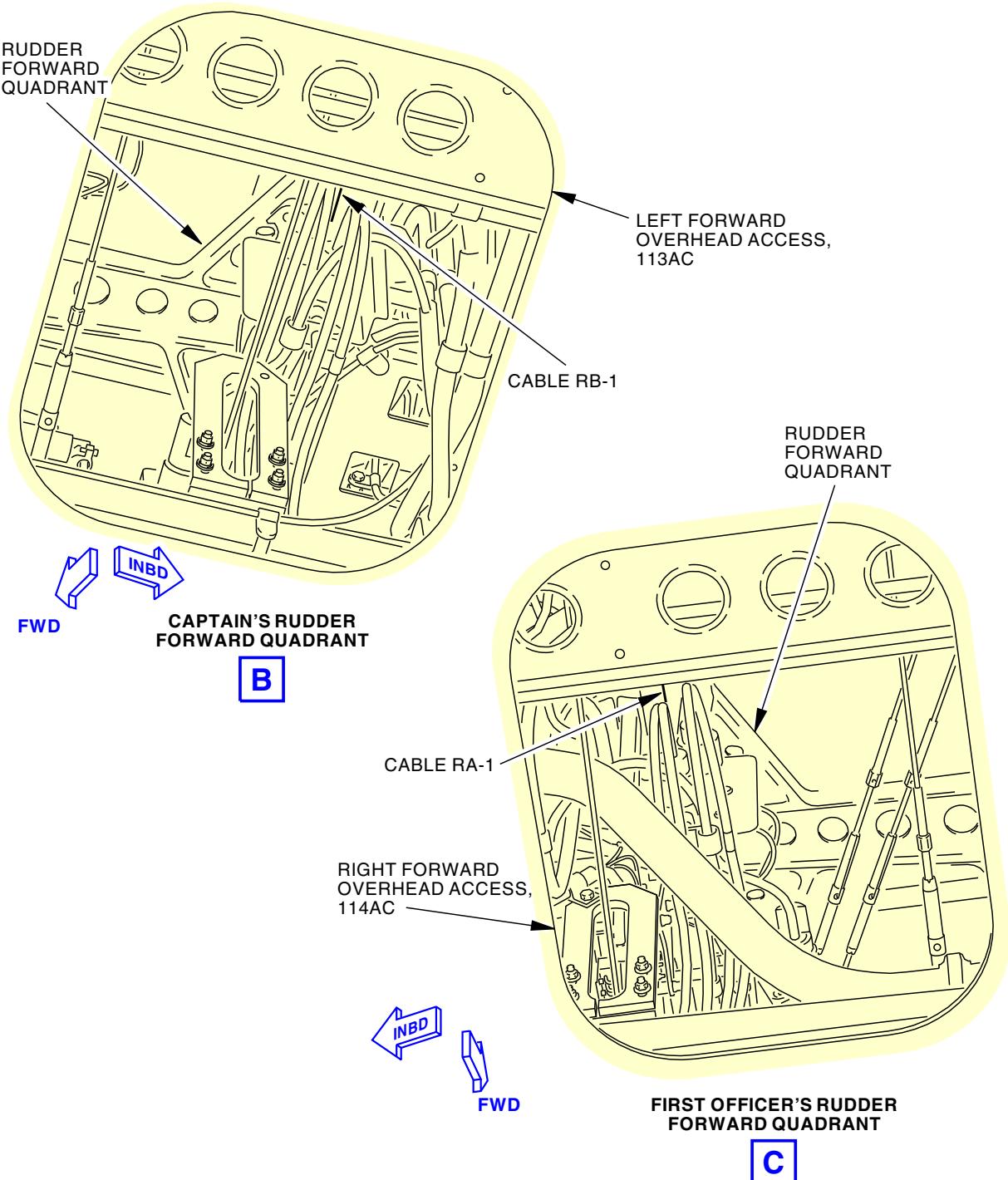
EFFECTIVITY
LOM ALL

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G28758 S0006568478_V2

Rudder Control Cables
Figure 302/12-26-00-990-802 (Sheet 3 of 5)

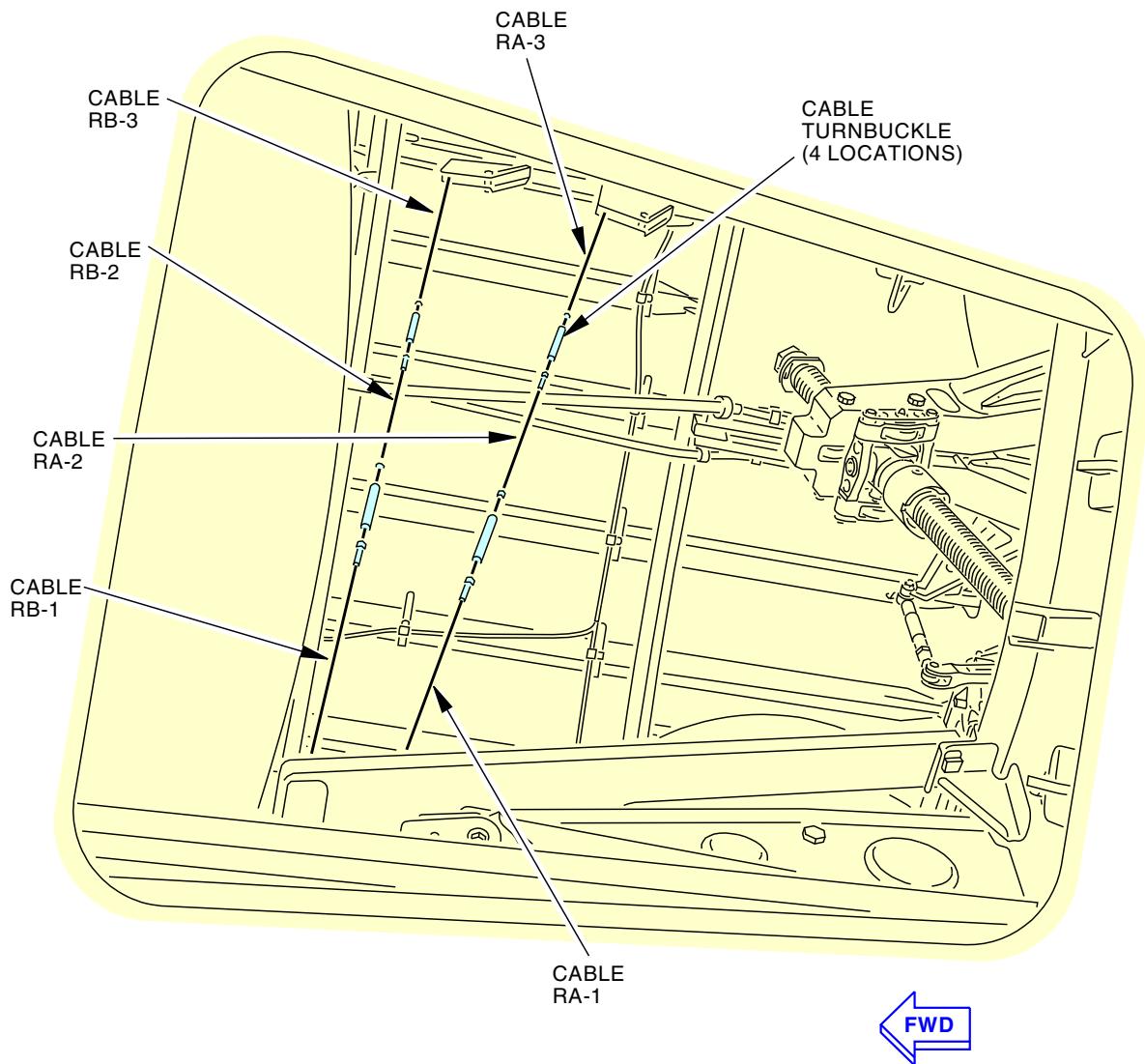
EFFECTIVITY
LOM ALL

12-26-00

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VIEW THROUGH THE ACCESS DOOR TO AFT
UNPRESSURIZED COMPARTMENT, 311BL

D

G28849 S0006568479_V2

Rudder Control Cables
Figure 302/12-26-00-990-802 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

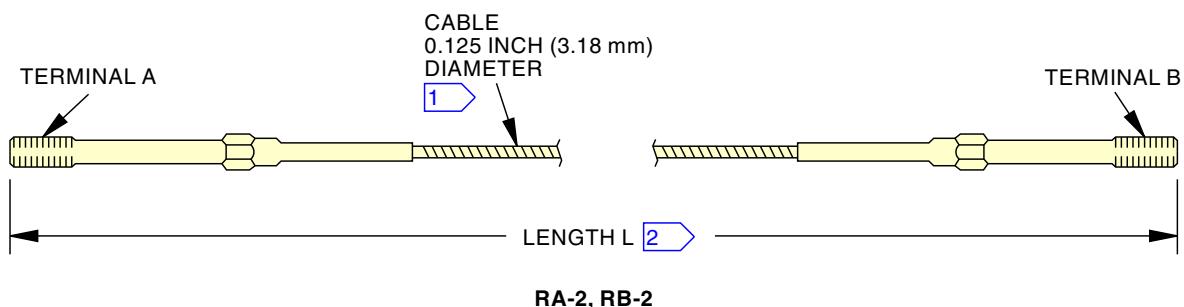
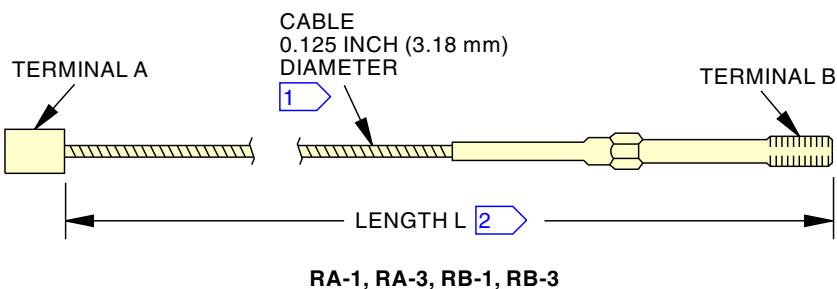
12-26-00

D633A101-LOM

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BOEING
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CABLE NAME		LENGTH L 2 INCHES (MILLIMETERS)	TERMINAL A	TERMINAL B
RIGHT SIDE	RA-1	1272.5 ±0.50 (32,321 ±13)	BACT14A	MS21260L4RH
	RA-2	18.8 ±0.12 (478 ±3)	MS21260L4RH	MS21260L4LH
	RA-3	111.0 ±0.12 (2,819 ±3)	BACT14A	MS21260L4LH
LEFT SIDE	RB-1	1265.2 ±0.50 (32,136 ±13)	BACT14A	MS21260L4LH
	RB-2	18.8 ±0.12 (478 ±3)	MS21260L4RH	MS21260L4LH
	RB-3	123.7 ±0.12 (3,142 ±3)	BACT14A	MS21260L4RH

TABLE A

- 1 CABLE CONSTRUCTION IS CARBON STEEL: BMS 7-265, TYPE 1,
COMPOSITION A (TIN OVER ZINC), 7 X 19
2 MEASURE CABLE WITH A LOAD OF 40 ±3 POUNDS (178 ±13 NEWTONS).

L82839 S0006568481_V2

Rudder Control Cables
Figure 302/12-26-00-990-802 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

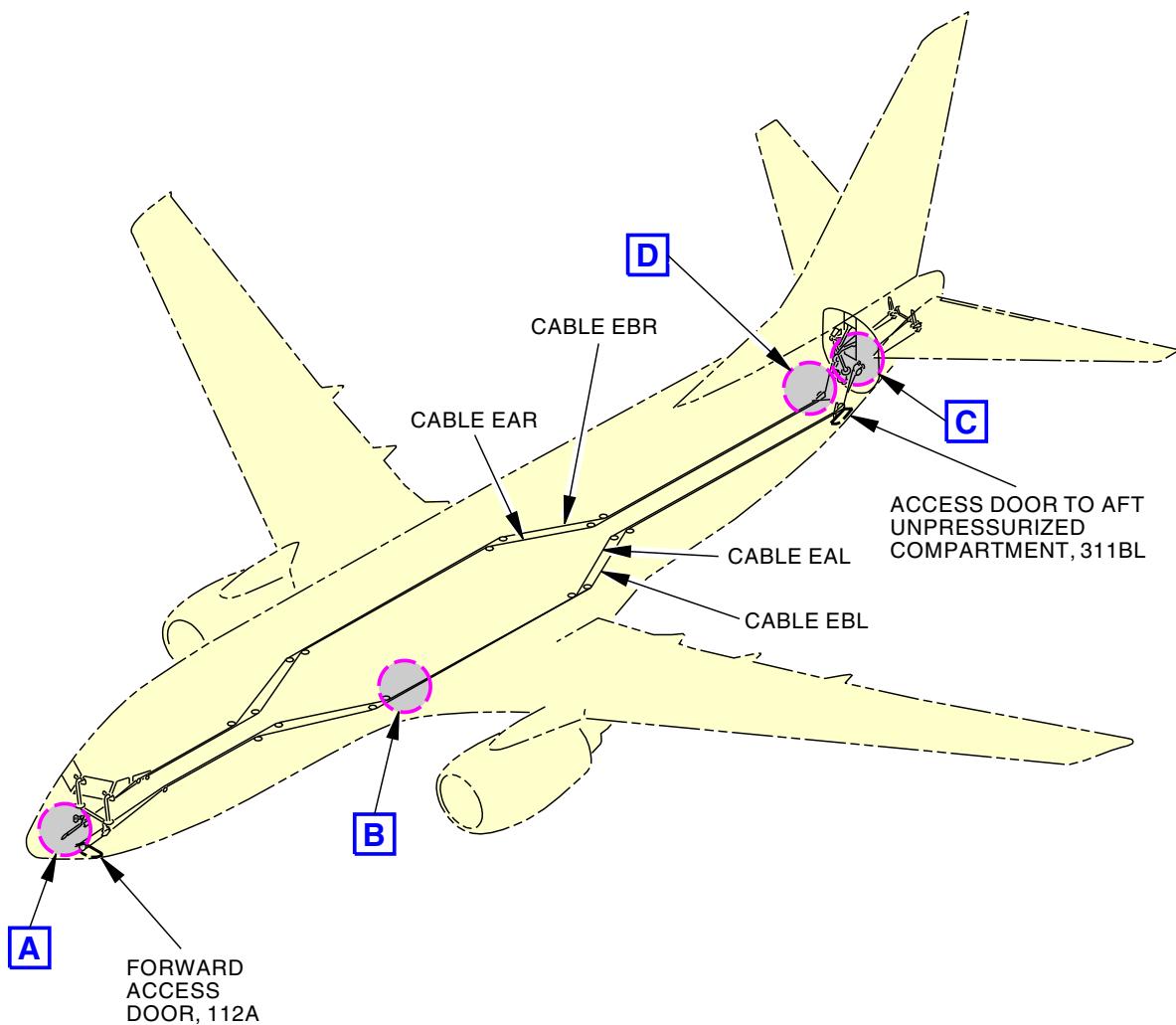
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D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL



G28931 S0006568488_V2

Elevator Control Cables
Figure 303/12-26-00-990-803 (Sheet 1 of 5)

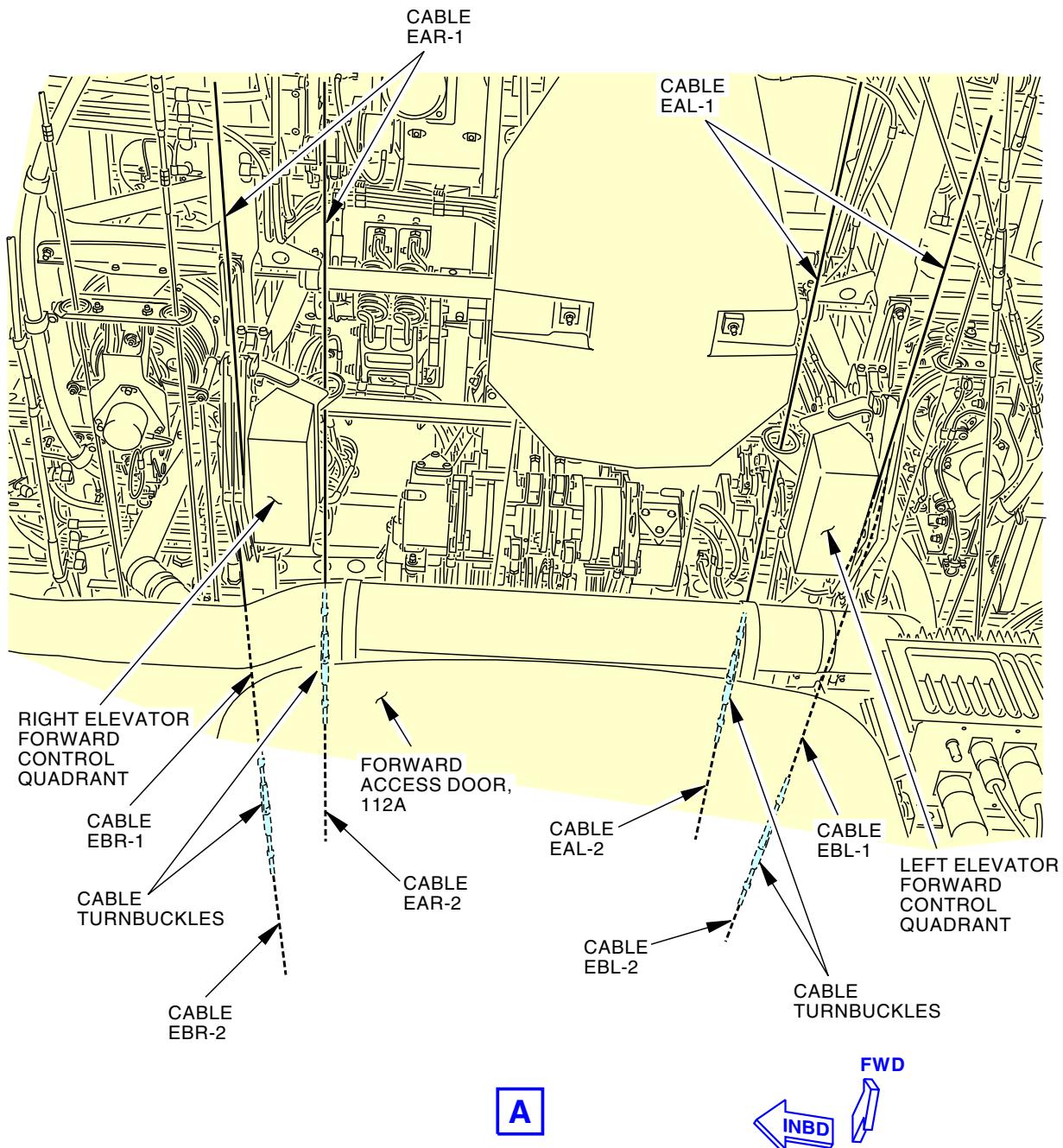
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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G28969 S0006568489_V3

Elevator Control Cables
Figure 303/12-26-00-990-803 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

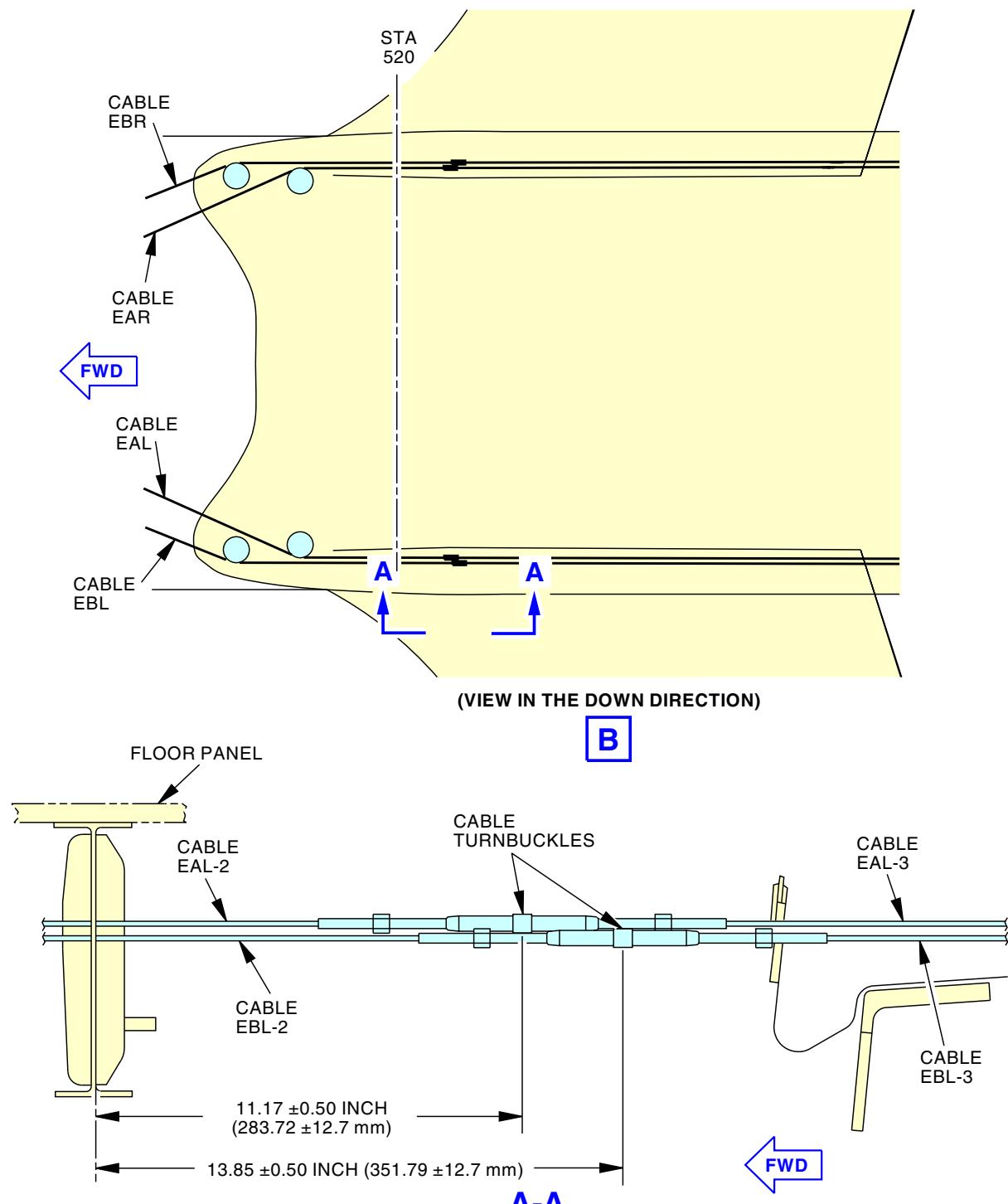
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL



W24219 S0006568490_V2

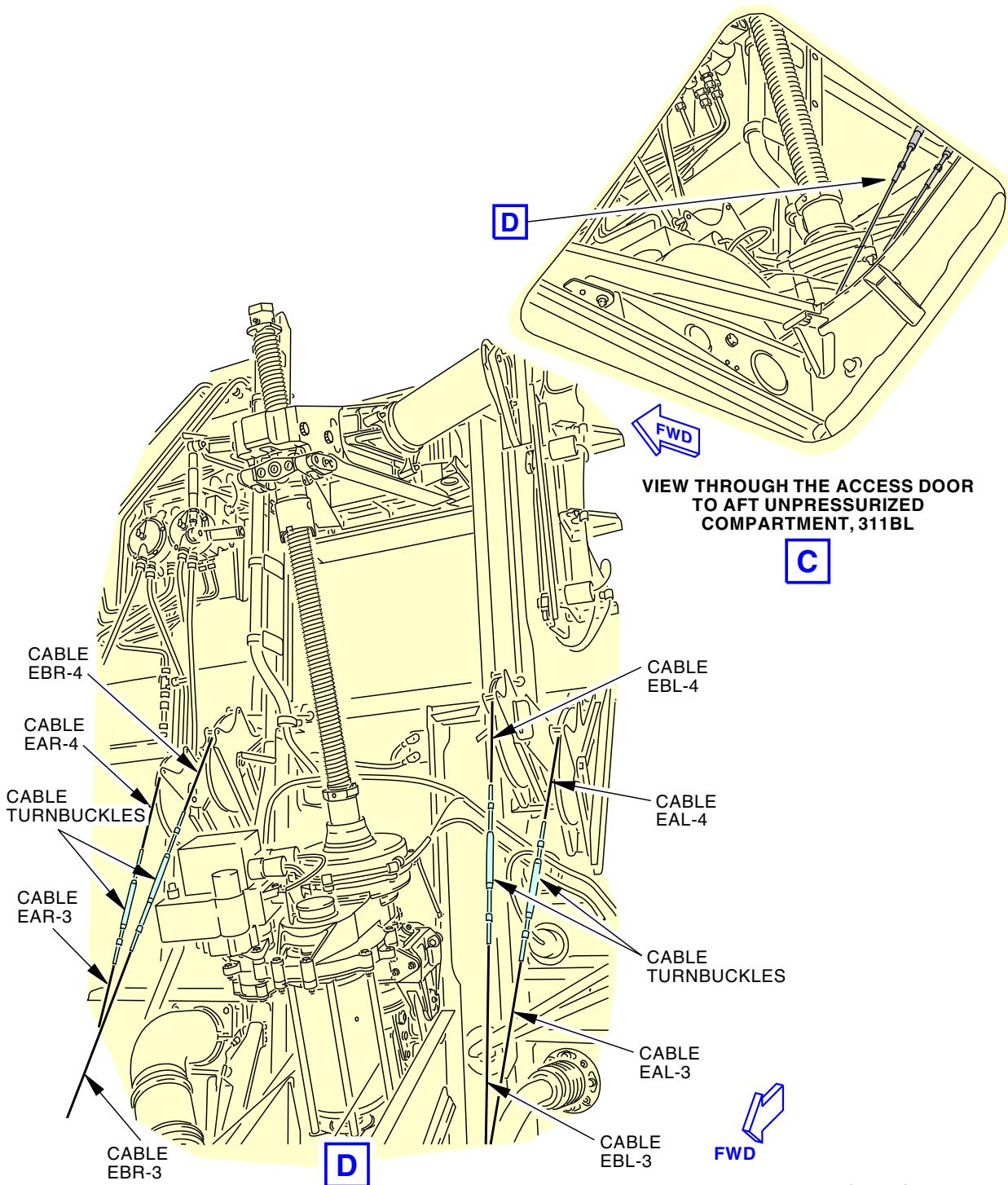
Elevator Control Cables
Figure 303/12-26-00-990-803 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-26-00

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ECCN 9E991 BOEING PROPRIETARY - See title page for details



G28992 S0006568491_V3

Elevator Control Cables
Figure 303/12-26-00-990-803 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

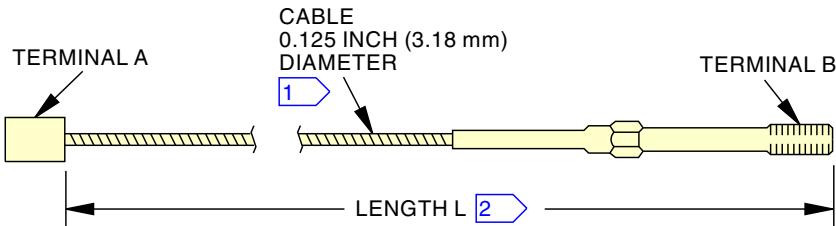
12-26-00

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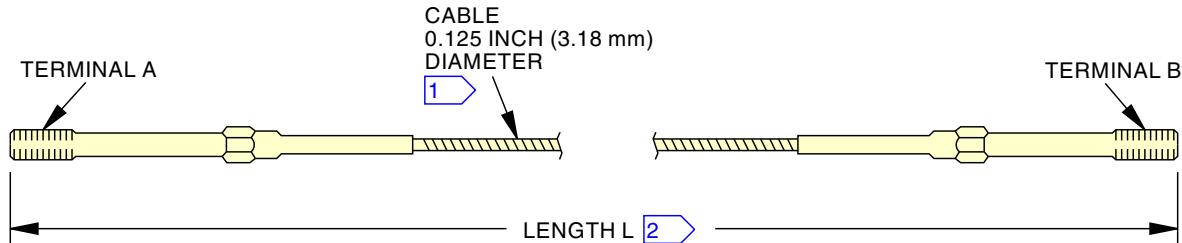
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EAL-1, EAL-4, EAR-1, EAR-4, EBL-1, EBL-4, EBR-1, EBR-4



EAL-2, EAL-3, EAR-2, EAR-3, EBL-2, EBL-3, EBR-2, EBR-3

CABLE NAME		LENGTH L [2] INCHES (MILLIMETERS)	TERMINAL A	TERMINAL B
LEFT SIDE	EAL-1	97.6 ±0.12 (2,479 ±3)	BACT14A	MS21260L4LH
	EAL-2	502.2 ±0.25 (12,756 ±6)	MS21260L4RH	MS21260L4LH
	EAL-3	780.0 ±0.38 (19,812 ±9)	MS21260L4RH	MS21260L4RH
	EAL-4	102.8 ±0.12 (2,611 ±3)	BACT14A	MS21260L4RH
RIGHT SIDE	EAR-1	97.6 ±0.12 (2,479 ±3)	BACT14A	MS21260L4LH
	EAR-2	502.2 ±0.25 (12,756 ±6)	MS21260L4RH	MS21260L4LH
	EAR-3	780.0 ±0.38 (19,812 ±9)	MS21260L4RH	MS21260L4RH
	EAR-4	102.8 ±0.12 (2,611 ±3)	BACT14A	MS21260L4LH
LEFT SIDE	EBL-1	31.5 ±0.12 (800 ±3)	BACT14A	MS21260L4RH
	EBL-2	495.8 ±0.25 (12,593 ±6)	MS21260L4RH	MS21260L4LH
	EBL-3	778.4 ±0.38 (19,771 ±9)	MS21260L4LH	MS21260L4RH
	EBL-4	102.1 ±0.12 (2,593 ±3)	BACT14A	MS21260L4RH
RIGHT SIDE	EBR-1	31.5 ±0.12 (800 ±3)	BACT14A	MS21260L4RH
	EBR-2	495.8 ±0.25 (12,593 ±6)	MS21260L4RH	MS21260L4LH
	EBR-3	778.4 ±0.38 (19,771 ±9)	MS21260L4LH	MS21260L4RH
	EBR-4	102.1 ±0.12 (2,593 ±3)	BACT14A	MS21260L4RH

TABLE A

[1] CABLE CONSTRUCTION IS CARBON STEEL: BMS 7-265, TYPE 1,
COMPOSITION A (TIN OVER ZINC), 7 X 19

[2] MEASURE CABLE WITH A LOAD OF 40 ±3 POUNDS (178 ±13 NEWTONS).

G57493 S0006568494_V5

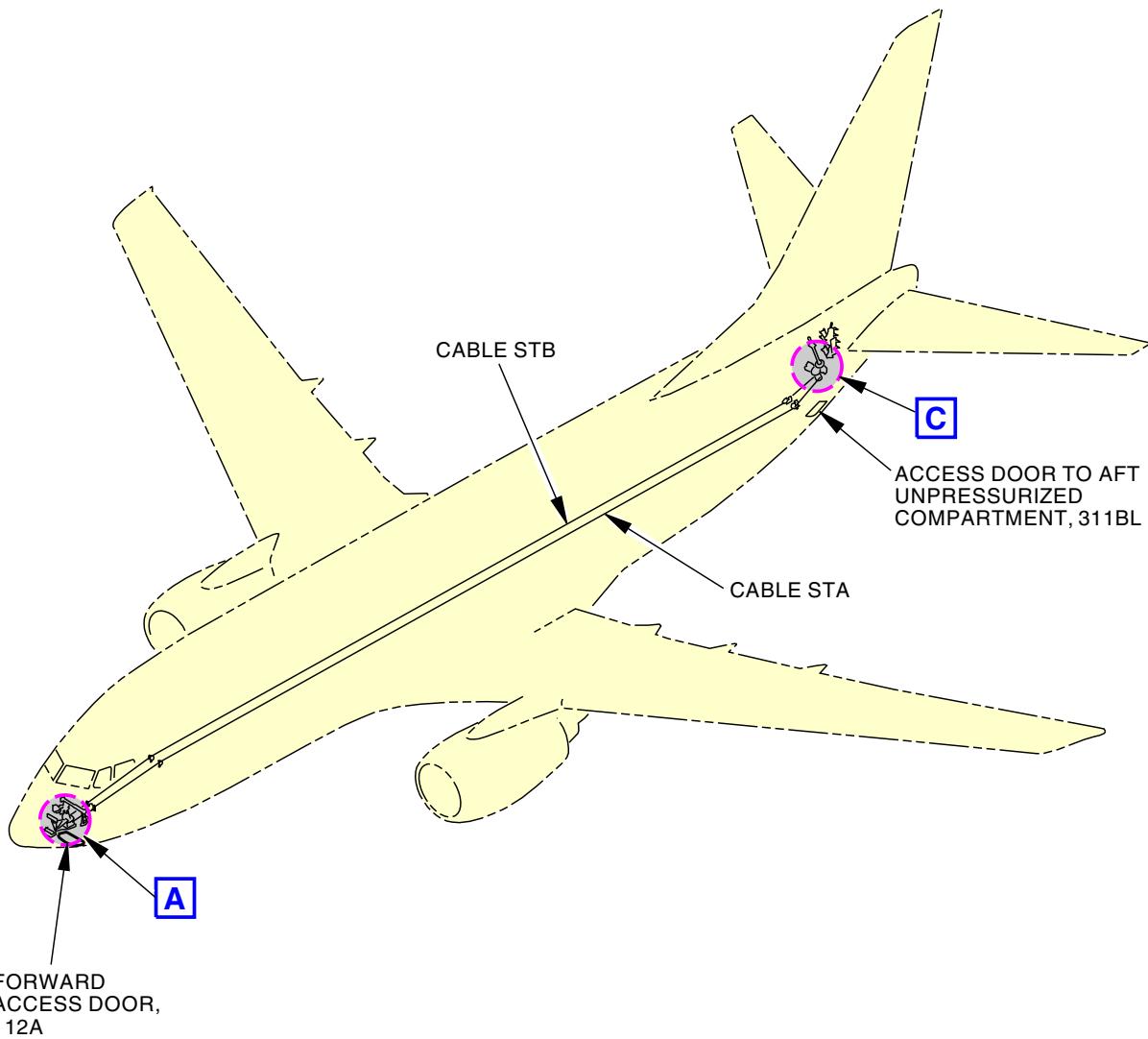
Elevator Control Cables
Figure 303/12-26-00-990-803 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

12-26-00



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G28997 S0006568500_V2

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 1 of 7)

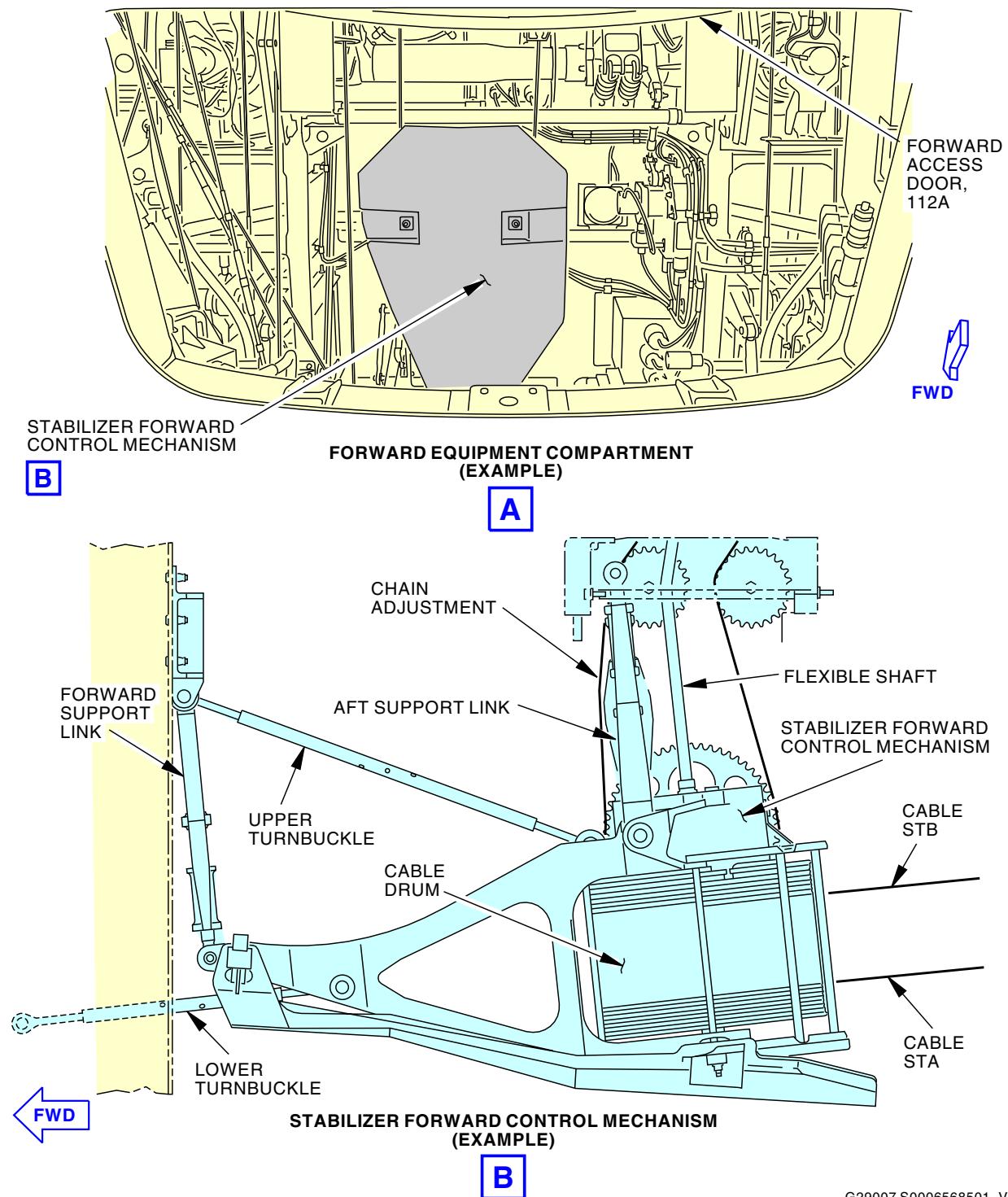
EFFECTIVITY
LOM ALL

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G29007 S0006568501_V3

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 2 of 7)

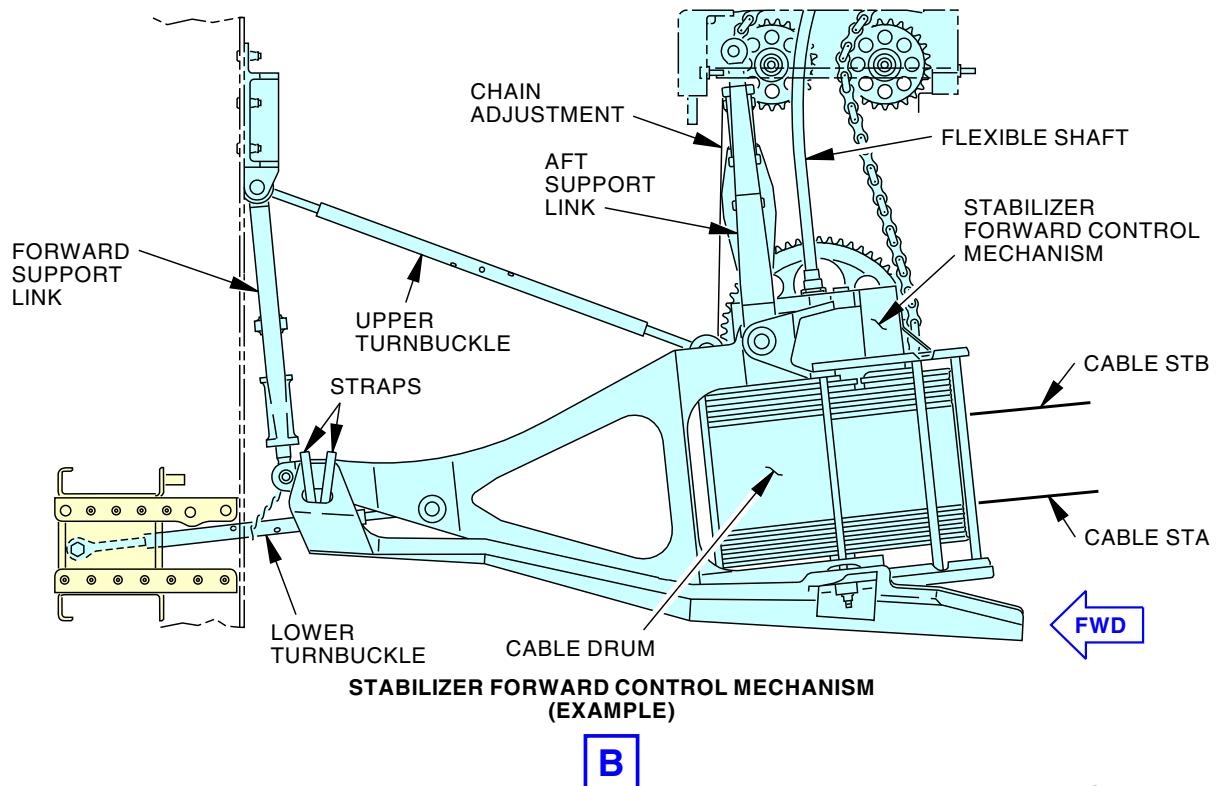
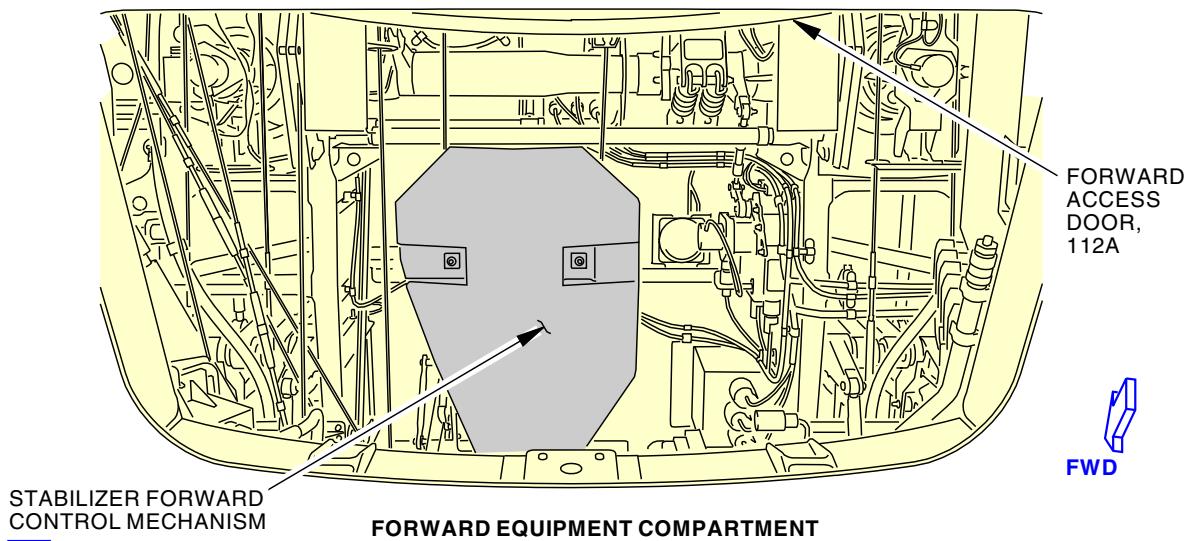
EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 416, 420, 422, 425-431

12-26-00

D633A101-LOM

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2928916 S0000708007_V1

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 3 of 7)

EFFECTIVITY
LOM 432-434, 437-447, 450-456

12-26-00

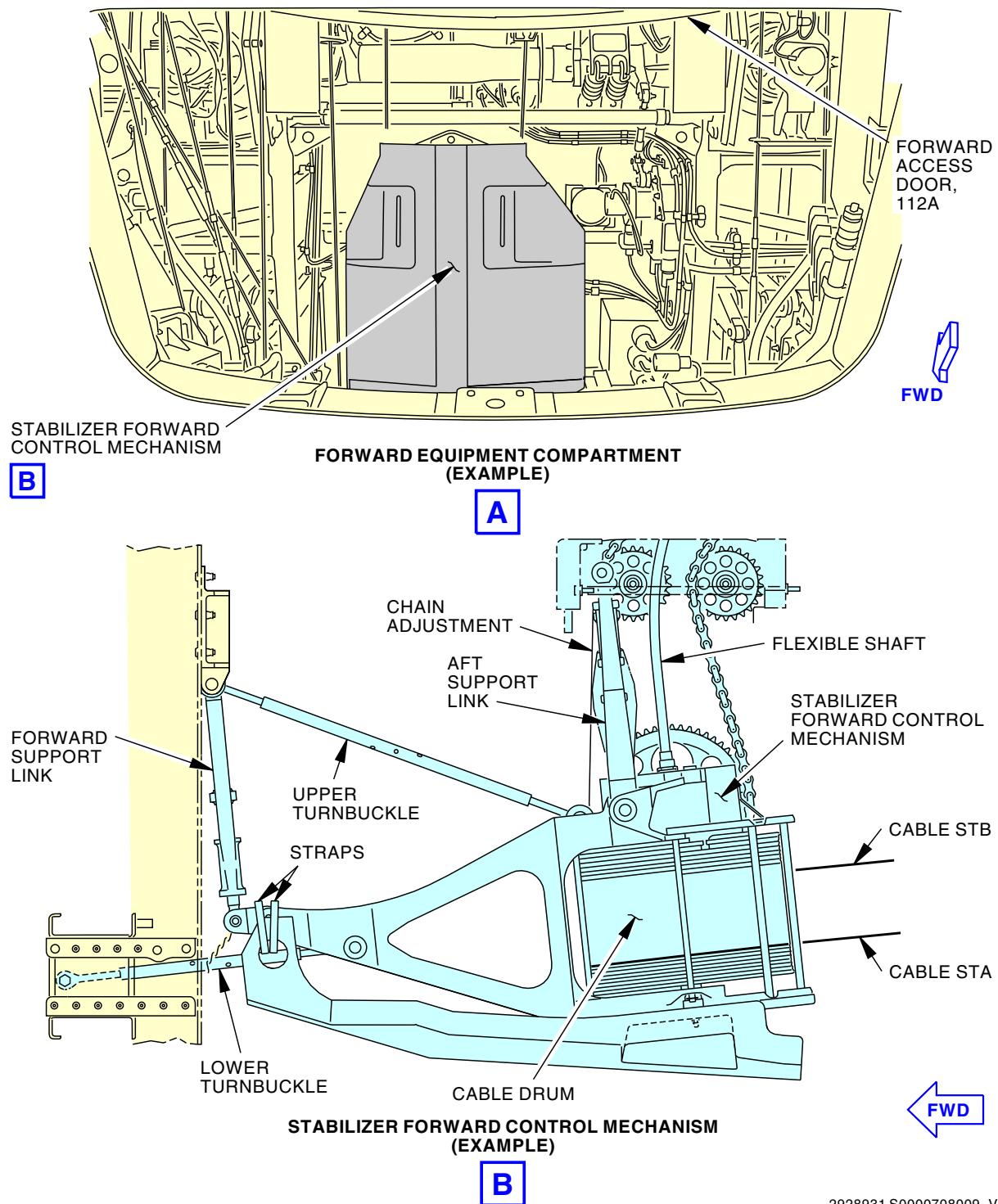
D633A101-LOM

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2928931 S0000708009_V1

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 4 of 7)

EFFECTIVITY
LOM 412, 415, 423, 424, 439, 441, 457-999

12-26-00

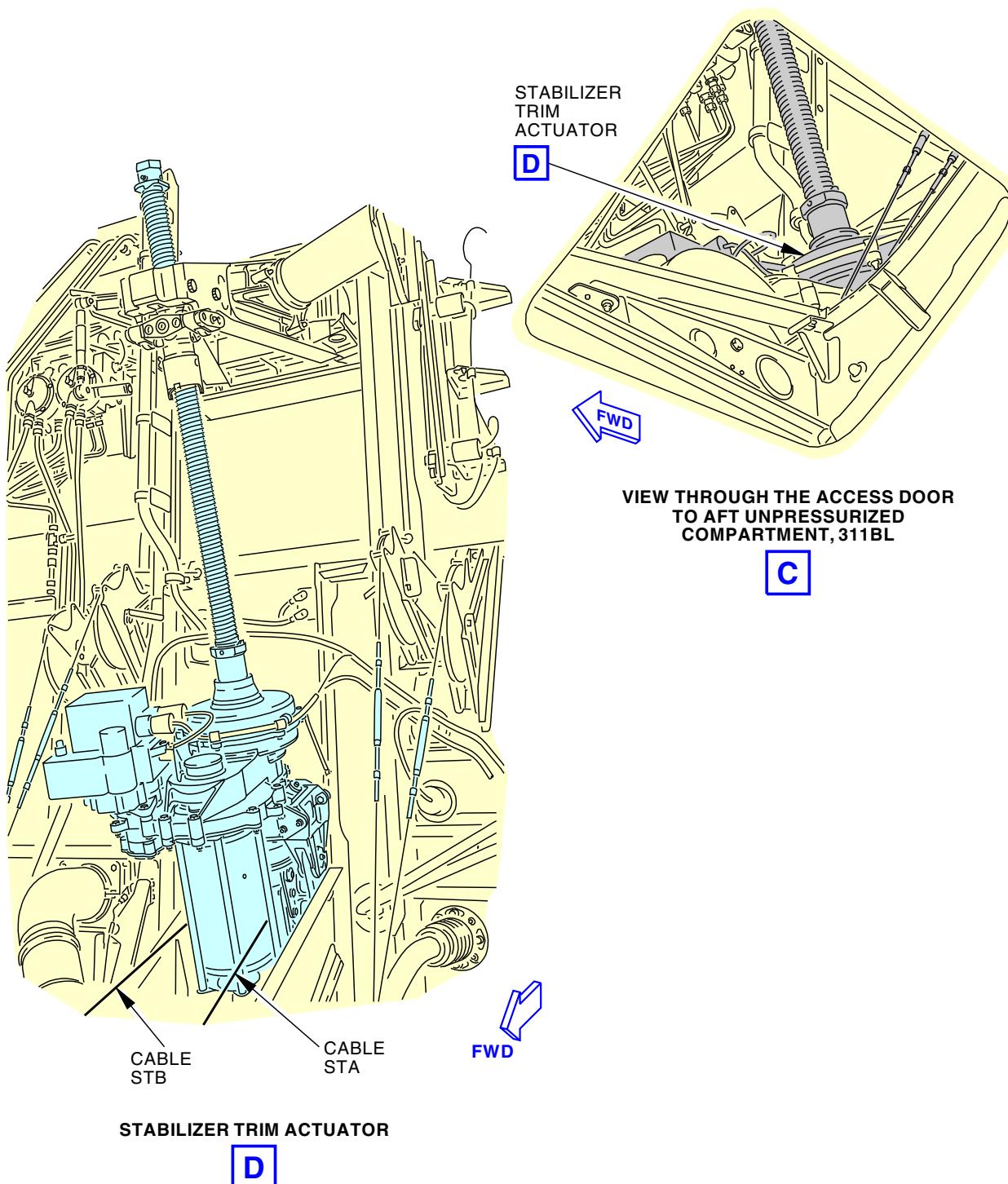
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G29012 S0006568502_V3

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 5 of 7)

EFFECTIVITY
LOM ALL

12-26-00

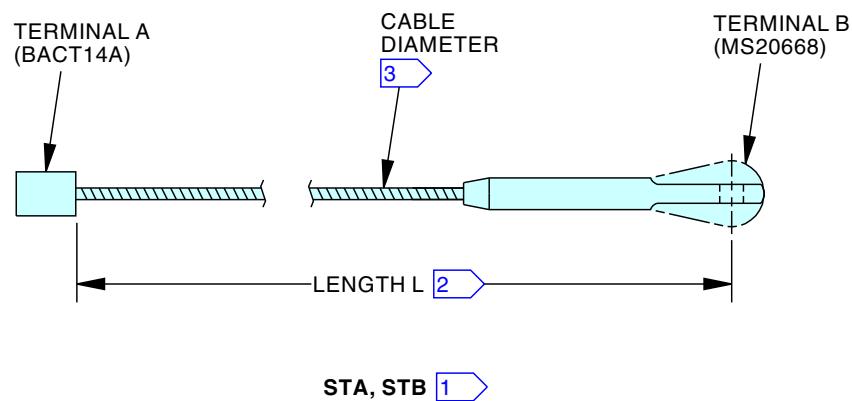
D633A101-LOM

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- [1] CABLE CONSTRUCTION IS CARBON STEEL: BMS 7-265, TYPE 1, COMPOSITION A (ZINC COATING) OR COMPOSITION A (TZ), (TIN OVER ZINC), 7 X 19.
- [2] MEASURE CABLE LENGTH WITH A LOAD OF 140 ± 5 POUNDS (623 ± 22 NEWTONS) OF FORCE. SEE TABLE A.
- [3] MEASURE THE NEW CABLE DIAMETER AT 3 PLACES AND AVERAGE. THIS CABLE DIAMETER MEASUREMENT SHOULD NOT BE TAKEN WHILE THE CABLE IS UNDER LOAD.

D49607 S0000157987_V3

Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 6 of 7)

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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CABLE DIAMETER  	CABLE LENGTH L INCHES (METERS)	
	STA (LEFT)	STB (RIGHT)
0.125	2199.55 ±0.50 (55.869 ±0.013)	2186.02 ±0.50 (55.525 ±0.013)
0.126	2199.69 ±0.50 (55.872 ±0.013)	2186.16 ±0.50 (55.528 ±0.013)
0.127	2199.83 ±0.50 (55.876 ±0.013)	2186.30 ±0.50 (55.532 ±0.013)
0.128	2199.97 ±0.50 (55.879 ±0.013)	2186.44 ±0.50 (55.536 ±0.013)
0.129	2200.11 ±0.50 (55.883 ±0.013)	2186.58 ±0.50 (55.539 ±0.013)
0.130	2200.25 ±0.50 (55.886 ±0.013)	2186.72 ±0.50 (55.543 ±0.013)
0.131	2200.39 ±0.50 (55.890 ±0.013)	2186.86 ±0.50 (55.546 ±0.013)
0.132	2200.53 ±0.50 (55.893 ±0.013)	2187.00 ±0.50 (55.550 ±0.013)
0.133	2200.67 ±0.50 (55.897 ±0.013)	2187.14 ±0.50 (55.553 ±0.013)
0.134	2200.81 ±0.50 (55.901 ±0.013)	2187.28 ±0.50 (55.557 ±0.013)
0.135	2200.95 ±0.50 (55.904 ±0.013)	2187.42 ±0.50 (55.560 ±0.013)
0.136	2201.09 ±0.50 (55.907 ±0.013)	2187.56 ±0.50 (55.564 ±0.013)
0.137	2201.23 ±0.50 (55.911 ±0.013)	2187.70 ±0.50 (55.568 ±0.013)
0.138	2201.37 ±0.50 (55.915 ±0.013)	2187.84 ±0.50 (55.571 ±0.013)
0.139	2201.51 ±0.50 (55.918 ±0.013)	2187.98 ±0.50 (55.575 ±0.013)

TABLE A

D49643 S0000157935_V2

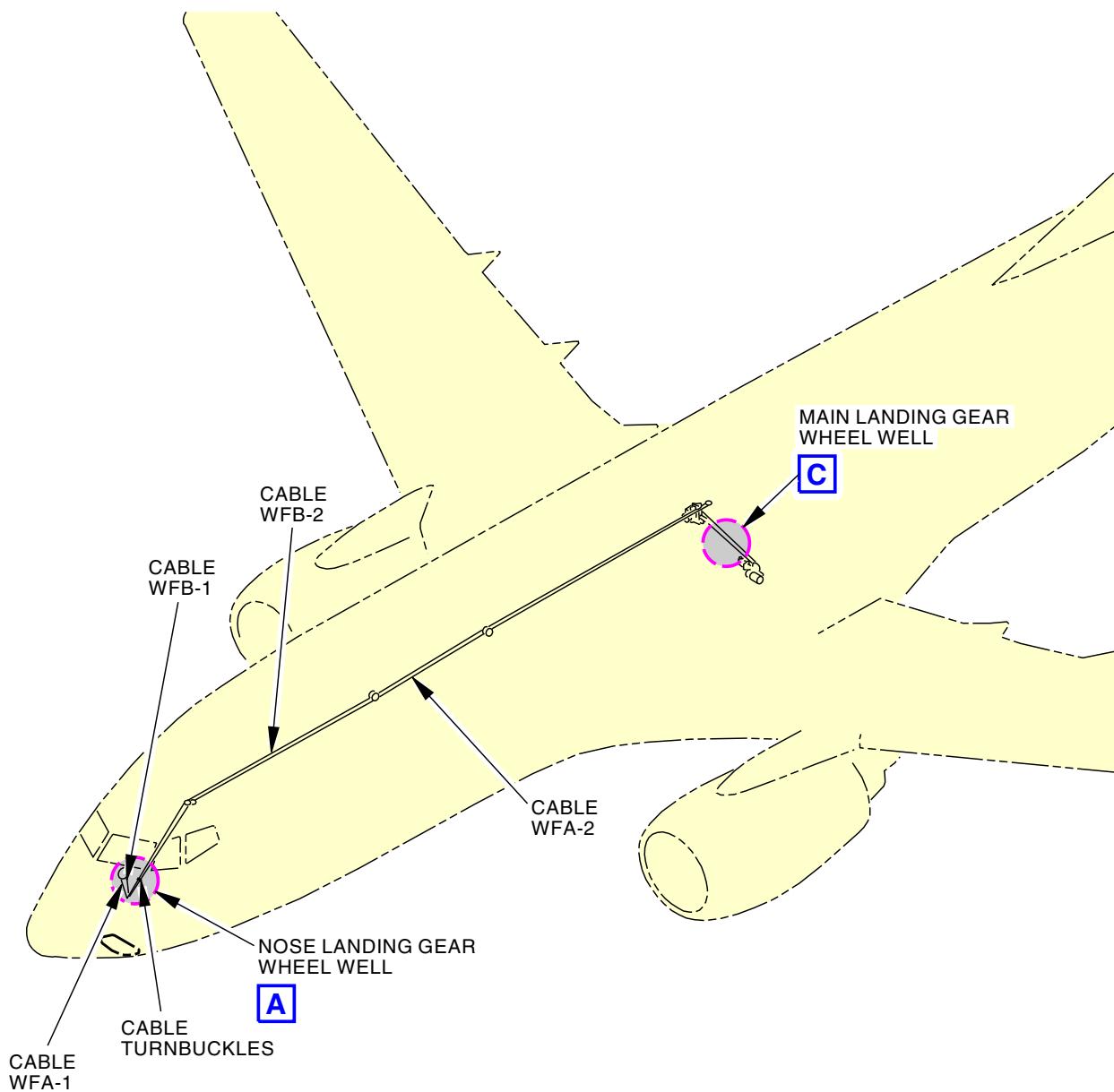
Stabilizer Control Cables
Figure 304/12-26-00-990-804 (Sheet 7 of 7)

EFFECTIVITY
LOM ALL

12-26-00



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AIRCRAFT MAINTENANCE MANUAL



G29135 S0006568508_V3

Trailing Edge Flap Control Cables
Figure 305/12-26-00-990-805 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

12-26-00

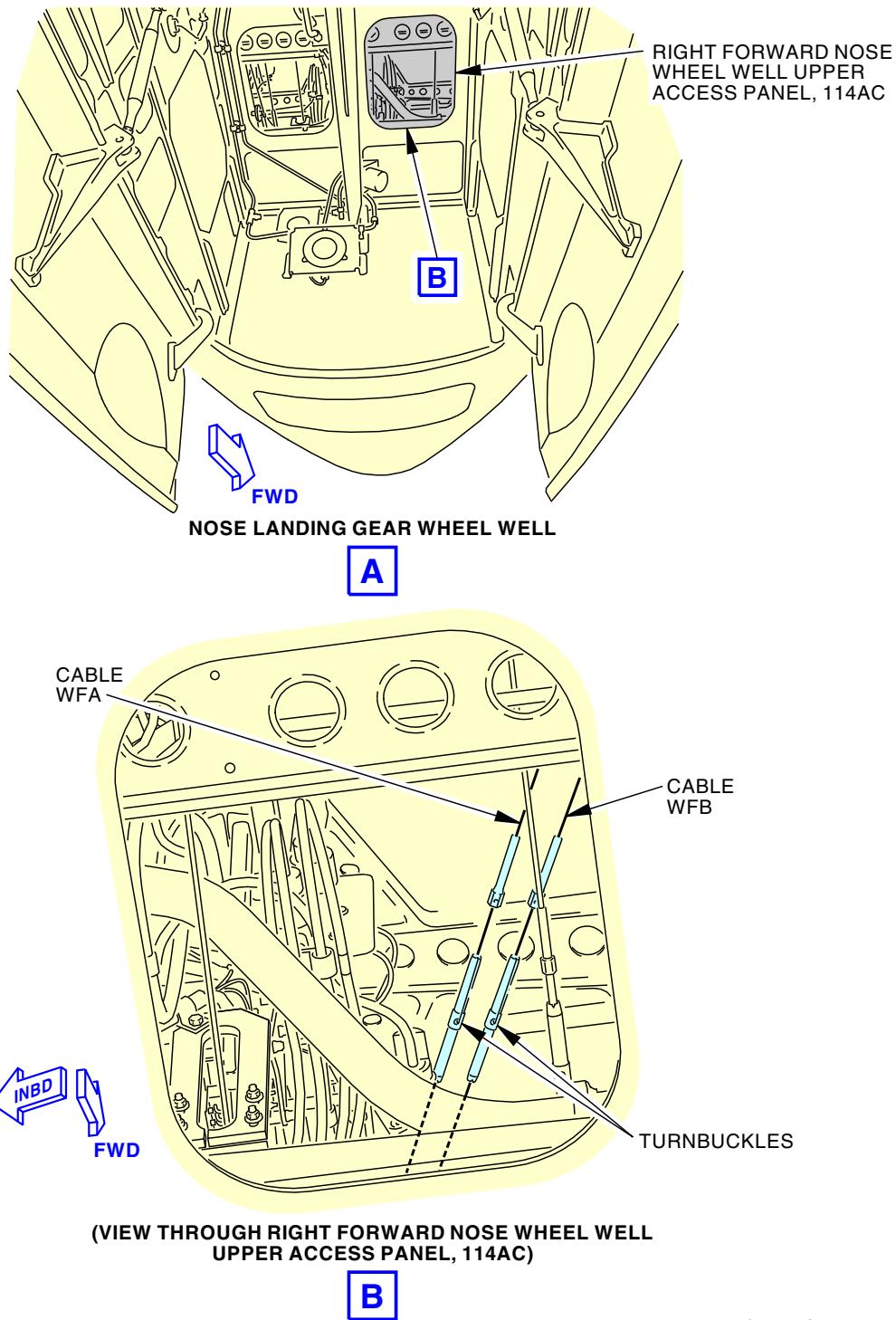
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G29138 S0006568509_V3

Trailing Edge Flap Control Cables
Figure 305/12-26-00-990-805 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

12-26-00

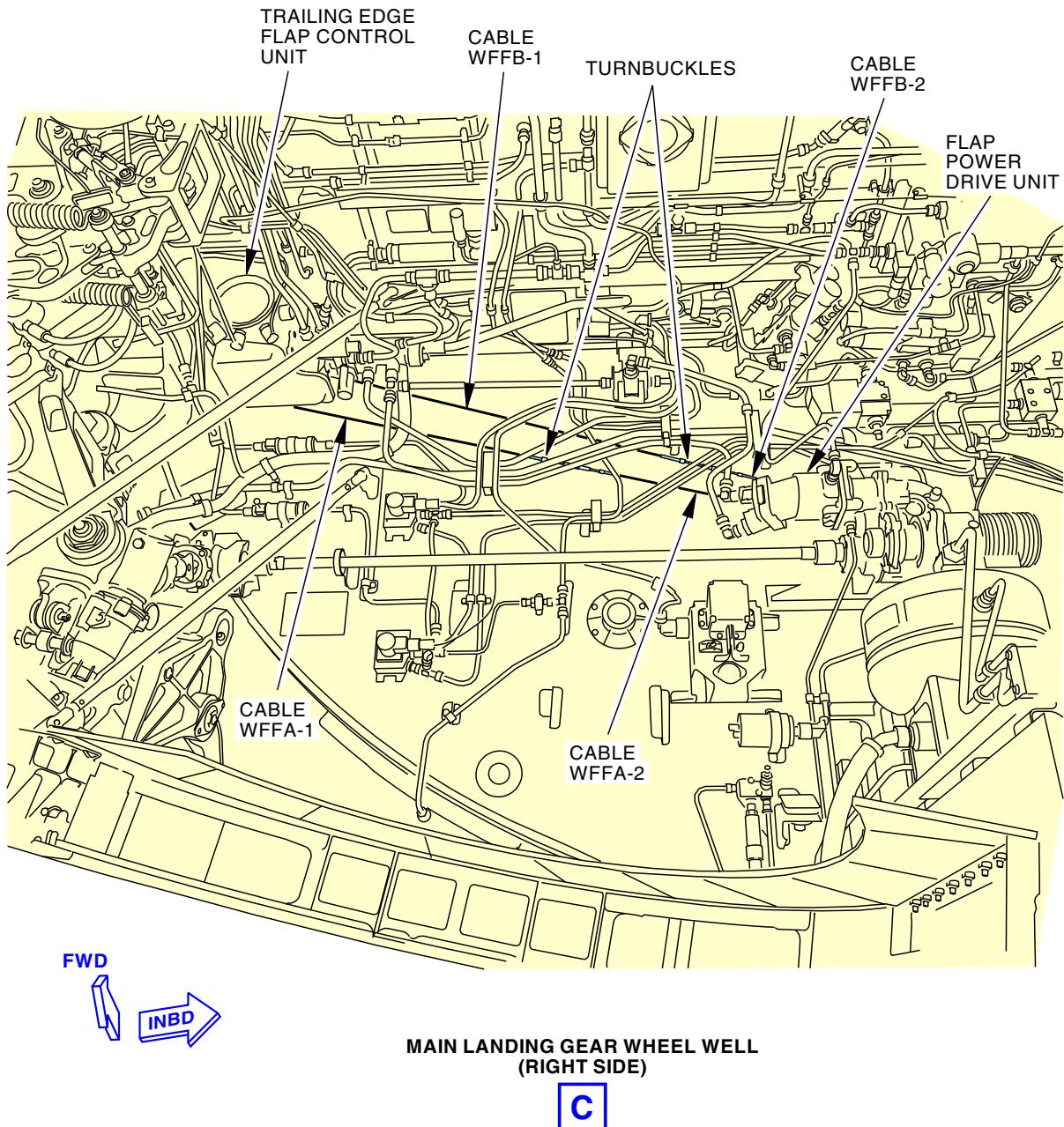
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G29152 S0006568510_V2

Trailing Edge Flap Control Cables
Figure 305/12-26-00-990-805 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-26-00

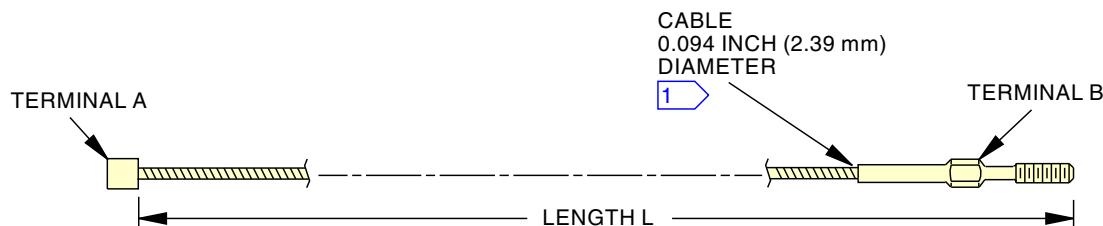
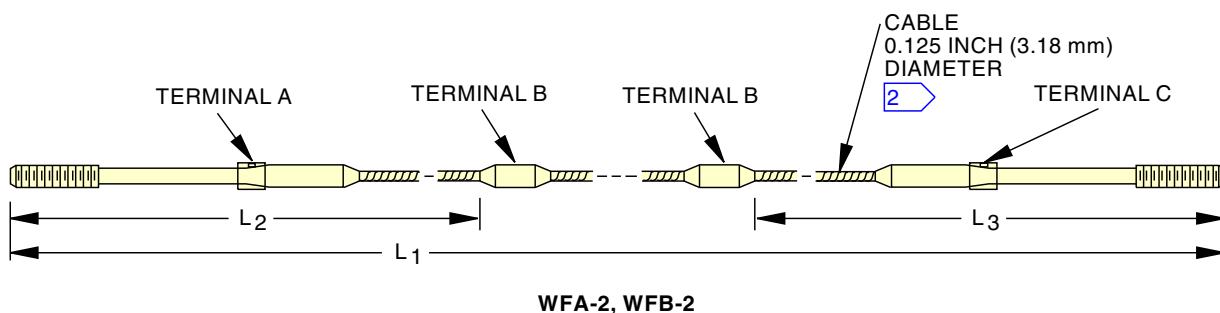
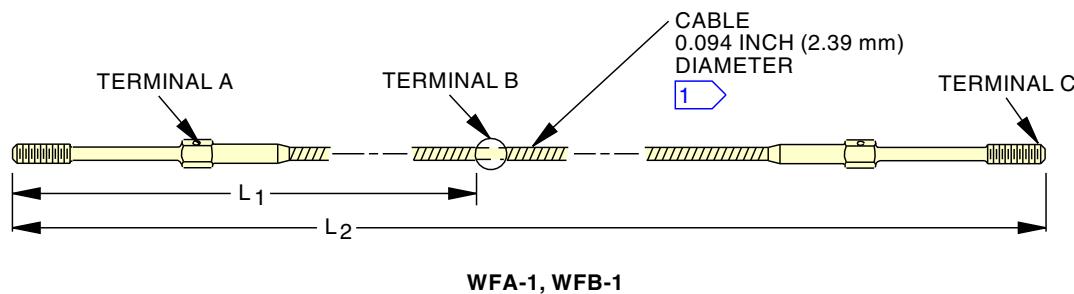
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



1 CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 7

2 CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 19

G32048 S0006568511_V3

Trailing Edge Flap Control Cables
Figure 305/12-26-00-990-805 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

12-26-00



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

CABLE NAME	LENGTH L 3 INCHES (MILLIMETERS)	TERMINAL A	TERMINAL B	TERMINAL C
WFA-1, WFB-1	L ₁ - 41.5 ±0.12 4 (1,054 ±3) L ₂ - 84.5 ±0.25 4 (2,146 ±6)	MS21260L3LH	BACT14B3	MS21260L3RH
WFA-2 5 WFB-2 5	L ₁ - 1418.8 (36,037) 3 L ₂ - 712.4 (18,095) 3 L ₃ - 695.4 (17,663) 3	69-38195-2	BACT14A4	69-38195-1
WFFA-1	30.4 (772) 4	BACT14A3	MS21260S3RH	
WFFB-1	32.9 (836) 4	BACT14A3	MS21260S3RH	
WFFA-2 WFFB-2	46.8 (1,189) 4	BACT14A3	MS21260S3LH	

TABLE A

- 1 CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 7
- 2 CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 19
- 3 MEASURE CABLE WITH A LOAD OF 40 ±3 POUNDS (178 ±13 NEWTONS).
- 4 MEASURE CABLE WITH A LOAD OF 20 ±3 POUNDS (89 ±13 NEWTONS).
- 5 PROOF LOAD THESE CABLES TO 552 +25/-0 POUNDS (250 +11/-0 KG).

L82856 S0006568512_V6

Trailing Edge Flap Control Cables
Figure 305/12-26-00-990-805 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

12-26-00

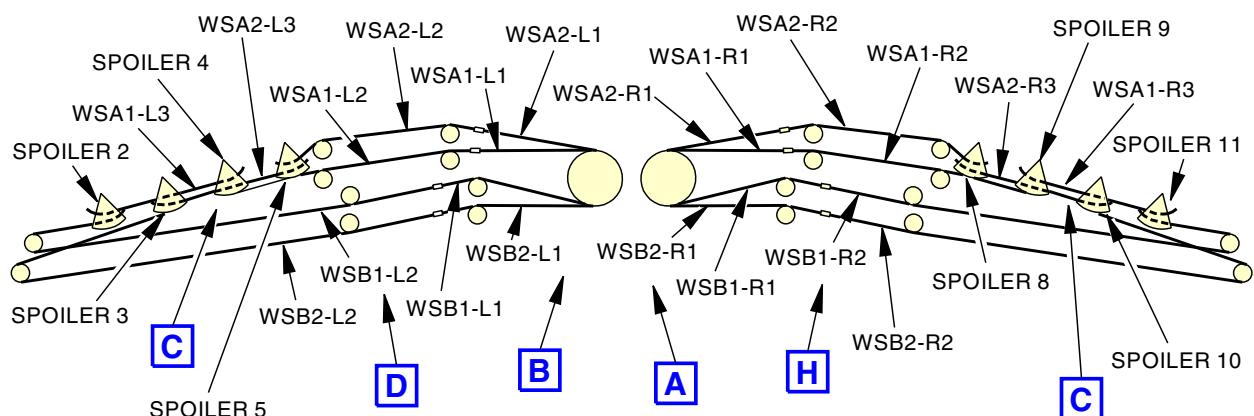
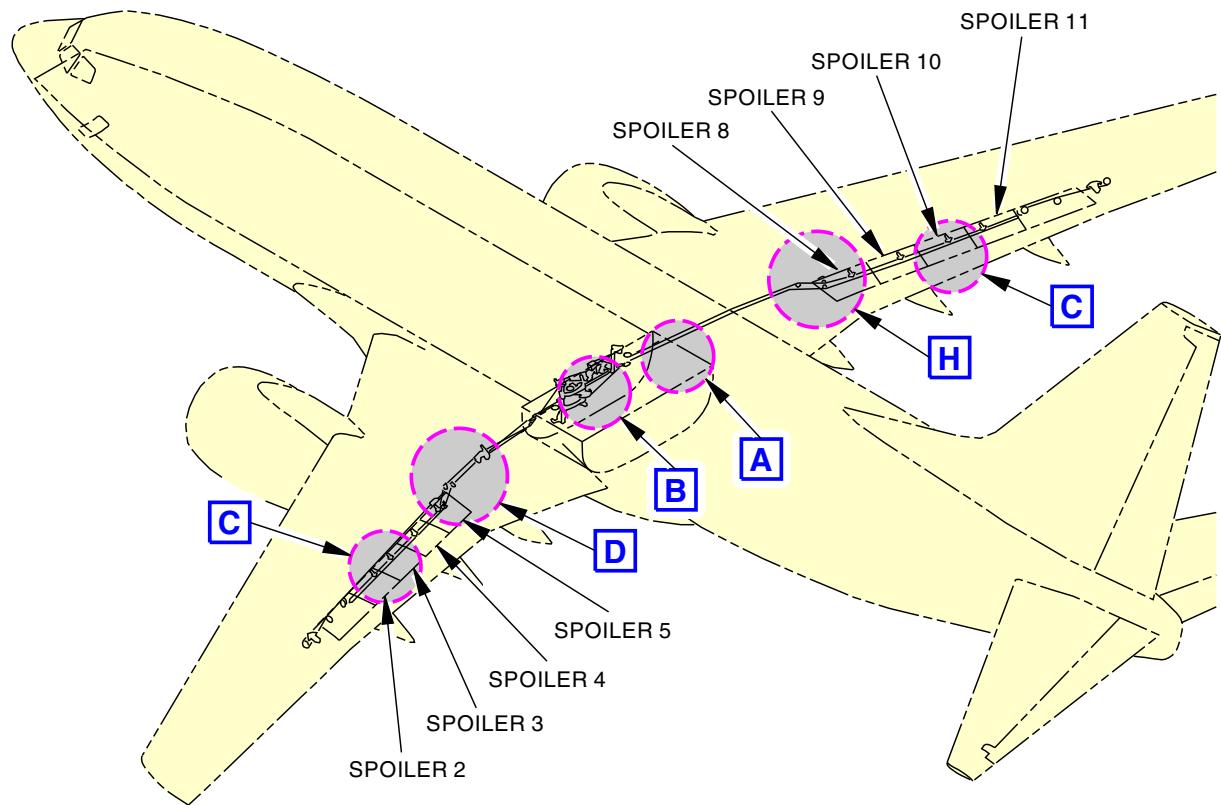
D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL



SPOILER CONTROL CABLE SCHEMATIC

G29449 S0006568521_V3

Spoiler Control Cables
Figure 306/12-26-00-990-806 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

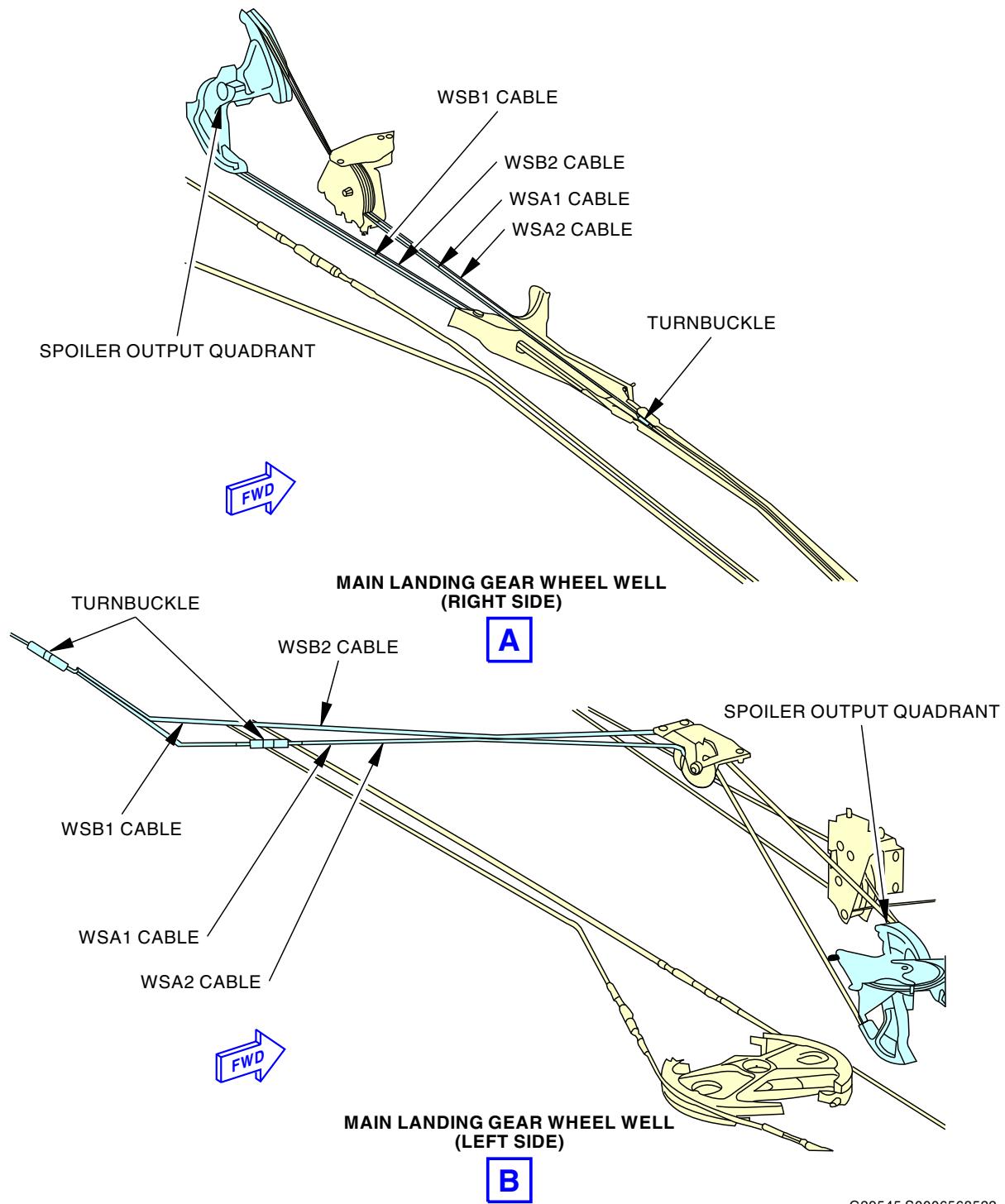
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ECCN 9E991 BOEING PROPRIETARY - See title page for details



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AIRCRAFT MAINTENANCE MANUAL



G29545 S0006568522_V3

Spoiler Control Cables
Figure 306/12-26-00-990-806 (Sheet 2 of 5)

EFFECTIVITY
LOM ALL

12-26-00

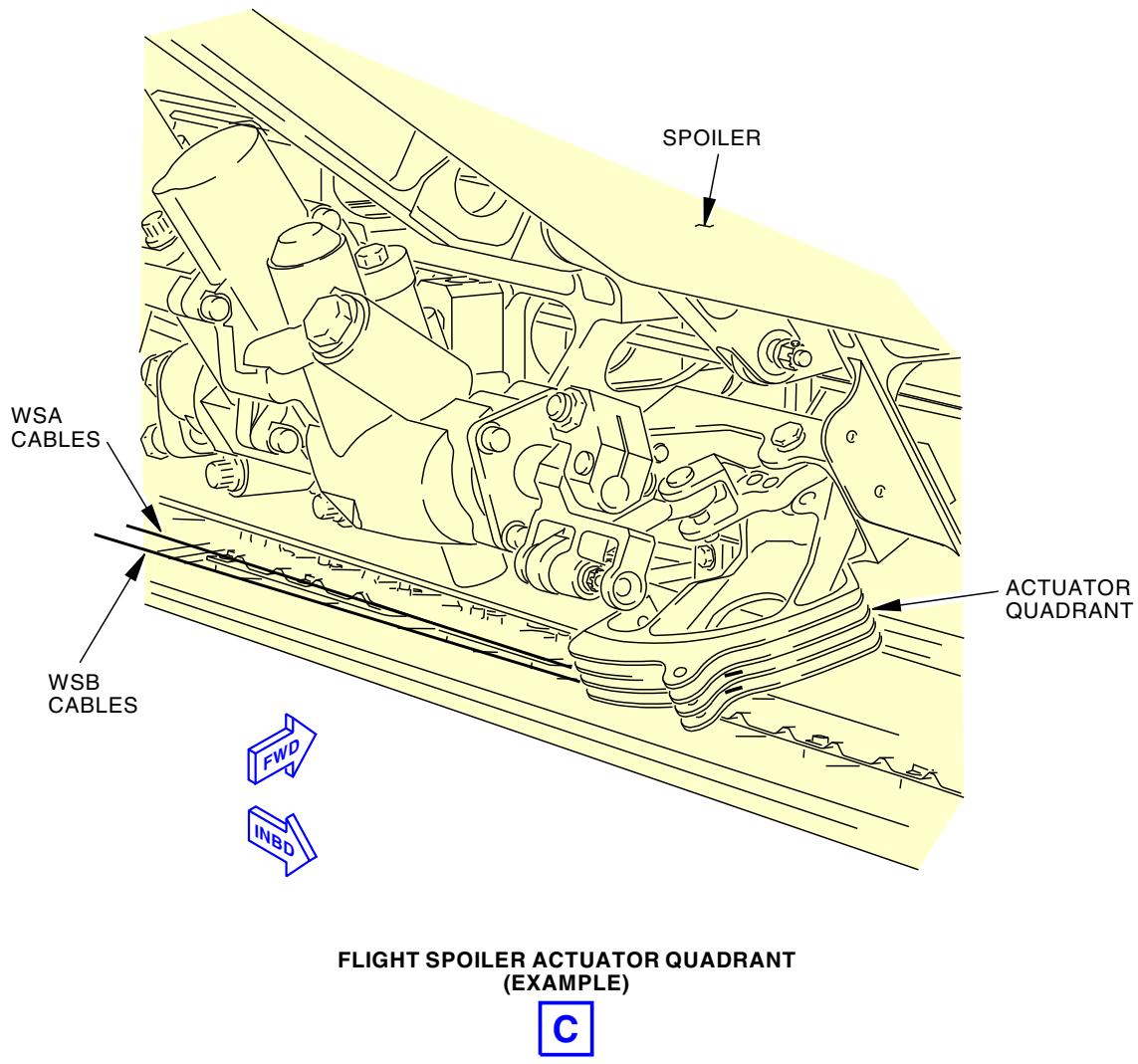
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AIRCRAFT MAINTENANCE MANUAL



FLIGHT SPOILER ACTUATOR QUADRANT
(EXAMPLE)

C

G29968 S0006568523_V3

Spoiler Control Cables
Figure 306/12-26-00-990-806 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-26-00

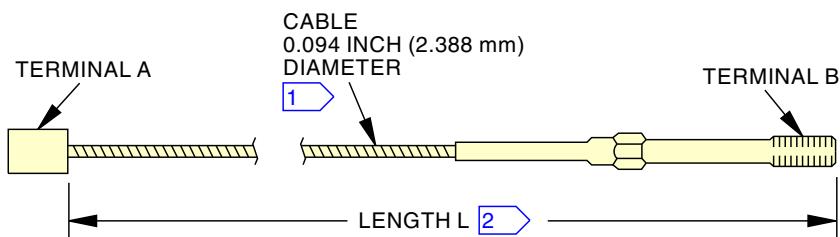
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

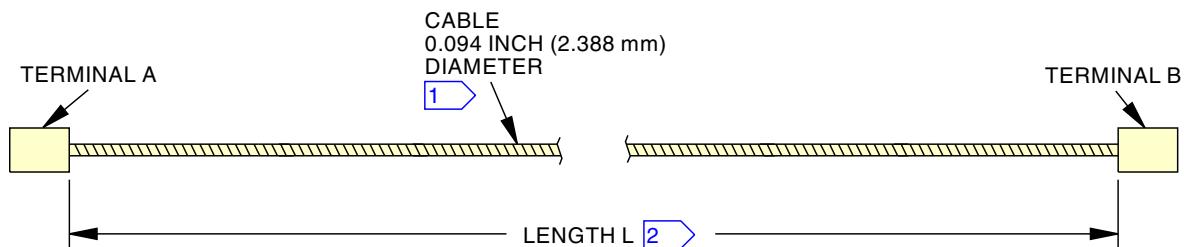
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AIRCRAFT MAINTENANCE MANUAL



WSA1-L1, WSA1-L2, WSA1-R1, WSA1-R2,
WSA2-L1, WSA2-L2, WSA2-R1, WSA2-R2,
WSB1-L1, WSB1-L2, WSB1-R1, WSB1-R2,
WSB2-L1, WSB2-L2, WSB2-R1, WSB2-R2



WSA1-L3, WSA1-R3, WSA2-L3, WSA2-R3

G29938 S0006568524_V4

Spoiler Control Cables
Figure 306/12-26-00-990-806 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL

CABLE NAME		LENGTH L INCHES (METERS)	TERMINAL A	TERMINAL B
LEFT SIDE	WSA1-L1	68.20 ±0.12 (1.732 ±0.003)	BACT14A	MS21260L3RH
	WSA1-L2	212.60 ±0.12 (5.400 ±0.003)	BACT14A	MS21260L3LH
	WSA1-L3	77.10 ±0.12 (1.958 ±0.003)	BACT14A	BACT14A
RIGHT SIDE	WSA1-R1	52.00 ±0.12 (1.321 ±0.003)	BACT14A	MS21260L3LH
	WSA1-R2	215.80 ±0.12 (5.481 ±0.003)	BACT14A	MS21260L3RH
	WSA1-R3	77.00 ±0.12 (1.956 ±0.003)	BACT14A	BACT14A
LEFT SIDE	WSA2-L1	93.20 ±0.12 (2.367 ±0.003)	BACT14A	MS21260L3LH
	WSA2-L2	144.30 ±0.12 (3.665 ±0.003)	BACT14A	MS21260L3RH
	WSA2-L3	89.90 ±0.12 (2.283 ±0.003)	BACT14A	BACT14A
RIGHT SIDE	WSA2-R1	38.30 ±0.12 (0.973 ±0.003)	BACT14A	MS21260L3RH
	WSA2-R2	187.80 ±0.12 (4.770 ±0.003)	BACT14A	MS21260L3LH
	WSA2-R3	89.10 ±0.12 (2.263 ±0.003)	BACT14A	BACT14A
LEFT SIDE	WSB1-L1	91.30 ±0.12 (2.319 ±0.003)	BACT14A	MS21260L3RH
	WSB1-L2	355.20 ±0.20 (9.022 ±0.005)	BACT14A	MS21260L3LH
RIGHT SIDE	WSB1-R1	46.80 ±0.12 (1.189 ±0.003)	BACT14A	MS21260L3LH
	WSB1-R2	355.50 ±0.20 (9.030 ±0.005)	BACT14A	MS21260L3RH
LEFT SIDE	WSB2-L1	63.90 ±0.12 (1.623 ±0.003)	BACT14A	MS21260L3LH
	WSB2-L2	406.20 ±0.20 (10.317 ±0.005)	BACT14A	MS21260L3RH
RIGHT SIDE	WSB2-R1	78.30 ±0.12 (1.989 ±0.003)	BACT14A	MS21260L3RH
	WSB2-R2	348.00 ±0.20 (8.839 ±0.005)	BACT14A	MS21260L3LH

TABLE A

- 1** CABLE CONSTRUCTION IS CARBON STEEL:
 BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 7
- 2** MEASURE CABLE WITH A LOAD OF 20 ±3 POUNDS (9.1 ±1.4 kg).

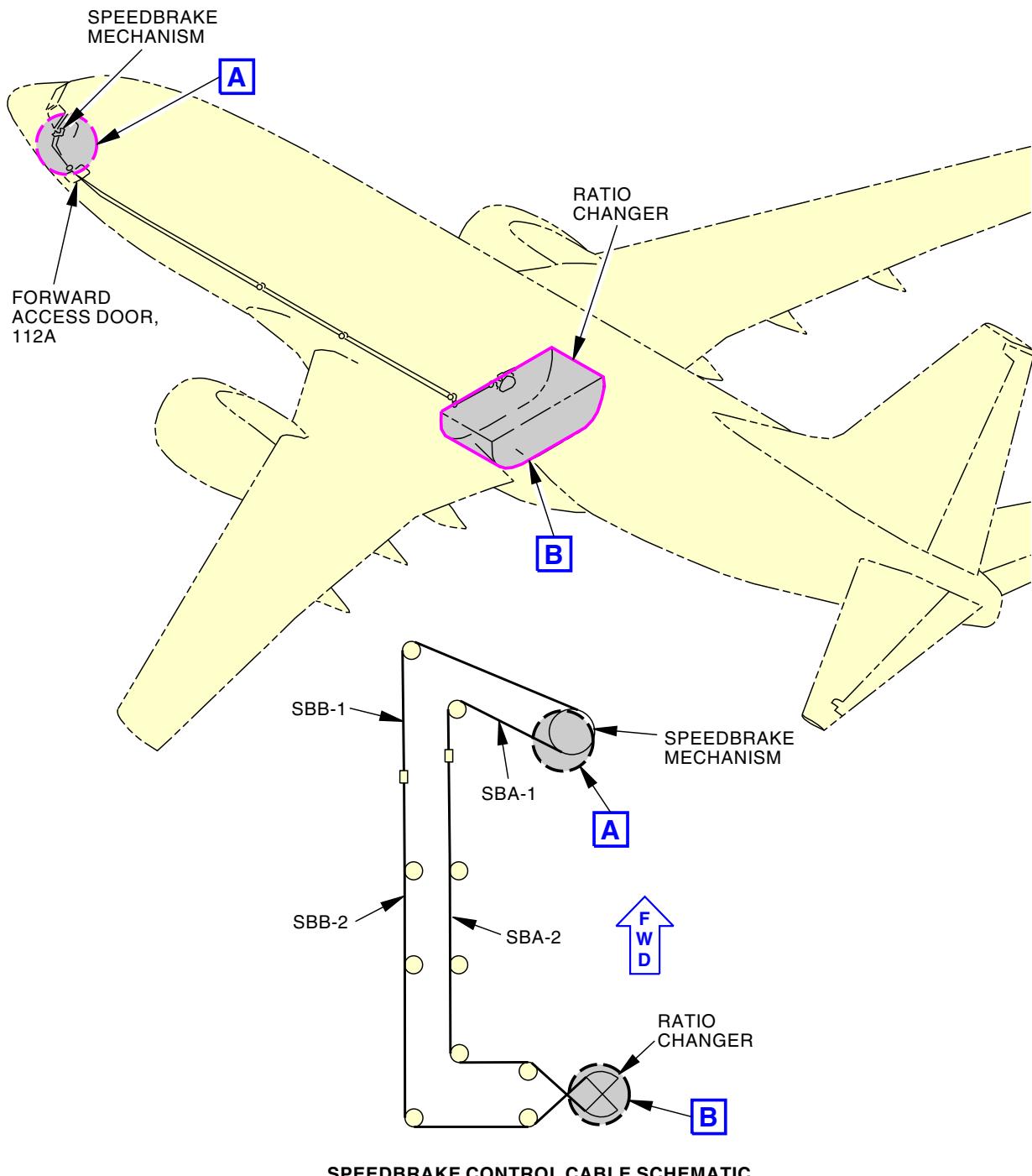
G29939 S0006568525_V2

Spoiler Control Cables
Figure 306/12-26-00-990-806 (Sheet 5 of 5)

EFFECTIVITY
 LOM ALL

12-26-00

D633A101-LOM



G29547 S0006568526_V3

Speedbrake Control Cables
Figure 307/12-26-00-990-807 (Sheet 1 of 4)

EFFECTIVITY
LOM ALL

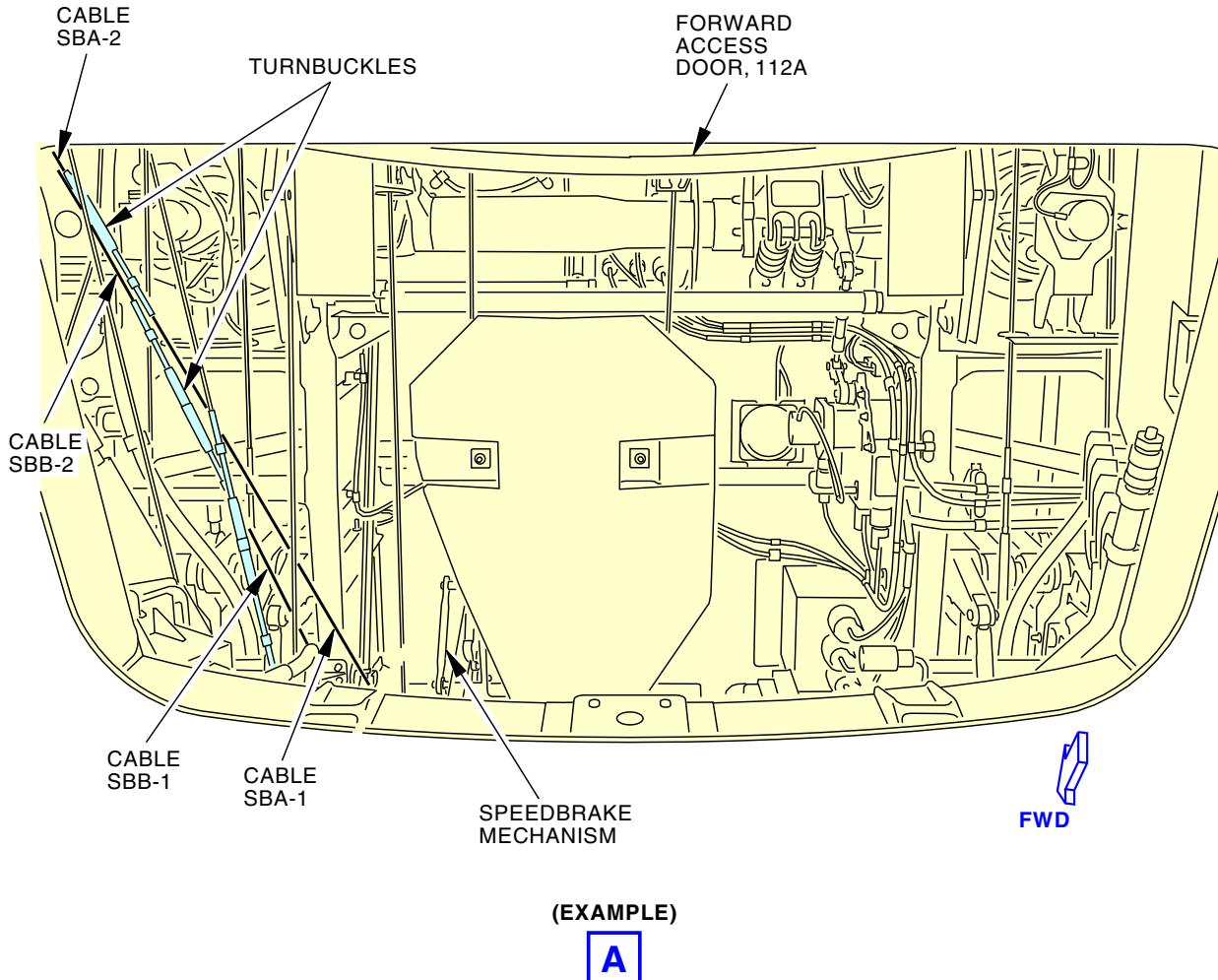
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D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL



G29548 S0006568527_V4

Speedbrake Control Cables
Figure 307/12-26-00-990-807 (Sheet 2 of 4)

EFFECTIVITY
LOM ALL

12-26-00

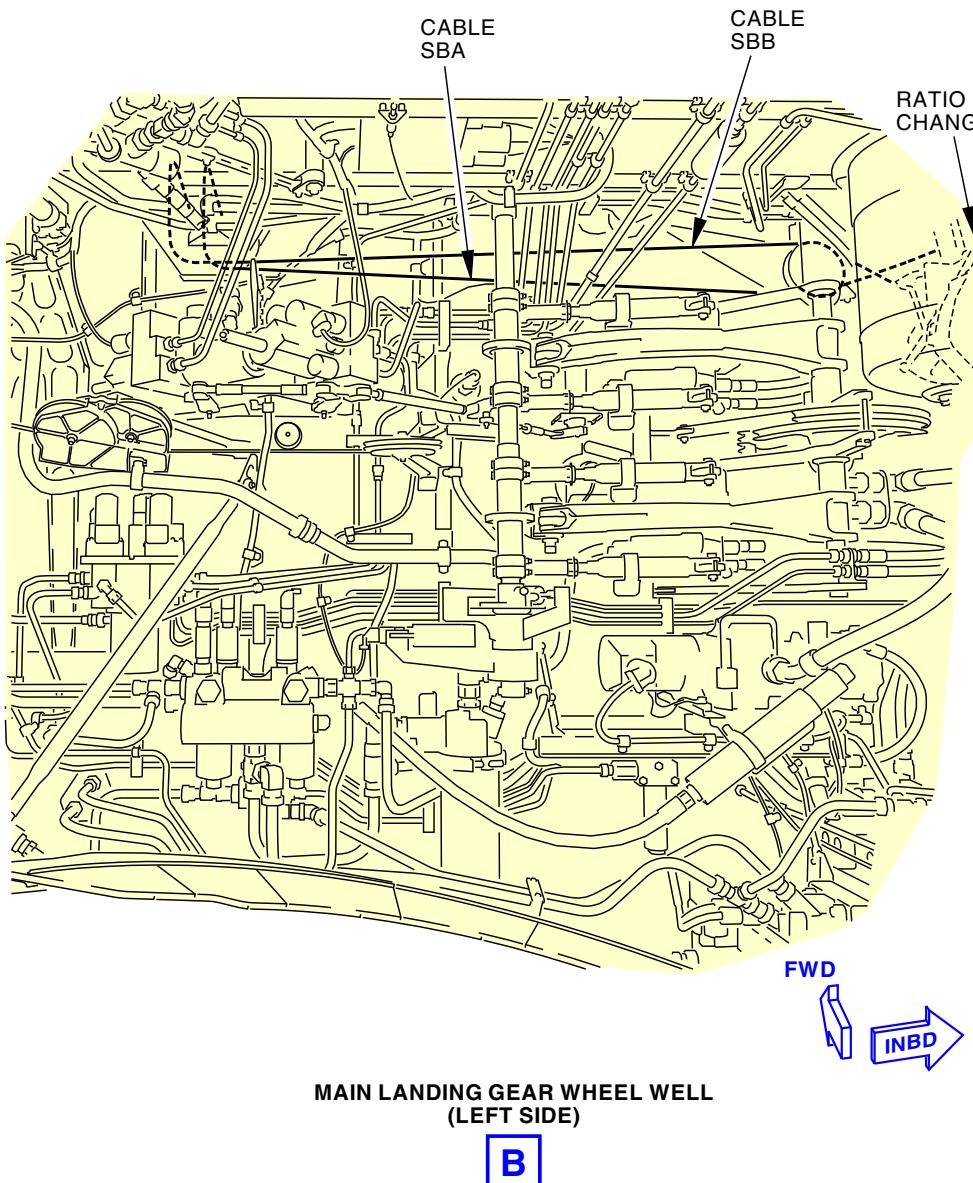
D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL



G29761 S0006568528_V2

Speedbrake Control Cables
Figure 307/12-26-00-990-807 (Sheet 3 of 4)

EFFECTIVITY
LOM ALL

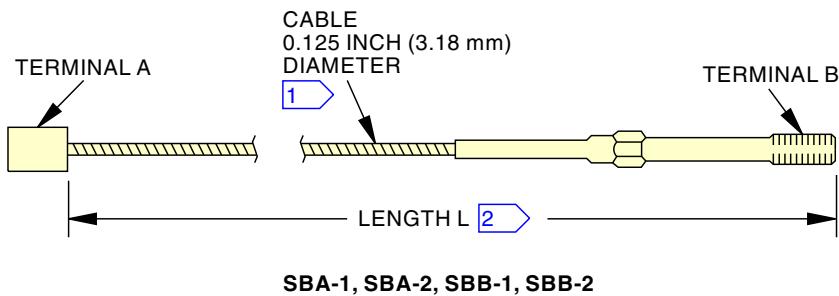
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D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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BOEING
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



CABLE NAME	LENGTH L 2 INCHES (MILLIMETERS)	TERMINAL A	TERMINAL B
SBA-1	39.2 ± 0.12 (996 ± 3)	BACT14A	MS21260L4RH
SBB-1	45.0 ± 0.12 (1,143 ± 3)	BACT14A	MS21260L4LH
SBB-2	723.3 ± 0.38 (18,372 ± 10)	BACT14A	MS21260L4RH
SBA-2	730.2 ± 0.38 (18,547 ± 10)	BACT14A	MS21260L4LH

TABLE A

1 CABLE CONSTRUCTION IS CARBON STEEL: BMS 7-265,
TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 19

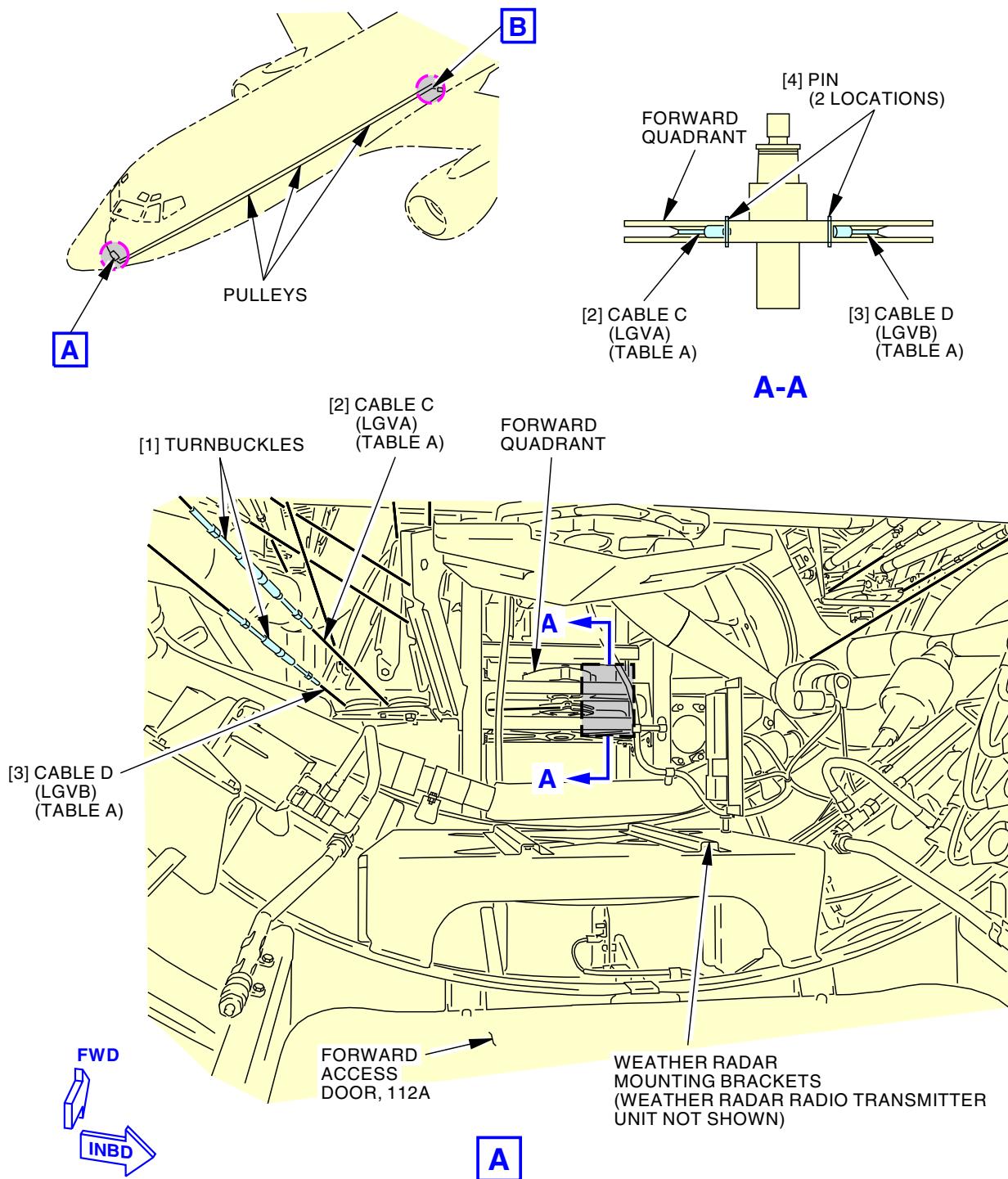
2 MEASURE CABLE WITH A LOAD OF 40 ± 3 POUNDS
(178 ± 13 NEWTONS).

G57555 S0006568531_V4

Speedbrake Control Cables
Figure 307/12-26-00-990-807 (Sheet 4 of 4)

EFFECTIVITY
LOM ALL

12-26-00



G45297 S0006575125_V2

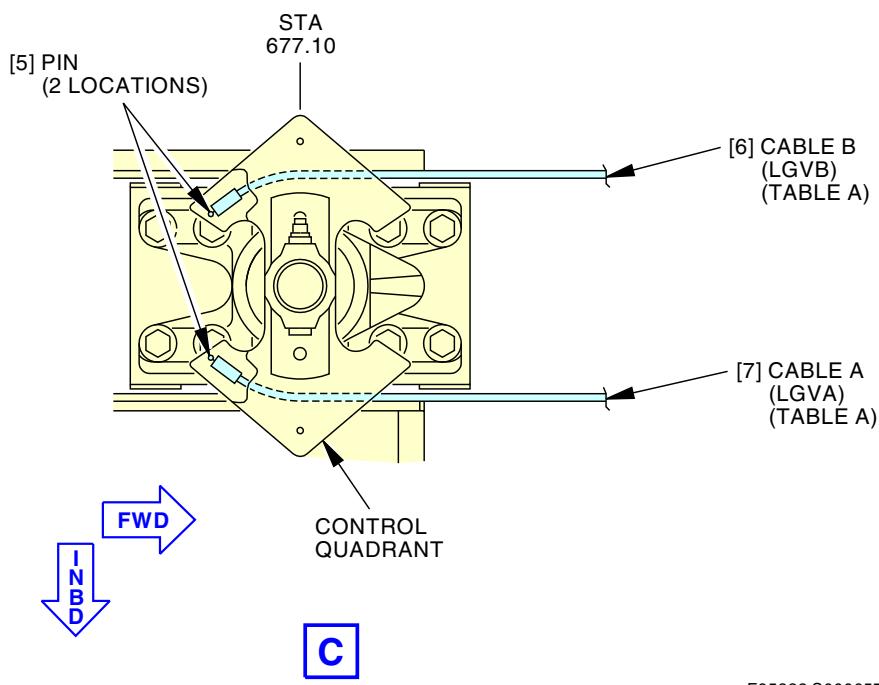
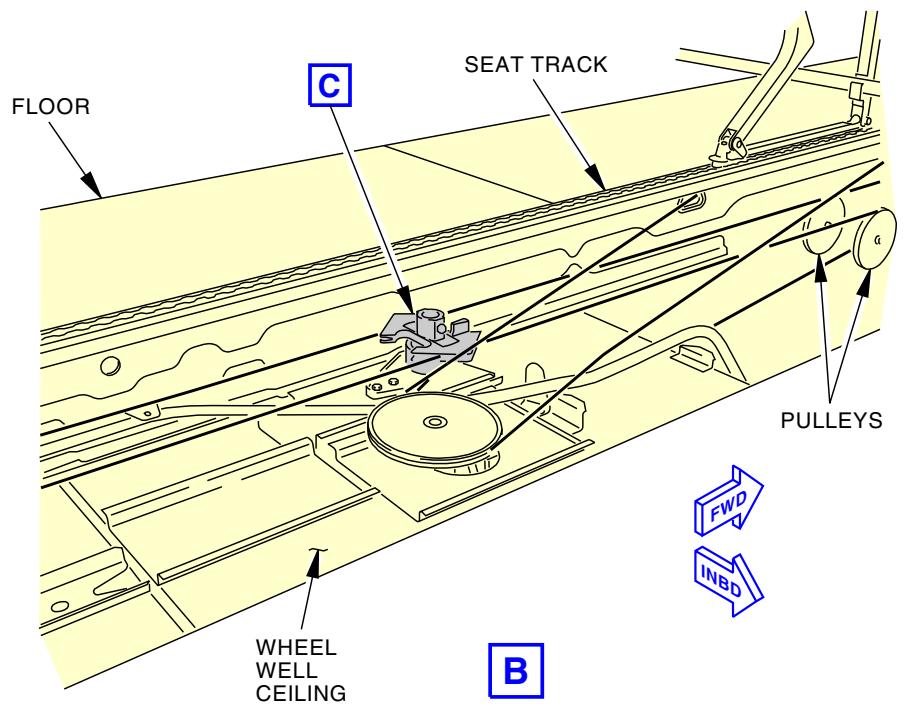
Landing Gear Control Cable Installation
Figure 308/12-26-00-990-808 (Sheet 1 of 3)

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

BOEING
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



F95822 S0006575130_V2

Landing Gear Control Cable Installation
Figure 308/12-26-00-990-808 (Sheet 2 of 3)

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL

CABLES A, B, C AND D

CABLE NAME	FUNCTION VA-UP VB-DN	LENGTH L*	TERMINAL A	TERMINAL B
A	LGVA	677.2	MS21260-L4LH	BACT14A4
B	LGVB	687.7	MS21260-L4RH	BACT14A4
C	LGVA	32.2	MS21260-L4RH	BACT14A4
D	LGVB	26.1	MS21260-L4LH	BACT14A4

* LENGTHS ARE IN INCHES

TABLE A

CABLE CONSTRUCTION IS CARBON STEEL:
BMS 7-265, TYPE 1, COMPOSITION A (TIN OVER ZINC), 7 X 19.

G45298 S0006575133_V4

Landing Gear Control Cable Installation
Figure 308/12-26-00-990-808 (Sheet 3 of 3)

EFFECTIVITY
LOM ALL

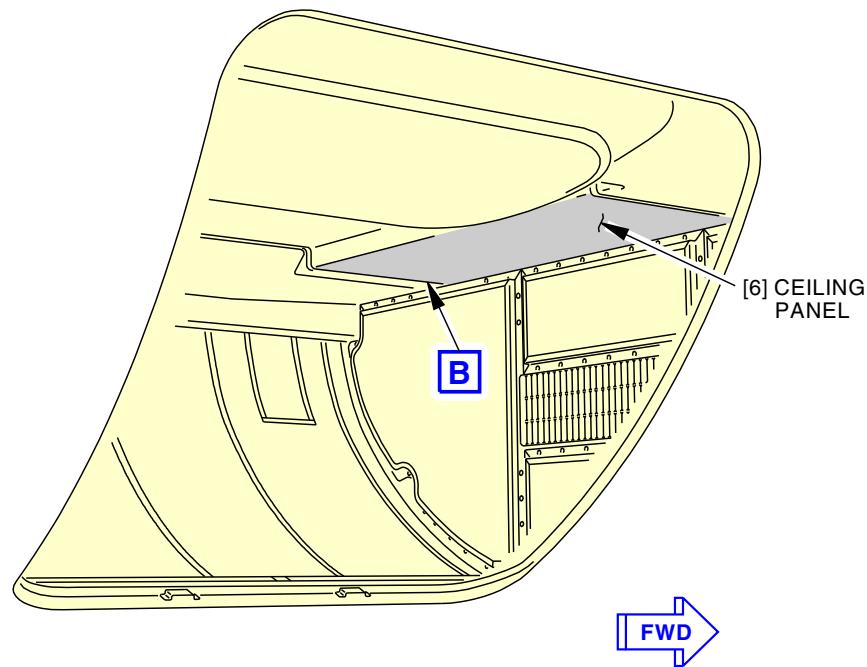
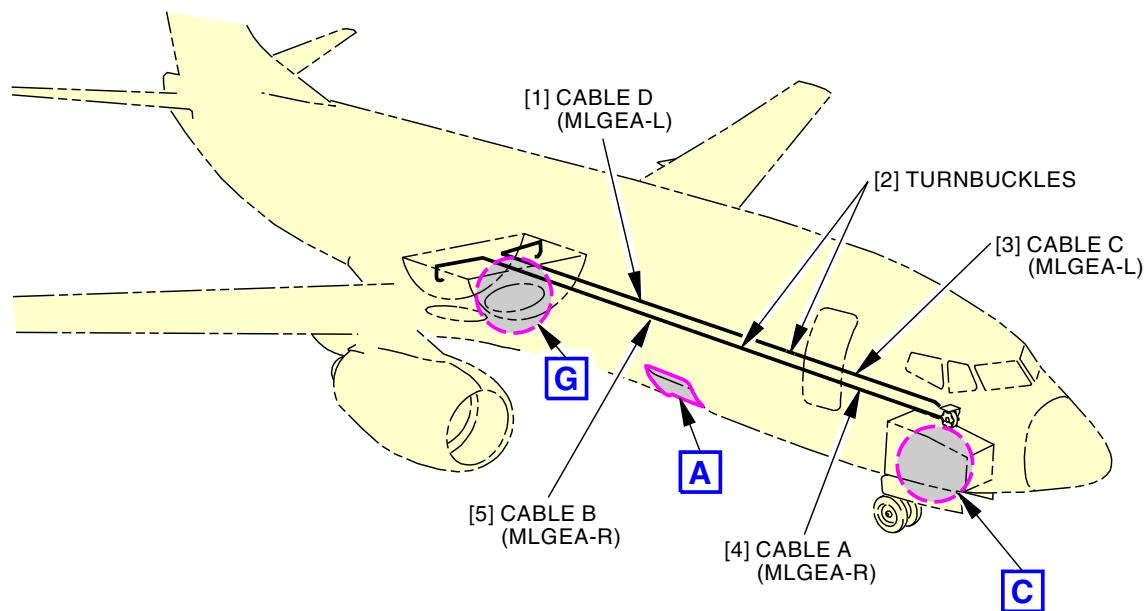
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D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL



FORWARD CARGO COMPARTMENT
(CEILING PANEL INSTALLED)

A

F85985 S0006575380_V2

Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 1 of 6)

EFFECTIVITY
LOM ALL

12-26-00

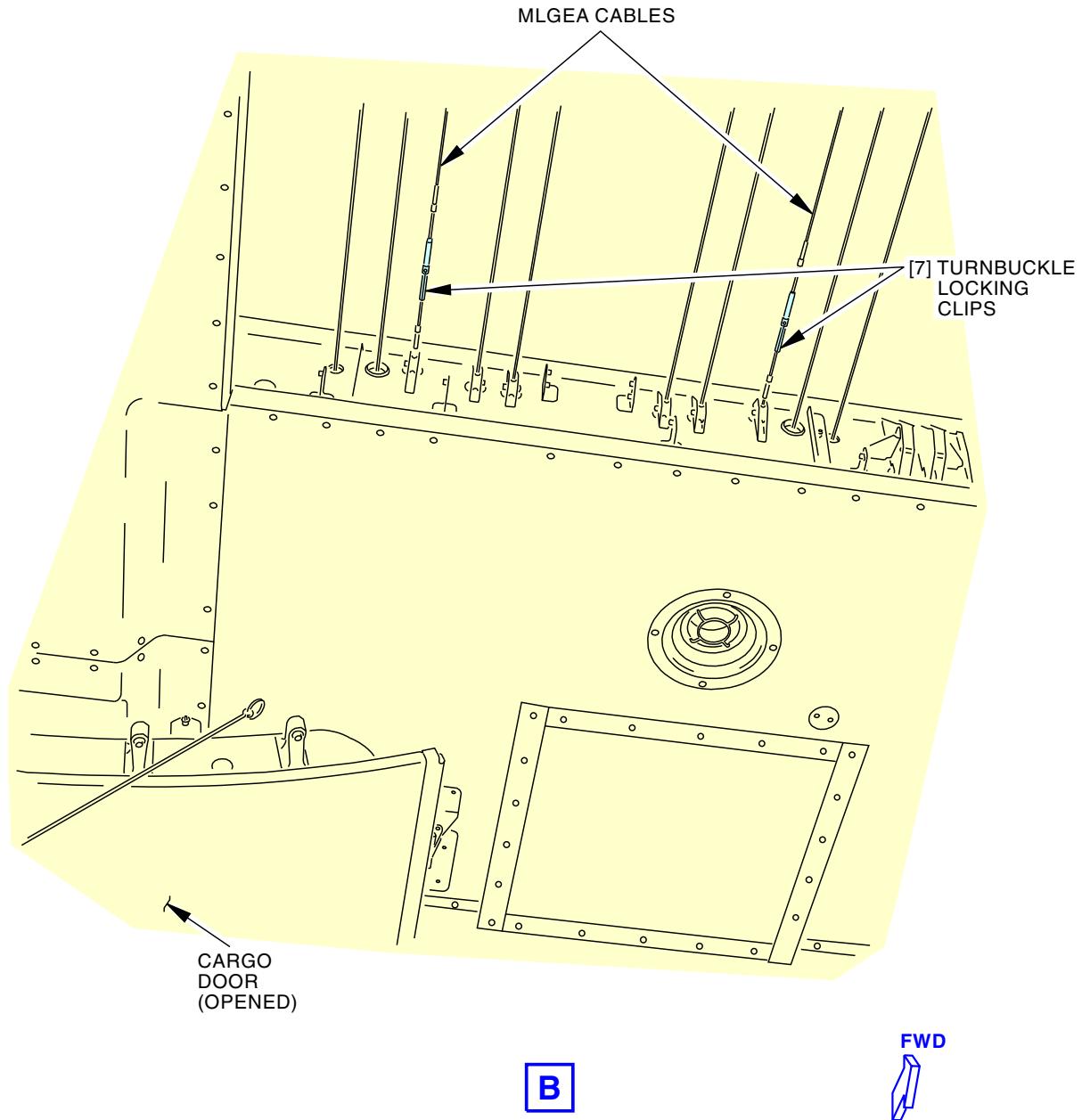
D633A101-LOM

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AIRCRAFT MAINTENANCE MANUAL



F85986 S0006575381_V2

Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 2 of 6)

EFFECTIVITY
LOM ALL

12-26-00

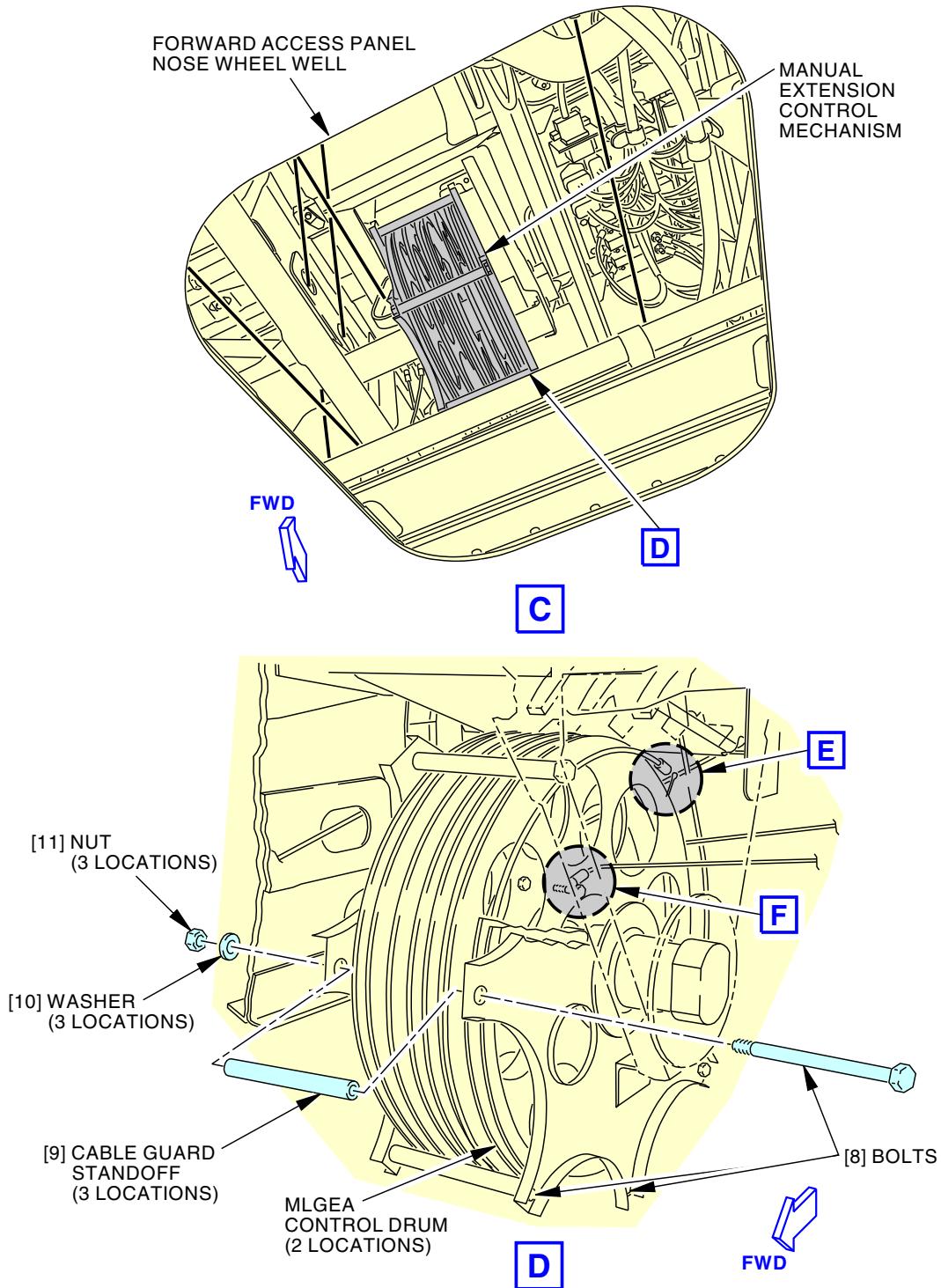
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



F85987 S0006575382_V2

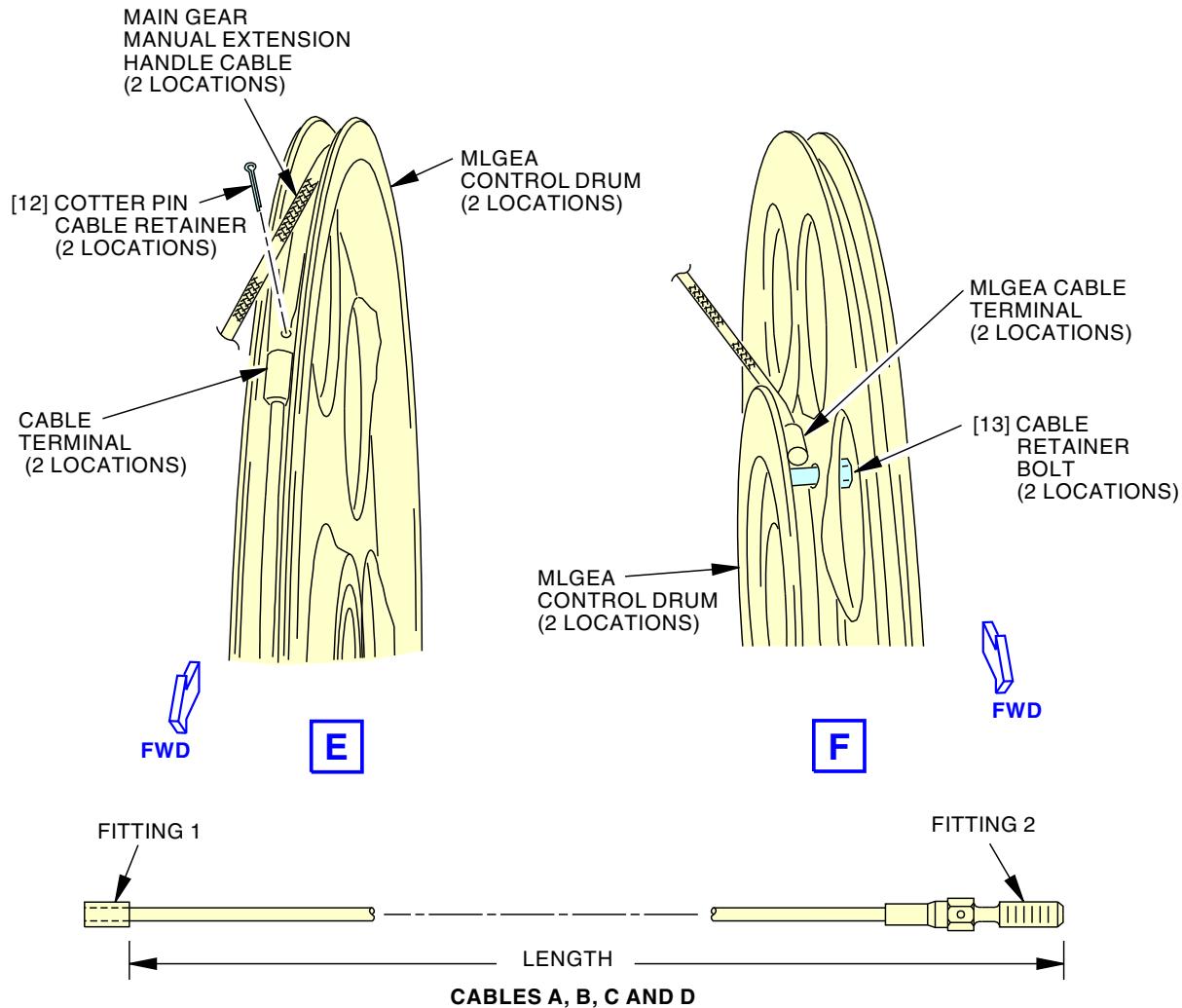
Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 3 of 6)

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details



CABLE REF	FUNCTION	NO. REQ	LENGTH INCHES (METERS)	CABLE SIZE	FITTINGS	
					1	2
A	MLGEA-R	1	163.7 (4.158)	3/32 7x7	BACT14A3	MS21260L3 LH
B	MLGEA-R	1	543.9 (13.815)	3/32 7x7	BACT14A3	MS21260L3 RH
C	MLGEA-L	1	182.4 (4.633)	3/32 7x7	BACT14A3	MS21260L3 LH
D	MLGEA-L	1	543.9 (13.815)	3/32 7x7	BACT14A3	MS21260L3 RH

MATERIAL:CABLE - CARBON STEEL PER BMS 7-265, TYPE I, COMPOSITION A,
TIN-ZINC (TZ)

G45347 S0006575384_V5

Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 4 of 6)

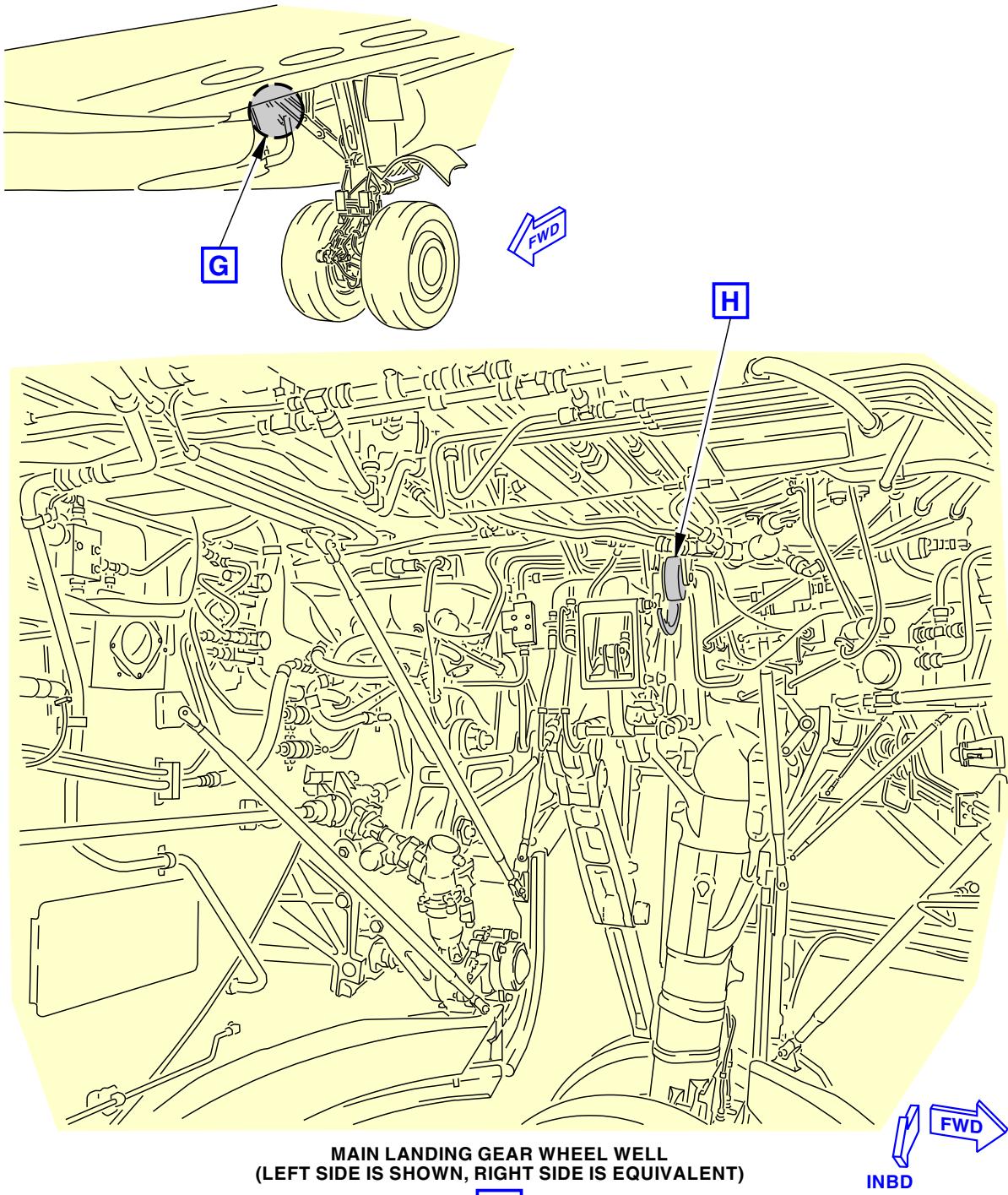
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM



737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



F85989 S0006575390_V2

Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 5 of 6)

EFFECTIVITY
LOM ALL

12-26-00

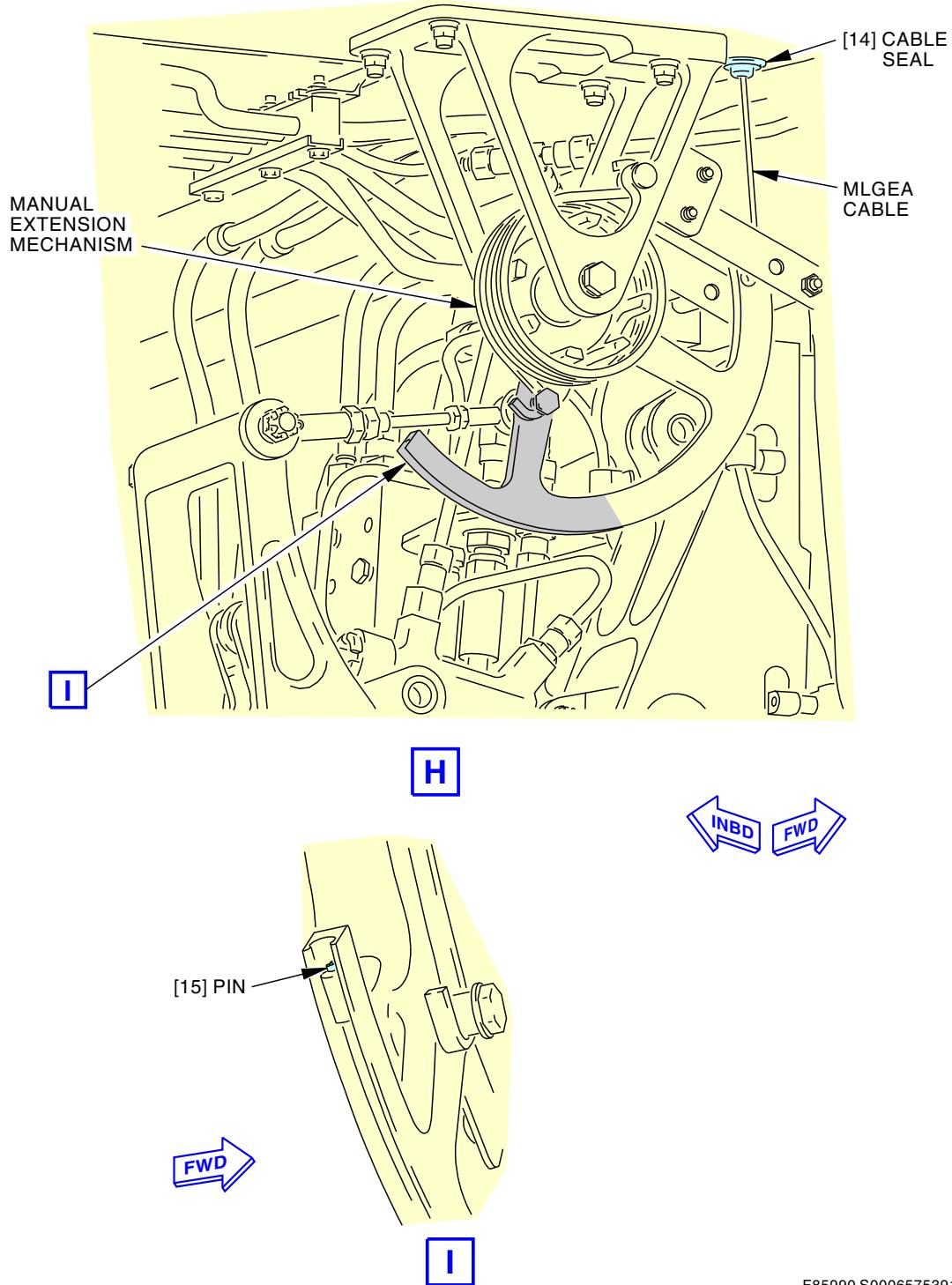
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



Main Gear Manual Extension System Cable Installation
Figure 309/12-26-00-990-809 (Sheet 6 of 6)

EFFECTIVITY
LOM ALL

12-26-00

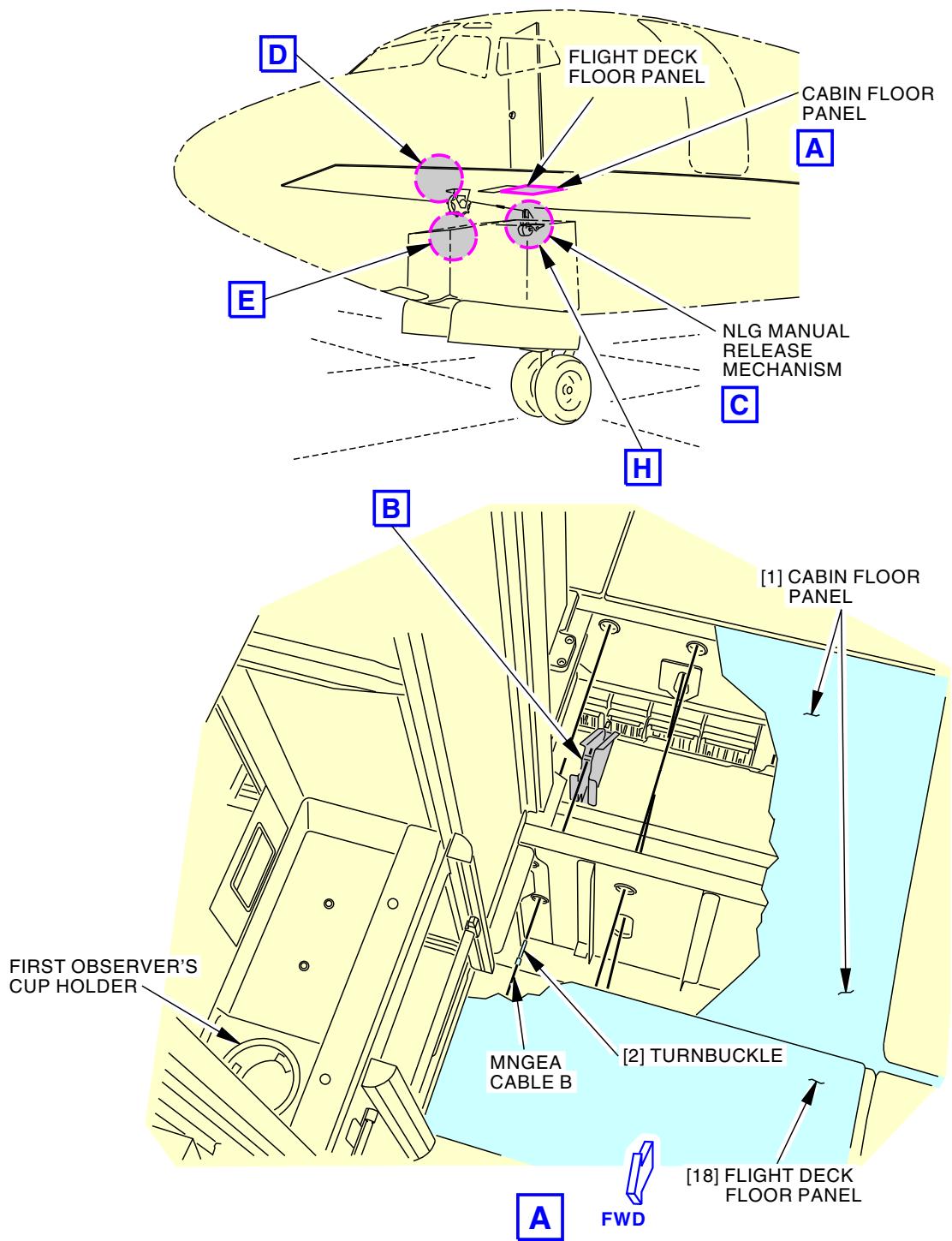
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AIRCRAFT MAINTENANCE MANUAL



G05481 S0006575410_V3

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 1 of 7)

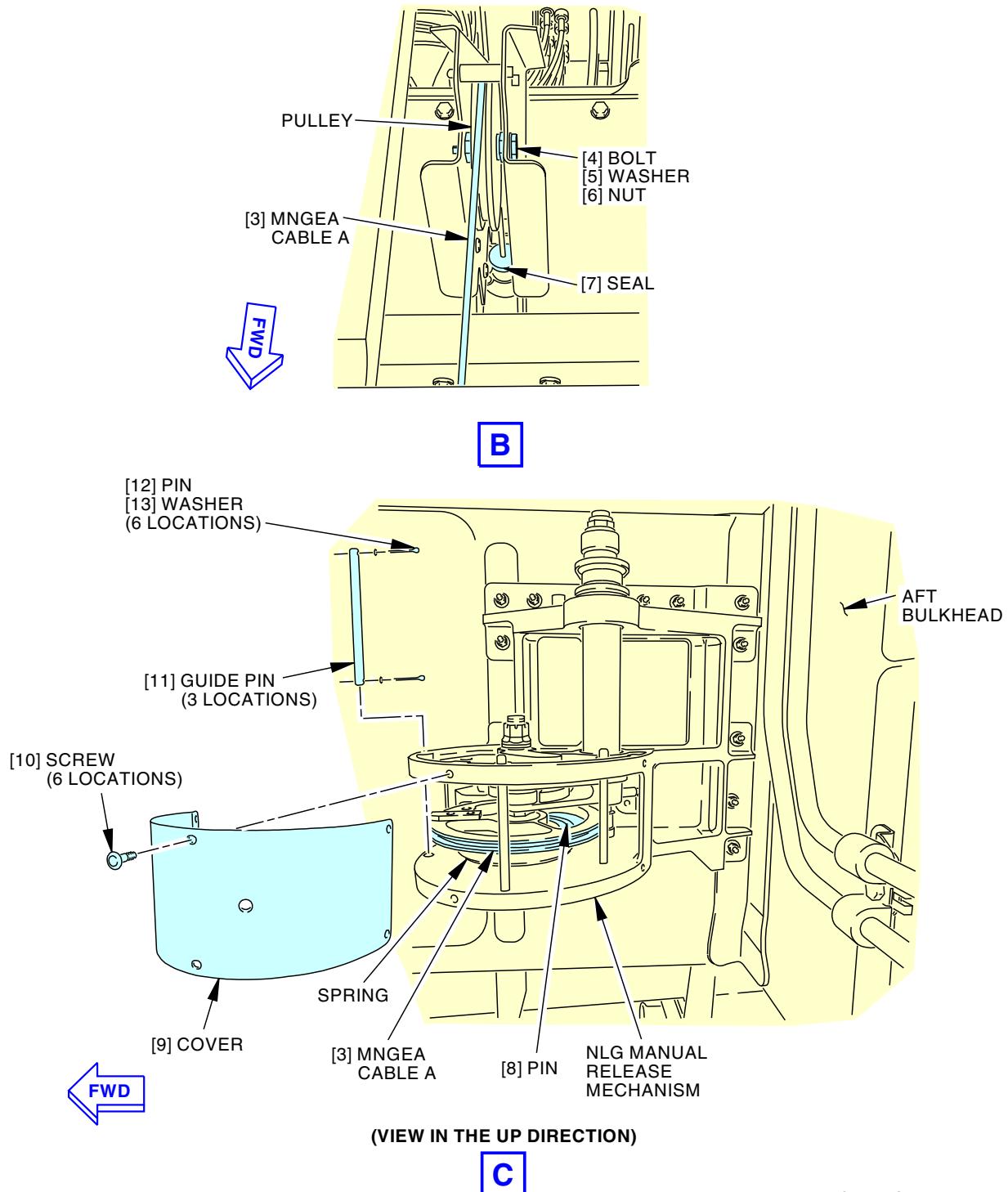
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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G05501 S0006575411_V2

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 2 of 7)

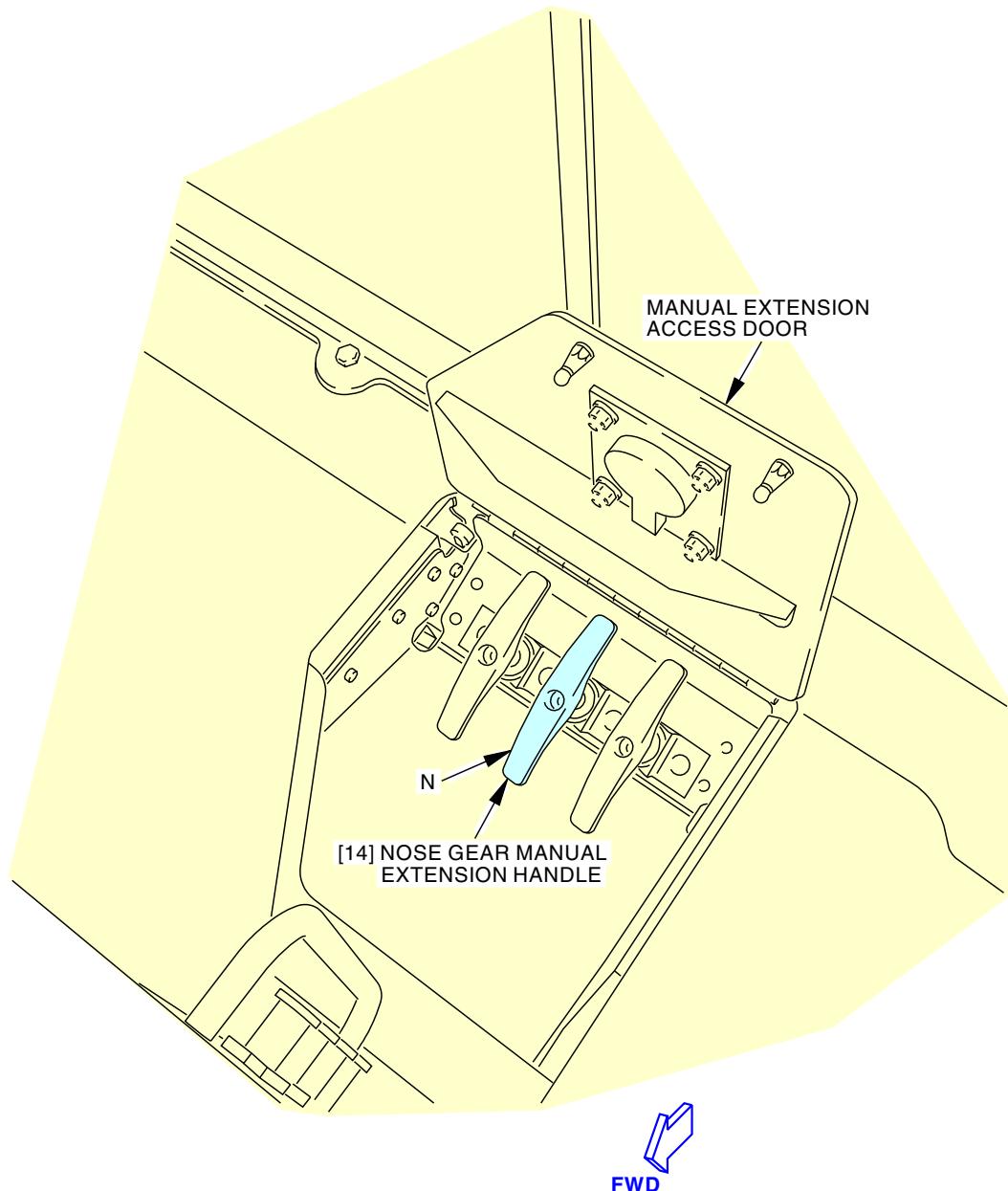
 EFFECTIVITY
 LOM ALL

12-26-00

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL



G05503 S0006575412_V2

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 3 of 7)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-424 PRE SB 737-32-1443

12-26-00

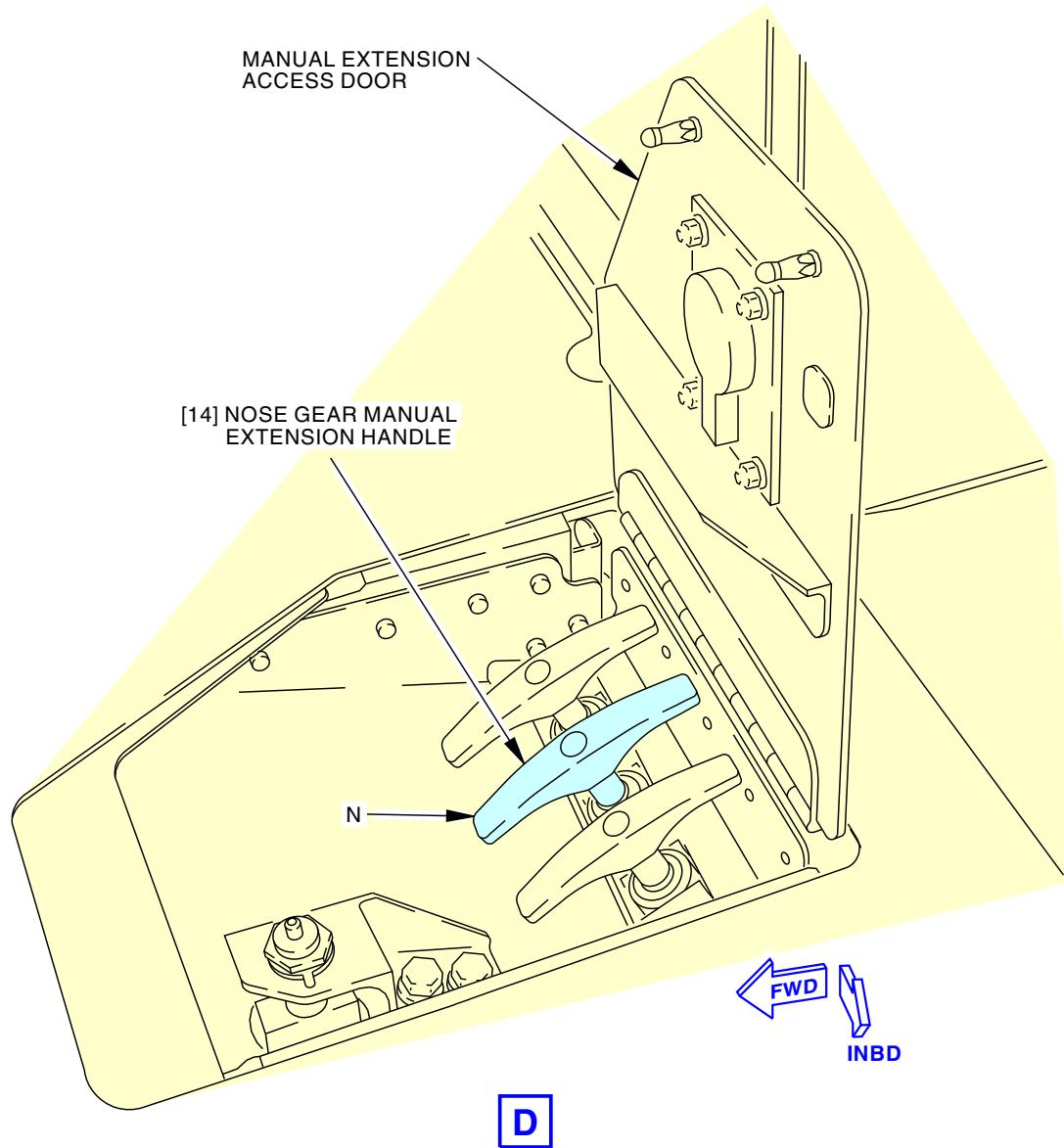
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AIRCRAFT MAINTENANCE MANUAL



2018580 S0000398684_V2

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 4 of 7)

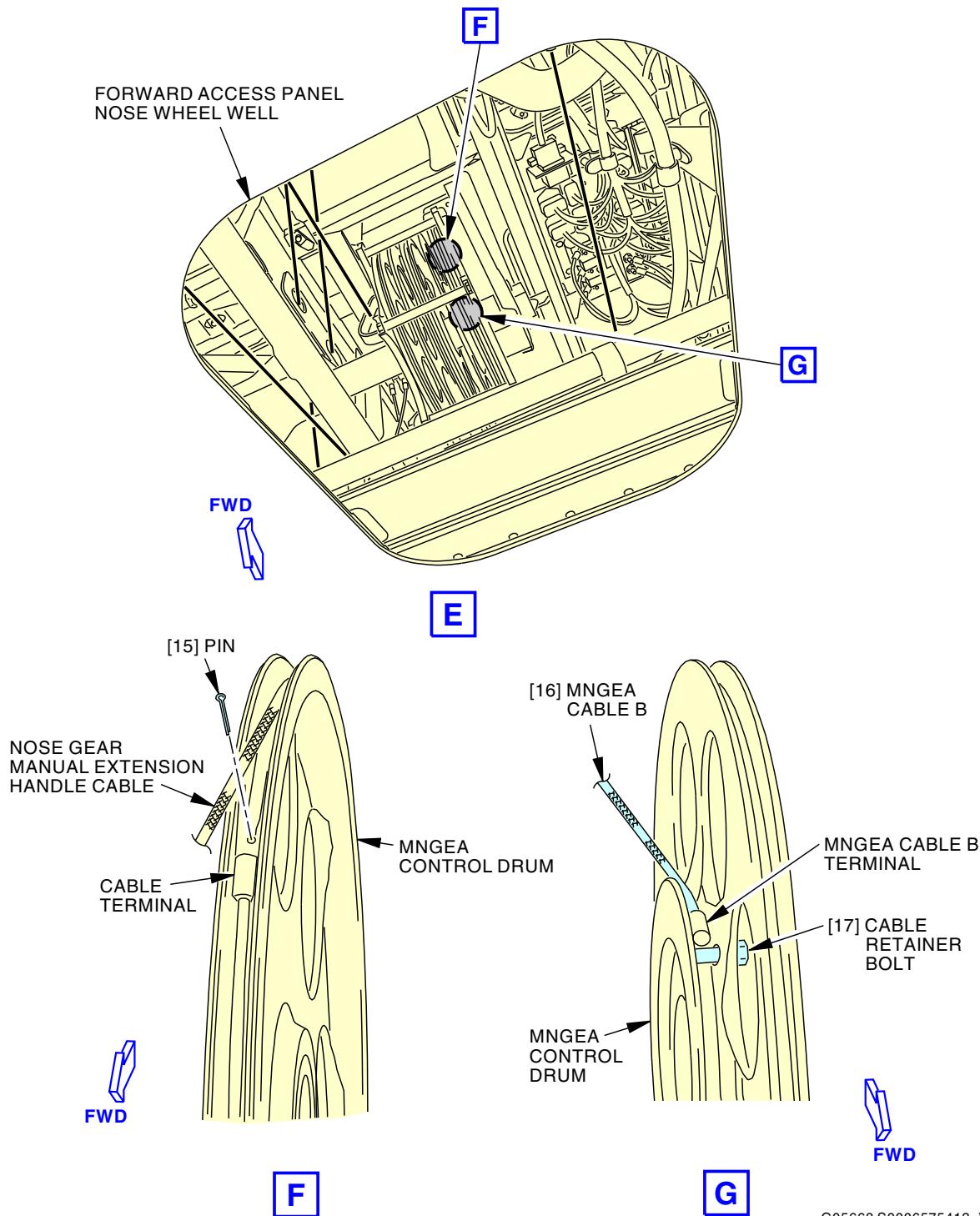
EFFECTIVITY
LOM 425-434, 437-447, 450-999; LOM 402, 404, 406,
407, 411, 412, 415, 416, 420, 422-424 POST SB
737-32-1443

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G05668 S0006575413_V2

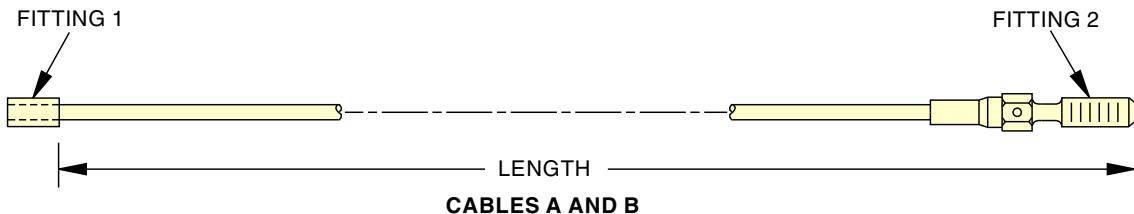
Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 5 of 7)

EFFECTIVITY
LOM ALL

D633A101-LOM

12-26-00


BOEING
 737-600/700/800/900
 AIRCRAFT MAINTENANCE MANUAL



CABLE NAME	FUNCTION	NO. REQ	LENGTH (INCHES)	CABLE SIZE	FITTINGS	
					1	2
A	MNGEA	1	38.2	3/32 7x7	BACT14A3	MS21260S3(RH)
B	MNGEA	1	21.7	3/32 7x7	BACT14A3	MS21260S3(LH)

MATERIAL: CABLE A - CORROSION RESISTANT STEEL PER BMS 7-265, TYPE I, COMPOSITION B

CABLE B - CARBON STEEL PER BMS 7-265, TYPE I,
COMPOSITION A (ZINC COATING) OR
COMPOSITION A (TZ) (TIN OVER ZINC COATING)

G05523 S0006575414_V5

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 6 of 7)

EFFECTIVITY
LOM ALL

12-26-00

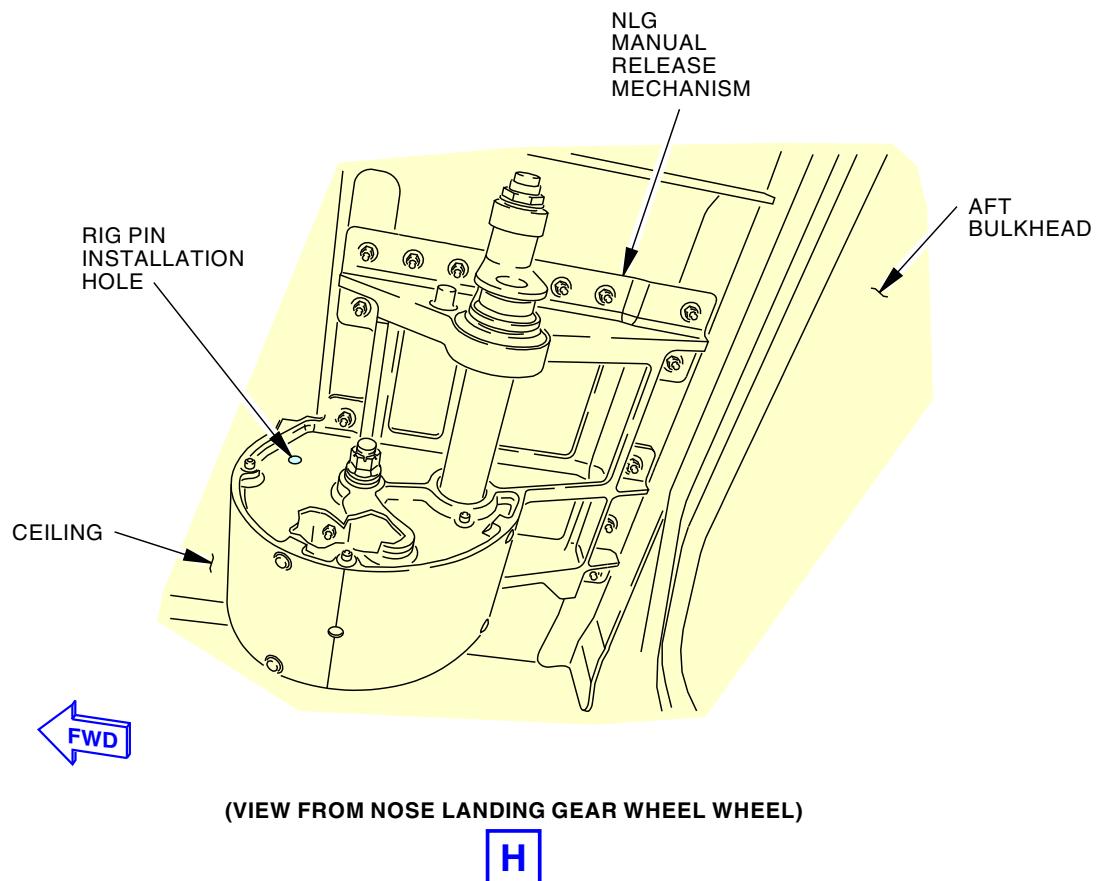
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



K03090 S0006575415_V2

Nose Gear Manual Extension System Cable Installation
Figure 310/12-26-00-990-810 (Sheet 7 of 7)

EFFECTIVITY
LOM ALL

12-26-00

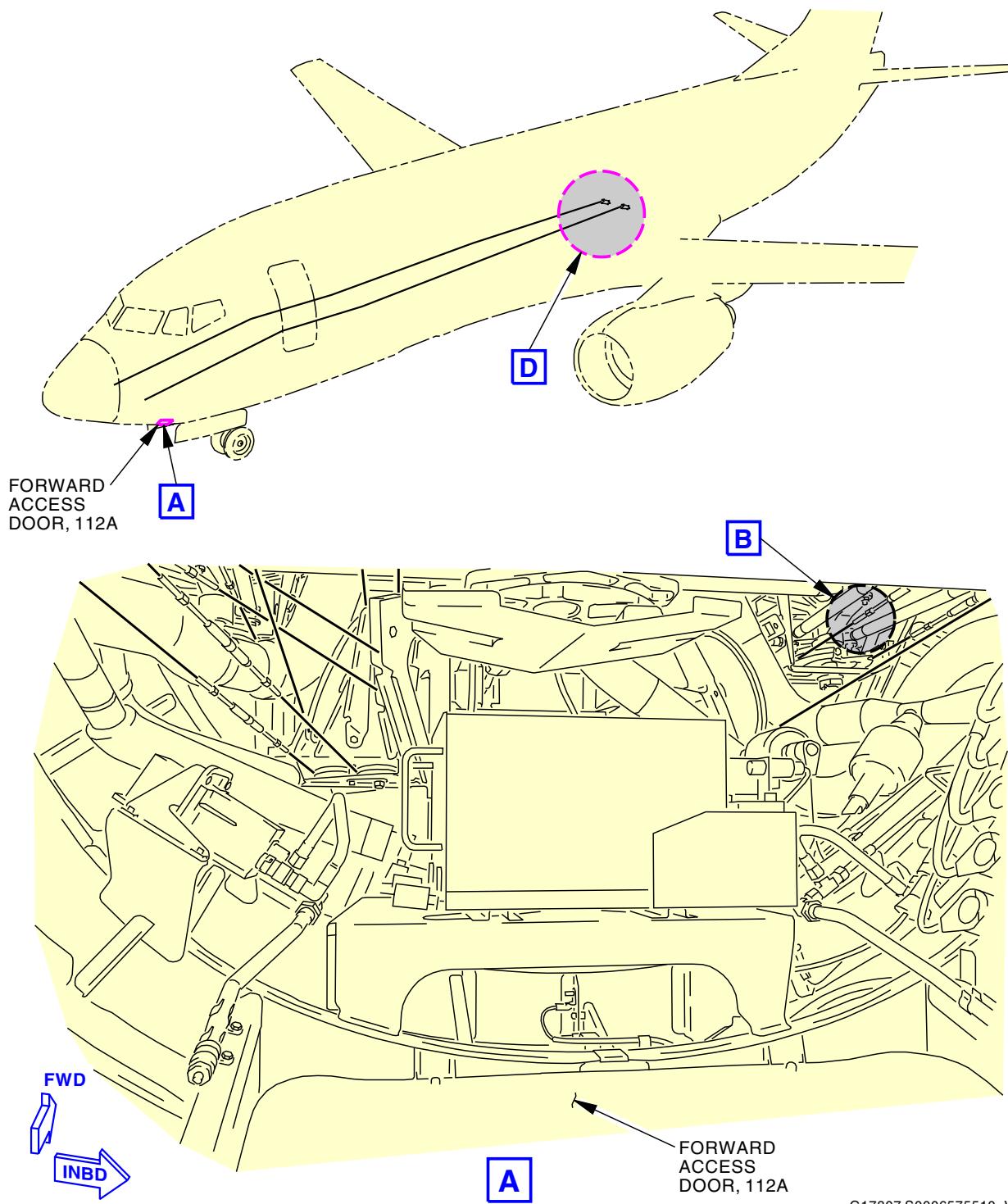
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G17807 S0006575510_V2

Hydraulic Brake Control Cable Installation
Figure 311/12-26-00-990-811 (Sheet 1 of 5)

EFFECTIVITY
LOM ALL

12-26-00

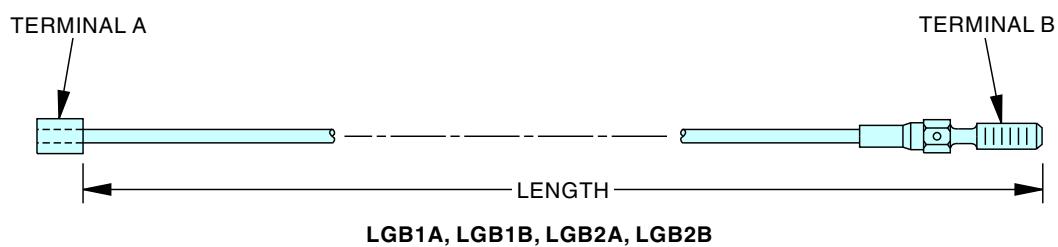
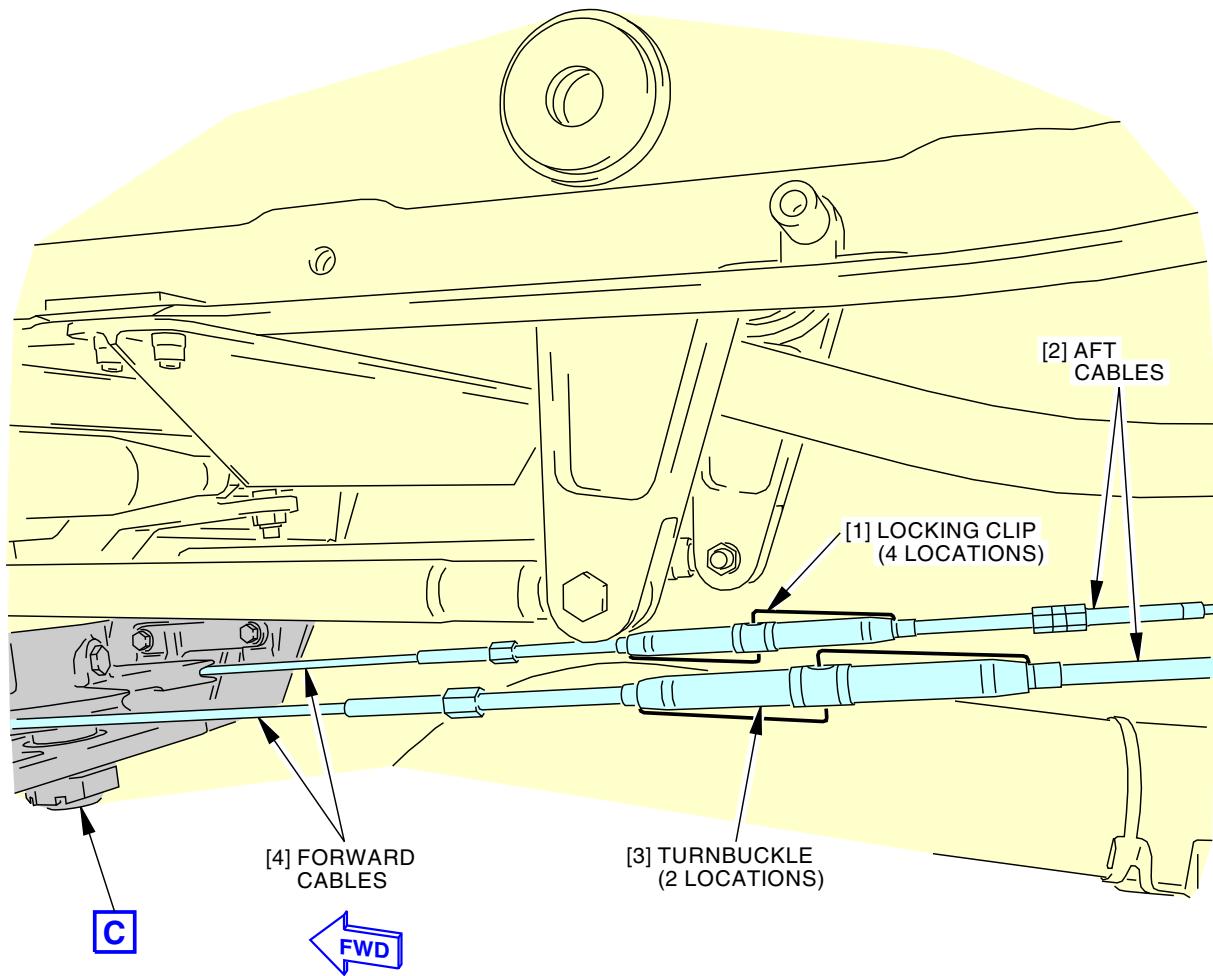
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G17813 S0006575511_V3

Hydraulic Brake Control Cable Installation
Figure 311/12-26-00-990-811 (Sheet 2 of 5)

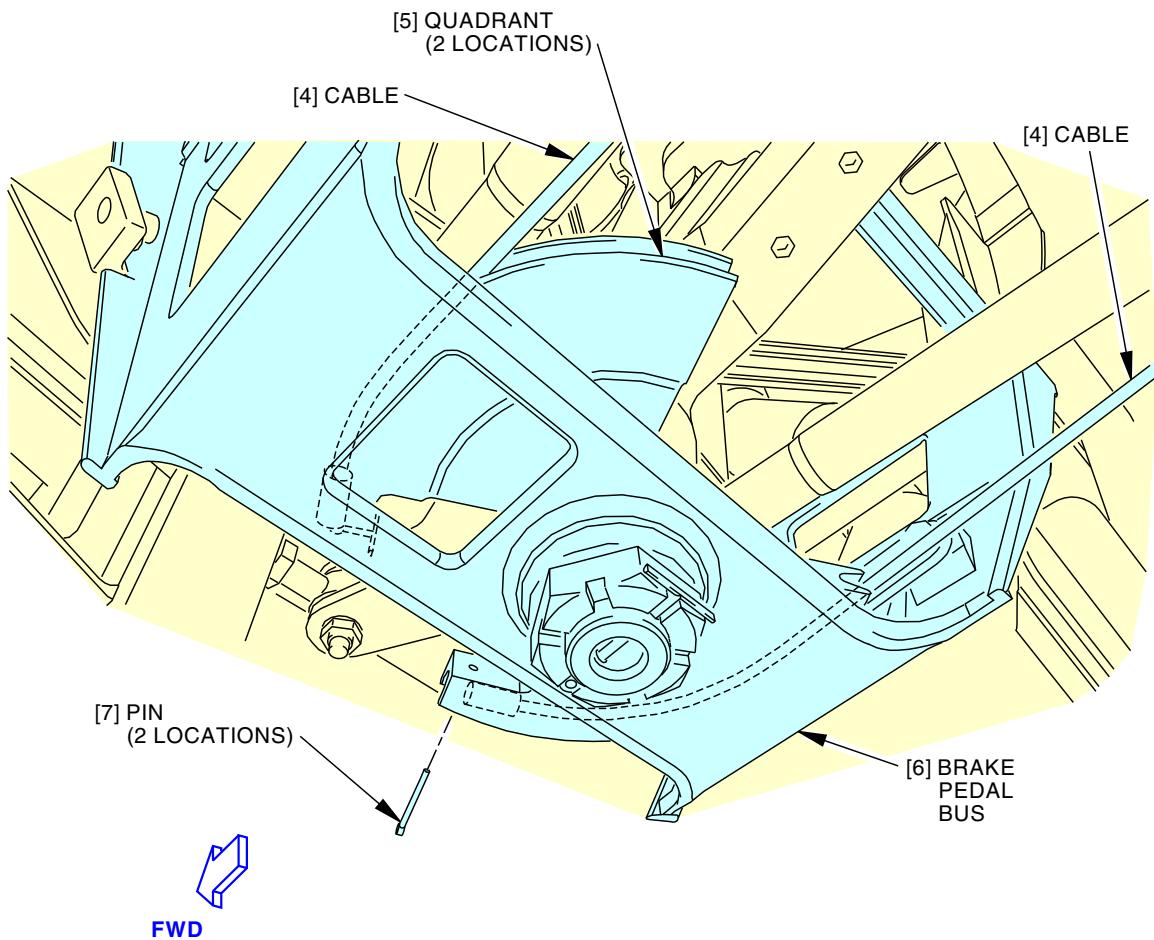
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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RIGHT BUS INSTALLATION
(LEFT BUS INSTALLATION IS EQUIVALENT)

C

G19422 S0006575512_V2

Hydraulic Brake Control Cable Installation
Figure 311/12-26-00-990-811 (Sheet 3 of 5)

EFFECTIVITY
LOM ALL

12-26-00

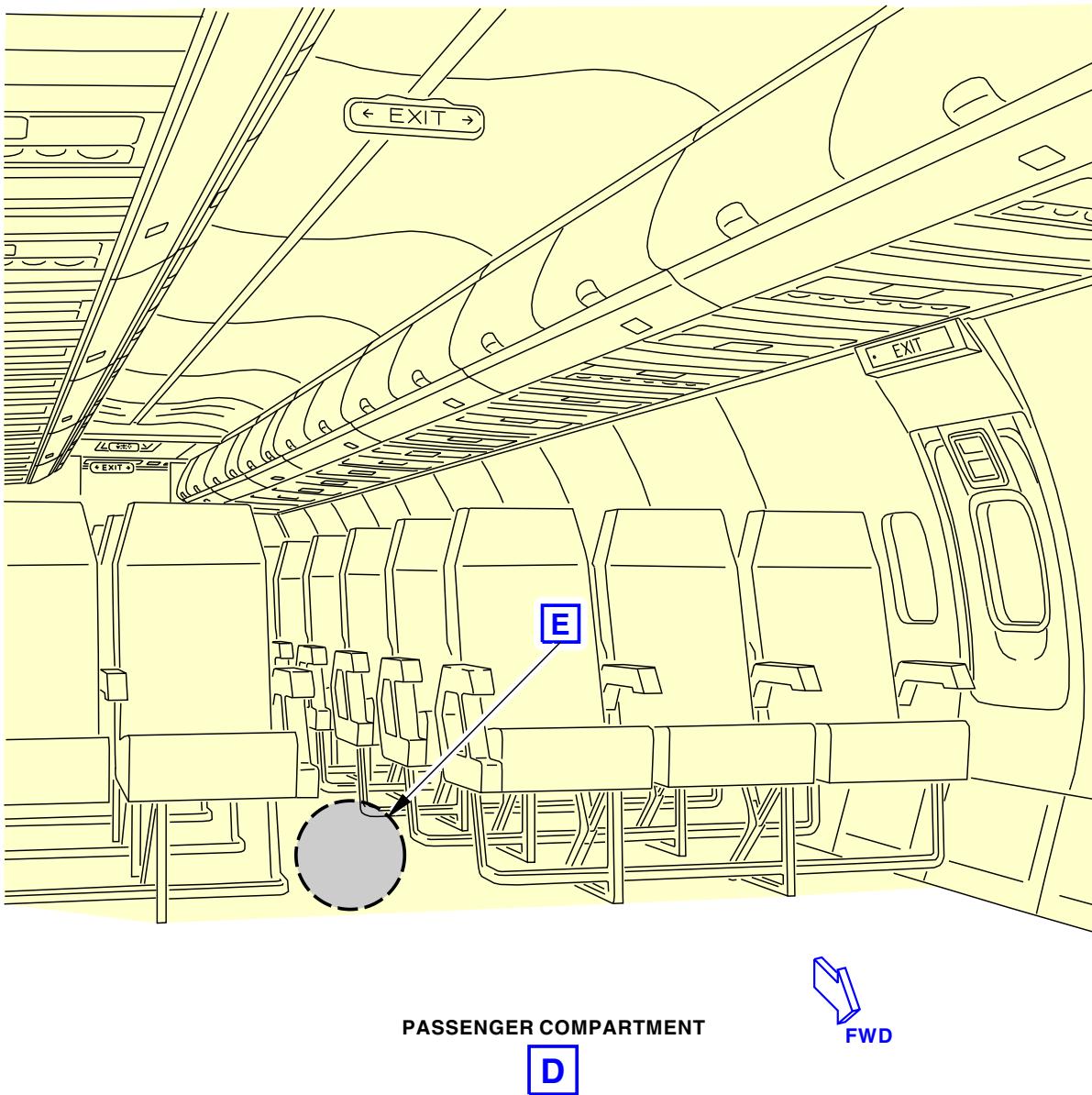
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G19564 S0006575513_V2

Hydraulic Brake Control Cable Installation
Figure 311/12-26-00-990-811 (Sheet 4 of 5)

EFFECTIVITY
LOM ALL

12-26-00

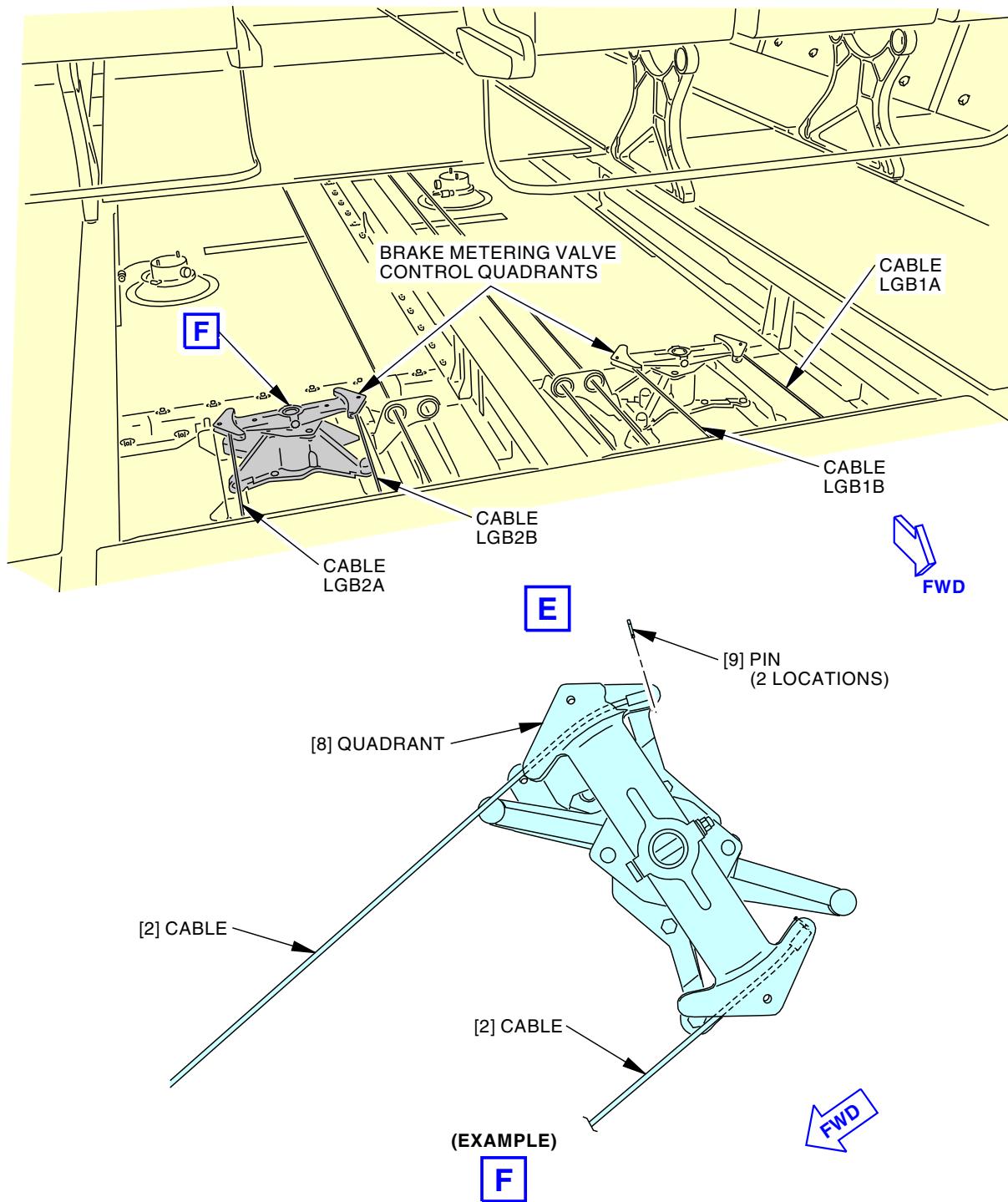
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G17909 S0006575514_V2

Hydraulic Brake Control Cable Installation
Figure 311/12-26-00-990-811 (Sheet 5 of 5)

EFFECTIVITY
LOM ALL

12-26-00

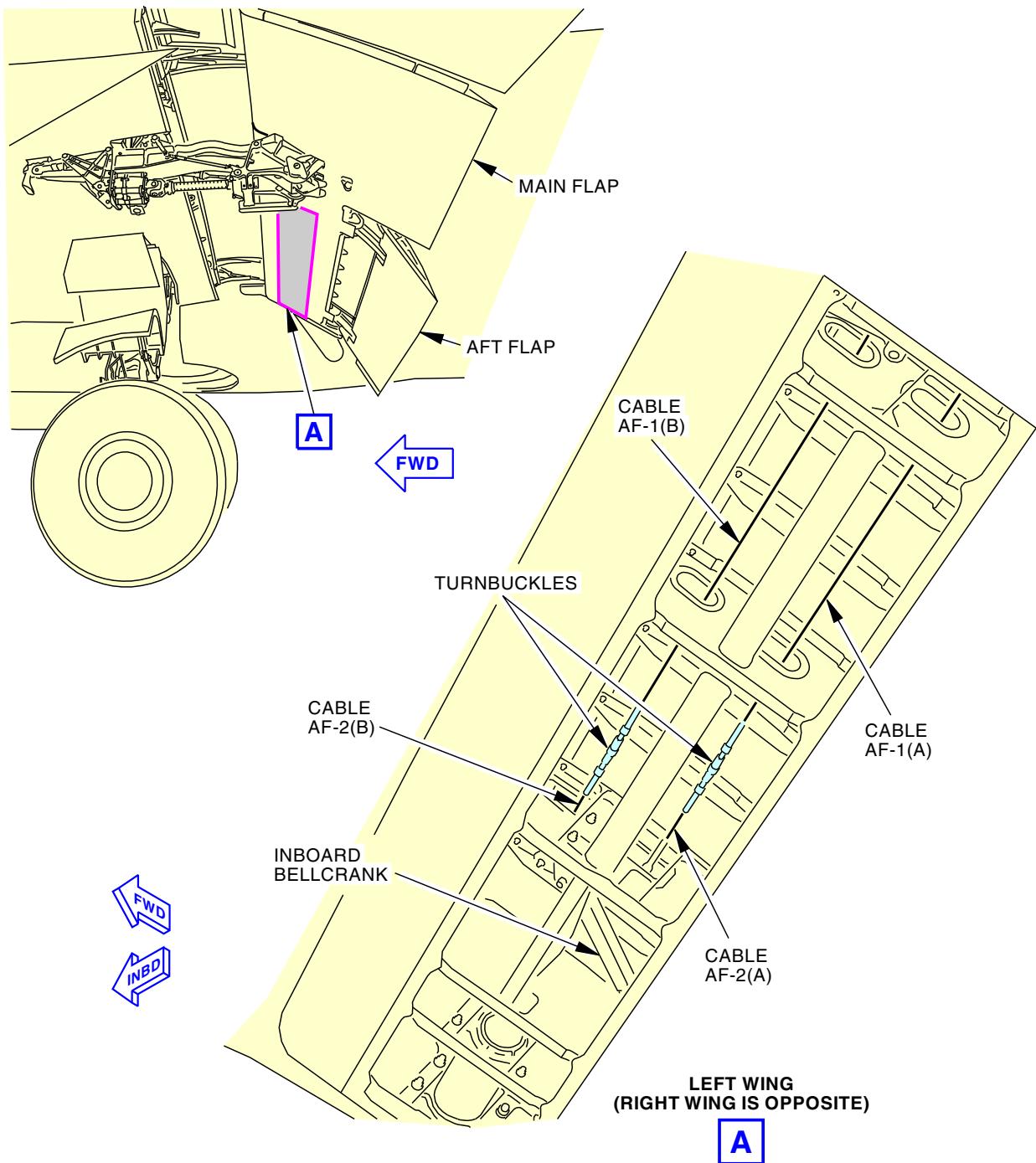
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



G29247 S0006568519_V2

Aft Flap Drive Cables
Figure 312/12-26-00-990-812 (Sheet 1 of 2)

EFFECTIVITY
LOM ALL

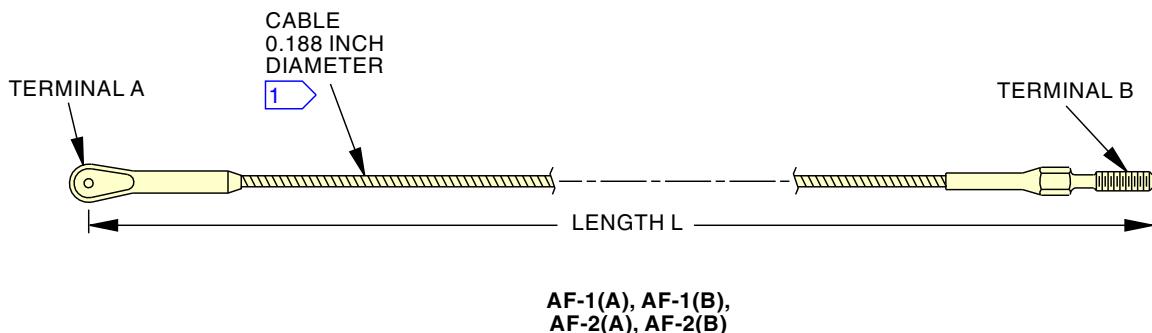
12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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BOEING
737-600/700/800/900
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CABLE NAME	LENGTH L [2] (INCHES)	TERMINAL A	TERMINAL B
AF-1(A) AF-1(B)	47.3384	113A2641-1	MS21260S6RH
AF-2(A) AF-2(B)	10.6360	113A2641-1	MS21260S6LH

TABLE A

[1] CABLE CONSTRUCTION IS CORROSION RESISTANT STEEL:
BMS 7-265, COMPOSITION B, 7 X 19

[2] MEASURE CABLE WITH A LOAD OF 40 ± 3 POUNDS.

G32084 S0006568520_V3

Aft Flap Drive Cables
Figure 312/12-26-00-990-812 (Sheet 2 of 2)

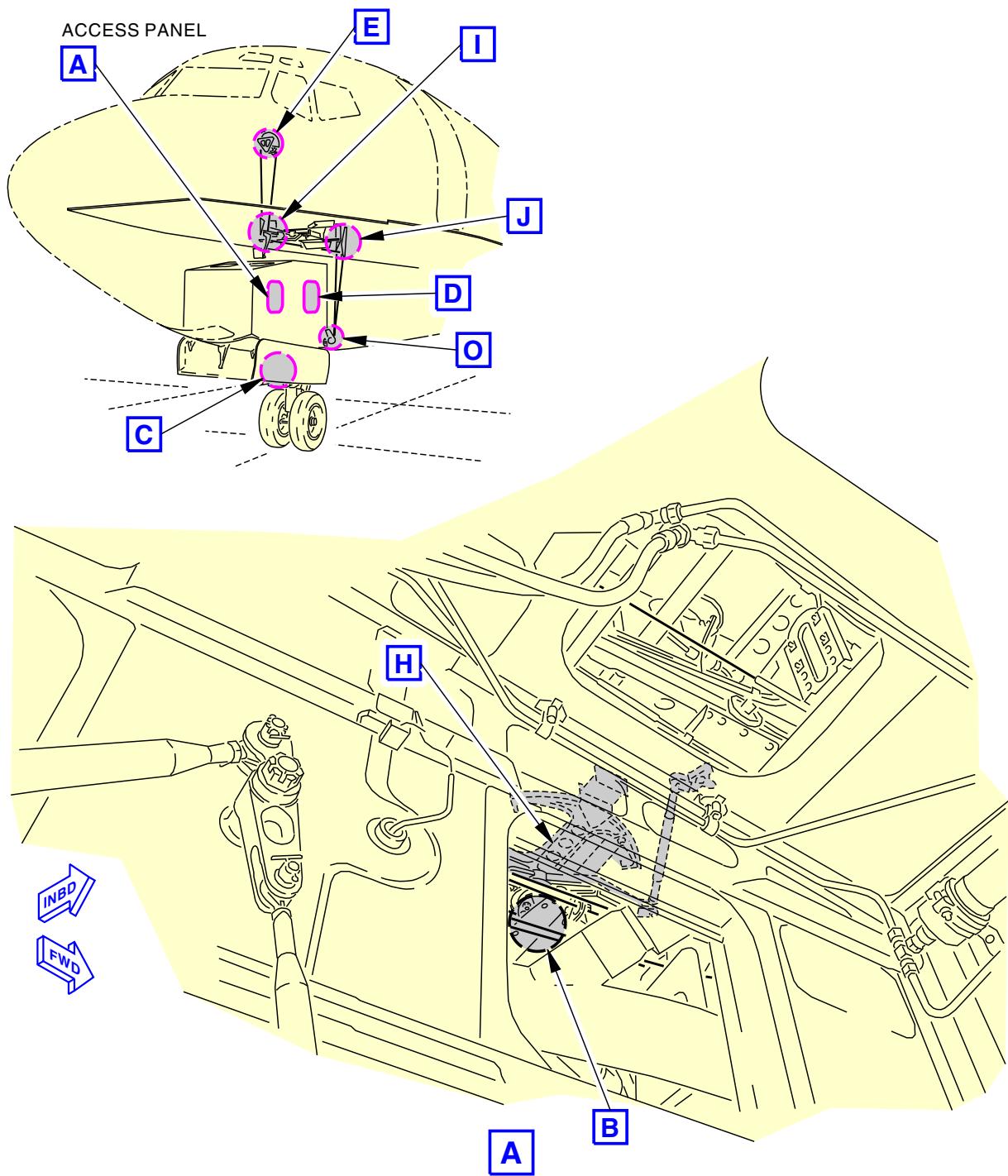
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G16146 S0006575769_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 1 of 15)

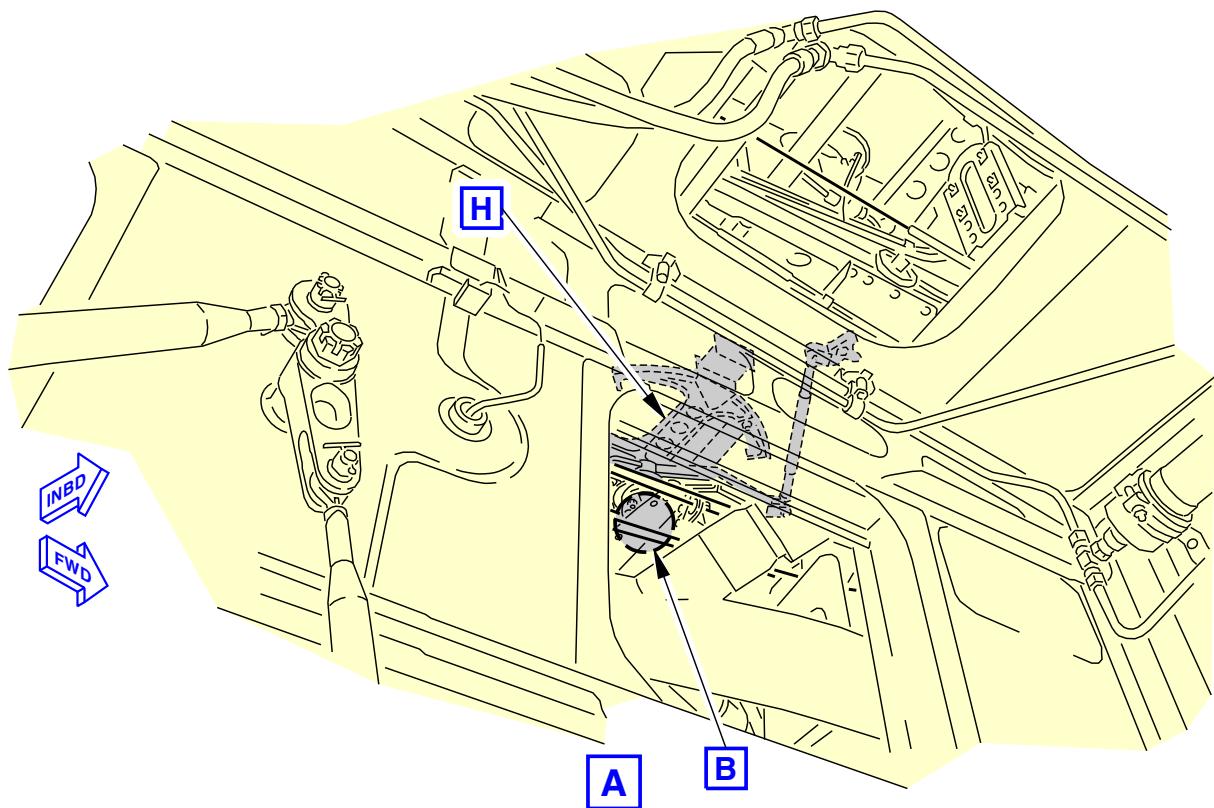
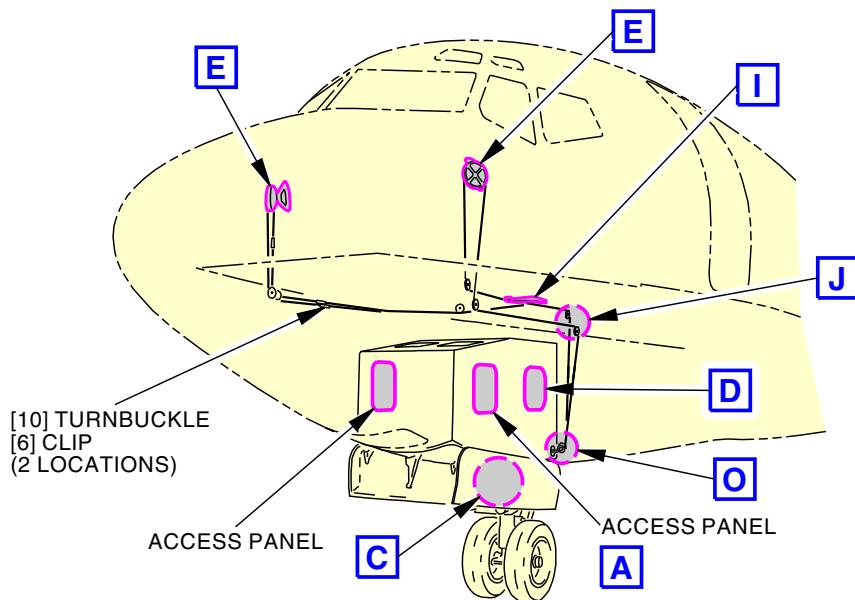
EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
 422-434, 437-442, 445-447, 450-463

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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K63925 S0006575770_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 2 of 15)

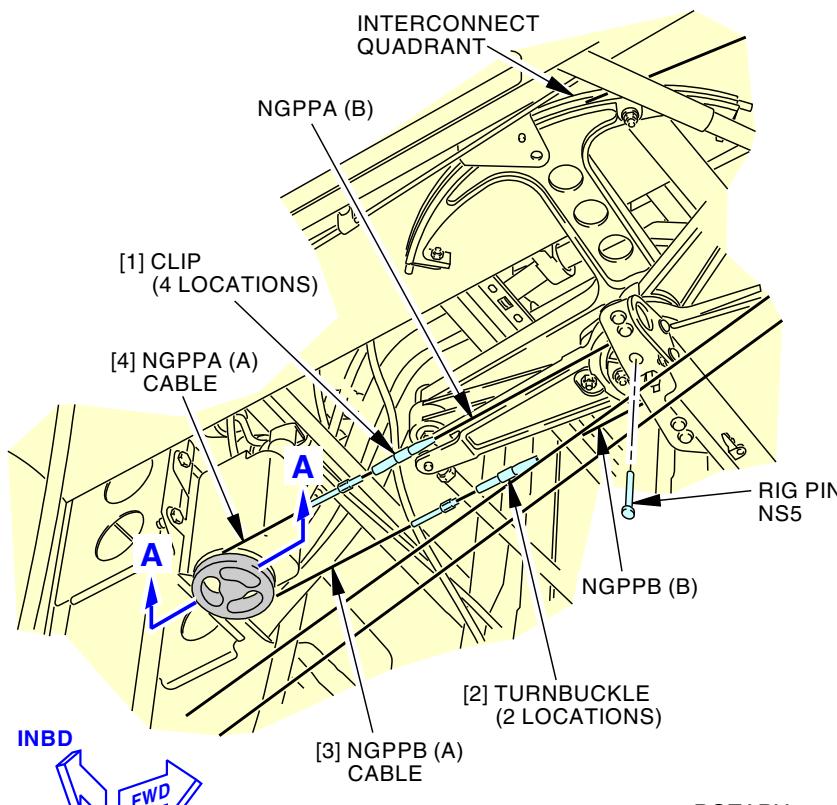
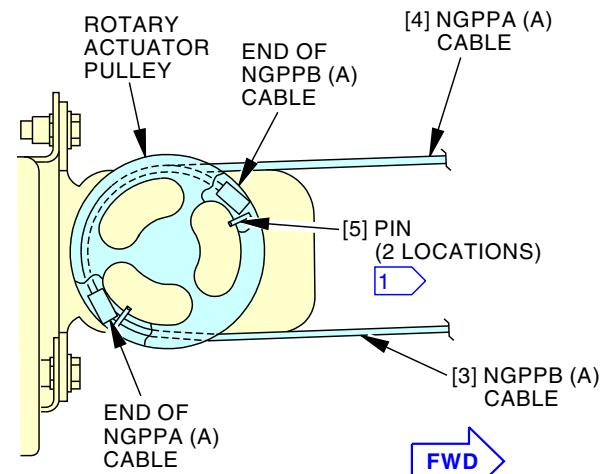
EFFECTIVITY
LOM 443, 444, 464-999

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**B****A-A****1 CAUTION:**

MAKE SURE THE ENDS OF THE PINS [5] DO NOT TOUCH THE HOUSING OF THE ROTARY ACTUATOR AFTER INSTALLATION. IF THE PINS TOUCH THE HOUSING, DAMAGE TO EQUIPMENT CAN OCCUR.

G16119 S0006575771_V4

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 3 of 15)

EFFECTIVITY
LOM ALL

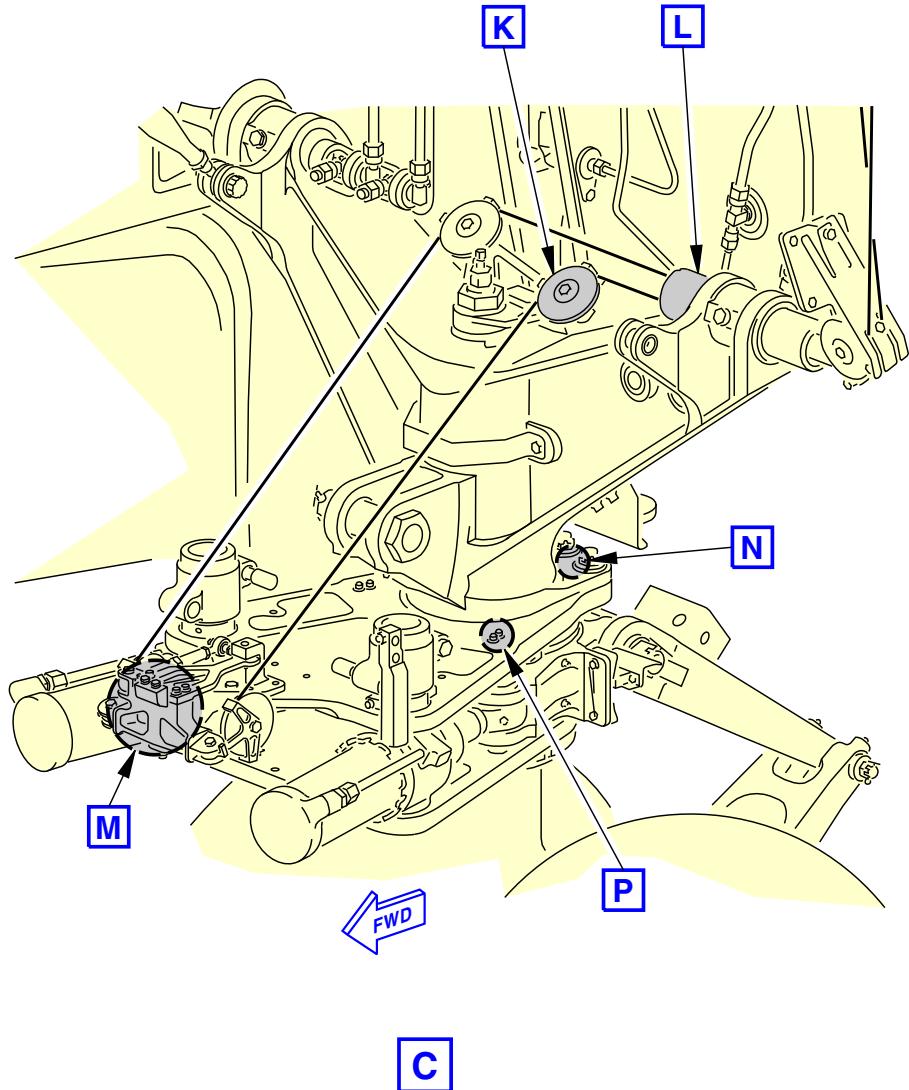
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



G16141 S0006575772_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 4 of 15)

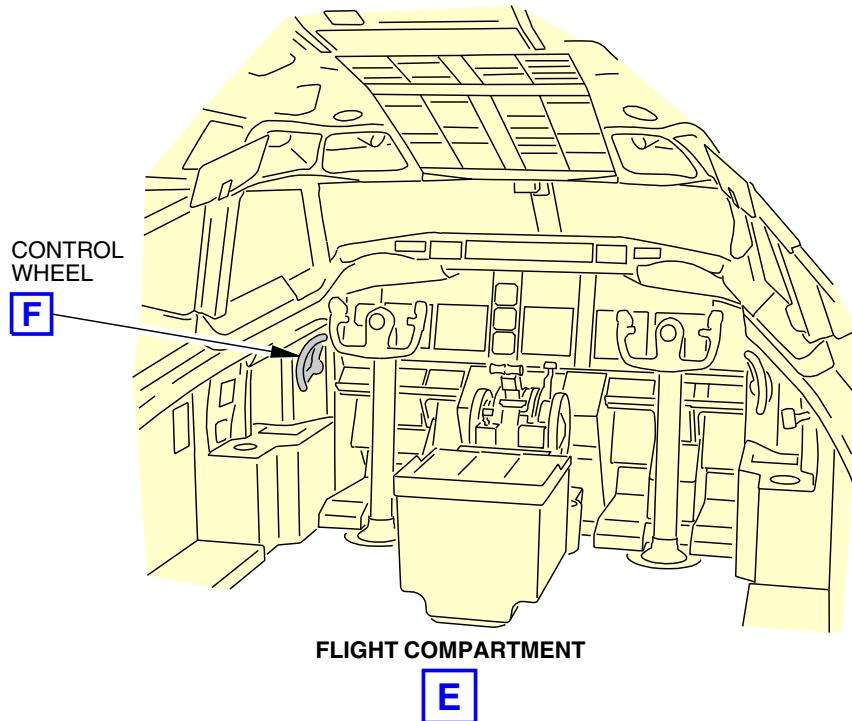
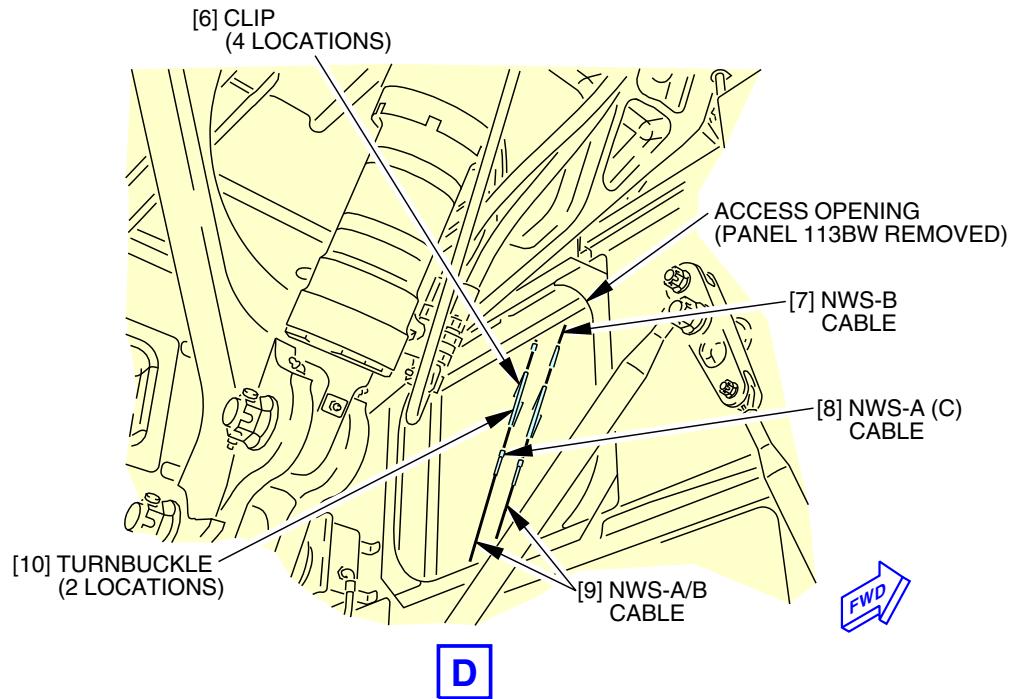
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G16164 S0006575773_V5

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 5 of 15)

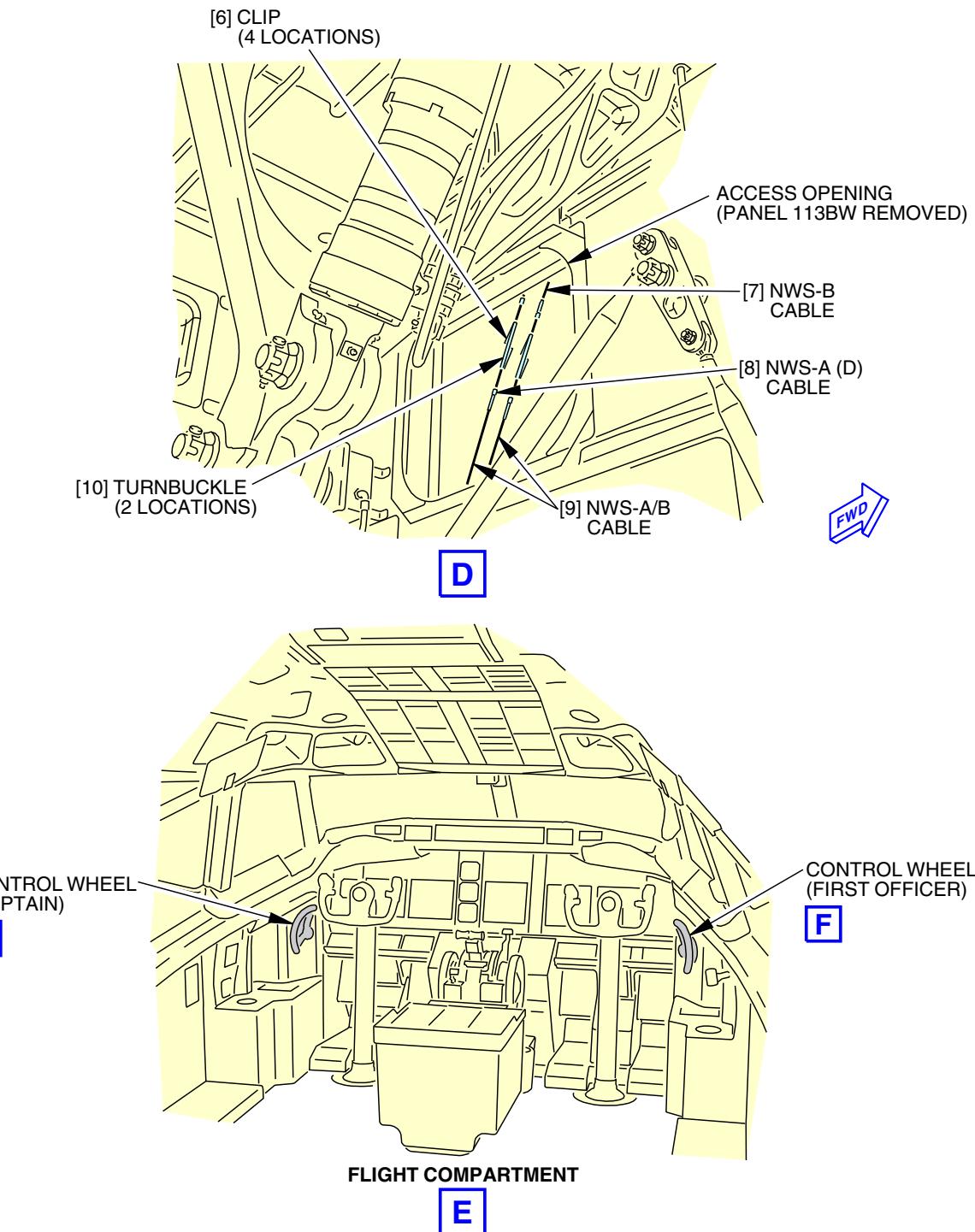
EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 450-463

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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K63601 S0006575774_V5

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 6 of 15)

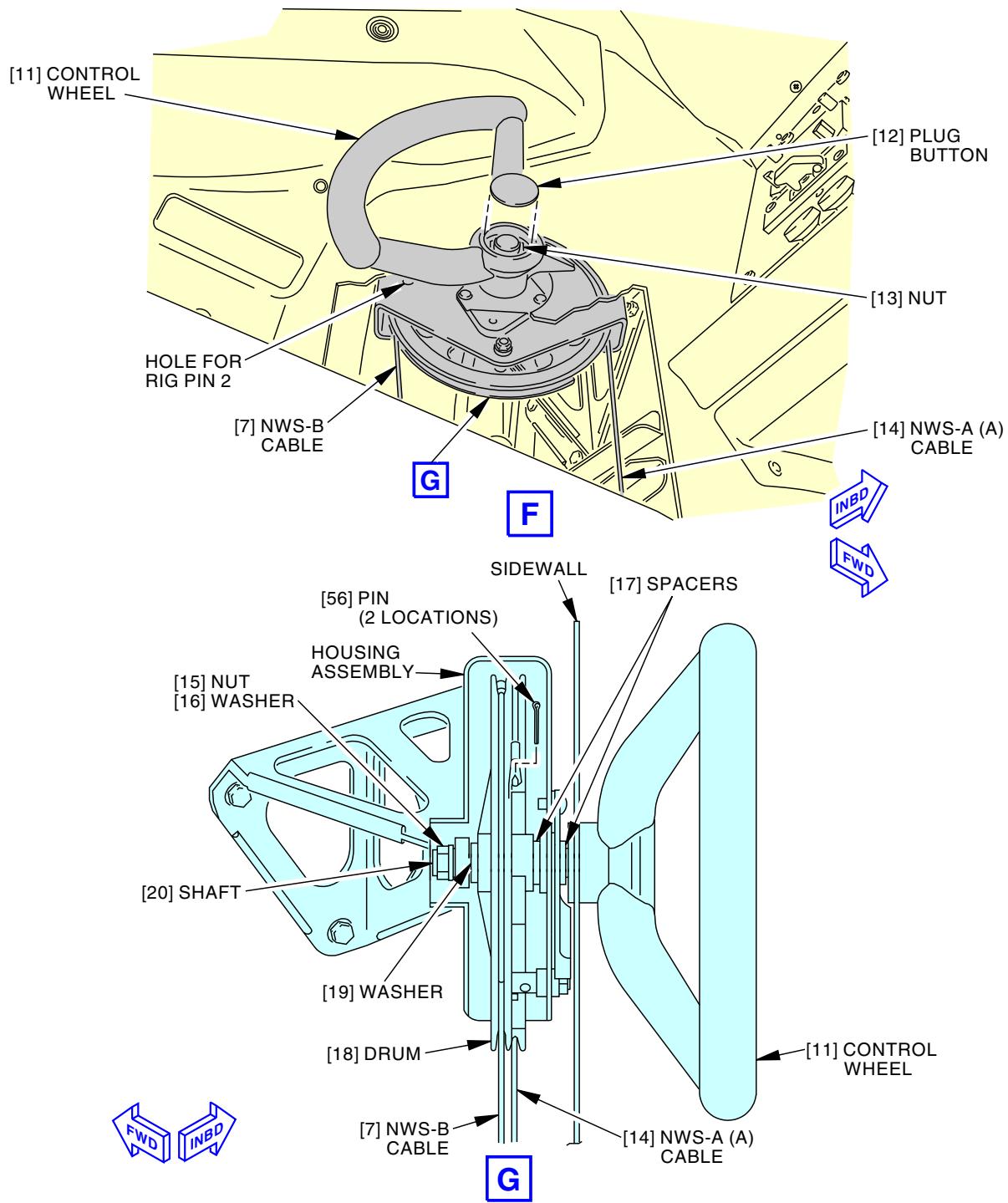
EFFECTIVITY
LOM 443, 444, 464-999

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G16178 S0006575775_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 7 of 15)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 450-463

12-26-00

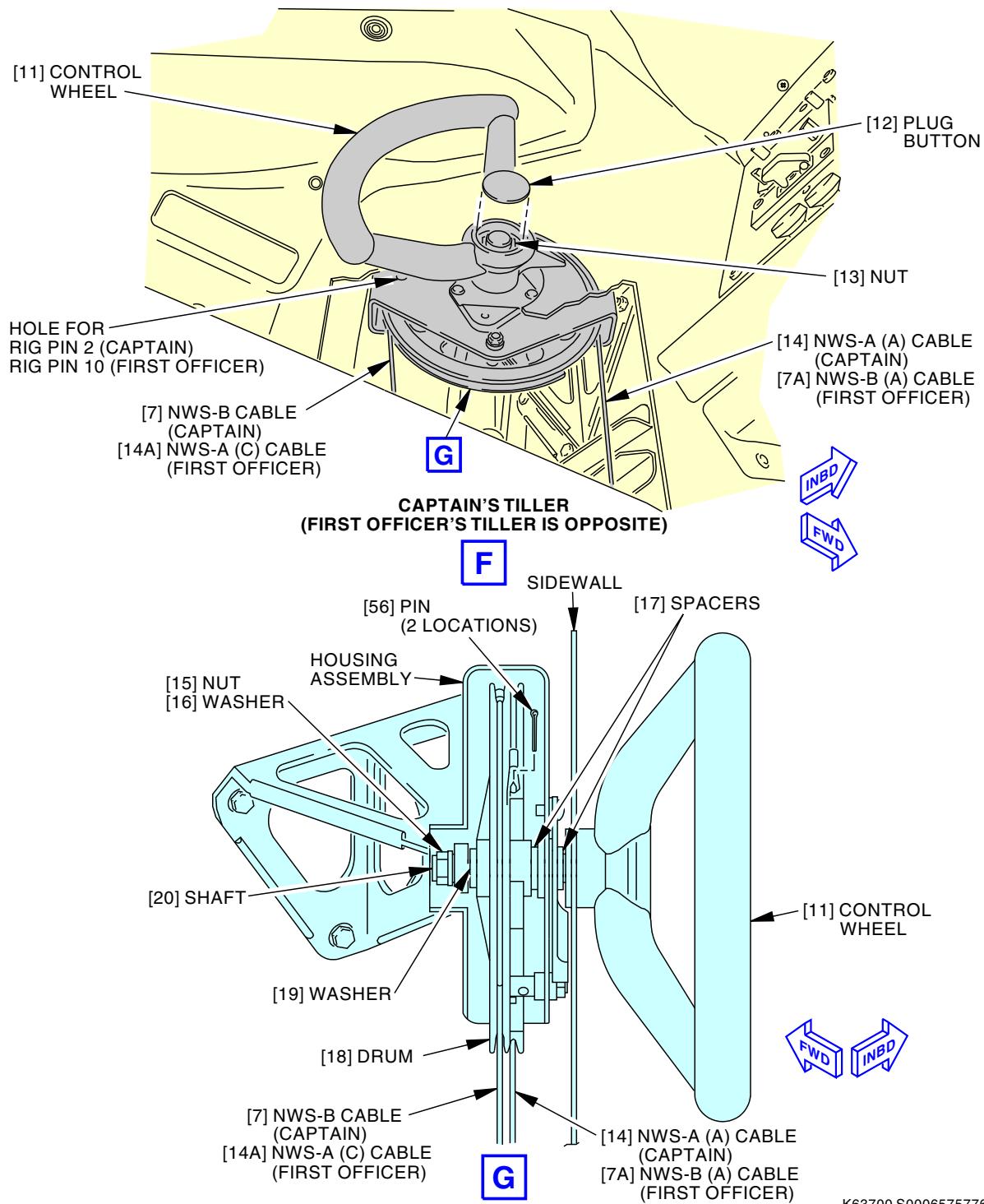
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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K63700 S0006575776_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 8 of 15)

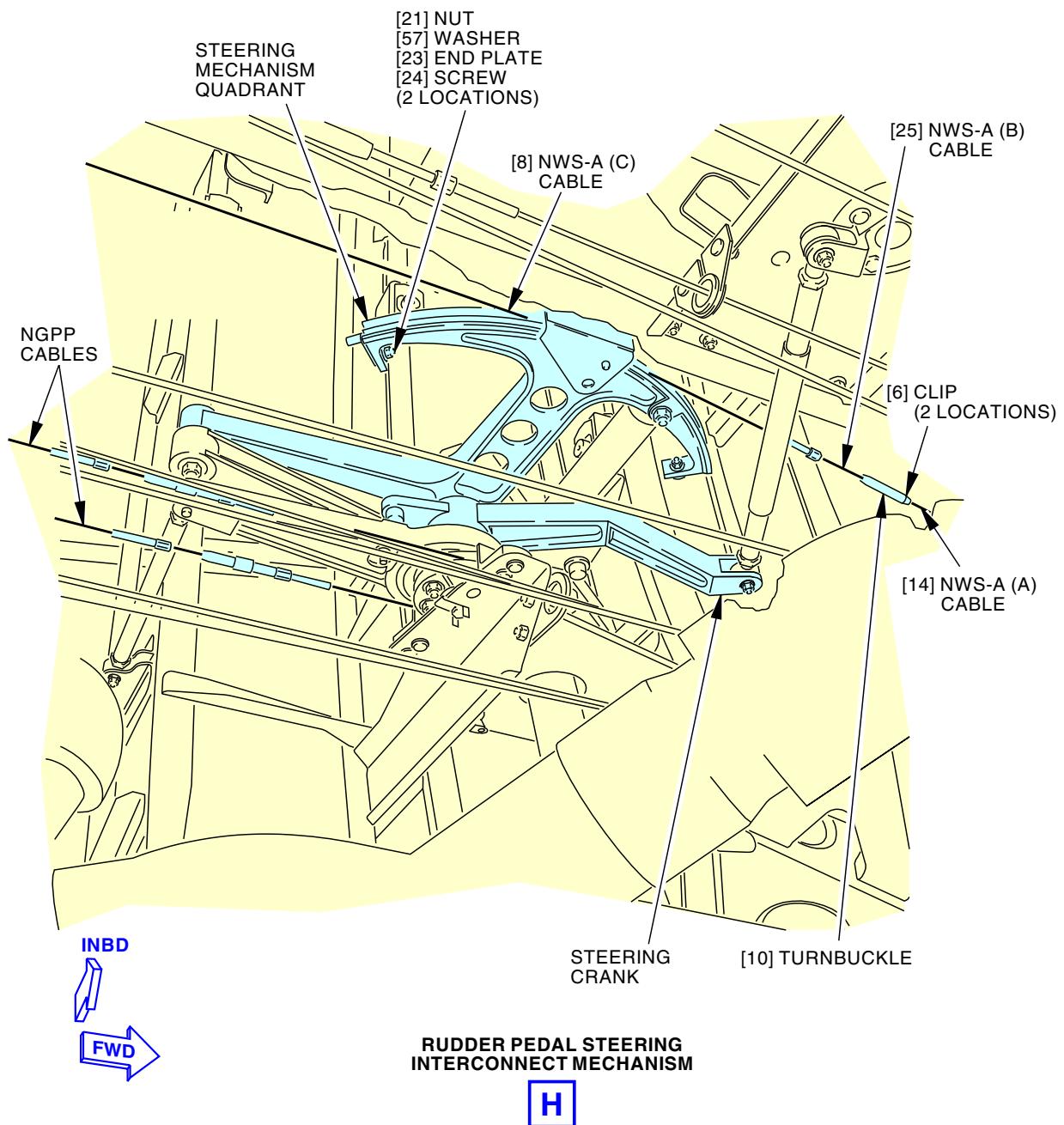
EFFECTIVITY
LOM 443, 444, 464-999

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G16196 S0006575777_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 9 of 15)

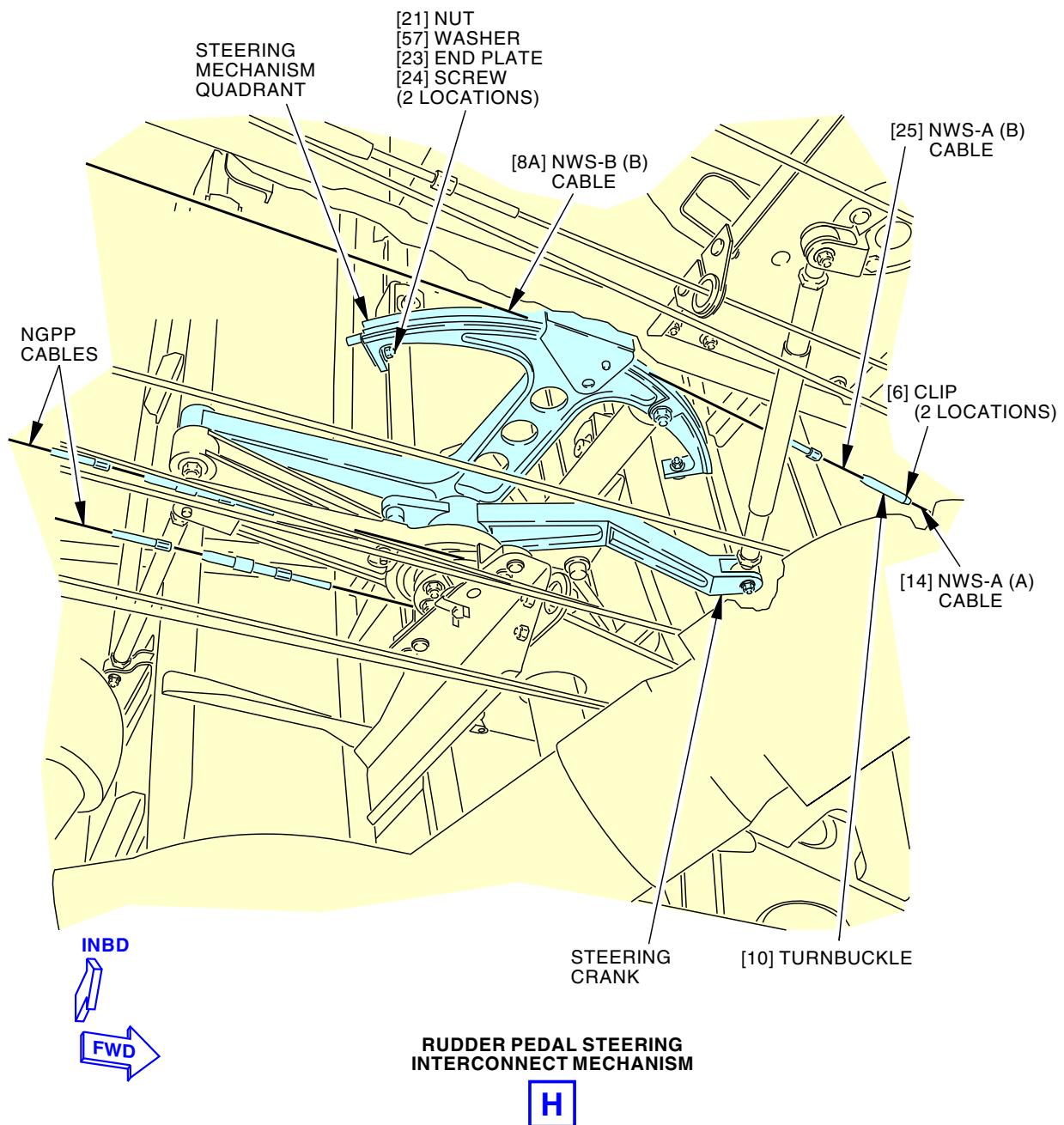
EFFECTIVITY
 LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
 422-434, 437-442, 445-447, 450-463

12-26-00

D633A101-LOM

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K63885 S0006575778_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 10 of 15)

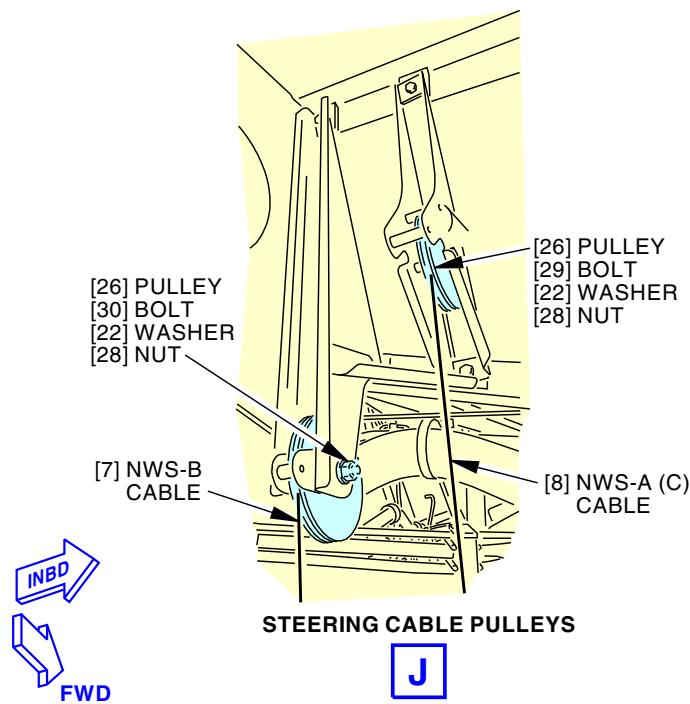
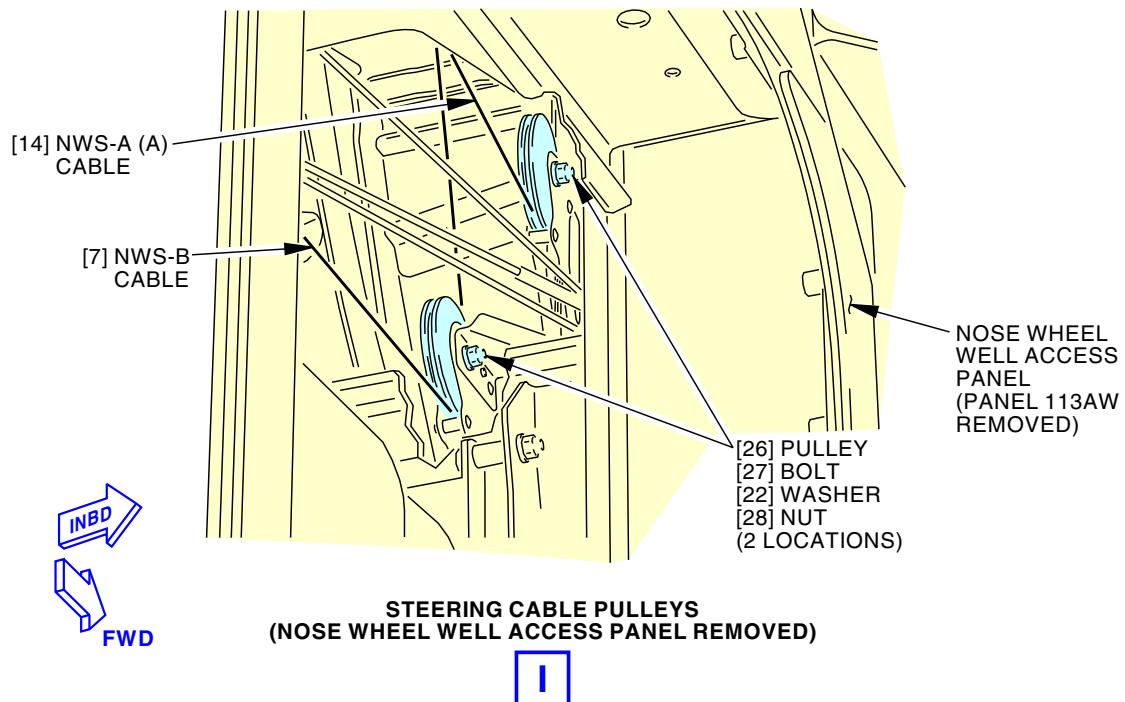
EFFECTIVITY
 LOM 443, 444, 464-999

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G17549 S0006575779_V4

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 11 of 15)

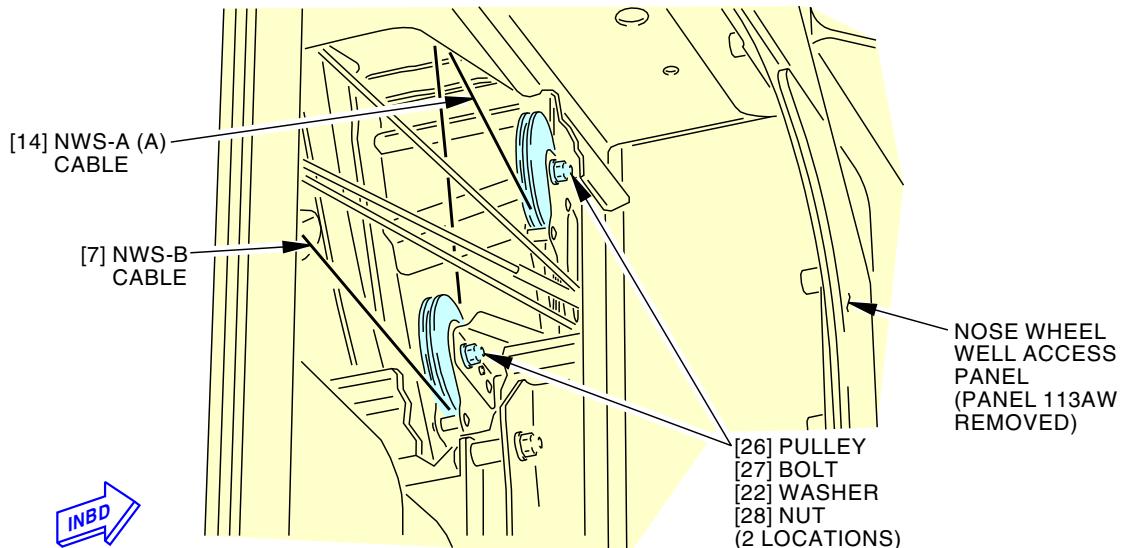
EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 450-463

12-26-00

D633A101-LOM

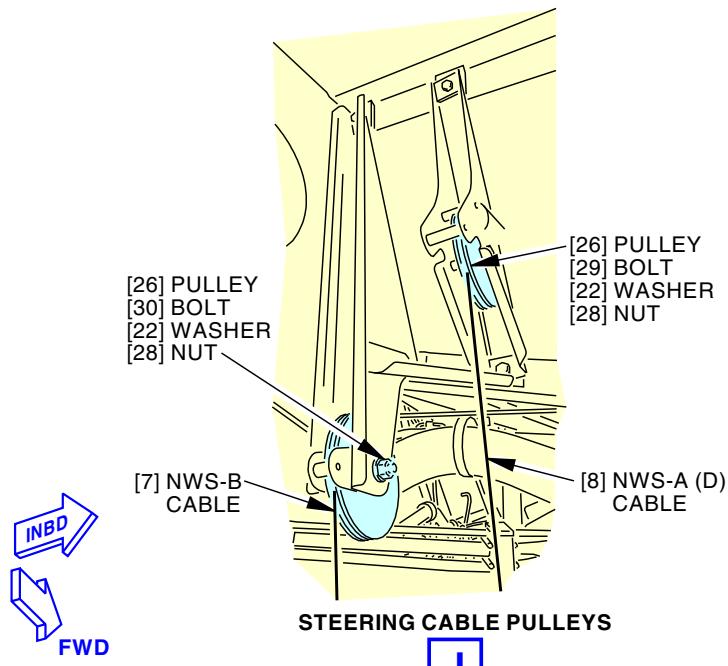
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**STEERING CABLE PULLEYS
(NOSE WHEEL WELL ACCESS PANEL REMOVED)**

I



STEERING CABLE PULLEYS

J

K64109 S0006575780_V4

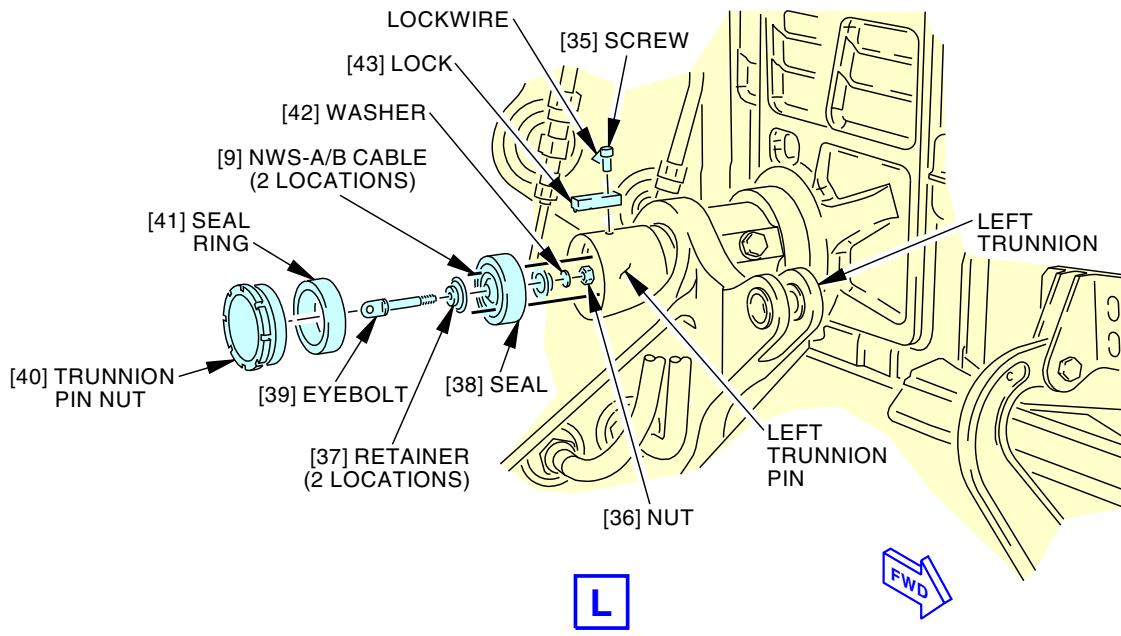
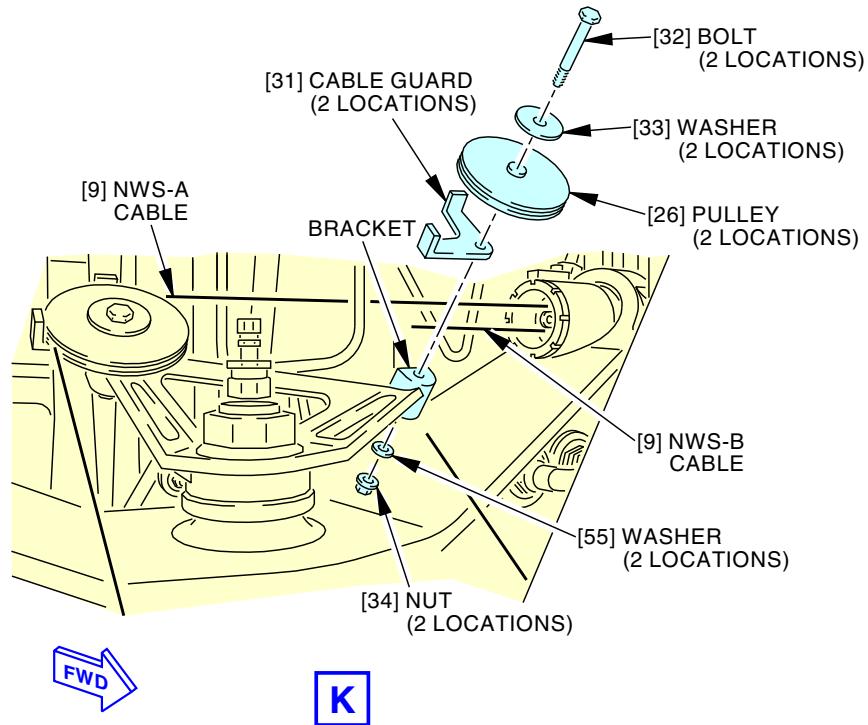
**Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 12 of 15)**

EFFECTIVITY
LOM 443, 444, 464-999

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**


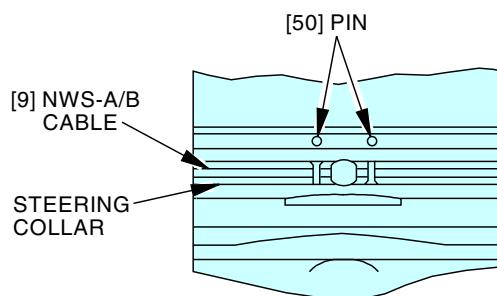
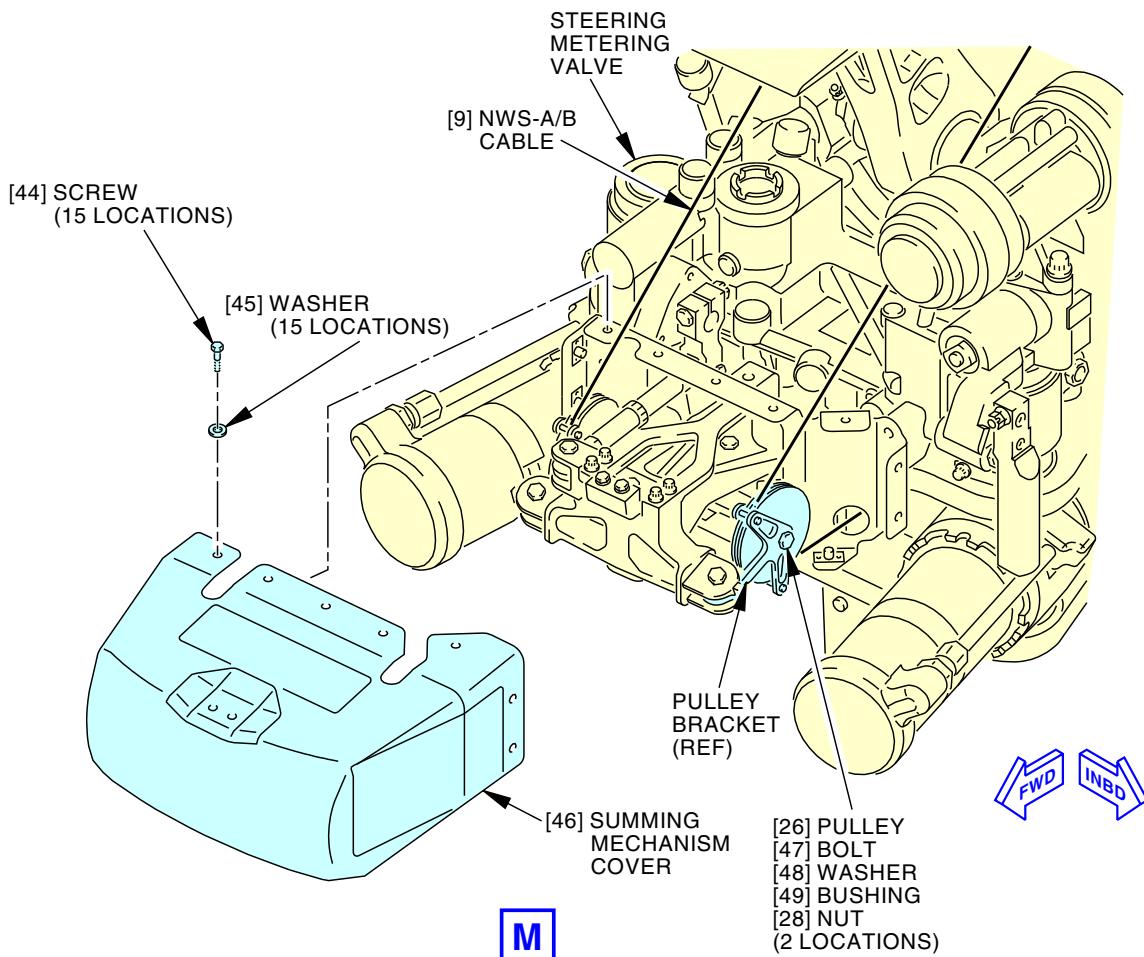
G17001 S0006575781_V3

**Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 13 of 15)**

EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

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(VIEW IN THE FORWARD DIRECTION)

G16260 S0006575782_V3

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 14 of 15)

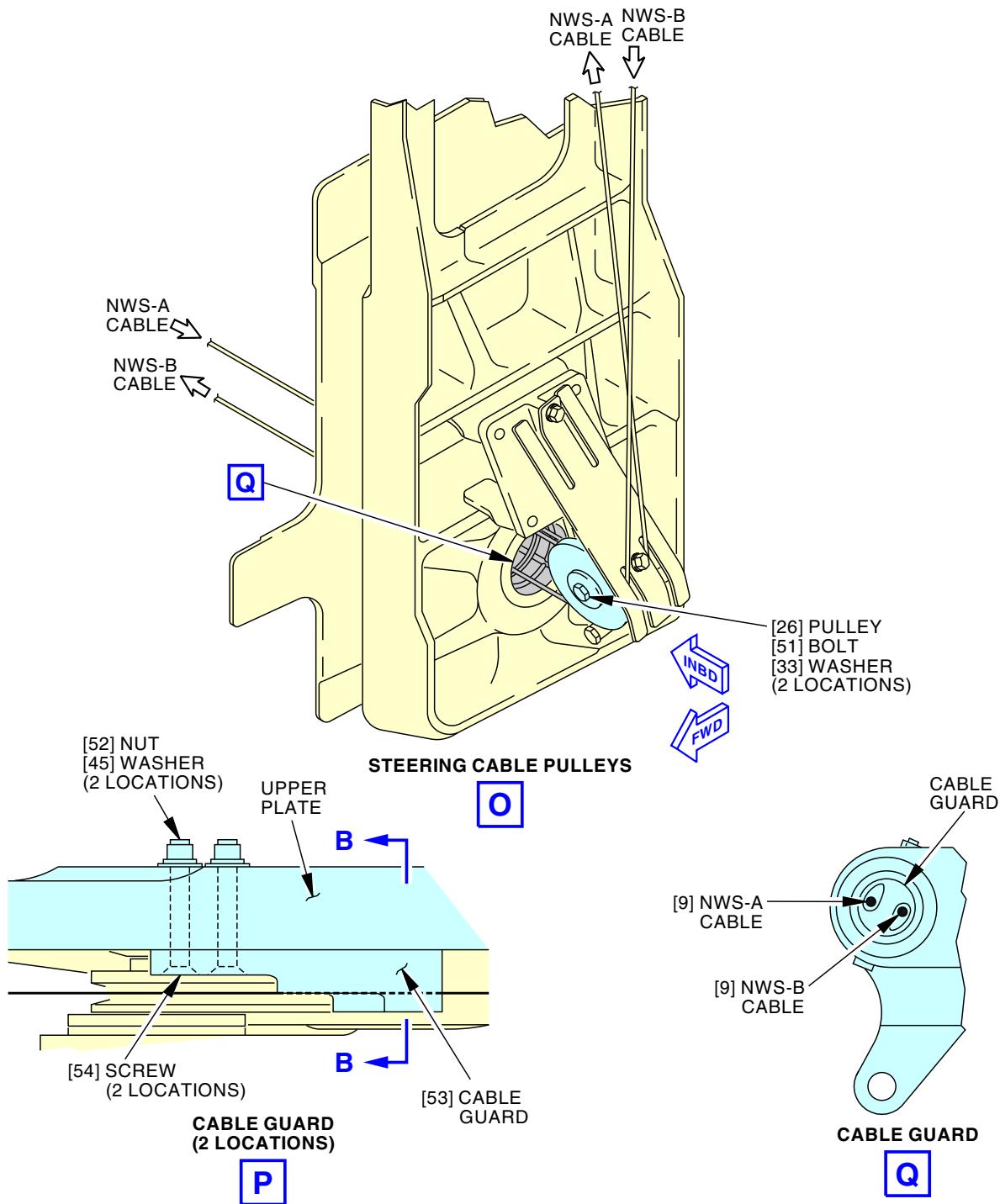
EFFECTIVITY
LOM ALL

12-26-00

D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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G18159 S0006575783_V5

Steering System Cables Installation
Figure 313/12-26-00-990-813 (Sheet 15 of 15)

EFFECTIVITY
 LOM ALL

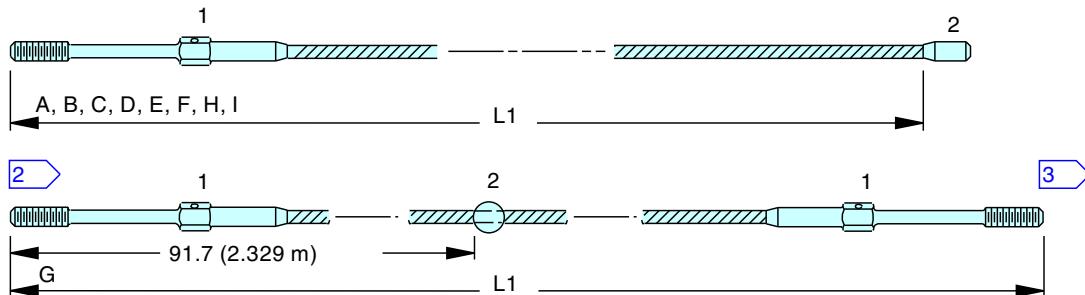
12-26-00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D633A101-LOM



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AIRCRAFT MAINTENANCE MANUAL



CABLE REFERENCE	FUNCTION	NUMBER REQUIRED	LENGTH INCHES 1	FITTINGS 1	
				1	2
A 5	NWSA (A)	1	L1 52.3 (1.328 m)	MS21260L3LH	BACT14A3
B 5	NWSA (B)	1	L1 16.8 (426.7 mm)	MS21260L3RH	BACT14A3
C 5	NGPPB (A)	1	L1 11.6 (294.6 mm)	MS21260S3LH	BACT14A3
D 5	NGPPA (A)	1	L1 11.2 (284.5 mm)	MS21260S3RH	BACT14A3
E 5	NWSA (C)	1	L1 68.0 (1.727 m)	MS21260L3RH	BACT14A3
F 5	NWSB	1	L1 127.2 (3.231 m)	MS21260L3LH	BACT14A3
G 4	NWSA/B	1	L1 190.2 (4.831 m)	MS21260L3RH/LH	BACT14B3
H 6	NGPPB (B)	1	L1 11.0 (279.4 mm)	MS21260S3RH	BACT14B3
I 6	NGPPA (B)	1	L1 9.7 (246.4 mm)	MS21260S3LH	BACT14B3

1 REFERENCE ONLY. REFER TO CURRENT IPC FOR SPECIFIC PART NUMBER, LENGTH, MATERIAL AND END FITTING ASSEMBLY FABRICATION TENSIONING LOADS, AND TOLERANCES.

2 THIS END TAKES A RIGHT HAND THREADED FITTING.

3 THIS END TAKES A LEFT HAND THREADED FITTING.

4 CABLE MATERIAL: 3/32 CRES 7X7 PER MIL-W-83420, TYPE IB, NO FINISH.

5 CABLE MATERIAL: 3/32 TIN OVER ZINC CARBON STEEL, 7X7 PER BMS 7-265, TYPE 1, COMPOSITION A.

6 CABLE MATERIAL: 3/32 ZINC PLATED CARBON STEEL, 7X7 PER MIL-DTL-83420, TYPE 1, COMPOSITION A.

G17009 S0006575785_V7

Steering System Cables Installation
Figure 314/12-26-00-990-814 (Sheet 1 of 4)

EFFECTIVITY
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420,
422-434, 437-442, 445-447, 450-461

12-26-00

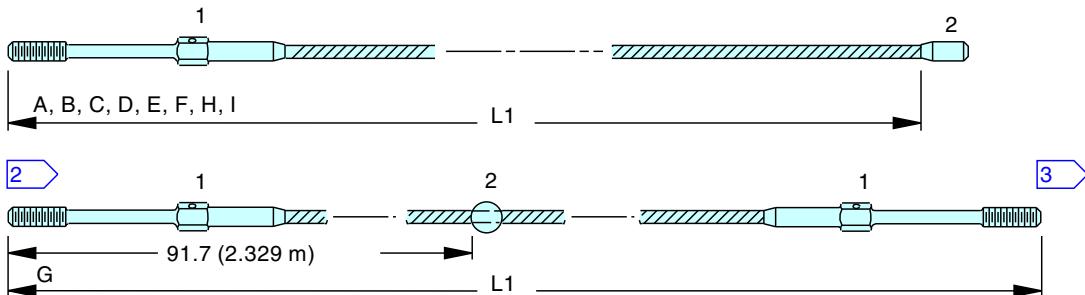
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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CABLE REFERENCE	FUNCTION	NUMBER REQUIRED	LENGTH INCHES 1	FITTINGS 1	
				1	2
A 5	NWSA (A)	1	L1 52.3 (1.328 m)	MS21260L3LH	BACT14A3
B 5	NWSA (B)	1	L1 16.8 (426.7 mm)	MS21260L3RH	BACT14A3
C 5	NGPPB (A)	1	L1 11.6 (294.6 mm)	MS21260S3LH	BACT14A3
D 5	NGPPA (A)	1	L1 11.2 (284.5 mm)	MS21260S3RH	BACT14A3
E 5	NWSA (C)	1	L1 68.0 (1.727 m)	MS21260L3RH	BACT14A3
F 5	NWSB	1	L1 127.2 (3.231 m)	MS21260L3LH	BACT14A3
G 4	NWSA/B	1	L1 190.2 (4.831 m)	MS21260L3RH/LH	BACT14B3
H 6	NGPPB (B)	1	L1 11.0 (279.4 mm)	MS21260S3RH	BACT14B3
I 6	NGPPA (B)	1	L1 9.7 (246.4 mm)	MS21260S3LH	BACT14B3

1 REFERENCE ONLY. REFER TO CURRENT IPC FOR SPECIFIC PART NUMBER, LENGTH, MATERIAL AND END FITTING ASSEMBLY FABRICATION TENSIONING LOADS, AND TOLERANCES.

2 THIS END TAKES A RIGHT HAND THREADED FITTING.

3 THIS END TAKES A LEFT HAND THREADED FITTING.

4 CABLE MATERIAL: 3/32 CRES 7X7 PER MIL-W-83420, TYPE IB, NO FINISH, OR CRES 7X7 PER BMS7-265, TYPE I, COMPOSITION B.

5 CABLE MATERIAL: 3/32 TIN OVER ZINC CARBON STEEL, 7X7 PER BMS 7-265, TYPE 1, COMPOSITION A.

6 CABLE MATERIAL: 3/32 ZINC PLATED CARBON STEEL, 7X7 PER MIL-DTL-83420, TYPE 1, COMPOSITION A.

3060508 S0000823721_V1

Steering System Cables Installation
Figure 314/12-26-00-990-814 (Sheet 2 of 4)

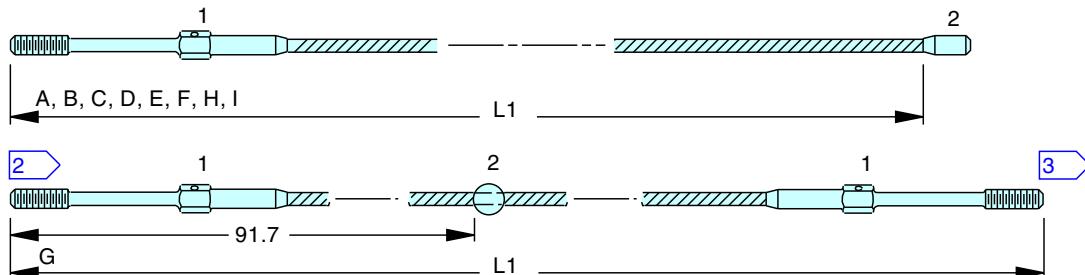
EFFECTIVITY
LOM 462, 463

12-26-00

D633A101-LOM



**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**



CABLE REFERENCE	FUNCTION	NUMBER REQUIRED	LENGTH INCHES 1	FITTINGS 1	
				1	2
A [5]	NWSA (A)	1	L1 52.3	MS21260L3LH	BACT14A3
B [5]	NWSA (B)	1	L1 16.8	MS21260L3RH	BACT14A3
C [5]	NGPPB (A)	1	L1 11.6	MS21260S3LH	BACT14A3
D [5]	NGPPA (A)	1	L1 11.2	MS21260S3RH	BACT14A3
E [5]	NWSB (B)	1	L1 97.7	MS21260L3RH	BACT14A3
F [5]	NWSB	1	L1 127.2	MS21260L3LH	BACT14A3
G [4]	NWSA/B	1	L1 190.2	MS21260L3RH/LH	BACT14B3
A [5]	NWSB (A)	1	L1 62.6	MS21260L3LH	BACT14A3
-	NWSA (C)	1	65.68 (REF)	-	-
F [5]	NWSA (D)	1	L1 111.5	MS21260L3LH	BACT14A3
H [6]	NGPPB (B)	1	L1 11.0	MS21260S3RH	BACT14B3
I [6]	NGPPA (B)	1	L1 9.7	MS21260S3LH	BACT14B3

[1] REFERENCE ONLY. REFER TO CURRENT IPC FOR SPECIFIC PART NUMBER, LENGTH, MATERIAL AND END FITTING ASSEMBLY FABRICATION TENSIONING LOADS, AND TOLERANCES.

[2] THIS END TAKES A RIGHT HAND THREADED FITTING.

[3] THIS END TAKES A LEFT HAND THREADED FITTING.

[4] CABLE MATERIAL: 3/32 CRES 7X7 PER MIL-W-83420, TYPE IB, NO FINISH.

[5] CABLE MATERIAL: 3/32 TIN OVER ZINC CARBON STEEL, 7X7 PER BMS 7-265, TYPE 1, COMPOSITION A.

[6] CABLE MATERIAL: 3/32 ZINC PLATED CARBON STEEL, 7X7 PER MIL-DTL-83420, TYPE 1, COMPOSITION A.

K63801 S0006575786_V5

**Steering System Cables Installation
Figure 314/12-26-00-990-814 (Sheet 3 of 4)**

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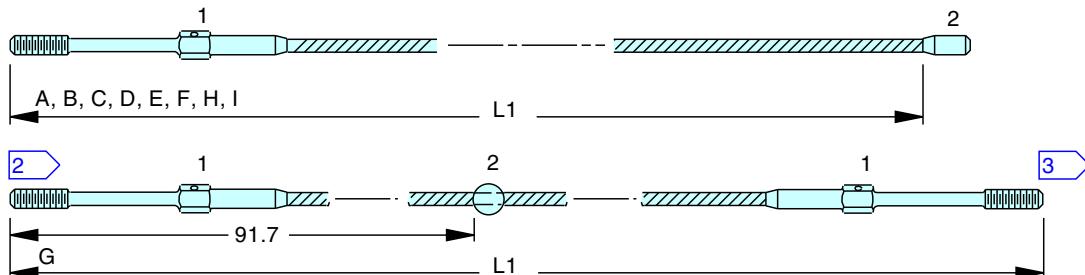
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CABLE REFERENCE	FUNCTION	NUMBER REQUIRED	LENGTH INCHES 	FITTINGS	
				1	2
A	NWSA (A)	1	L1 52.3	MS21260L3LH	BACT14A3
B	NWSA (B)	1	L1 16.8	MS21260L3RH	BACT14A3
C	NGPPB (A)	1	L1 11.6	MS21260S3LH	BACT14A3
D	NGPPA (A)	1	L1 11.2	MS21260S3RH	BACT14A3
E	NWSB (B)	1	L1 97.7	MS21260L3RH	BACT14A3
F	NWSB	1	L1 127.2	MS21260L3LH	BACT14A3
G	NWSA/B	1	L1 190.2	MS21260L3RH/LH	BACT14B3
A	NWSB (A)	1	L1 62.6	MS21260L3LH	BACT14A3
-	NWSA (C)	1	65.68 (REF)	-	-
F	NWSA (D)	1	L1 111.5	MS21260L3LH	BACT14A3
H	NGPPB (B)	1	L1 11.0	MS21260S3RH	BACT14B3
I	NGPPA (B)	1	L1 9.7	MS21260S3LH	BACT14B3

REFERENCE ONLY. REFER TO CURRENT IPC FOR SPECIFIC PART NUMBER, LENGTH, MATERIAL AND END FITTING ASSEMBLY FABRICATION TENSIONING LOADS, AND TOLERANCES.

THIS END TAKES A RIGHT HAND THREADED FITTING.

THIS END TAKES A LEFT HAND THREADED FITTING.

CABLE MATERIAL: 3/32 CRES 7X7 PER MIL-W-83420, TYPE IB, NO FINISH, OR CRES 7X7 PER BMS7-265, TYPE I, COMPOSITION B.

CABLE MATERIAL: 3/32 TIN OVER ZINC CARBON STEEL, 7X7 PER BMS 7-265, TYPE 1, COMPOSITION A.

CABLE MATERIAL: 3/32 ZINC PLATED CARBON STEEL, 7X7 PER MIL-DTL-83420, TYPE 1, COMPOSITION A.

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**Steering System Cables Installation
Figure 314/12-26-00-990-814 (Sheet 4 of 4)**

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COLD WEATHER MAINTENANCE - SERVICING

1. General

- A. This procedure contains one task. This task is cold weather maintenance, servicing.

TASK 12-33-01-600-802

2. Cold Weather Maintenance Procedure

(Figure 301, Figure 302)

A. General

- (1) Airplane operation in cold weather conditions can cause special problems. These problems occur because of the effects of the ice, snow, slush, frost, and low temperatures. This procedure gives data for removal of ice, snow, slush and frost from the airplane. This procedure also gives data for the prevention of subsequent accumulation of ice, snow, slush and frost. It also includes other related data for the operation of the airplane in cold weather. The operator must find and use the correct procedures for the weather conditions that occur.
- (2) Make sure that the maintenance procedures for operation during ice, snow and/or frost conditions are satisfactory for the conditions. Use the data that follow to make sure that the procedures are satisfactory:
 - (a) Previous weather conditions.
 - (b) The equipment or materials that are available.
 - (c) The weather conditions at the airport where you will operate.
- (3) Low temperatures (below freezing) can affect grease viscosity. Lubricate landing gear and flight control components in warm weather prior to cold weather ground operations or in a heated hangar.
 - (a) If lubrication must be accomplished in cold weather, warm air or electric heat blankets can be used to heat the components and the grease gun.
 - (b) For the landing gear, an enclosure can be fabricated around the strut to make the heating more efficient.
 - (c) Do not apply heat directly to tires.
- (4) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps.
- (5) Definitions:
 - (a) Ice that has accumulated on the fan blades while the airplane has been on the ground for a prolonged stop, such as a plane that has been parked overnight, is considered Ground-Accumulated Ice.
 - 1) Ground-Accumulated Ice must be removed before engine start.
 - (b) Ice that has accumulated on the fan blades while the engine is running at idle is considered Operational Ice.
 - 1) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.
 - (c) Deicing is a procedure to remove the frost, ice or snow from the airplane. Hot water or a hot mixture of water and deicing/anti-icing fluid is applied.
 - 1) For alternate methods of deicing refer to FAA Notice 8900.XXX for the current winter season.

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- (d) Anti-icing is a procedure to make sure that ice, snow and/or frost does not collect and become attached to the airplane surfaces. Anti-icing fluid or a mixture of anti-icing fluid and water is applied to the airplane.
- (e) One step ice removal/anti-icing applies a hot deicing/anti-icing fluid or mixture of fluid and water. Use the conditions that follow to make a decision on how hot to make the fluid or the fluid and water mixture:
 - 1) The ambient temperature
 - 2) The weather conditions.
- (f) Two step ice removal/anti-icing has the steps that follow:
 - 1) Apply hot water or a hot mixture of deicing/anti-icing fluid and water to remove the ice.
 - 2) Immediately follow with a spray of a deicing/anti-icing fluid or a mixture of deicing/anti-icing fluid and water for anti-icing. This step must be done less than 3 minutes after you started the first step. If it is necessary, do the procedure area by area.
- (g) Holdover time is the approximate time anti-icing fluid will keep the frost, ice, or snow off the airplane surfaces that have protection.

NOTE: You cannot find the level of protection or the holdover time with precision. The weather conditions and the fluid/fluid mixture will have an effect on the holdover time. Refer to FAA Notice 8900.XXX for the current winter season. This document includes tables for holdover times for all commercially available deicing fluids that have been certified for the current winter season.



USE THE CORRECT EQUIPMENT FOR EACH TYPE OF FLUID. THE INCORRECT EQUIPMENT WILL DECREASE THE TIME THAT THE FLUID WILL PREVENT ICE. ICE CAN PREVENT THE FREE MOVEMENT OF FLIGHT CONTROL SURFACES. THIS CAUSES A DANGEROUS CONDITION DURING FLIGHT.

- (h) Type I (not thickened) deicing/anti-icing fluids usually have a minimum of 80 percent Glycol. The temperature makes the viscosity change, but the shear stress does not change. These fluids give anti-icing protection for only a short time.
- (i) Type II, Type III and Type IV (thickened) deicing/anti-icing fluids usually have a minimum of 50 percent Glycol. There is also 45 to 50 percent water plus thickeners and inhibitors. The temperature and the shear stress that is applied can make the viscosity of these fluids change. They are usually very viscous at low levels of shear stress. When the shear stress changes, their viscosity decreases very quickly. Type II, Type III and Type IV fluids give longer holdover times than Type I deicing/anti-icing fluids.



KEEP WATER OUT OF THE STATIC PORTS. WATER CAN FREEZE AND CAUSE A BLOCKAGE OF THE PORTS. ICE IN THE STATIC PORTS IS DANGEROUS DURING FLIGHT.

- (j) An airplane that is parked, for this cold weather procedure, is an airplane in the loading area for a short time to be prepared for the departure. If the airplane stays in the loading area through the night in cold weather conditions, refer to the guidelines for Parked Airplanes in this procedure.

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- 1) Cold weather operation does not include an airplane that is parked for a long time. If the airplane has been parked for a long time, do this task: Put the Airplane Back to A Serviceable Condition After the Storage, TASK 10-12-02-550-801.
- (k) Slush is ice and/or snow that is not fully melted. Thus, the ice removal/anti-icing procedures for ice and snow removal apply to slush. A special procedure for slush is not necessary.
- (6) The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may rehydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
- (7) Deicing fluid residues can slowly migrate out of crevice areas after being removed from open areas by cleaning. Repeated cleaning of the aircraft may be necessary. The deicing fluid residue inspection and cleaning steps in this procedure should be used to remove these residues.
- (8) Start electronic equipment in the cold weather conditions the same as in the usual conditions. A special procedure is not necessary.
- (9) To start the engines in cold weather, do this task: Procedure to Prepare the Engine for Operation, TASK 71-00-00-700-818-F00.
- (10) To start the Auxiliary Power Unit (APU) in cold weather, do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (11) It is acceptable to install the spare dynamic seal in place of the active dynamic seal (cap seal assembly) to reduce leakage past the shock strut dynamic seal in cold weather. Re-install the cap seal assembly as the active dynamic seal when warm weather returns. See NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS, PAGEBLOCK 32-21-11/801 for details.

B. References

Reference	Title
05-51-92 P/B 201	COLD-SOAKED FUEL FROST – MAINTENANCE PRACTICES
10-11-01-580-801	Airplane Parking (P/B 201)
10-12-02-550-801	Put the Airplane Back to A Serviceable Condition After the Storage (P/B 201)
10-12-02-550-802	Prepare The Airplane For Storage for More Than Seven Days (P/B 201)
12-14-01-600-801	Potable Water System - Drain (P/B 301)
12-17-01-610-801	Waste Tank Servicing (P/B 301)
32-21-11 P/B 801	NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS
49-11-00-860-801	APU Starting and Operation (P/B 201)
71-00-00-700-818-F00	Procedure to Prepare the Engine for Operation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02301	Fluid - Aircraft Deicing/Anti-Icing (SAE Type I)	AMS 1424/1

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Reference	Description	Specification
G02460	Fluid - Aircraft Deicing/Anti-Icing, Non-Newtonian (SAE Type II, III, IV)	SAE AMS1428
G51576	Tape - Pressure Sensitive Adhesive - BA6866	BAC5034-4
G51663	Tape - Duct, Outdoor - 3M 8979	BAC5034-4
G51664	Tape - Duct, Outdoor - 3M 8979N (MIL-STD-2041 Compliant)	BAC5034-4

D. Cold Weather Maintenance Procedure

SUBTASK 12-33-01-660-003

(1) Guidelines

- (a) Many conditions can have an effect on which procedure you use to remove ice, snow, or frost or to make sure that it does not collect and become attached to the airplane surfaces. Each operator must look at the local weather conditions. If it is possible, use the procedures that were used before with the same conditions. In general, Type II, Type III and Type IV fluids give a longer holdover time than Type I fluids. Use Type II, Type III and Type IV fluids to decrease the risk that ice, snow, or frost will collect on the airplane during a long taxi. The figure that follows gives general guidelines to help you find the correct ice, snow, or frost removal procedure. This gives you the same procedure you will find when you use the full guidelines in this procedure (Table 301, Table 302).

NOTE: The applicable fluids which meet the Boeing document BSS7432, "Evaluation of Airplane Maintenance Material" and conform to any of the following specifications, are acceptable fluids.

Table 301/12-33-01-993-801 Guideline for the Application of Type I Fluid Mixture

OUTSIDE AIR TEMPERATURE (OAT)	TWO-STEP PROCEDURE		ONE-STEP PROCEDURE DEICING/ANTI-ICING ^[1]
	1ST STEP: DEICING	2ND STEP: ANTI-ICING ^[1]	
27°F (-3°C) or more	Water, or a mixture of fluid and water at a minimum temperature of 140°F (60°C) at the nozzle	Mixture of fluid and water at a minimum temperature of 140°F (60°C), 180°F (82°C) maximum at the nozzle with freezing point of at least 18 degrees F (10 degrees C) below OAT	Mixture of fluid and water at a minimum temperature of 140°F (60°C), 180°F (82°C) maximum at the nozzle with a maximum freezing point of 18 degrees F (10 degrees C) less than the OAT (subtract 18 degrees F from the OAT to get the maximum freezing point)
Less than 27°F (-3°C)	The freezing point of the heated fluid mixture must be at the OAT or below		
NOTE: Upper temperature limit can not be more than the fluid manufacturer's recommendation.			
NOTE: This table is applicable for the use of Type I Holdover Time Guidelines. If holdover times are not required, a temperature of 140°F (60°C), 180°F (82°C) maximum at the nozzle is desirable.			
CAUTION: WING SKIN TEMPERATURE MAY DIFFER AND, IN SOME CASES, BE LOWER THAN OAT. A STRONGER MIX (MORE GLYCOL) CAN BE USED UNDER THESE CONDITIONS.			
1) To be applied before first step fluid freezes, typically within 3 minutes.			

*[1] For takeoff in heavy snow the aircraft must be anti-iced with undiluted Type II, III or IV fluids.

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Table 302/12-33-01-993-802 Guideline for the Application of Type II, Type III and Type IV Fluid Mixtures

OUTSIDE AIR TEMPERATURE OAT	ONE-STEP PROCEDURE DEICING/ANTI-ICING ^[1]	TWO-STEP PROCEDURE ^[2]				
		1ST STEP: DEICING	2ND STEP: ANTI-ICING ^[1]			
27°F (-3°C) and above	50/50 Heated Type II / IV or 100/0 Heated Type III	Heated water or a heated mixture of Type I, Type II, Type III or Type IV and water	50/50 Type II / IV or 100/0 Type III			
Below 27°F (-3°C) to 7°F (-14°C)	75/25 Heated Type II / IV or 100/0 Heated Type III	Heated mixture of Type I, Type II, Type III, or Type IV, and water with a maximum freezing point of 5 degrees F (3 degrees C) more than OAT	75/25 Type II / IV or 100/0 Type III			
Below 7°F (-14°C) to -13°F (-25°C)	100/0 Heated Type II / III or IV	Heated mixture of Type I, Type II, Type III, or Type IV, and water with a maximum freezing point of 5 degrees F (3 degrees C) more than OAT	100/0 Type II / III or IV			
Below -13°F (-25°C)	You can use Type II / IV fluid at temperatures that are less than -13°F (-25°C) if the freezing point of the fluid is a maximum of 13 degrees F (7 degrees C) less than the OAT, and aerodynamic acceptance criteria are met. You can use Type III fluid when the temperature is less than 14°F (-10°C) if the fluid freezing point is a maximum of 13 degrees F (7 degrees C) less than the OAT, and aerodynamic acceptance criteria are met. Consider the use of Type I when Type II, III, or IV fluid can not be used.					
1) To be applied before first step fluid freezes, typically within 3 minutes. 2) Clean aircraft may be anti-iced with unheated fluid.						
NOTE: For heated fluids, a fluid temperature not less than 140°F (60°C) and not more than 180°F (82°C) at the nozzle is desirable. Upper temperature limit shall not exceed fluid manufacturers recommendations.						
CAUTION: <ul style="list-style-type: none"> • WING SKIN TEMPERATURE MAY DIFFER AND, IN SOME CASES, BE LOWER THAN OAT. A STRONGER MIX (MORE GLYCOL) CAN BE USED UNDER THESE CONDITION. • AS FLUID FREEZING MAY OCCUR, 50/50 TYPE II OR IV FLUID SHALL NOT BE USED FOR THE ANTI-ICING STEP OF A COLD-SOAKED WING AS INDICATED BY FROST OR ICE ON THE LOWER SURFACE OF THE WING IN THE AREA OF THE FUEL TANK. • AN INSUFFICIENT AMOUNT OF ANTI-ICING FLUID, ESPECIALLY IN THE SECOND STEP OF A TWO-STEP PROCEDURE, MAY CAUSE A SUBSTANTIAL LOSS OF HOLDOVER TIME, PARTICULARLY WHEN USING A TYPE I FLUID MIXTURE FOR THE FIRST STEP (DEICING). • USE COMPATIBLE TYPE I AND IV FLUIDS. TO MAKE SURE THAT THE FLUIDS ARE COMPATIBLE, CONTACT THE RESPECTIVE FLUID MANUFACTURER. 						

*[1] For takeoff in heavy snow the aircraft must be anti-iced with undiluted Type II, III or IV fluids.

*[2] Effectiveness of a Type IV fluid can be seriously decreased when applying it over a Type I fluid. A sufficient quantity of Type IV fluid should be applied to displace any remaining Type I fluid from the aircraft surfaces.

(b) The following is a list of Type I (Newtonian) fluids:

1) aircraft deicing fluid, G02301, latest revision, Type I

(c) The following is a list of Type II, Type III and Type IV (non-Newtonian) fluids:

1) fluid, G02460

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- (d) Use a hot mixture of water and Type I, Type II, Type III, or Type IV deicing/anti-icing fluids when you do the one-step ice removal/anti-icing procedure. The quantity of water mixed with the fluid, and the temperature you use, are affected by the following:
- 1) The weather conditions
 - 2) The holdover protection that is necessary
 - 3) The condition of the airplane.
- (e) It is necessary to have sufficient fluid temperature and flow rate to flush the ice and snow from the airplane surfaces when it collects there. More ice, snow or frost will not collect on the airplane surfaces where there is remaining fluid. The mixture and type of fluid used will have an effect on the holdover time. The weather conditions can make it necessary to apply the fluid/water mixture again. This will be necessary to remove the frozen fluid that collected since the fluid/water mixture was last applied. This is also done to increase the protection time.



**DO NOT POINT A SOLID FLOW OF FLUID DIRECTLY AT THE SURFACE.
APPLY THE FLUID AT LOW ANGLE TO PREVENT DAMAGE TO THE
AIRPLANE SURFACES. DO NOT USE A HIGH PRESSURE SPRAY TO
BLOW THE ICE AND SNOW OFF THE AIRPLANE SURFACES.**

- (f) For the best ice or snow removal, the temperature of the deicing fluid and hot water should be 140–180°F (60–82°C), at the nozzle. A fine to medium spray is recommended to apply the fluid across a large area of ice or snow. This will cause the ice or snow to melt the fastest. A solid flow of fluid is recommended to flush the ice or snow from the airplane surfaces.
- (g) A layer of anti-icing fluid will give protection from ice, snow, and frost if you apply the fluid to a dry wing on a cold soaked airplane. A mixture of anti-icing fluid and water (the ambient temperature will have an effect on when to use a mixture with water) will also give protection if you apply it to a dry wing.
- (h) Since the temperature of the external surfaces of the airplane can be below freezing, ice can attach to the surface. There can be clear ice below the layer of snow or slush, which is not easy to find. Make sure that all the ice is removed after you do the ice removal or ice removal/anti-icing procedure. It may be necessary to feel the surface to do the inspection.
- (i) When the precipitation is continuous, the two-step ice removal/anti-icing procedure is usually recommended. The quantity of fluid used in the mixture is affected by the following:
- 1) The airline experience
 - 2) The instructions of the fluid manufacturer
 - 3) The air temperature.
- (j) Make sure there is no ice, snow, or frost on the wing for the takeoff. To do this, you must carefully examine the airplane before the departure.
- (k) You must remove snow from a parked airplane regularly. This will make sure that a large quantity of snow will not collect and possibly freeze on the airplane surface.

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CAUTION

CAREFULLY MOVE ROPES OR FABRIC HOSES ON THE WING OR FUSELAGE. THE MOVEMENT OF THE ROPES OR HOSES CAN CAUSE DAMAGE TO EQUIPMENT THAT IS INSTALLED ON THE SURFACE OF THE WING OR FUSELAGE.

- (l) Use brooms with long handles to remove the snow from the wings and horizontal stabilizers. You can use ropes or a fabric hose to remove the snow from the fuselage. Move the rope or hose back and forth on the top of the fuselage as you move it aft.
- (m) Before you move an airplane out of a warm hangar during icing conditions, do the anti-icing procedure on the airplane. This will make it less likely that ice or snow will melt when it touches the warm airplane and freeze again.
- (n) If you remove ice with water that is not hot you must do it in a warm hangar. Keep the airplane in the hangar until the surfaces are dry. It will be necessary to do a check of those areas where the water can collect and freeze. If anti-icing fluid is applied, it is not as necessary for the airplane to dry.
- (o) General Precautions



WARNING

DO NOT GET DEICING/ANTI-ICING FLUID IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. PUT ON GOGGLES, GLOVES, AND CLOTHING FOR PROTECTION WHEN YOU USE DEICING/ANTI-ICING FLUID. DEICING/ANTI-ICING FLUID IS POISONOUS. IT CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT DIRECTLY SPRAY DEICING FLUIDS INTO APU OR ENGINE INLETS, EXHAUSTS, DUCTS AND PITOT-STATIC PROBES. THESE FLUIDS CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN CAUSE BAD AIR FLIGHT DATA.



CAUTION

DO NOT POINT THE FLUID STREAM DIRECTLY ON THE SURFACE OF THE AIRPLANE (NORMAL, OR PERPENDICULAR TO THE SURFACE). APPLY THE FLUID AT A LOW ANGLE TO PREVENT DAMAGE TO AIRPLANE SURFACES. HIGH-PRESSURE FLUID CAN CAUSE DAMAGE TO AIRPLANE SURFACES.

- 1) Do not point a spray of deicing/anti-icing fluid directly at or into the pitot inlets, TAT probes or static ports shown in (Figure 301).
- 2) Do not point a spray of hot deicing fluid or hot water directly at cold windows.
- 3) Make sure that the air conditioning pack switches are in the OFF position prior to deicing.
- 4) Do not point a spray of deicing/anti-icing fluid directly into the engine, APU, scoops, vents, drains, Cabin Air Compressor (CAC) and Ram Air inlets, etc.
- 5) Do not exceed an impingement of 50 psi (345 kPa) at the surface.
- 6) Do not point a solid flow of fluid directly at the airplane surfaces.
- 7) Make sure that ice and/or snow is not pushed into the areas around the flight controls during ice and snow removal.
- 8) Remove all of the ice or snow from the door and girt bar areas before you close a door.

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- 9) Do not open the cargo doors if it is not necessary. Remove the ice and snow from the cargo containers before you put them on the airplane. Before the doors are closed for flight put anti-icing fluid on these areas:
 - a) The lower door sills
 - b) The bottom edge of the door.
- 10) Do not use hard or sharp tools to remove the ice from the airplane surface.
- 11) The right and left sides of the wing and horizontal stabilizer must get the same ice removal/anti-icing procedure.
 - a) If contamination exists only in a limited area (such as a spoiler panel) and there is no active precipitation, it is permitted to deice only that area, but the same area should also be treated on the other wing.
- 12) If SAE Type II, III, or IV fluids are used, then remove all of the deicing/anti-icing fluid from the cockpit windows before the departure. Make sure that you carefully examine the windows with the wipers installed. Make sure that fluid is removed from all the forward areas where it can flow back on the windshields during the taxi and takeoff. These areas must be clean before the departure.

NOTE: Deicing/anti-icing fluid can be removed by rinsing with approved cleaner and a soft cloth or flushing with type I fluid.



WARNING

YOU MUST REMOVE DEICING/ANTI-ICING FLUID RESIDUES BEFORE TOO MUCH COLLECTS. RESIDUES CAN COLLECT IN AERODYNAMICALLY QUIET AREAS. THESE RESIDUES CAN PREVENT THE MOVEMENT OF CRITICAL FLIGHT CONTROL SYSTEMS. THIS CAN CAUSE SYSTEM DAMAGE, AND DANGEROUS FLIGHT CONDITIONS.

- 13) After ice removal/anti-icing procedure has been done many times, you must examine the following areas for deicing/anti-icing fluid residues, remove the residues, and re-lubricate affected components as follows:
 - a) If the ambient temperature is at or below freezing, move the airplane to a heated hangar.
 - b) Gain access to the following areas where flight controls and other system components are located:
 - <1> Wing rear spar areas, including the actuating components for the spoilers, ailerons, flaps, and the control surface hinges and balance bays.
 - <2> Wing leading edge devices, including the actuating components.
 - <3> Horizontal stabilizer rear spar, including the actuating components for the elevators, elevator tabs (if applicable) and the control surface hinges and balance bays.
 - <4> Vertical stabilizer, including actuating components for the rudder, and the control surface hinges.
 - <5> APU bay and bilge area of the tailcone.

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- c) Visually inspect for dry or rehydrated residues in the areas mentioned above.

NOTE: Dry residue will normally be a thin film that may be partially covered with dirt or grease. Rehydrated residue will often be a thicker, gel-like substance.

NOTE: It may be necessary to use a borescope to inspect inside the elevator panels where the tab control rods go through. Residues can get into this area and cause an unbalance condition in the elevator.



WARNING DO NOT APPLY WATER TO THE CONTROL CABLES WHEN THE TEMPERATURE IS AT OR BELOW 32°F (0°C). ICE CAN FORM ON THE CABLES AND PREVENT THE OPERATION OF IMPORTANT FLIGHT CONTROL SYSTEMS DURING FLIGHT.

- d) Spray the area with a fine mist of warm water to rehydrate any residue and wait at least 15 minutes to allow the rehydration to occur.

- e) Remove the residues by hand with rags or soft brushes using warm water or a mixture of warm water and Type I fluid.

<1> You can also use a low pressure stream of water or compressed air to rinse away the residues.

<a> When rinsing the residues away, make sure that the residues do not flow into crevice areas that are not accessible.

- f) Check all drain holes in the areas where residues were removed to make sure that they are clear and not blocked by the residues.

- g) Re-lubricate bearings, fittings, and control cables in areas that were cleaned as required.

- h) Re-apply corrosion inhibiting compound to all surfaces and components in areas that were cleaned as required.

- (p) When there is slush on the runways, examine the aircraft when it gets to the ramp. Look for slush that collected on the airplane or damage to the airplane surfaces.

- 1) Examine the areas that follow for ice that collected and damage to the skin panels (remove the ice if it is necessary):

- a) The leading edges

- b) The flaps

- c) The flap wells

- d) The vertical stabilizer

- e) The rudder

- f) The bottom and the top surface of the horizontal stabilizers and elevators.

- 2) Examine the wheel well areas for ice, slush and snow that collected. Remove the ice if it is necessary.

- 3) Examine the skin panels behind the wheel wells for damaged edges.

- (q) Use the applicable Structural Repair Manual (SRM) procedure to repair any damaged skin panels.

- (r) Make sure that the concentration of the deicing/anti-icing fluid is correct before you apply it to the airplane.

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WARNING

DO NOT WALK ON THE WINGS OR THE HORIZONTAL STABILIZER. ICE OR SNOW ON THESE SURFACES IS NOT SAFE. MAINTENANCE PERSONS CAN FALL WHICH WILL CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT OR THE AIRPLANE.

- (s) Use a boom-truck, a cherry-picker or deicing/anti-icing truck to do deicing/anti-icing.

SUBTASK 12-33-01-580-002

(2) Specific Requirements

(a) Probes and Sensors

- 1) All of the probes and sensors must have no ice, snow, or frost on them. After you remove the ice, make sure there is no moisture collected on them. This moisture could subsequently freeze. Apply deicing/anti-icing fluid for protection.
- 2) Pitot Probe, Static Ports, and Total Air Temperature (TAT) Probes (Figure 301):
 - a) Look for ice that is attached to the surface 4 feet or less from the pitot inlets, static ports, and TAT probe inlets. Remove all the ice in these areas.
 - b) Do not point a spray of deicing/anti-icing fluid directly at or into the pitot inlets, static ports, or the TAT probes.
 - c) If ice causes a blockage of the static openings, carefully apply warm air until the ice melts.
 - d) If you applied too much fluid to the fuselage near the static ports, examine the nearest in-line drain.
- 3) Angle-of-Attack Sensor (Figure 301)
 - a) Make sure that no ice and/or snow is on the sensors.
 - b) Make sure that the sensors are free to move.
 - c) Apply deicing fluid if it is necessary.



WARNING

YOU MUST REMOVE THE ICE FROM CONTROL SURFACES BEFORE THE HYDRAULIC SYSTEM PRESSURIZATION. HYDRAULIC PRESSURIZATION CAN CAUSE MOVEMENT OF CONTROL SURFACES WITHOUT CONTROL INPUT. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

(b) Control Surfaces

- 1) Retract the wing flaps, slats, and spoilers during icing conditions or when snow falls. If it is necessary to operate these controls, make sure that they are not blocked by ice or snow before you retract them.
NOTE: If an airplane comes to the gate with the flaps not fully retracted during icing conditions or when snow falls, examine those flaps that are not fully retracted. Look for ice or snow that has collected before they are retracted.
- 2) All of the control surfaces must have no ice, snow, or frost on them. After you remove the ice, make sure that there is no moisture collected in the hinges, guide tracks and actuators for the flight controls. This moisture could subsequently freeze. Apply deicing/anti-icing fluid for protection.

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WARNING

STAY AWAY FROM THE STABILIZER TRIM WHEEL ON THE CONTROL STAND IF YOU USE THE STABILIZER TRIM SWITCH ON THE CONTROL WHEEL. THE STABILIZER TRIM SWITCH CAN CAUSE THE STABILIZER TRIM WHEEL TO TURN QUICKLY. INJURY TO PERSONS CAN OCCUR IF YOU TOUCH IT WHEN IT TURNS.

3) Stabilizer trim

- a) Set the stabilizer position to 5 units.
- b) Deicing operations should be conducted from the forward side of the stabilizer to minimize liquids that might enter the tailcone area.

4) Open the leading edge devices and look for ice or snow.

(c) Wing and Horizontal Tail Surfaces



CAUTION

BE CAREFUL WHEN YOU REMOVE THE ICE AND SNOW FROM THE FUSELAGE, WING AND TAIL AREAS. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT ATTACHED TO THE SURFACES.

1) The wing, including winglets (if installed) and horizontal tail surfaces must have no ice, snow, and frost on them.

NOTE: A layer of frost 1/8-inch thick or less on the lower wing surfaces (in the spar area) is permitted if it is caused by very cold fuel. But, all of these areas must have no ice, snow, or frost on them:

Leading edge devices

Control surfaces, including both sides of horizontal and vertical stabilizers

Tab surfaces

The top wing surface.

2) The leading edge surfaces must have no ice, snow or frost on them. Examine the areas between the surfaces that move and the surfaces that do not move to make sure that there is no ice.

3) The right and left sides of the horizontal stabilizer must get the same ice removal/anti-icing procedure.

- a) If contamination exists only in a limited area (such as a spoiler panel) and there is no active precipitation, it is permitted to deice only that area, but the same area should also be treated on the other wing.

(d) Fuselage and Vertical Tail Surfaces

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CAUTION

BE CAREFUL WHEN YOU REMOVE THE ICE AND SNOW FROM THE FUSELAGE, WING AND TAIL AREAS. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT ATTACHED TO THE SURFACES.

- 1) The fuselage and the vertical tail surfaces must have no ice or snow on them. Ice and snow increase the aerodynamic drag and the weight of the airplane.

NOTE: Thin hoar frost is permitted on the top surface of the fuselage if all the vents and ports are clear. Thin hoar frost is a white layer of constant thickness with a sharp crystalline texture. It usually occurs on surfaces that are out on a cold night with no clouds. Hoar frost is thin. You can see items on the surface below the layer of frost, such as paint lines, marks or letters.

- 2) Do not apply hot deicing fluid or hot water directly on the pilots' windshield or the passenger windows. You can let the fluid flow on the windows after you apply it to the top of the cabin. This is permitted since the fluid will be cool when it gets to the window.



WARNING

DO NOT POINT DEICING/ANTI-ICING FLUID IN THE DIRECTION OF THE ELEVATOR FEEL PITOT PROBES. IN THE AREA ADJACENT TO THE ELEVATOR PROBES POINT THE FLUID FLOW IN A FORWARD DIRECTION (AWAY FROM THE PROBES OPENING). FLUID IN THE ELEVATOR PROBES CAN CAUSE HIGHER THAN EXPECTED CONTROL COLUMN FORCES. THIS CAN CAUSE A DANGEROUS CONDITION DURING LANDING THAT CAN CAUSE INJURY TO PERSONNEL.

- 3) Do not spray any fluid into the elevator feel system pitot probes that are located on each side of the vertical stabilizer.
- 4) Do not point a spray of deicing/anti-icing fluid directly into the inlet duct or exhaust for the APU.
- 5) If SAE Type II, III or IV fluids are used, then all of the deicing/anti-icing fluid on the cockpit windows must be removed before the departure. Carefully examine the windows with the wipers installed. Also, examine the forward areas where the fluid can flow aft on the windshields during the taxi and takeoff. These areas must be clear before the departure.

NOTE: Deicing/anti-icing fluid can be removed by rinsing with approved cleaner and a soft cloth or flushing with type I fluid.

(e) Engines and APU



WARNING

PERSONS MUST STAY CLEAR OF THE DANGEROUS AREAS IN FRONT OF OR IN BACK OF AN ENGINE AND IN THE APU EXHAUST WHEN THEY OPERATE. INJURY OR DEATH OF PERSONS CAN OCCUR IN THESE AREAS.

- 1) For the safety of persons, do not operate the engines or the APU during the ice removal/anti-icing operations. But, if it is necessary to do the ice removal/anti-icing procedure during engine and/or APU operation, do the steps that follow:
 - a) Make sure that the engine is at idle speed and/or the APU is running.
 - b) Do not point the spray of deicing/anti-icing fluids directly into the engine and/or APU inlet.

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DO NOT START THE ENGINES IN AREAS WHERE THERE ARE PUDDLES OF DEICING OR ANTI-ICING FLUID. MOVE THE AIRPLANE TO A DIFFERENT LOCATION. THE FLUID CAN GO INTO THE ENGINE COMPRESSOR. THESE FLUIDS CAN CAUSE COMPRESSOR STALL, AND ENGINE SURGE.



MAKE SURE THAT THERE IS NO SNOW, ICE, OR EQUIPMENT IN THE APU INLET AREA BEFORE YOU START THE APU. DAMAGE TO THE APU CAN OCCUR.

- 2) If the engines/APU are on, do the steps that follow to keep the fumes out of the cabin when you apply deicing/anti-icing fluid in the area of the engines/APU inlets.
 - a) Put the air conditioning pack switches for the cabin in the off position.
 - b) Close the shutoff valves for the APU air supply.



DO NOT DIRECTLY SPRAY DEICING FLUIDS INTO APU OR ENGINE INLETS, EXHAUSTS, DUCTS AND PITOT-STATIC PROBES. THESE FLUIDS CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN CAUSE BAD AIR FLIGHT DATA.

- 3) Do not point a spray of deicing/anti-icing fluid directly into the areas below:
 - a) The inlet ducts for the engine or APU
 - b) Exhausts
 - c) Engine thrust reversers
 - d) Engine inlet
 - e) Probes attached to the strut
 - f) Engine bleed air ducts.
 - 4) Remove the ice from the Vortex generator on the APU inlet door when the APU is not in operation.
 - 5) Remove Ground-Accumulated Ice from fan blades prior to take-off.
- (f) Brakes
- 1) When deicing or anti-icing the airplane, protect the wheels and brakes from fluid contamination with the methods below:
 - a) Do not direct a spray of deicing or anti-icing fluids at the wheels or brakes.
 - b) Use suitable covers on the wheels and brakes when operationally feasible.
 - c) Apply the parking brake to reduce incidental contamination of brake friction surfaces when operationally feasible.

NOTE: The brakes do not need to be re-applied if the wheels have not rotated since the last brake application.

 - d) Manually remove snow or ice accumulation from the wheels, brakes, or tires. A hot air blower may be used for this purpose.
- (g) Landing Gear and Doors
- 1) Make sure that there is not a layer of ice or snow on the movable parts and the position indication switches for the landing gear.
 - a) This could prevent the correct operation of the landing gear.

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- b) Make sure that you do not remove lubricants, or make the lubricants thinner when you apply deicing, or anti-icing fluids.
 - c) Parts that are not lubricated can seize, or they will not operate correctly.
- 2) Remove the ice and snow from these areas:
- NOTE: It is the airline's decision to apply or not apply anti-icing fluid as protection after the ice is removed.
- a) The landing gear doors
 - b) The door latches
 - c) The uplock mechanism
 - d) The uplock hook
 - e) The downlock mechanism
 - f) The bungee springs
 - g) The lock actuators
 - h) The position indication switches.
- 3) Make sure that ice did not collect on the steering cables for the nose wheel.
- a) If there is ice, remove it from the cables.
- 4) Examine the alternate extend system for ice in these areas because they are open, and do not have heat:
- a) Examine control cables for landing gear extension
 - b) The external mechanism for the landing gear.



CAUTION

DO NOT TRY TO MOVE THE AIRPLANE IF THE TIRES ARE FROZEN TO THE GROUND. MAKE SURE THAT THE WHEELS TURN WHEN YOU MOVE THE AIRPLANE. IF THE WHEELS DO NOT TURN, DAMAGE TO THE WHEELS AND THE AIRPLANE CAN OCCUR.

- 5) Remove the ice and snow from the ground areas around the landing gear. This will make it less possible that the tires will freeze to the ground. This will also prevent unwanted airplane movement because of the wind or engine operation.
- a) Use warm air or deicing fluid to release the tires from the ground or to remove frozen material.
 - b) Do not use salt because it can collect on the metal parts, and it causes corrosion.
- (h) Wing Fuel Tanks
- 1) Frost can occur on the wings in the fuel tank areas in ambient air temperatures that are more than 32°F (0°C).
 - 2) The condensation of moisture in the air causes frost when it touches cold surfaces that are less than 32°F (0°C).
 - 3) The frost will usually melt when you add fuel.
 - a) If the frost stays on the bottom surfaces, and it is more than $\frac{1}{8}$ in. (3 mm) thick, remove it before flight.

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- b) If the frost occurs on the upper wing tank surfaces when the fuel temperature as given on the flight deck is at or below 32°F (0°C).

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LOM 432, 465-999 (Continued)

<1> Do the procedure as described in COLD-SOAKED FUEL FROST – MAINTENANCE PRACTICES, PAGEBLOCK 05-51-92/201.

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- 4) Clear ice can occur on the top of the wing when these conditions occur:
 - a) The temperature of the fuel in the tank is less than 32°F (0°C)
 - b) The ambient temperature is more than 32°F (0°C)
 - c) There is rain, drizzle, or fog.
- 5) Carefully examine the top of the wing to see if there is clear ice. Use the equipment that is necessary to get sufficient access to the top of the wing to do this check. It is possible that the clear ice can only be found by touch. You must remove clear ice and anti-ice the wing, if it is necessary, before the takeoff.
 - (i) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps.
 - (j) Miscellaneous.
 - 1) Drains
 - a) Examine all of the waste water and condensate drains on the airplane to make sure there are not blockages because of ice or other material. It is not necessary to put a plug on the drains during the ice removal or anti-icing procedure. But, do not point a fluid spray at these drain areas.
 - 2) Windshield Wiper Blades
 - a) Remove the ice that collected on the windshield wiper blades.

SUBTASK 12-33-01-580-004

(3) Tape Application Requirements

NOTE: This step is for airplanes that parked in active storage or prolonged parking.

- (a) If it is necessary to apply Scotch Brand No.471 tape, G02219, to attach cover for openings (vent, engine inlet and exhaust, APU, air conditioning system, etc), use one of these alternative tapes for cold weather:
 - 1) 3M 8979 tape, G51663
 - 2) 3M 8979N tape, G51664
 - 3) tape, G51576

NOTE: It is recommended to keep the roll of tape warm until it is needed for better application capabilities.

SUBTASK 12-33-01-660-004

(4) Hot Water Ice Removal

- (a) You can use hot water 140°F (60°C) to 180°F (82°C) maximum nozzle temperature to remove ice and snow from the airplane surfaces when the ambient temperature is 27°F (-3°C), stable or on the increase.
- (b) To prevent the water from freezing again you must apply anti-icing fluid to the surface immediately after you remove the ice with hot water.

SUBTASK 12-33-01-660-005

(5) One-Step Ice Removal/Anti-Icing

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- (a) The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may rehydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
- (b) You can do the one-step ice removal/anti-icing procedure, with the deicing/anti-icing fluid heated to 140°F (60°C) to 180°F (82°C) at the nozzle. Use this procedure to remove the ice and snow from the airplane when the temperature is less than 28°F (-2°C).
 - 1) After you use the mixture to make the airplane surfaces are clean, the remaining fluid will give some anti-icing protection.
- (c) The fluid mixed with the water can be Type I deicing (ice removal)/anti-icing fluid or Type II, Type III or Type IV deicing/anti-icing fluid. The holdover time will be longer with the Type II, Type III or Type IV deicing/anti-icing fluid. With each fluid, quantity of fluid to use in the mixture is affected by the following:
 - 1) The airline experience
 - 2) The fluid specifications
 - 3) The manufacturer's recommendations
 - 4) The weather conditions.
- (d) If additional treatment is required before flight, the full deicing/anti-icing procedure must be performed. Ensure that any residues from previous treatments are flushed off.

SUBTASK 12-33-01-660-006

- (6) Two-Step Ice Removal/Anti-Icing
 - (a) The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may rehydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
 - (b) The two-step ice removal/anti-icing procedure is usually the recommended procedure when the precipitation conditions are continuous. The second step must be done no more than 3 minutes after you begin the first step. Do the procedure area by area if it is necessary.
 - (c) The items that follow will have an effect on the holdover time you get after you do the anti-icing procedure.
 - 1) The fluid that was used
 - 2) The weather conditions.
 - (d) Do not apply an additional coating of anti-icing fluid on top of contaminated fluid (fluid that has been absorbing precipitation). If additional treatment is required before flight, the full deicing/anti-icing procedure must be performed. Ensure that any residues from previous treatment are flushed off.

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SUBTASK 12-33-01-580-003

(7) To Park the Airplane



IF HIGH WINDS ARE POSSIBLE, USE THE PROCEDURE IN THE PGBLK 10-11-03-2 TO SET THE STABILIZER. HIGH WIND CONDITIONS CAN CAUSE DAMAGE TO THE AIRPLANE AND INJURY TO PERSONNEL.

- (a) Make sure that area for park the airplane is clear of ice and snow (TASK 10-11-01-580-801).

NOTE: Use Prepare The Airplane For Storage for More Than Seven Days, TASK 10-12-02-550-802 if more steps are necessary because of the weather conditions and length of time the airplane will be parked.

- (b) When it is possible, point the airplane in the direction the wind is usually from.
(c) Set the airplane control surfaces so that the airplane is ready for deicing/anti-icing operations if necessary to remove accumulated snow and ice.
1) Put the wing flaps to the full up position.
2) Put the stabilizer position to 5 units of trim.



EXAMINE THE ENGINE INTAKE AREAS IMMEDIATELY AFTER SHUTDOWN FOR ICE THAT IS THERE. REMOVE THE ICE WHILE THE TEMPERATURE OF THE ENGINE DECREASES AND BEFORE YOU INSTALL THE ENGINE PROTECTIVE PLUGS AND COVERS. IF YOU INSTALL THE PLUGS BEFORE THE TEMPERATURE OF THE ENGINE DECREASES, THE REMAINING HEAT IN THE ENGINE WILL MELT THE ICE TO WATER. THIS WATER WILL FLOW TO THE BOTTOM OF THE FAN SECTION. IT WILL FREEZE AGAIN WHEN THE TEMPERATURE OF THE ENGINE IS BELOW FREEZING. THIS WILL LOCK THE TIPS OF THE FAN LOWER BLADES IN ICE.

- (d) Install all the plugs and covers, where available, for the intake or exhaust ducts and the different probes such as the pitot tubes. Use a brush to apply a thin layer of anti-ice fluid to the airplane surface before you install the cover. The covers will not freeze to the airplane if you do this.

SUBTASK 12-33-01-860-001

(8) Engine Operation

- (a) The full procedures to operate the engines in cold weather conditions, do this task: Procedure to Prepare the Engine for Operation, TASK 71-00-00-700-818-F00.



REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- (b) Remove Ground-Accumulated Ice.
(c) Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.
(d) Engine icing can occur when the conditions that follow occur:

NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.

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- 1) There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
- 2) You will do ground operations with the static air temperature is less than 50°F (10°C).
- (e) Before you start the engines, make sure that there are no fluids around the exhaust areas that can start ignition.

SUBTASK 12-33-01-680-001

(9) Fuel Icing

- (a) The items that follow have the most effect on the quantity of water in aviation fuels:
 - 1) Where the fuel is kept
 - 2) How the fuel is moved.
- (b) Fuel that is open to moisture or the usual atmospheric conditions contains more water than that kept in tightly sealed containers. This water in the fuel, when there is high humidity and temperature conditions that change, can be more than 3 gallons in each thousand gallons of fuel. As the temperatures decrease, there is a separation of the water and the fuel. The water will collect at the lowest point in the tank and freeze if the temperature is sufficiently low. If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps. To check for water at the fuel tank sump drain valves with fuel temperature below 32°F (0°C), do one of the following to raise the temperature of the fuel:
 - 1) Fill the fuel tanks with warm fuel
 - 2) Move the airplane in to a warm hangar.

SUBTASK 12-33-01-610-001

(10) Toilets and Potable Water

- (a) The water will not freeze in an airplane that operates because there is sufficient heat in the area. When the airplane does not operate and is let stay in an area that is not heated, more servicing is necessary. Do the steps that follow if the cabin temperature will decrease below the freezing point.
 - 1) Toilets
 - a) When the airplane will be operated you can add antifreeze fluids to the solution used to precharge the waste tank to make sure that it will not freeze. Be careful in the selection of the materials you use. The antifreeze and the flushing deodorizer detergent can make foam when mixed. Foam can also occur when antifoam agents break down when they mix with a deodorizing detergent. Look at the fluid manufacturers' instructions to see if they can be mixed.
 - b) When the airplane will not be operated you must fully drain the toilet flushing system to make sure that it will not freeze, do this task: Waste Tank Servicing, TASK 12-17-01-610-801.
 - 2) Potable Water

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CAUTION

DRAIN THE WATER SYSTEM. IF THE WATERLINES HAVE
WATER IN THEM, THEY CAN FREEZE IN COLD WEATHER.
THIS CAN CAUSE DAMAGE TO THE WATERLINES.

- a) You must drain all of the water from the potable water system, do this task:
Potable Water System - Drain, TASK 12-14-01-600-801.

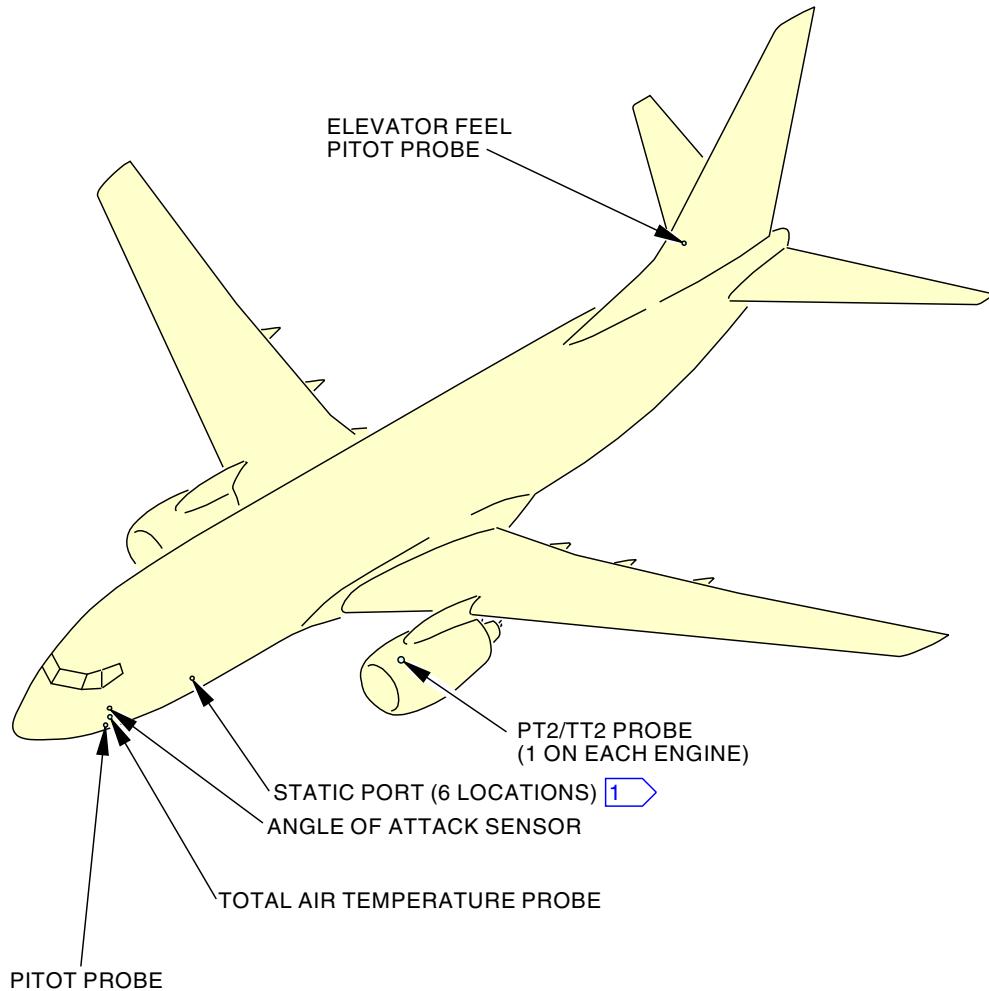
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
(EXAMPLE)

[1] ONE ALTERNATE STATIC PORT NEAR THE BOTTOM
OF THE FUSELAGE IS NOT SHOWN.

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Probe Locations
Figure 301/12-33-01-990-806

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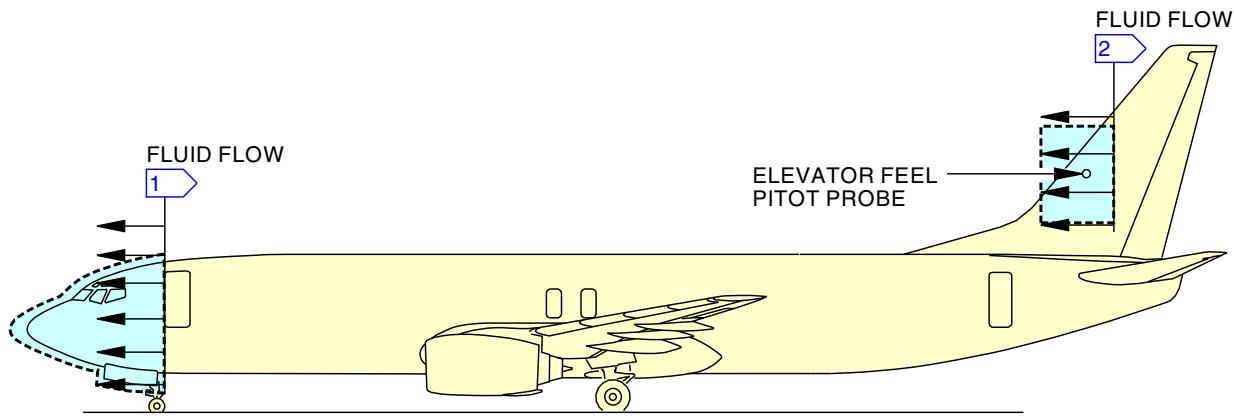
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
(EXAMPLE)

- 1 FROM THE FORWARD ENTRY DOOR, SPRAY DEICING/ANTI-ICING FLUID ONLY IN THE FORWARD DIRECTION TO PREVENT INGESTION INTO THE PITOT PROBES, STATIC PORTS, AND TOTAL AIR TEMPERATURE PROBES.
- 2 IN THE AREA ADJACENT TO THE ELEVATOR PITOT PROBES, 3 FEET (0.91 m) AFT TO 10 FEET (3.04 m) FORWARD, SPRAY DEICING/ANTI-ICING FLUID ONLY IN THE FORWARD DIRECTION TO PREVENT INGESTION INTO THE PITOT PROBES.

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Deicing/Anti-icing Fluid Application
Figure 302/12-33-01-990-816

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EXTREME COLD WEATHER MAINTENANCE - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) Cold Weather Attended Parking
 - (2) Return the Airplane to Service After Cold Weather Attended Parking
 - (3) Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)
 - (4) Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)
- B. In the usual operation of the airplane, air comes through the airplane structure. During flight, the water vapor in the air can condense and freeze in the airplane. When you continuously operate the airplane in cold weather, ground temperatures below the freezing point will not let the ice melt. To remove the ice, do this task: Interior Ice Removal, TASK 05-51-53-210-801.
- C. Definitions:
 - (1) Ice that has accumulated on the engine fan blades while the airplane has been on the ground for a prolonged stop, such as a plane that has been parked overnight, is considered Ground-Accumulated Ice.
 - (a) Ground-Accumulated Ice must be removed before engine start.
 - (2) Ice that has accumulated on the engine fan blades while the engine is running at idle is considered Operational Ice.
 - (a) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.

TASK 12-33-02-600-804

2. Cold Weather Attended Parking

A. General

- (1) This task is to park the airplane during extreme cold weather in an attended parking condition. Attended parking is generally used when the airplane will be on the ground for a period of time between flights and ready for immediate operation.
- (2) During attended parking, the temperatures of the cabin and flight deck are maintained warmer than 32°F (0°C) and the engines are maintained warmer than -40°F (-40°C) while the airplane is on the ground.
- (3) For airplanes that operate continuously in extreme cold weather, put the airplane into a heated hangar periodically to thaw the insulation blankets and other equipment
- (4) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps. To check for water at the fuel tank sump drain valves with fuel temperature below 32°F (0°C), do one of the following to raise the temperature of the fuel:
 - (a) Do this task: Fuel System Sumping, TASK 12-11-00-680-801.
- (5) When adding fuel, you must use these requirements:
 - (a) Make sure the fuel temperature is at least 6°F or 3°C above the fuel freeze point. Use the ASTM method to determine the freeze point.
NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.
 - (b) Use fuels that meet specification ASTM D1655:

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- 1) Jet A or Jet A1.
- (c) It's acceptable to use alternate fuels that meet specification MIL-DTL-5624G (or MIL-DTL-83133):
 - 1) JP-5 (or JP-8).
- (d) Approved fuel additive is:

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

- 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
 - a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
- 2) Fuel additive, specification ASTM D4171.
 - a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.

B. References

Reference	Title
10-11-01-580-801	Airplane Parking (P/B 201)
12-11-00-680-801	Fuel System Sumping (P/B 301)
12-13-21-200-801	IDG Oil Level Check (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)
21-00-00-800-801	Supply Conditioned Air to the Airplane (P/B 201)
32-21-11 P/B 801	NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS
71-00-00-700-818-F00	Procedure to Prepare the Engine for Operation (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (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-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: MARK IV-900 COLDBUSTER Supplier: 12008 Part #: MARK IV-DSL COLDBUSTER Supplier: 12008 Part #: MARK IV-TDSL COLDBUSTER Supplier: 12008 Part #: MARK VI COLDBUSTER Supplier: 12008 Opt Part #: 5050D Supplier: 12867 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008 Opt Part #: MARK IV-700 COLDBUSTER Supplier: 12008
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

E. Location Zones

Zone	Area
100	Lower Half of Fuselage

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Zone	Area
200	Upper Half of Fuselage
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Doors

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Procedure

SUBTASK 12-33-02-490-001



WARNING

WHEN THE PITOT PROBES HAVE COVERS ON THEM, MAKE SURE THAT A PERSON ON THE GROUND CAN SEE THE COVERS. ALSO MAKE SURE YOU ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT COMPARTMENT AS A REMINDER THAT THE PITOT PROBES HAVE COVERS ON THEM. IF THE COVERS ARE NOT REMOVED FROM THE PITOT PROBES, INCORRECT AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS CAN OCCUR. THIS CAN CAUSE DANGEROUS FLIGHT CONDITIONS.

- (1) Install covers on the pitot probes.

SUBTASK 12-33-02-480-005



CAUTION

EXAMINE THE ENGINE INTAKE AREAS IMMEDIATELY AFTER SHUTDOWN FOR ICE THAT IS THERE. REMOVE THE ICE WHILE THE TEMPERATURE OF THE ENGINE DECREASES AND BEFORE YOU INSTALL THE ENGINE PROTECTIVE PLUGS AND COVERS. IF YOU INSTALL THE PLUGS BEFORE THE TEMPERATURE OF THE ENGINE DECREASES, THE REMAINING HEAT IN THE ENGINE WILL MELT THE ICE TO WATER. THIS WATER WILL FLOW TO THE BOTTOM OF THE FAN SECTION. IT WILL FREEZE AGAIN WHEN THE TEMPERATURE OF THE ENGINE IS BELOW FREEZING. THIS WILL LOCK THE TIPS OF THE FAN LOWER BLADES IN ICE.

- (2) Install the engine inlet and exhaust covers as soon as possible after landing.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

SUBTASK 12-33-02-480-003

- (3) Do this task: Airplane Parking, TASK 10-11-01-580-801.

SUBTASK 12-33-02-210-009

- (4) If the airplane has a forward airstair, you must follow the steps below each time the airstair is put in the stow position:

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REMOVE ALL ICE AND SNOW FROM THE AIRSTAIRS BEFORE YOU MOVE THE AIRSTAIRS IN THE FUSELAGE. ICE AND SNOW WILL MELT IN THE FUSELAGE AND CAN DRAIN ON THE ELECTRONIC EQUIPMENT. DAMAGE TO ELECTRONIC EQUIPMENT CAN OCCUR.

- (a) Remove all ice and snow completely from the airstair steps and structure before the airstair is put in the stow position.
- (b) After the airstairs are in the stow position, do the steps that follow:

- 1) Gain access under the airstairs through this access panel:

Number **Name/Location**

117A Electronic Equipment Access Door

- 2) Check for water on the drip shields and around the electronic equipment.
- 3) Remove all water on the drip shields and around electronic equipment.
- 4) Close this access panel:

Number **Name/Location**

117A Electronic Equipment Access Door

SUBTASK 12-33-02-880-004

- (5) Do one of the steps that follow to maintain the flight deck and cabin temperature above 32°F (0°C):
 - (a) Use the APU or a ground air source to run both ECS packs:
NOTE: If the APU is off and the APU oil temp is below -35°F (-37°C), warm the APU prior to starting.
 - 1) Run the APU.
 - 2) Do this task: Supply Conditioned Air to the Airplane, TASK 21-00-00-800-801.
 - (b) Use a heater, COM-2478 or suitable substitute to heat the airplane through the Low Pressure ECS Panel - Forward, 191E (if applicable).
 - (c) Use a heater, COM-2478 or suitable substitute to heat the airplane through the forward and aft entry doors

SUBTASK 12-33-02-210-010

- (6) Use the Engine Oil System Input Monitoring Page on the CDU to monitor the engine oil temperature when the engines are not running.
 - (a) To see the engine oil temperatures, do these steps:
 - 1) Select ENGINE> from the MAINT BITE INDEX 1/1 page on the CDU.
 - 2) Select applicable engine (1 or 2) ENGINE EXCEED BITE INDEX page which will initialize the engine bite test.
 - 3) Select INPUT MONITORING from the ENGINE BITE TEST MAINT MENU.
 - 4) Select CONTINUE to open the ENGINE BITE TEST INPUT MONITORING page.
 - (b) If the engine oil temperature shown on the CDU approaches -35°F (-37°C), do the steps that follow:
 - 1) Remove the inlet and exhaust covers.
 - 2) Heat the engines with a explosion proof electric blower - heater, STD-3925 or suitable substitute:

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- a) If you use a multiple hose ground cart heater, COM-2478, direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine oil tank (preferred) or gearbox (alternate).
 - b) If you use a multiple hose ground cart (YMP-350 heater), direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine oil tank (preferred) or gearbox (alternate).
 - c) If you use a single hose ground cart (Herman Nelson heater), direct the heater hose on the engine oil tank (preferred) or gearbox (alternate).
- 3) Make sure the engine oil temperature on the CDU is above -35°F (-37°C), then follow one of these steps:
- a) Remove the heater from the engine and install the engine covers
NOTE: Heaters can be used to maintain the engine oil temp above -35°F (-37°C) for extended periods if necessary.
OR;
 - b) Run engines to increase the oil temperature.
 - <1> If you will run the engines, make sure the engine oil temperature on the CDU is above -35°F (-37°C).
 - <2> See engine operating limits in TASK 71-00-00-800-806-F00.
 - <3> Prepare the engine for operation and cold weather starting, do this task: TASK 71-00-00-700-818-F00.
 - <4> Remove Ground-Accumulated Ice from fan blades.
 - <5> Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.



CAUTION

REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- <6> Engine icing can occur when the conditions that follow occur:

NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.

- There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
- You will do ground operations with the static air temperature is less than 50°F (10°C).
-

- <7> Visually check the IDG oil level.

- <a> To service the IDG, do this task: IDG Oil Level Check, TASK 12-13-21-200-801.

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, D00071 lubricant instead of MIL-L-23699 lubricant. The only MIL-PRF-7808 lubricants approved for use below -40°F (-40°C) for Hamilton Sundstrand IDGs are Exxon 2389, BPTO 2389, Aero Shell 390, and Castrol 325.

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<8> Before you start the engines, make sure there are no fluids around the exhaust areas that can start ignition.

<9> Do this task: Start the Engine Procedure (Selection),
TASK 71-00-00-800-807-F00.

<10> Run the engines at idle until the oil temperature is at or above 32°F (0°C).

<11> Make sure the oil temperature is at or above 32°F (0°C) before you increase the power above idle.

NOTE: This will let the engine temperature stabilize.

<12> Before shutdown of the engines, run the engines at idle for a minimum of 10 minutes.

<13> Do this task: Stop the Engine Procedure (Usual Engine Stop),
TASK 71-00-00-700-819-F00.

<14> Install the inlet and exhaust covers.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

(c) Continue to use the CDU to monitor the engine oil temperature when the engines are not running.

SUBTASK 12-33-02-210-021

(7) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-011

(8) Visually check the tires for indication of proper inflation.

(a) To service the landing gear tires, do this task: Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801.

SUBTASK 12-33-02-600-008

(9) Visually check the landing gear and service if necessary.

(a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.

(b) For airplanes originating in a warm environment and terminating in a cold environment, do the following:

1) Over-inflate the shock struts by approximately 1 in. (25 mm).

2) Perform a single point pressure/extension check while in the colder location.

a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the AMM shock strut servicing band.

(c) For airplanes originating in a cold environment and terminating in a warm environment, do the following:

1) Perform a single point pressure/extension check before departure.

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- a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the servicing band.

NOTE: When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, then re-service the struts.

- (d) If is acceptable to install the spare dynamic seal in place of the active dynamic seal (cap seal assembly) to reduce leakage past the shock strut dynamic seal in cold weather. Re-install the cap seal assembly as the active dynamic seal when warm weather returns. See NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS, PAGEBLOCK 32-21-11/801 for details.

———— END OF TASK ——

TASK 12-33-02-600-810

3. Return the Airplane to Service After Cold Weather Attended Parking

A. General

- (1) This task is for airplanes that were parked during extreme cold weather in an attended parking condition. Attended parking is generally used when the airplane was on the ground for a period of time between flights and ready for immediate operation.
- (2) During attended parking, the temperatures of the cabin and flight deck are maintained warmer than 32°F (0°C) and the engines are maintained warmer than -40°F (-40°C) while the airplane is on the ground.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-13-21-200-801	IDG Oil Level Check (P/B 301)
12-33-01-600-802	Cold Weather Maintenance Procedure (P/B 301)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
32-41-11-000-801	Brake Disconnect Removal (P/B 401)
32-41-11-400-801	Brake Disconnect Installation (P/B 401)
32-41-41-000-801	Main Landing Gear Brake Removal (P/B 401)
32-41-41-400-801	Main Landing Gear Brake Installation (P/B 401)
71-00-00-700-818-F00	Procedure to Prepare the Engine for Operation (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (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-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: MARK IV-900 COLDBUSTER Supplier: 12008 Part #: MARK IV-DSL COLDBUSTER Supplier: 12008 Part #: MARK IV-TDSL COLDBUSTER Supplier: 12008 Part #: MARK VI COLDBUSTER Supplier: 12008 Opt Part #: 5050D Supplier: 12867 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008 Opt Part #: MARK IV-700 COLDBUSTER Supplier: 12008
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

E. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Doors

F. Procedure

NOTE: Do the steps that follow just prior to flight.

SUBTASK 12-33-02-090-001

- (1) Remove the covers from the pitot probes.

- (a) Make sure there is no ice blocking the pitot probe openings.
- 1) If ice causes a blockage of the pitot probe openings, carefully apply warm air until the ice melts.

SUBTASK 12-33-02-860-032



DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (2) Turn on the hydraulic system electric motor pumps 30 minutes before starting the engines.

NOTE: This will make sure the hydraulic system operates normally and will prolong the life of the component.

NOTE: Leave the motor pumps running until the engine-driven pumps are operating.

- (a) Do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

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- 1) Make sure these electric switches to the ON position, on the overhead Hydraulic Control Panel.
 - a) HYD PUMPS ELEC 1
 - b) HYD PUMPS ELEC 2
- (b) If the hydraulic pressure in one system increases, then drops to zero, do the steps that follow:

NOTE: Repeat the steps a maximum of three times. After three times (cycles), you must find the cause of the pressure drop.

 - 1) Turn the electric motor pump OFF.
 - 2) Turn the electric motor pump ON.
- (c) Leave the motor pumps running until the engine-driven pumps are operating.
- (d) Monitor the hydraulic reservoir levels while the pumps are on.

NOTE: The hydraulic system reservoir level can decrease until you actuate the flight controls.

SUBTASK 12-33-02-860-036



CAUTION

DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (3) Do the functions of the flight control systems that follow:
 - (a) Slowly (1 to 2 seconds), move the control column, wheel, rudder pedals, and the ground spoilers.

NOTE: You must complete at least 10 cycles of each control to near full travel.

 - 1) Verify that the movement of the flight control systems are normal on CDU.
 - (b) Run the stabilizer trim full travel nose up and nose down using the column mounted trim switch.
 - (c) Select the LE Flaps and Slats to the full down position.

NOTE: Wait for the LE flaps/slats to reach the full down position.
 - (d) Select the LE Flaps and Slats to the full up position.

NOTE: Wait for the LE flaps/slats to reach the full up position.
 - (e) Prepare for the autopilot check:
 - 1) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.
 - 2) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.
 - (f) Operate the autopilot servos as follows:
 - 1) Engage one autopilot channel
 - 2) Engage vertical speed mode
 - a) Select vertical speed of 2000 fpm.

NOTE: Wait for column motion to stop.

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- b) Select vertical speed of 0 fpm.
NOTE: Wait for column motion to stop.
 - c) Select vertical speed of -2000 fpm.
NOTE: Wait for column motion to stop.
 - d) Select vertical speed of 0 fpm.
NOTE: Wait for column motion to stop.
- 3) Engage heading select mode.
- a) Select 30 degree heading change to the left of airplane heading.
NOTE: Wait for wheel motion to stop.
 - b) Select 30 degree heading change to the right of airplane heading.
NOTE: Wait for wheel motion to stop.
- 4) Repeat steps 1 thru 3 for the other autopilot channel.

SUBTASK 12-33-02-610-003

- (4) Monitor the hydraulic reservoir levels on the center display.
- (a) Service the hydraulic system if necessary: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 12-33-02-860-033

- (5) At temperatures below -22°F (-30°C), do these steps before starting the engines:
- (a) Apply localized heat to the inner cylinder of the nose and main gear.
 - (b) Pump the brake pedals 20 times shortly and verify extension/retraction of brake pistons at each brake.
- 1) If brake operation is not normal, do the steps that follow:
- a) Provide local warming to the brake.
 - b) Repeat the test until proper operation is observed.
 - c) If the difficulty continues:
 - <1> Do this task: Brake Disconnect Removal, TASK 32-41-11-000-801
 - <2> Do this task: Brake Disconnect Installation, TASK 32-41-11-400-801
 - <3> Do this task: Main Landing Gear Brake Removal, TASK 32-41-41-000-801
 - <4> Do this task: Main Landing Gear Brake Installation, TASK 32-41-41-400-801.

SUBTASK 12-33-02-210-044

- (6) Use the Input Monitoring Page on the CDU to monitor the engine oil temperature with the engines not running.
- (a) To see the engine oil temperatures, do these steps:
 - 1) Select ENGINE> from the MAINT BITE INDEX 1/1 page on the CDU.
 - 2) Select applicable engine (1 or 2) ENGINE EXCEED BITE INDEX page which will initialize the engine bite test.
 - 3) Select INPUT MONITORING from the ENGINE BITE TEST MAINT MENU.
 - 4) Select CONTINUE to open the ENGINE BITE TEST INPUT MONITORING.

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- (b) If the engine oil temperature shown on the CDU approaches -35°F (-37°C), do the steps that follow:
- 1) Remove the inlet and exhaust covers.
 - 2) Heat the engines with a explosion proof electric blower - heater, STD-3925 or suitable substitute:
 - a) If you use a multiple hose ground cart heater, COM-2478, direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine oil tank (preferred) or gearbox (alternate).
 - b) If you use a multiple hose ground cart (YMP-350 heater), direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine oil tank (preferred) or gearbox (alternate).
 - c) If you use a single hose ground cart (Herman Nelson heater), direct the heater hose on the engine oil tank (preferred) or gearbox (alternate).
 - 3) Make sure the engine oil temperature on the CDU is above -35°F (-37°C), then follow one of these steps:
 - a) Remove the heater from the engine and install the engine covers
NOTE: Heaters can be used to maintain the engine oil temp above -35°F (-37°C) for extended periods if necessary.
OR;
 - b) Run engines to increase the oil temperature.
 - <1> If you will run the engines, follow these steps: Make sure the engine oil temperature on the CDU Display Unit is above -35°F (-37°C).
 - <2> See engine operating limits in TASK 71-00-00-800-806-F00.
 - <3> Prepare the engine for operation and cold weather starting, do this task: TASK 71-00-00-700-818-F00.
 - <4> Remove Ground-Accumulated Ice from fan blades.
 - <5> Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.



REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- <6> Engine icing can occur when the conditions that follow occur:
NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.
- There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
 - You will do ground operations with the static air temperature is less than 50°F (10°C).
 -
- <7> Visually check the IDG oil level.

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- <a> To service the IDG, do this task: IDG Oil Level Check, TASK 12-13-21-200-801.

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, D00071 lubricant instead of MIL-L-23699 lubricant. The only MIL-PRF-7808 lubricants approved for use below -40°F (-40°C) for Hamilton Sundstrand IDGs are Exxon 2389, BPTO 2389, Aero Shell 390, and Castrol 325.

- <8> Before you start the engines, make sure there are no fluids around the exhaust areas that can start ignition.
- <9> Do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.
- <10> Run the engines at idle until the oil temperature is at or above 32°F (0°C).
- <11> Make sure the oil temperature is at or above 32°F (0°C) before you increase the power above idle.
- NOTE: This will let the engine temperature stabilize.
- <12> Before shutdown of the engines, run the engines at idle for a minimum of 10 minutes.
- <13> Do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00.
- <14> Install the inlet and exhaust covers.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

- (c) Continue to use the CDU to monitor the engine oil temperature when the engines are not running.

SUBTASK 12-33-02-210-045

- (7) Do the task that follows to prepare for flight if necessary:
(a) Do this task: Cold Weather Maintenance Procedure, TASK 12-33-01-600-802.

———— END OF TASK ————

TASK 12-33-02-600-805

4. Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

A. General

- (1) This task is to park the airplane during extreme cold weather in an unattended parking condition. Unattended parking is generally used when the airplane will be on the ground in a non-operational condition between flights.
- (2) During unattended parking, the temperatures of the cabin and flight deck were not maintained warmer than 32°F (0°C) and the engines were not maintained warmer than -40°F (-40°C) while the airplane is on the ground.

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- (3) For airplanes that operate continuously in extreme cold weather, put the airplane into a heated hangar periodically to thaw the insulation blankets and other equipment
- (4) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps. To check for water at the fuel tank sump drain valves with fuel temperature below 32°F (0°C), do one of the following to raise the temperature of the fuel:
 - (a) Do this task: Fuel System Sumping, TASK 12-11-00-680-801.
- (5) When adding fuel, you must use these requirements:
 - (a) Make sure the fuel temperature is at least 6°F or 3°C above the fuel freeze point. Use the American Society for Testing and Materials (ASTM) method to determine the freeze point.
NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.
 - (b) Use fuels that meet specification ASTM D1655:
 - 1) Jet A or Jet A1.
 - (c) It's acceptable to use alternate fuels that meet specification MIL-DTL-5624G (or MIL-DTL-83133):
 - 1) JP-5 (or JP-8).
 - (d) Approved fuel additive is:
NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.
 - 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
 - a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
 - 2) Fuel additive, specification ASTM D4171.
 - a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.

B. References

Reference	Title
09-11-00-580-801	Maintenance Towing (P/B 201)
10-11-01-580-801	Airplane Parking (P/B 201)
10-12-02-550-802	Prepare The Airplane For Storage for More Than Seven Days (P/B 201)
12-11-00-680-801	Fuel System Sumping (P/B 301)
12-14-01-600-801	Potable Water System - Drain (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)
12-17-01-610-801	Waste Tank Servicing (P/B 301)
24-31-11-000-801-001	Battery Removal (P/B 401)
24-31-11-000-802-002	Battery Removal (P/B 401)
25-25-11-000-802	Attendant's Panel with LCD Touch Panel - Removal (P/B 401)
32-21-11 P/B 801	NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS
34-11-00-680-801	Pitot Static System - Draining (P/B 301)

C. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage



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(Continued)

Zone	Area
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Doors

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Procedure

SUBTASK 12-33-02-420-005

- (1) Install the inlet and exhaust covers.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

SUBTASK 12-33-02-020-013



WARNING

WHEN ELECTRICAL POWER IS NOT AVAILABLE TO OPERATE THE BRAKE HYDRAULIC SYSTEM, TELL THE TOW VEHICLE DRIVER. YOU MUST DECREASE THE SPEED OR YOU MUST NOT TOW THE AIRPLANE. WITHOUT ELECTRICAL POWER, THERE IS ONLY ACCUMULATOR PRESSURE AVAILABLE TO OPERATE THE BRAKES. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT WILL OCCUR.

- (2) If you need to tow the airplane, do this task: Maintenance Towing, TASK 09-11-00-580-801.

- (a) If you need to tow the airplane without electrical power, then follow the steps below:

NOTE: Boeing does not recommend towing the airplane when electrical power is not available to operate the brake hydraulic system. If towing without power is necessary, you must obey the following steps:

- 1) Tell the tow vehicle driver of the situation.
- 2) Tow speeds must be decreased to walking speed (or a speed which will allow the tow vehicle to stop the airplane in a short distance) or you must not tow the airplane.
- 3) Make sure the brake accumulator is charged with a minimum of 2800 psi (19,305 kPa).

NOTE: With a minimum of 2800 psi (19,305 kPa) in the accumulator, you can apply the brakes no more than three (3) times before the accumulator is depleted below the precharge (red band) level where no brakes will be available.

SUBTASK 12-33-02-480-004

- (3) Do this task: Airplane Parking, TASK 10-11-01-580-801.

- (a) If the airplane will be parked for longer than 7 days, follow the task below:

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- 1) Do this task: Prepare The Airplane For Storage for More Than Seven Days, TASK 10-12-02-550-802.

SUBTASK 12-33-02-210-024

- (4) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-600-009

- (5) Visually check the tires for indication of proper inflation.
 - (a) To service the landing gear tires, do this task: Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801.

SUBTASK 12-33-02-210-025

- (6) Visually check the landing gear and service if necessary.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
 - (b) For airplanes originating in a warm environment and terminating in a cold environment, do the following:
 - 1) Over-inflate the shock struts by approximately 1 in. (25 mm).
 - 2) Perform a single point pressure/extension check while in the colder location.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the AMM shock strut servicing band.
 - (c) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
 - 1) Perform a single point pressure/extension check before departure.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the servicing band.
- NOTE: When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, then re-service the struts.
- b) Install a spare dynamic seal in place of the active dynamic seal (cap seal assembly) if necessary to reduce leakage past the shock strut dynamic seal.
 - <1> Re-install the cap seal assembly as the active dynamic seal when warm weather returns.
 - <2> See NOSE LANDING GEAR SHOCK STRUT SEALS - REPAIRS, PAGEBLOCK 32-21-11/801 for more details.

SUBTASK 12-33-02-680-003



DO NOT USE SHARP INSTRUMENT TO CLEAR THE ICE BUILD-UP BLOCKAGE. THIS CAN CAUSE DAMAGE TO THE WATERLINES.

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(CAUTION PRECEDES)



CAUTION

DRAIN THE WATER SYSTEM. IF THE WATERLINES HAVE WATER IN THEM, THEY CAN FREEZE IN COLD WEATHER. THIS CAN CAUSE DAMAGE TO THE WATERLINES.

- (7) Do this task: Potable Water System - Drain, TASK 12-14-01-600-801.

NOTE: The potable water system and all components must be fully drained to make sure it will not freeze.

NOTE: It's recommended to use warm service cart water to thaw the ice, if ice blockage was occurred.

- Make sure all galley inserts, coffee pots, water heaters and boilers are empty and supply lines are drained.
- Follow the manufacturer's instructions to prepare the steam oven for below freezing temperatures, or remove the steam oven.

NOTE: Steam ovens do not have drains.

SUBTASK 12-33-02-680-005

- (8) Drain and flush the waste system, do this task: Waste Tank Servicing, TASK 12-17-01-610-801.

NOTE: The toilet flushing system must be fully drained to make sure it will not freeze.

SUBTASK 12-33-02-680-012

- (9) Drain the pitot static system, do this task: Pitot Static System - Draining, TASK 34-11-00-680-801.

SUBTASK 12-33-02-550-001

- (10) Prepare the airplane for storage:

- Remove portable fire extinguishers, emergency flashlights, first aid kits, smoke protection hoods, portable oxygen equipment, and bull horns if necessary.

NOTE: Follow the manufacturers' documentations on these components to determine if they should be removed or can remain on the airplane.

- Close all the main cabin doors, galley service doors, cargo compartment doors, access doors, and flight compartment windows.

LOM 427-434, 437-447, 450-999

SUBTASK 12-33-02-010-001

- (11) If the ambient temperature will be less than -13°F (-25°C), remove the attendant control panel (Attendant's Panel with LCD Touch Panel - Removal, TASK 25-25-11-000-802).

LOM ALL

SUBTASK 12-33-02-860-039

- (12) If the ambient temperature will be less than -35°F (-37°C) during the unattended period, Turn off flight control hydraulic power.

- Move the FLT CONTROL A and B switches on the P5 Flight Control Panel to OFF.

- Make sure the LOW PRESS light is on after the flight control switches are off.

NOTE: The low pressure light indicates the valve is closed.

- Move the SPOILER A and B switches on the P5 Flight Control Panel to OFF

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SUBTASK 12-33-02-680-011

- (13) If the airplane has a forward airstair, all ice and snow must be removed completely each time the airstairs are put in the stow position.



REMOVE ALL ICE AND SNOW FROM THE AIRSTAIRS BEFORE YOU MOVE THE AIRSTAIRS IN THE FUSELAGE. ICE AND SNOW WILL MELT IN THE FUSELAGE AND CAN DRAIN ON THE ELECTRONIC EQUIPMENT. DAMAGE TO ELECTRONIC EQUIPMENT CAN OCCUR.

- (a) Stow the airstair.
(b) Gain access under the airstairs through this access panel:

Number Name/Location

117A Electronic Equipment Access Door

- (c) Check for water on the drip shields and around the electronic equipment.
(d) Remove all water on the drip shields and around electronic equipment.
(e) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 12-33-02-550-015

- (14) Make sure the DC meter on the P5-13 panel shows that the battery is fully charged.

SUBTASK 12-33-02-040-001

- (15) Shut down the Auxiliary Power Unit (APU).

SUBTASK 12-33-02-040-002



MAKE SURE THAT THE OUTFLOW VALVE IS CLOSED. IF THE OUTFLOW VALVE IS NOT CLOSED, SNOW AND ICE COULD COLLECT IN THE AIRPLANE ON THE OUTFLOW VALVE ACTUATOR. THE OUTFLOW VALVE ACTUATOR CAN BECOME BLOCKED DURING AIRPLANE START UP. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (16) Close the outflow valve.

SUBTASK 12-33-02-550-016

- (17) Remove the main and auxiliary batteries, do this task: Battery Removal, TASK 24-31-11-000-801-001 or Battery Removal, TASK 24-31-11-000-802-002.

- (a) Put the batteries in a warm location where the temperature remains above 50°F (10°C).

NOTE: The batteries can stay in the airplane that is left without personnel during a cold soak down to 5°F (-15°C).

———— END OF TASK ————

TASK 12-33-02-600-806

5. Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

A. General

- (1) This task is for airplanes that were parked during extreme cold weather in an unattended parking condition. Unattended parking is generally used when the airplane was on the ground in a non-operational condition between flights.

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- (2) During unattended parking, the temperatures of the cabin and flight deck were not maintained warmer than 32°F (0°C) and the engines were not maintained warmer than -40°F (-40°C) while the airplane is on the ground.
- (3) If the temperature has remained above -40°F (-40°C) passenger cabin warming is not necessary, but warming is required for the flight deck and Electronic Equipment (EE) Bay.
- (4) For temperatures below 5°F (-15°C), the EE Bay must be warmed before the electronics are energized.
- (5) For temperatures below -4°F (-20°C), the flight deck must be warmed before the electronics are energized.

B. References

Reference	Title
10-11-01-580-801	Airplane Parking (P/B 201)
10-12-02-550-801	Put the Airplane Back to A Serviceable Condition After the Storage (P/B 201)
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-13-21-200-801	IDG Oil Level Check (P/B 301)
12-15-21-600-801	Crew Oxygen Cylinder Replacement (P/B 301)
12-15-21-600-803-002	Crew Oxygen Cylinder Replacement (P/B 301)
12-15-31-610-801	Main Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-41-610-801	Nose Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)
12-33-01-600-802	Cold Weather Maintenance Procedure (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-31-11-400-801-001	Battery Installation (P/B 401)
24-31-11-400-802-002	Battery Installation (P/B 401)
25-25-11-400-802	Attendant's Panel with LCD Screen - Installation (P/B 401)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
32-41-11-000-801	Brake Disconnect Removal (P/B 401)
32-41-11-400-801	Brake Disconnect Installation (P/B 401)
32-41-41-000-801	Main Landing Gear Brake Removal (P/B 401)
32-41-41-400-801	Main Landing Gear Brake Installation (P/B 401)
32-42-00-400-802	Autobrake Shuttle Valve Operational Test (P/B 501)
32-42-00-720-801	Antiskid/Autobrake Control Unit Operational Test (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
71-00-00-700-818-F00	Procedure to Prepare the Engine for Operation (P/B 201)
71-00-00-800-806-F00	Engine Operation Limits (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (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-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: MARK IV-900 COLDBUSTER Supplier: 12008 Part #: MARK IV-DSL COLDBUSTER Supplier: 12008 Part #: MARK IV-TDSL COLDBUSTER Supplier: 12008 Part #: MARK VI COLDBUSTER Supplier: 12008 Opt Part #: 5050D Supplier: 12867 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008 Opt Part #: MARK IV-700 COLDBUSTER Supplier: 12008
STD-464	Heater - Ductable, Heavy Duty, Air
STD-1125	Heater - Blower, Explosion Proof
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

E. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Doors

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
191E	Access Door - Forward Fairing

G. Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

SUBTASK 12-33-02-550-008

- (1) Do the steps at the end of the task for Put the Airplane Back In Its Usual Condition for Return to Service: Airplane Parking, TASK 10-11-01-580-801
 - (a) For airplanes that were parked for longer than 7 days, do the applicable task for the length of the parking period: Put the Airplane Back to A Serviceable Condition After the Storage, TASK 10-12-02-550-801

SUBTASK 12-33-02-880-005

- (2) Do these steps to warm the interior of the airplane:
 - (a) Secure the following doors in the open position:
 - 1) lavatory doors
 - 2) flight deck door
 - 3) closet doors

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- 4) galley bin doors
- 5) overhead stowage bin doors.



CAUTION

THE AIR ENTERING THE CONDITIONED AIR GROUND SERVICE PORT MUST NOT EXCEED 158°F (70°C) AND THE PRESSURE MUST NOT EXCEED 15IN (38CM) OF WATER AT THE POINT WHERE THE AIR ENTERS THE BODY OF THE AIRPLANE. IF THE AIR TEMPERATURE AND PRESSURE EXCEEDS 158°F (70°C) AND 15IN (38CM) OF WATER, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (b) Do these steps to attach one or more ground heater equipment to the airplane:
- explosion proof electric blower - heater, STD-3925, explosion proof heater, STD-1125, ductable heavy duty portable air heater, STD-464, heater, COM-2478, or suitable substitute.

- 1) Connect one heater hose to this access panel (if applicable):

Number Name/Location

191E Access Door - Forward Fairing

- 2) Insert one heater hose in this access panel:

Number Name/Location

117A Electronic Equipment Access Door

- 3) Insert one or more heater hoses in the forward and aft entry doors.

- 4) If additional heater hoses are available, insert one heater hoses in the forward cargo compartment in the area of the main battery and EE Bay wall.

- (c) Warm the interior of the airplane before you energize any of the electronics:

- 1) For heating schedule, see Figure 301.

NOTE: It will take approximately 60 minutes to raise the flight deck temperature from -65°F (-54°C) to -4°F (-20°C) with one heating unit (reference YMP-350). It will take approximately 90 minutes to raise the EE Bay temperature from -65°F (-54°C) to 5°F (-15°C) with one heating unit.

- 2) Make sure that the flight deck temperature is maintained at or above -4°F (-20°C) for 30 minutes before you energize any of the electronics.
- 3) Make sure that the EE Bay temperature is maintained at or above 5°F (-15°C) for 30 minutes before you energize any of the electronics.
- 4) If an additional ground heating cart is available, heat the aft galley.

NOTE: Heating of the passenger cabin is not necessary before Auxiliary Power Unit (APU) start, but can decrease the time it takes to raise the cabin to operating temperature with the Environmental Control System (ECS) system.

SUBTASK 12-33-02-420-006

- (3) Do this task: Battery Installation, TASK 24-31-11-400-801-001 or Battery Installation, TASK 24-31-11-400-802-002.

SUBTASK 12-33-02-880-006

- (4) Make sure that the flight deck is maintained at or above -4°F (-20°C) for 30 minutes and the EE Bay is maintained at or above 5°F (-15°C) for 30 minutes, then do these steps:
- (a) Disconnect the ground heater equipment.

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- (b) Close these access panels (if applicable):

Number Name/Location

117A Electronic Equipment Access Door
191E Access Door - Forward Fairing

- (c) Make sure that the outflow valve is in the OPEN position.

- (d) Start the APU with the main battery or ground power:

NOTE: To improve starting capability and longevity of the APU make sure that APU oil temperatures is above -35°F (-37°C) before starting. If the APU oil temperature is below -35°F (-37°C), you must warm the APU before starting.

- 1) If the ambient temperature is below -35°F (-37°C), heat the APU compartment for 15 minutes before starting the APU.

- 2) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

- (e) Make sure that the left and right recirculation fan switches are in the AUTO position.

- (f) Close the pack and zone circuit breakers on the P6 panel if they are open.

- (g) Put all zone selectors to the 12 o'clock position.

- (h) Make sure that the isolation valve is open.

- (i) Make sure that the Trim Air switch is ON.

- (j) Turn the left and right pack switches to the AUTO position.

LOM 427-434, 437-447, 450-999

SUBTASK 12-33-02-410-003

- (5) If you removed the attendant control panel, install the panel (TASK 25-25-11-400-802).

LOM ALL

SUBTASK 12-33-02-860-038



WARNING

MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Make sure that the flight control hydraulic power are OFF.

- (a) Move the FLT CONTROL A and B switches, on the P5 flight control panel, to the OFF position.

- 1) Make sure that the LOW PRESS light is on when the flight control switches are off.

NOTE: The low pressure light indicates the valve is closed.

- (b) Move the SPOILER A and B switches, on the P5 flight control panel, to the OFF position.

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SUBTASK 12-33-02-860-021



CAUTION

DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (7) Turn on the hydraulic system pumps 15 minutes before actuating the flight controls:

NOTE: This will warm the hydraulic systems (A and B, and Standby) to make sure that the hydraulic system operates normally and will prolong the life of the components.

- (a) Do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

- 1) Make sure that these electric switches are in the ON position.
 - a) HYD PUMPS ELEC 1
 - b) HYD PUMPS ELEC 2.



CAUTION

DO NOT START THE PUMP MORE THAN FIVE TIMES IN A FIVE MINUTE PERIOD. THE PUMP CAN BECOME TOO HOT. THIS CAN CAUSE DAMAGE TO THE PUMP.

- 2) If the amber LOW PRESSURE light illuminates on the Hydraulic Control Panel for ELEC 1 or ELEC 2, do the steps that follow:
 - a) Move the switch for the electric motor pump with the low pressure to the OFF position.
 - b) Move the switch for the electric motor pump with the low pressure to the ON position.
- (b) Cut the frangible wire on the guard for the ALTERNATE FLAPS switch, on the P5 flight control panel, and move it to ARM.
- (c) While the hydraulic pumps are on, check the hydraulic systems for leaks:
 - 1) Monitor the hydraulic reservoir levels.

NOTE: The hydraulic system reservoir level can decrease slightly until you actuate the flight controls.
 - 2) Visually check these areas for hydraulic leaks:
 - a) main wheel well
 - b) empennage
 - c) wing root
 - d) nose wheel well.
- (d) Keep the electric motor pumps ON until the engine-driven pumps are operating.

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SUBTASK 12-33-02-860-037



WARNING

MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Make sure that the hydraulic pumps have been on for a minimum of 15 minutes, then turn on flight control and spoiler hydraulic power:
- Move the FLT CONTROL A and B switches, on the P5 flight control panel, to the ON position.
 - Make sure that the LOW PRESS light is off.
 - Move the SPOILER A and B switches, on the P5 flight control panel, to the ON position.
 - Move the ALTERNATE FLAPS switch, on the P5 flight control panel, to the OFF position.
 - Close the switch guard for the ALTERNATE FLAPS switch and secure with 0.015 in. (0.381 mm) copper wire, do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801.

SUBTASK 12-33-02-860-022



CAUTION

DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (9) Do the functions of the flight control systems that follow:
- Slowly (1 to 2 seconds), move the control column, wheel, rudder pedals, and ground spoilers.

NOTE: it is necessary to complete at least 10 cycles of each control to near full travel.

 - Make sure that the movement of the flight control systems are normal on Control Display Unit (CDU).
 - Run the stabilizer trim full travel nose up and nose down using the column mounted trim switch.
 - Select the LE Flaps and Slats to the full down position.

NOTE: Wait for the LE flaps/slats to reach the full down position.
 - Select the LE Flaps and Slats to the full up position.

NOTE: Wait for the LE flaps/slats to reach the full up position.
 - Prepare for the autopilot check:
 - Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.
 - Set the left and right IRS select switches, on the P5 aft overhead panel, to the NAV position.

NOTE: The IRS can take 5 to 17 minutes to align.
 - Operate the autopilot servos as follows:
 - Engage one autopilot channel.

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- 2) Engage vertical speed mode.
 - a) Select vertical speed of 2000 fpm.
NOTE: Wait for column motion to stop.
 - b) Select vertical speed of 0 fpm.
NOTE: Wait for column motion to stop.
 - c) Select vertical speed of -2000 fpm.
NOTE: Wait for column motion to stop.
 - d) Select vertical speed of 0 fpm.
NOTE: Wait for column motion to stop.
- 3) Engage heading select mode.
 - a) Select 30 degree heading change to the left of airplane heading.
NOTE: Wait for wheel motion to stop.
 - b) Select 30 degree heading change to the right of airplane heading.
NOTE: Wait for wheel motion to stop.
- 4) Repeat steps 1 through 3 for the other autopilot channel.

SUBTASK 12-33-02-860-024

- (10) Inspect the wheel wells for ice/snow/slush on the Alternate Landing Gear System Components.
 - (a) Clear as necessary.

SUBTASK 12-33-02-210-026

- (11) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-027

- (12) Visually check the landing gear.

- (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
- (b) Look for leaks on the Main Landing Gear (MLG) and Nose Landing Gear (NLG) retract actuators.
- (c) Service the landing gear tires if necessary: Landing Gear Tire Pressure Check and Tire Servicing, TASK 12-15-51-780-801.
- (d) Service the NLG shock strut if necessary: Main Landing Gear Shock Strut Fluid Check, TASK 12-15-31-610-801.
- (e) Service the MLG shock strut if necessary: Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-41-610-801.

SUBTASK 12-33-02-610-004

- (13) Service the hydraulic system if necessary: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 12-33-02-860-025

- (14) When adding fuel, it is necessary to use these requirements:

- (a) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps.
 - 1) To check for water at the fuel tank sump drain valves with fuel temperature below 32°F (0°C), do one of the following to raise the temperature of the fuel:
 - a) Fill the tanks with warm fuel.
 - b) Move the airplane in to a warm hangar.

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- (b) Make sure that the fuel temperature is at least 6°F or 3.3°C above the fuel freeze point. Use the American Society for Testing and Materials (ASTM) method to determine the freeze point.

NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.

- 1) Use fuels that meet specification ASTM D1655:
 - a) Jet A or Jet A1.
- 2) It's acceptable to use alternate fuels that meet specification MIL-DTL-5624G (or MIL-DTL-83133):
 - a) JP-5 (or JP-8).

- (c) Approved fuel additive is:

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

- 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
 - a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
- 2) Fuel additive, specification ASTM D4171.
 - a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.

SUBTASK 12-33-02-860-023

- (15) At temperatures below -22°F (-30°C), do these steps before starting the engines:
- (a) Apply localized heat to the inner cylinder of the nose and main gear.
 - (b) Pump the brake pedals 20 times shortly and verify extension/retraction of brake pistons at each brake.
 - 1) If brake operation is not normal, do the steps that follow:
 - a) Provide local warming to the brake.
 - b) Repeat the test until proper operation is observed.
 - c) If the difficulty continues:
 - <1> Do this task: Brake Disconnect Removal, TASK 32-41-11-000-801
 - <2> Do this task: Brake Disconnect Installation, TASK 32-41-11-400-801
 - <3> Do this task: Main Landing Gear Brake Removal, TASK 32-41-41-000-801
 - <4> Do this task: Main Landing Gear Brake Installation, TASK 32-41-41-400-801.

SUBTASK 12-33-02-700-001

- (16) Do these tasks to check the antiskid/autobrake system:
- (a) Autobrake Shuttle Valve Operational Test, TASK 32-42-00-400-802.
 - (b) Antiskid/Autobrake Control Unit Operational Test, TASK 32-42-00-720-801.

SUBTASK 12-33-02-600-010

- (17) Use the Input Monitoring Page on the CDU to monitor the engine oil temperature before you start the engines.
- (a) To see the engine oil temperatures, do these steps:
 - 1) Select ENGINE> from the MAINT BITE INDEX 1/1 page on the CDU.

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- 2) Select applicable engine (1 or 2) ENGINE EXCEED BITE INDEX page which will initialize the engine bite test.
 - 3) Select INPUT MONITORING from the ENGINE BITE TEST MAINT MENU.
 - 4) Select CONTINUE to open the ENGINE BITE TEST INPUT MONITORING.
- (b) If the engine oil temperature shown on the CDU is below -35°F (-37°C), heat the engines with a explosion proof electric blower - heater, STD-3925, or suitable substitute:
- (c) Make sure the engine oil temperature on the CDU is above -35°F (-37°C), then follow the steps below to start the engines:
- 1) See engine operating limits (TASK 71-00-00-800-806-F00).
 - 2) Prepare the engine for operation and cold weather starting, do this task: Procedure to Prepare the Engine for Operation, TASK 71-00-00-700-818-F00.



CAUTION

REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- 3) Remove Ground-Accumulated Ice.
 - a) Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts.
 - b) Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.
- 4) Engine icing can occur when the conditions that follow occur:
NOTE: It is necessary to use the thermal anti-icing system for the engines/nacelles when these conditions occur.
 - a) There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
 - b) Do ground operations with the static air temperature is less than 50°F (10°C).
- 5) Do this task: IDG Oil Level Check, TASK 12-13-21-200-801.
NOTE: If the Integrated Drive Generator (IDG) is serviced for cold weather operation, use the preferred oil, D00071, lubricant instead of MIL-L-23699 lubricant. The only MIL-PRF-7808 lubricants approved for use below -35°F (-37°C) for Hamilton Sundstrand IDGs are Exxon 2389, BPTO 2389, Aero Shell 390, and Castrol 325.
- 6) Before start the engines, remove all heater hoses from the engine fan outlet and engine gear box.
- 7) Make sure that there are no fluids around the exhaust areas that can start ignition.
- 8) Do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.
- 9) Run the engines at idle until the oil temperature is at or above 32°F (0°C).
- 10) Make sure that the oil temperature is at least 32°F (0°C) before you increase the power above idle.

SUBTASK 12-33-02-700-003

- (18) Do a function of the flaps as follows:
- (a) Select the flaps to the full down position.
 - 1) Make sure that the flaps move to the full down position.

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- (b) Select the flaps to the full up position.
 - 1) Make sure that the flaps move to the full up position.

SUBTASK 12-33-02-550-002



CAUTION

REMOVE ALL ICE AND SNOW FROM THE AIRSTAIRS BEFORE YOU MOVE THE AIRSTAIRS IN THE FUSELAGE. ICE AND SNOW WILL MELT IN THE FUSELAGE AND CAN DRAIN ON THE ELECTRONIC EQUIPMENT. DAMAGE TO ELECTRONIC EQUIPMENT CAN OCCUR.

- (19) If the airplane has a forward airstair, all ice and snow must be removed completely each time the airstairs are put in the stow position.

- (a) Gain access under the airstairs through this access panel:

Number Name/Location

117A Electronic Equipment Access Door

- (b) Check for water on the drip shields and around the electronic equipment.

- (c) Remove all water on the drip shields and around electronic equipment.

- (d) Close this access panel:

Number Name/Location

117A Electronic Equipment Access Door

SUBTASK 12-33-02-550-007

- (20) Prior to flight, do this task:

- (a) Cold Weather Maintenance Procedure, TASK 12-33-01-600-802

- (b) Install portable fire extinguishers, emergency flashlights, first aid kits, smoke protection hoods, portable oxygen equipment, and bull horns.

- (c) Install the galley boilers and steam ovens if they were removed.

SUBTASK 12-33-02-800-001

- (21) Observe the flight crew and portable oxygen systems.

- (a) It may be noted that the pressure in the flight crew and portable oxygen systems may indicate lower than normal at cold temperatures (Crew Oxygen Cylinder Replacement, TASK 12-15-21-600-801 or Crew Oxygen Cylinder Replacement, TASK 12-15-21-600-803-002 for temperature effects).

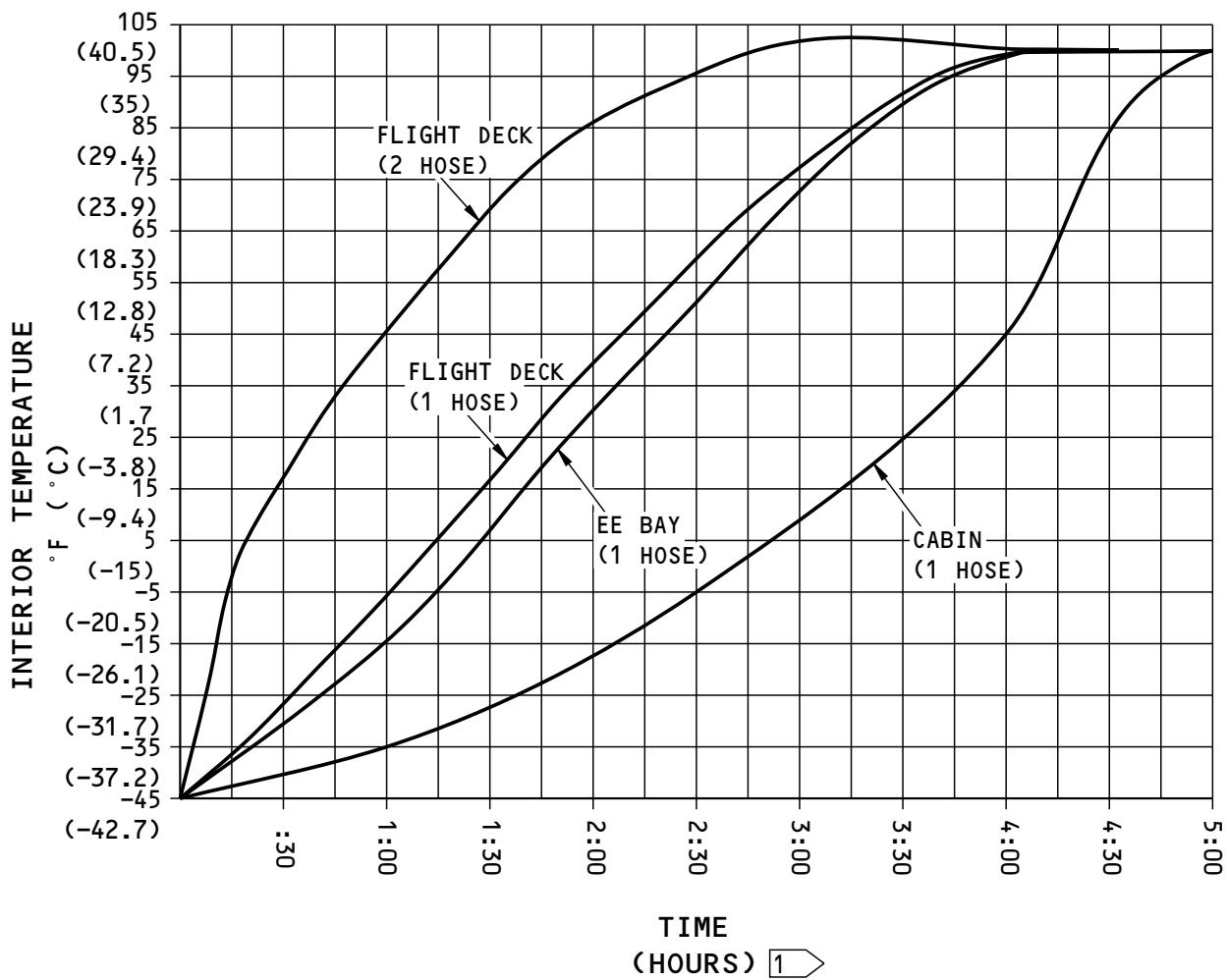
———— END OF TASK ————

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1 TIME TO WARM INTERIOR COMPONENTS TO AVERAGE STABLE TEMPERATURE CONDITION

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Heating Schedule
Figure 301/12-33-02-990-806

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AIRPLANE CLEANING AND POLISHING - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Clean (Wet Wash) the external surfaces of the airplane.
 - (2) Clean (Waterless Wash) the external surfaces of the airplane.
 - (3) Polish the external surfaces of the airplane.
 - (4) Clean the Exterior Surface of Volcanic and Fire Ash.

TASK 12-40-00-100-801

2. Clean (Wet Wash) the External Surfaces of the Airplane

A. General

- (1) Failure to remove covers from pitot probes or coverings from static ports before flight may cause large errors in airspeed-sensing and altitude-sensing signals which may lead to loss of safe flights.
- (2) Use this procedure to clean and polish the external surfaces of the airplane. Use this procedure to help decrease filiform corrosion under paint on clad aluminum surfaces. Clean the external surfaces frequently to help prevent corrosion and to extend the life of the airplane structure. Clean the surfaces that do not have paint more frequently than the painted surfaces.



WARNING

ALWAYS WEAR PROTECTIVE CLOTHING THAT WILL PREVENT INJURY WHEN YOU CLEAN THE AIRPLANE. THE LIQUIDS USED IN THIS PROCEDURE CAN CAUSE INJURY TO THE SKIN AND EYES, OR DAMAGE TO THE AIRPLANE. THE CLEANERS CAN CAUSE CORROSION IF THEY ARE NOT REMOVED COMPLETELY FROM THE AIRPLANE SURFACES. THE SOLVENT THAT IS MIXED WITH THE CLEANERS IS FLAMMABLE. KEEP THE SOLVENT AWAY FROM SOURCES OF HEAT.

- (3) This section includes these procedures:

NOTE: Boeing considers water pressure above 80 psi to be "high pressure".

- (a) Remove light material (dust and dirt) from smooth surfaces.
- (b) Remove moderately heavy material (oil and mud) from smooth surfaces.
- (c) Remove heavy material (grease and exhaust particles) from smooth surfaces.
- (d) Remove material around sensitive components.
- (e) Remove unwanted hydraulic fluid.
- (f) Clean with foam.
- (4) Use the Remove Material Around Sensitive Components procedure to clean the areas that contain mechanical, electrical, or hydraulic components. These areas include the wheel wells, flight control surfaces, and landing gear.
- (5) When moderately heavy or heavy material removal is necessary, remove the heavier material first. Then clean the airplane with the procedure for light material removal.
- (6) To clean large areas, use non-atomizing spray equipment, swabs, and brushes. To clean small areas, use rags, brushes, and sponges. Do not clean an area so large that the cleaner dries on the surface before you can flush it with water.

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- (7) To clean the windows in the flight compartment, do this task: Clean the Glass Flight Compartment Windows - Inner Surface, TASK 12-16-02-100-801.
- (8) To clean the windows in the passenger compartment, do this task: Clean The Passenger Compartment Windows, TASK 12-16-03-100-801.
- (9) All cleaning materials should meet the requirements of BSS7432, "Evaluation of Airplane Maintenance Materials".

B. References

Reference	Title
12-11-00-680-801	Fuel System Sumping (P/B 301)
12-16-02-100-801	Clean the Glass Flight Compartment Windows - Inner Surface (P/B 301)
12-16-03-100-801	Clean The Passenger Compartment Windows (P/B 301)
12-26-00-600-801	Control Cable Lubrication (P/B 301)
20-30-82-910-801	General Cleaning of Solvent Resistant Organic Coatings (Series 82) (P/B 201)
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-814	Remove External 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-1501	Kit - Engine Cover Part #: BBJ-2001-JB-R Supplier: 4VVY1 Part #: BBJ-2001-JB-SDP Supplier: 4VVY1 Part #: I10233AR Supplier: 064U8
COM-1503	Cover - Probe, Pitot Part #: AVTB737PIT Supplier: 018PR Part #: B737-415 Supplier: 1LE67 Part #: KPC3-480-325 Supplier: 0P9C7 Part #: PC737 Supplier: 3BSK6 Part #: PC757-01SB Supplier: 38002 Part #: PCDH8-400 Supplier: 3BSK6 Part #: ZT-102 Supplier: 3BSK6 Opt Part #: KPC4-480-325 Supplier: 0P9C7
COM-1509	Cover - Protective, Main Landing Gear Wheels/Brakes Part #: AVTB737MLG Supplier: 018PR Part #: AVTB737MLGW Supplier: 018PR Part #: B737-455 Supplier: 1LE67 Part #: WL07J99 Supplier: 8M213
COM-1516	Cover - Engine Inlet, CFM56-7 Part #: 892807 Supplier: SBK11 Part #: AVTB73NCFM56 Supplier: 018PR Part #: B737-150 Supplier: 1LE67 Part #: B737-152 Supplier: 1LE67 Part #: BBJ-2V Supplier: 4VVY1 Part #: WL14L96A Supplier: 8M213

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Reference	Description
COM-1519	Cover - Protective, Total Air Temperature Probe Part #: AVTB737TAT Supplier: 018PR Part #: B737-420 Supplier: 1LE67 Part #: FTC-102 Supplier: 0P9C7 Part #: TAT102 Supplier: 3BSK6
COM-2499	Cover - Vane, Angle of Attack Part #: AVTB737AOA Supplier: 018PR Part #: R/C-AOAC-2 Supplier: 0P9C7
SPL-1508	Pole - Removal/Installation, Pitot Static Probe Cover Part #: A10002-9 Supplier: 81205 Part #: IP100 Supplier: 0P9C7 Opt Part #: A10002-7 Supplier: 81205
SPL-1513	Cover - Probe, Ice Detector Part #: 0061BN1 Supplier: 0P9C7 Part #: AVTB737ICE Supplier: 018PR Part #: ID400-1 Supplier: 3BSK6
SPL-1517	Cover - Engine Exhaust Part #: 896807 Supplier: SBK11 Part #: AVTB73NCFM56EPS Supplier: 018PR Part #: AVTB73NCFM5EEPS Supplier: 018PR
SPL-14189	Protective Cover - AOA Vane Part #: AOA100 Supplier: 3BSK6 Part #: AVTB737AOA Supplier: 018PR Part #: C10004-1 Supplier: 81205
SPL-14648	Plug - Fan Reverser Part #: 895807 Supplier: SBK11 Part #: AVTB73NCFM56BPS Supplier: 018PR
SPL-18121	Plug - Bypass & Exhaust Part #: B737-250 Supplier: 1LE67 Part #: BBJ-XG-2001 Supplier: 4VVY1 Part #: WL15L96A Supplier: 8M213
STD-1086	Gloves - Rubber
STD-1137	Glasses - Safety

D. Consumable Materials

Reference	Description	Specification
B00003	Cleaner - Emulsion Alkaline - GMC 528B (use until stock depleted)	
B00005	Cleaner - Alkaline - Cee Bee 280	BAC5744
B00013	Cleaner - Alkaline - Dubois C-1102	BAC5744
B00014	Cleaner - Zip-Chem Products Calla 301 Heavy Duty Cleaner	BAC5744
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00314	Compound - Aircraft Surface Cleaning	MIL-C-43616

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Reference	Description	Specification
B00325	Cleaner - Alkaline - Turco Jet Clean E	
B00434	Solvent - Alkaline - Metaclean AC	
B01023	Cleaner - Primary - Ardrox 6025	
B50085	Solvent - Skykleen 1000	BAC5750
B50093	Soap - Liquid - Kelite Spraywhite (Use until stock depleted)	BAC5507
B50114	Cleaner - General Purpose, Super Bee 210	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G02447	Tag - Red Paper, "PITOT PROBES COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G50330	Fabric - Insulation Covering, Flame Propagation Resistant	BMS8-377
G51859	Sheeting - Polyethylene, 6 mils thick minimum	ASTM D2103

E. Cleaner Mixing Instructions

SUBTASK 12-40-00-110-001

- (1) For alkaline cleaners mix the cleaners in the proportions in Table 201.

NOTE: These cleaners are used for light material removal.

Table 201/12-40-00-993-801 Water Base Alkaline Cleaners

Dilution Ratios (Number of Volumes of Water per One Volume of Cleaner)			
Cleaner	Lightly Dirty	Moderately Dirty	Very Dirty
GMC 528B cleaner, B00003 ^[1]	7	3	2
Kelite Spraywhite, B50093	10	4	2
Cee Bee 280 cleaner, B00005	10	4	2
Ardrox 6025 cleaner, B01023	9	5	1
Super Bee 210 cleaner, B50114	4	3	2
Metaclean AC solvent, B00434	10	4	2
Dubois C-1102 cleaner, B00013	10	4	3
Calla 301 cleaner, B00014	10	4	3
Turco Jet Clean E cleaner, B00325	10	5	3

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*[1] Solution should not be allowed to contact acrylic plastics – crazing may occur.

SUBTASK 12-40-00-110-002

- (2) For solvent emulsion cleaners, mix the cleaners in the proportions in Table 202.

NOTE: These cleaners are used for moderate material removal.

Table 202/12-40-00-993-802 Solvent Emulsion Cleaners

Dilution Ratio (Number of Volumes of Water and Cleaning Solvent per One Volume of Cleaner)		
Cleaner	Water	Cleaning Solvent (General Cleaning of Solvent Resistant Organic Coatings (Series 82), TASK 20-30-82-910-801)
Any Cleaner in TASK 20-30-82-910-801	2	5 to 6

SUBTASK 12-40-00-110-009

- (3) For heavy duty cleaners, mix the cleaners in the proportions in Table 203.

Table 203/12-40-00-993-808 Heavy Duty Cleaners

Dilution Ratio (Number of Volumes of Water and Cleaning Solvent per One Volume of Cleaner)		
Cleaner	Water	Cleaning Solvent
Heavy duty cleaning compound, B00314	2	1
Super Bee 210 cleaner, B50114	1	1 to 3

F. Prepare to Clean the Airplane

NOTE: Be careful when you clean the airplane in very hot weather. The heated surface of the airplane can dry the cleaners before you can flush them with water. The dried cleaners can stain the surface.

SUBTASK 12-40-00-500-001



KEEP ALL OF THE EQUIPMENT THAT YOU USE WITH FLAMMABLE SOLVENTS AWAY FROM SOURCES OF HEAT. IF THERE IS WIND, MAKE SURE THE SOLVENTS DO NOT FALL ON ELECTRICAL EQUIPMENT OR WARM COMPONENTS.

- (1) Move all of the equipment that you will use with flammable solvents away from sources of heat.

SUBTASK 12-40-00-860-001

- (2) Do this task: Static Grounding, TASK 20-40-11-910-801.

SUBTASK 12-40-00-860-006

- (3) Remove electrical power, do this task: Remove External Power, TASK 24-22-00-860-814.

SUBTASK 12-40-00-840-002

- (4) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.

NOTE: If the doors cannot be closed because of other servicing, be careful that no fluid gets into the cabin area.

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SUBTASK 12-40-00-840-003



WARNING

WHEN THE PITOT PROBES ARE COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. IN ADDITION, ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT DECK AS A REMINDER THAT PITOT PROBES ARE COVERED. FAILURE TO OBSERVE AND REMOVE COVERINGS OVER PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

USE COVERS, BLACK POLYETHYLENE SHEET, AND YELLOW VINYL ADHESIVE TAPE TO KEEP LIQUIDS OUT OF AREAS THAT CONTAIN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. LIQUIDS THAT GET INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.



CAUTION

WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (5) Install covers on components to prevent contamination.



CAUTION

MAKE SURE THE PROBE COVER IS IN GOOD WORKING CONDITION WITH NO EVIDENCE OF DAMAGE, ESPECIALLY FRAYING AROUND THE COVER OPENING. FRAYED FIBERS FROM THE COVER COMBINED WITH OTHER SUBSTANCES SUCH AS DIRT, GREASE AND FLUIDS CAN CAUSE OBSTRUCTION IN THE PROBE.

- (a) Install the pitot probe cover, COM-1503, on the elevator and fuselage pitot probes with the pitot static probe cover removal/installation pole, SPL-1508 (Figure 201).

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- (b) Install the probe cover, SPL-1513, on the ice detector probes.

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- (c) Install the probe cover, COM-1519, on the total air temperature probes.
(d) Install the Angle of Attack (AOA) sensor AOA vane protective cover, SPL-14189 (recommended), or angle of attack vane cover, COM-2499 (alternate).
(e) Install the engine covers as follows:
1) For the GE CFM 56-7 inlet, use the kit, COM-1501 (preferred), or inlet cover, COM-1516 (alternate).
2) For the GE CFM 56-7 exhaust, use the kit, COM-1501 (preferred), or exhaust plug, SPL-18121 (alternate).
NOTE: The exhaust plug, SPL-18121, installs to the exhaust and bypass of the engine.
NOTE: The engine exhaust cover, SPL-1517, and engine fan reverser plug, SPL-14648, are alternative covers to the exhaust plug, SPL-18121.
(f) Install the cover, COM-1509, on each landing gear wheel/brake.

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SUBTASK 12-40-00-840-009

- (6) Attach the "PITOT PROBES COVERED" tag, G02447, that has "PITOT PROBES COVERED" printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

SUBTASK 12-40-00-840-004



WARNING

MAKE SURE THE FUEL TANK VENT AND PRESSURE RELIEF VALVES ARE COVERED AND AVOID SPRAYING WATER DIRECTLY ONTO THE PRESSURE RELIEF VALVE. EXCESS WATER IN THE FUEL CAN CAUSE ENGINE OPERATIONAL ISSUES INCLUDING ENGINE SHUTDOWN.



CAUTION

WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.



CAUTION

DO NOT UNDER ANY CIRCUMSTANCES SPRAY DETERGENT OR WATER DIRECTLY INTO OR AT ANY OF THE OPENINGS LISTED BELOW OR DAMAGE TO THE AIRPLANE COULD RESULT.

- (7) Use vinyl adhesive Scotch Brand No.471 tape, G02219, and black polyethylene sheet polyethylene sheeting, G51859, to cover and seal the following openings in the following manner:
- (a) Cover and seal the following openings, but do not seal them air-tight (Figure 202):
- 1) Surge tank vents
 - 2) Fuel tank vents
 - 3) Fuel tank pressure relief valves.
- (b) Cover and seal the following openings so that the seal is air-tight:
- 1) Auxiliary Power Unit (APU) exhaust duct outlet port
 - 2) Ram air inlet and outlet doors
 - 3) Outflow valve
 - 4) Positive Pressure Relief Valve (PPRV) pressure ports.

SUBTASK 12-40-00-840-010



WARNING

WHEN THE STATIC PORTS ARE COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. IN ADDITION, ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT DECK AS A REMINDER THAT THE STATIC PORTS ARE COVERED. FAILURE TO OBSERVE AND REMOVE COVERINGS OVER STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

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(CAUTION PRECEDES)



CAUTION

DO NOT UNDER ANY CIRCUMSTANCES SPRAY DETERGENT OR WATER DIRECTLY INTO OR AT ANY OF THE OPENINGS LISTED BELOW OR DAMAGE TO THE AIRPLANE COULD RESULT.

- (8) Use yellow vinyl adhesive Scotch Brand No.471 tape, G02219, and barricade tape, G02443, that covers all of the alternate static ports in the following manner (Figure 203).



WARNING

DO NOT PLACE THE SCOTCH BRAND (3M) NUMBER 471 YELLOW VINYL ADHESIVE TAPE OVER THE HOLES OF THE STATIC PORTS. FAILURE TO REMOVE VINYL ADHESIVE TAPE FROM STATIC PORTS BEFORE FLIGHT CAN LEAD TO LOSS OF SAFE FLIGHT AND INJURY.

- (a) Clean the area around each static port with solvent, B00083, or equivalent, and a clean dry rag where you will put the Scotch Brand No.471 tape, G02219.
- (b) Put one end of approximately a 4 ft (1.2 m) piece of barricade tape, G02443, over the holes of the static port and secure the upper edge with a 5 in. (13 cm) strip of the adhesive Scotch Brand No.471 tape, G02219 (Figure 203).
 - 1) Smooth the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (3M), on the airplane surface to make sure that the bond is satisfactory.
- (c) Put a 5 in. (13 cm) piece of vinyl adhesive Scotch Brand No.471 tape, G02219, on each vertical edge of barricade tape, G02443, overlapping the first strip of vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 203).
- (d) Put an 8 in. (20 cm) piece of vinyl adhesive Scotch Brand No.471 tape, G02219, horizontally over the barricade tape, G02443, below the static port holes, overlapping the two vertical strips of adhesive Scotch Brand No.471 tape, G02219 (Figure 203).
- (e) The barricade tape, G02443, should be allowed to stream down so it is visible from the ground.

SUBTASK 12-40-00-620-001

- (9) For the all of the primary static ports, use the following static port cover procedure (Figure 203).



WARNING

DO NOT PLACE THE SCOTCH BRAND (3M) NUMBER 471 YELLOW VINYL ADHESIVE TAPE OVER THE HOLES OF THE STATIC PORTS. FAILURE TO REMOVE VINYL ADHESIVE TAPE FROM STATIC PORTS BEFORE FLIGHT CAN LEAD TO LOSS OF SAFE FLIGHT AND INJURY.

- (a) Clean the area around each primary static port with solvent, B00083, or equivalent, and a clean dry rag where you will put the 3M No. 471 yellow vinyl adhesive tape (Figure 203).
- (b) Place one end of a 4 ft (1.2 m) piece of barricade tape, G02443, over the holes of the upper primary static port and secure the upper edge with 5 in. (13 cm) of Scotch Brand No.471 tape, G02219 (Figure 203).
 - 1) Smooth the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (3M), on the airplane surface to make sure that the bond is satisfactory.
 - 2) Do not put Scotch Brand No.471 tape, G02219, over the holes of the static ports.
- (c) Put an 8 in. (20 cm) strip of Scotch Brand No.471 tape, G02219, on each vertical edge of the barricade tape, G02443, overlapping the first strip of adhesive tape (Figure 203).
- (d) Repeat this procedure for the other two primary static ports.

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- (e) Put an 8 in. (20 cm) strip of Scotch Brand No.471 tape, G02219, horizontally over the barricade tape, G02443, below the lower static port holes, overlapping the two vertical strips of adhesive tape (Figure 203).
- (f) The barricade tape, G02443, should be allowed to stream down so it is visible from the ground.

SUBTASK 12-40-00-840-011

- (10) Attach a "STATIC PORTS COVERED" tag, G02444, that has "STATIC PORTS COVERED" printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

SUBTASK 12-40-00-840-026

- (11) Attach a red tag with wire to the top of the left control wheel in the flight compartment.
 - (a) Write "AOA SENSORS COVERED" on the tag.

SUBTASK 12-40-00-840-027

- (12) Cover the AOA sensors (Figure 210).
 - (a) Use a piece of fabric, G50330, sheeting to cover each of the AOA sensors.
 - (b) Attach a 4 ft (1.2 m) piece of barricade tape, G02443, to the piece of fabric sheeting.
 - (c) Put the fabric sheeting along the upper edge of the AOA sensor.
 - 1) Make sure that the edge of the fabric on the upper edge of the AOA sensor is opposite of the end with the piece of barricade tape.
 - (d) Put one piece of Scotch Brand No.471 tape, G02219, on the upper edge of the fabric sheeting.
 - (e) Put a piece of Scotch Brand No.471 tape, G02219, on each vertical edge of the fabric sheeting.
 - 1) Overlap the horizontal piece of tape with the two vertical pieces of tape.
 - (f) Put a piece of Scotch Brand No.471 tape, G02219, horizontally over the fabric sheeting below the AOA sensor.
 - 1) Overlap the two vertical strips of tape.

SUBTASK 12-40-00-950-001

- (13) Use polyethylene sheeting, G51859, to cover the components (Table 204).

NOTE: All components are identified in the figures below.

- Aileron Power Control Unit (Figure 204)
- A/P Aileron Actuator (Figure 205)
- Spring Cartridge (Figure 206)
- Nose Gear Wheel Bearings (Figure 207)
- Boost Pump Low Pressure Switches (Figure 208)
- Control Valve Module (CVM) (Figure 209).

Table 204/12-40-00-993-809 Wheel Well Component Protection

DESCRIPTION	LOCATION	FIGURE NUMBER
Aileron Centering Mechanism Assembly		
Aileron Upper Reaction Support Assembly		
Bearing	1	Figure 204
Bearing	2	Figure 204

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Table 204/12-40-00-993-809 Wheel Well Component Protection (Continued)

DESCRIPTION	LOCATION	FIGURE NUMBER
Centering Cam Follower		
Bearing	3	Figure 204
Lever Assembly		
Bearing	4	Figure 204
Aileron Lower Reaction Support Assembly		
Bearing	5	Figure 204
Aileron Trim Mechanism		
Aileron Trim Actuator/Electrical Connector	6	Figure 204
Aileron Position Sensor		
Transmitter/Electrical Connector	7	Figure 205
Rod Assembly/Bearings	8,9	Figure 205
Aileron Control Autopilot Actuator		
Autopilot Actuator/Electrical Connector	10	Figure 205
Rod Assembly/Bearings	11,12	Figure 205
Power Control - Aileron Control		
Power Control Assembly (B System)	30	Figure 204
Bearing	13	Figure 204
Bearing	14	Figure 204
Support Assembly (Upper)		
Bearing	15	Figure 204
Bearing	16	Figure 204
Lever Assembly		
Bearing	17	Figure 204
Power Control Assembly (A System)	31	Figure 204
Bearing	18	Figure 204
Bearing	19	Figure 204
Support Assembly (Lower)		
Bearing	20	Figure 204
Support Assembly		
Bearing	21	Figure 204
Lever Assembly		
Bearing	22	Figure 204
Quadrant - Spoiler Control		
Shaft Assembly		
Bearing	23	Figure 206

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Table 204/12-40-00-993-809 Wheel Well Component Protection (Continued)

DESCRIPTION	LOCATION	FIGURE NUMBER
Support Assembly		
Bearing	24	Figure 206
Cartridge Assembly		
Rod End Bearing	25	Figure 206
Casing Assembly		
Rod End	26	Figure 206
Spoiler - Mixer Assembly	27	Figure 206
Spoiler Ratio Changer Assembly	28	Figure 206
Ground Spoiler Control Valve Assembly and Rod Bearings	29	Figure 206
Nose Landing Gear Wheel Bearings	32	Figure 207
Boost Pump Low Pressure Switch	33, 34, 35	Figure 208
Control Valve Module (CVM)	36	Figure 209

SUBTASK 12-40-00-950-002



CAUTION

PUT A COVER ON THE WHEEL BEARINGS OF THE NOSE LANDING GEAR BEFORE YOU CLEAN THE AIRPLANE. WATER OR CLEANING SOLUTIONS CAN CAUSE DAMAGE TO THE WHEEL BEARINGS AND MAKE THEM UNSERVICEABLE.

- (14) Cover the nose landing gear wheel bearings with a plastic membrane before washing.

SUBTASK 12-40-00-840-005



WARNING

WEAR CLOTHING AND EQUIPMENT THAT WILL PREVENT INJURY WHEN YOU CLEAN THE AIRPLANE. THE LIQUIDS USED IN THIS PROCEDURE CAN CAUSE INJURY TO SKIN AND EYES.

- (15) Wear rubber glove, STD-1086, and safety glasses, STD-1137, to prevent injury to your skin and eyes.

SUBTASK 12-40-00-840-006

- (16) Do not let the tires stay in the liquid that was used to clean the airplane longer than the time necessary to clean the airplane.

SUBTASK 12-40-00-840-007



CAUTION

MAKE SURE THAT THE MIXTURE OF WATER AND CLEANER DOES NOT GET IN THE STEEL OR CARBON-BRAKE HEAT-SINKS. CONTAMINATION CAN CAUSE DAMAGE TO CARBON BRAKES AND DECREASE BRAKE PERFORMANCE FOR CARBON AND STEEL BRAKES.

- (17) Make sure that the brakes are properly covered.

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SUBTASK 12-40-00-840-008



CAUTION

DO NOT USE A CLEANER IF IT IS IN A STRATIFIED (NOT MIXED) CONDITION. A CLEANER THAT IS STRATIFIED CAN STAIN OR CAUSE CORROSION TO AIRPLANE SURFACES.

- (18) Examine the cleaner before you use it.
 - (a) If cleaner does not look mixed, mix it again.
 - (b) Examine the cleaner again after one hour.
 - 1) Discard the cleaner if it does not stay in a mixed condition.

G. Clean the Airplane

SUBTASK 12-40-00-110-003

- (1) Remove light material (dust and dirt) from smooth surfaces.
 - (a) Move the flaps to the fully retracted position.



CAUTION

DO NOT USE THE CLEANERS IN HIGHER CONCENTRATIONS THAN RECOMMENDED IN THE TABLE "WATER BASE ALKALINE CLEANERS". HIGHER CONCENTRATIONS CAN CAUSE DAMAGE TO ACRYLIC WINDOWS, STAINS ON PAINTED SURFACES, AND CORROSION ON METALS.

- (b) Mix the cleaner for the condition of the surface that you will clean (Table 201).



WARNING

DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



CAUTION

MAKE SURE THAT YOU KEEP THE SPRAY EQUIPMENT NOZZLE MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. IF YOU DO NOT OBEY, THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.

- (c) Apply water to the area that you will clean.

- (d) Apply the cleaner to the applicable area with non-atomizing spray equipment, swabs, or brushes.

NOTE: To prevent scratches on the surface, it is necessary to soak the brushes in the cleaner before you use them.



CAUTION

DO NOT LET THE CLEANER DRY. THE DRIED CLEANER CAN CAUSE CORROSION AND DAMAGE TO THE AIRPLANE SURFACE.

- (e) Let the cleaner soak for approximately five minutes.

- 1) Apply the cleaner again if it is necessary to keep the surface wet.

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- (f) Rub the surface with a brush to help remove unwanted material.



CAUTION MAKE SURE THAT YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. IF YOU DO NOT REMOVE ALL OF THE CLEANER, IT CAN CAUSE CORROSION ON THE AIRPLANE SURFACE.

- (g) Flush the surface with clean, warm water (160°F (71°C) maximum).
(h) Dry the wet surface with air or towels.

SUBTASK 12-40-00-110-004

- (2) Remove moderately heavy material (oil and mud) from smooth surfaces.

- (a) Move the flaps to the fully retracted position.

NOTE: To clean the flaps in the extended position, refer to the steps below shown under "Remove Material Around Sensitive Components".



WARNING KEEP EMULSION CLEANER SOLVENT AWAY FROM SOURCES OF HEAT. THE SOLVENT IS FLAMMABLE AND CAN CAUSE INJURY.

- (b) Mix the cleaner (Table 202).
(c) Mix the cleaner until it is thick and creamy.



WARNING DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



CAUTION

MAKE SURE THAT YOU KEEP THE SPRAY EQUIPMENT NOZZLE MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. IF YOU DO NOT OBEY, THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.



CAUTION

DO NOT LET THE SOLVENT EMULSION CLEANER TOUCH ACRYLIC WINDOWS OR RUBBER PARTS. THE SOLVENT EMULSION CLEANER WILL CAUSE DAMAGE TO ITEMS THAT CONTAIN ACRYLIC OR RUBBER.

- (d) Apply a heavy layer of cleaner to the applicable area with non-atomizing spray equipment, mops, or brushes.
(e) Let the cleaner soak for five to ten minutes.
 1) Do not let the cleaner dry on the surface.
(f) Rub the surface with a brush to help remove unwanted material.

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MAKE SURE THAT YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. IF YOU DO NOT REMOVE ALL OF THE CLEANER, IT CAN CAUSE CORROSION ON THE AIRPLANE SURFACE.

- (g) Flush the surface with clean, warm water (160°F (71°C) maximum).

- (h) Dry the wet surfaces with air or towels.

SUBTASK 12-40-00-110-005

- (3) Remove heavy material (grease and exhaust particles) from smooth surfaces.

- (a) Use the procedure to remove moderately heavy material (oil and mud) from smooth surfaces with these changes:
- 1) Use a cleaner (Table 203).
 - 2) Let the cleaner soak for 15 minutes maximum.
 - 3) For stains that are not removed by the cleaners (Table 203), use Cee Bee 280 cleaner, B00005.

SUBTASK 12-40-00-110-006

- (4) Remove material around sensitive components.

- (a) If you clean the flaps, extend them to the fully down position.
- (b) Mix the cleaner for the condition of the surface that you will clean (Table 201).
- 1) Mix the cleaner for heavy material (grease and exhaust particles), (Table 203).



WARNING

DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.

- (c) Apply cleaner to the applicable area with swabs, brushes, or clean with the cotton wiper, G00034. Make sure that the cotton wiper is moist with solvent, B00148 or alcohol, B00130.

NOTE: To prevent scratches on the surface, it is necessary to soak the brushes in the cleaner before you use them.

- (d) Let the cleaner soak for approximately five minutes.

- 1) Apply the cleaner again if it is necessary to keep the surface wet.



CAUTION

DO NOT REMOVE THE LAYER OF GREASE FROM MECHANICAL JOINTS. THIS GREASE LUBRICATES THE JOINT AND PREVENTS CORROSION. IF YOU REMOVE THE GREASE, IT CAN CAUSE DAMAGE.

- (e) Carefully rub the surface with a clean brush to help remove unwanted material.

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MAKE SURE THAT YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. IF YOU DO NOT REMOVE ALL OF THE CLEANER, IT CAN CAUSE CORROSION ON THE AIRPLANE SURFACE.

- (f) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (g) Dry the wet surface with air or towels.



YOU MUST LUBRICATE ALL THE BEARINGS AND JOINTS IN THE AREA YOU CLEANED. THE LUBRICANT WILL REMOVE THE UNWANTED FLUIDS WHICH COULD FREEZE, OR CAUSE CORROSION TO THE BEARING OR THE JOINT. IF YOU DO NOT LUBRICATE THE BEARINGS AND JOINTS, DAMAGE TO THE COMPONENTS CAN OCCUR.

- (h) Lubricate all bearings and joints in the cleaned area.

SUBTASK 12-40-00-110-007

- (5) Remove unwanted hydraulic fluid.
 - (a) Clean the unwanted hydraulic fluid with a mop or rags.



DO NOT USE WATER OR CLEANERS THAT CONTAIN FLAMMABLE SOLVENTS TO CLEAN WARM COMPONENTS. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (b) Use the solvent, B50085, to clean the hydraulic fluid from warm components.

SUBTASK 12-40-00-110-008

- (6) Clean with foam.
 - (a) Use foam when it is possible that the cleaner will stay on the surface for up to 15 minutes.
 - (b) Fill the tank of the foam generator with a liquid that contains one part of cleaner and 10 to 20 parts of water (Table 201).
 - 1) If you do not have a foam generator, mix the liquid quickly to make foam.



DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



MAKE SURE THAT YOU KEEP THE SPRAY EQUIPMENT NOZZLE MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. IF YOU DO NOT OBEY, THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.

- (c) Apply water to the area you will clean.
- (d) Apply a heavy layer of foam cleaner.
- (e) Let the cleaner soak for 5 to 15 minutes.

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- 1) Apply the cleaner again if it is necessary.
- (f) Rub the surface with a brush to help remove unwanted material.



CAUTION

MAKE SURE THAT YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. IF YOU DO NOT REMOVE ALL OF THE CLEANER, IT CAN CAUSE CORROSION ON THE AIRPLANE SURFACE.

- (g) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (h) Dry the wet surface with air or towels.



CAUTION

DO NOT APPLY SOLVENTS, GREASE, OR OIL TO STAINLESS STEEL CONTROL CABLES. THESE MATERIALS CAN COLLECT CONTAMINATION THAT CAN CAUSE DAMAGE TO THE INTERNAL SURFACES OF THE CRES CABLE STRANDS. THIS CAN DECREASE THE SERVICE LIFE OF THE CABLE.

- (i) Clean and lubricate the carbon steel control cables located in the wheel wells after cleaning or washing, do this task: Control Cable Lubrication, TASK 12-26-00-600-801 (Figure 206).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-40-00-020-004

- (1) Remove polyethylene sheeting, G51859, from the components (Table 204).

NOTE: All components are identified in the figures below.

- Aileron Power Control Unit (Figure 204)
- A/P Aileron Actuator (Figure 205)
- Spring Cartridge (Figure 206)
- Nose Gear Wheel Bearings (Figure 207)
- Boost Pump Low Pressure Switches (Figure 208)
- CVM (Figure 209).

SUBTASK 12-40-00-020-001



WARNING

FAILURE TO REMOVE COVERS FROM PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

REMOVE ALL COVERS. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (2) Remove all covers from the following components:

- (a) Pitot probes

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- (b) Ice detector probes

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- (c) Total air temperature probes

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- (d) Engine inlet
- (e) Turbine exhaust
- (f) Each landing gear wheel/brake.

SUBTASK 12-40-00-840-012

- (3) Remove the "PITOT PROBES COVERED" tag, G02447, from the left control wheel in the flight deck.

SUBTASK 12-40-00-840-013



WARNING

FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM ALL OF THE STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



WARNING

DRAIN THE FUEL TANK SUMPS AND ASSOCIATED SURGE TANKS IF THE PRESSURE RELIEF VALVE IS FOUND OPEN. WATER MAY HAVE ENTERED THE TANK AND MUST BE DRAINED. EXCESS WATER CAN CAUSE ENGINE OPERATIONAL ISSUES INCLUDING SHUTDOWN.



CAUTION

REMOVE ALL BARRICADE TAPE AND VINYL ADHESIVE TAPE. ENGINES SHOULD NOT BE OPERATED WITH COVERINGS IN PLACE BECAUSE THE COVERINGS CAN COME OFF AND DAMAGE THE ENGINES.

- (4) Remove all barricade tape, G02443, covers, polyethylene sheeting, G51859, and vinyl adhesive Scotch Brand No.471 tape, G02219, from the following openings:
 - (a) Static ports
 - 1) Inspect each static port and if it is necessary, use solvent, B00083, or equivalent, to remove all tape residue, dirt, and other contaminants from around the static ports.
 - (b) AOA sensors
 - 1) Remove the AOA sensor AOA vane protective cover, SPL-14189 (recommended), or angle of attack vane cover, COM-2499 (alternate).
 - 2) Inspect each AOA sensor and if it is necessary, use solvent, B00083, or equivalent, to remove all tape residue, dirt, and other contaminants from around the AOA sensors.
 - (c) Surge tank and fuel tank vents and fuel tank pressure relief valves

NOTE: If the pressure relief valve is found open, water may have entered the fuel tank.
This water needs to be removed before flight.
 - (d) APU exhaust duct outlet port
 - (e) Ram air inlet and outlet doors
 - (f) Outflow valve
 - (g) PPRV pressure ports.

SUBTASK 12-40-00-680-001

- (5) If necessary, drain fuel from the fuel tank sump drains, do this task: Fuel System Summing, TASK 12-11-00-680-801.

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- (a) Continue to drain fuel/water from the tank until no water drains from the tanks.

NOTE: A large quantity of water in the surge tank or in a fuel tank can indicate that water entered the tank during washing. Excess water in the fuel can cause engine operational issues including engine shutdown.

SUBTASK 12-40-00-840-014

- (6) Remove the "STATIC PORTS COVERED" tag, G02444, from the left control wheel in the flight deck.

SUBTASK 12-40-00-840-028

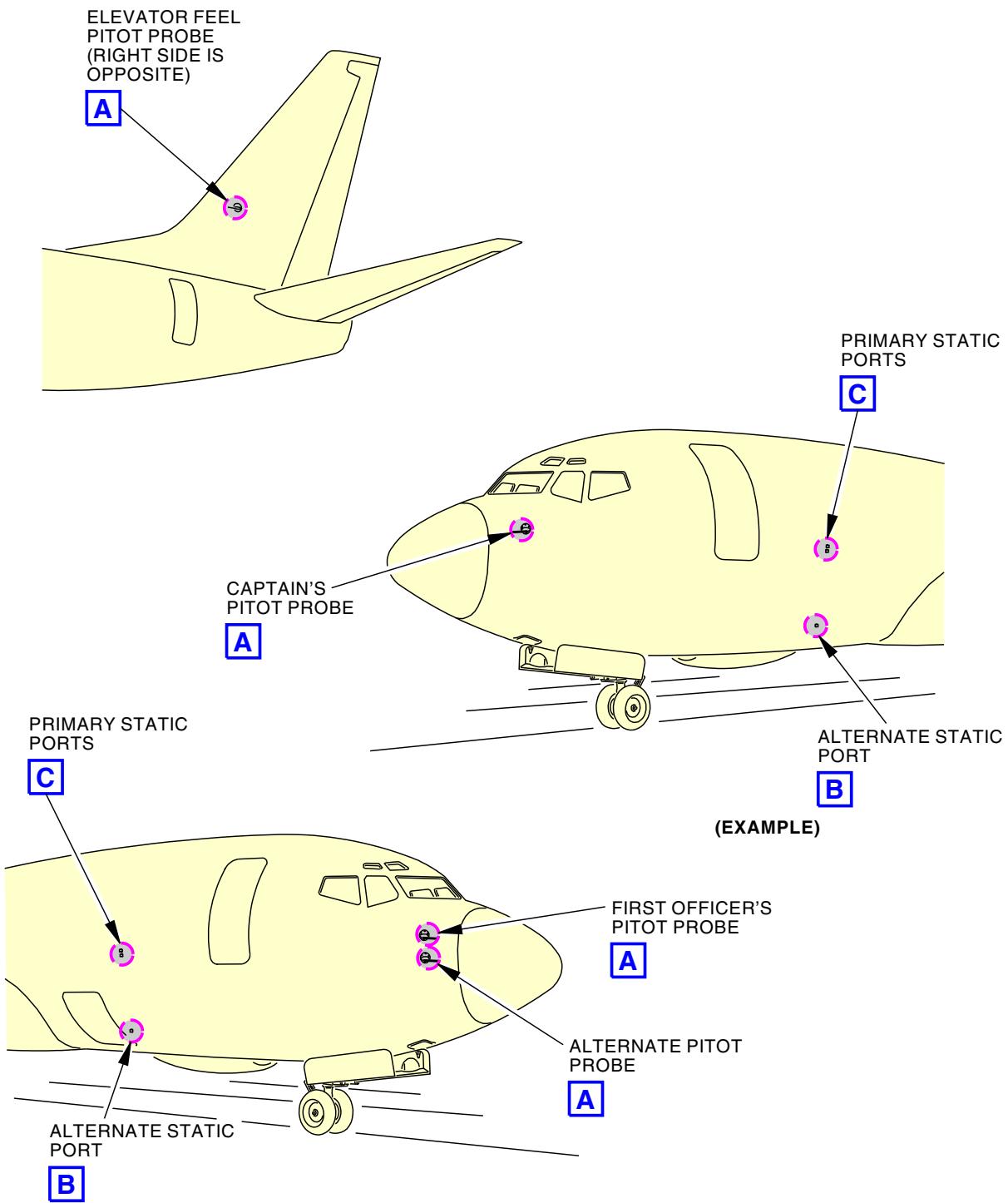
- (7) Remove the "AOA SENSORS COVERED" tag from the left control wheel in the flight deck.

———— END OF TASK ————

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G55370 S0006561793_V4

Pitot Static System - Component Location
Figure 20112-40-00-990-809 (Sheet 1 of 2)

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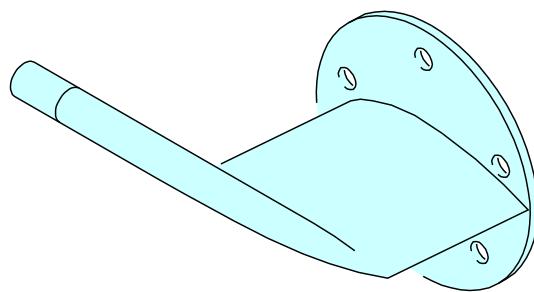
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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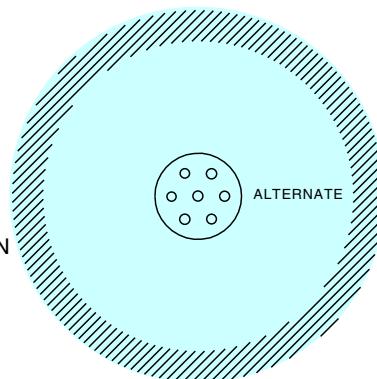
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PITOT PROBE
(EXAMPLE)

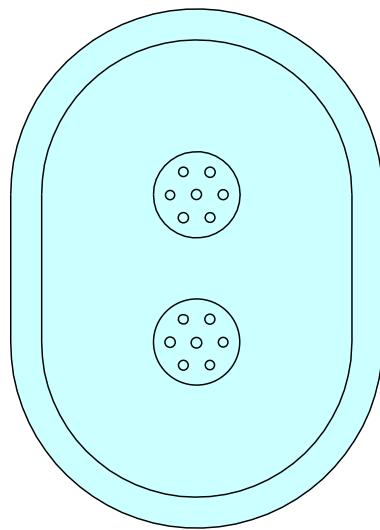
A

STATIC PORT
DO NOT PLUG OR DEFORM
HOLES INDICATED AREAS
MUST BE SMOOTH AND CLEAN



ALTERNATE STATIC PORT
(EXAMPLE)

B



PRIMARY STATIC PORTS
(EXAMPLE)

C

G55402 S0006561794_V3

Pitot Static System - Component Location
Figure 20112-40-00-990-809 (Sheet 2 of 2)

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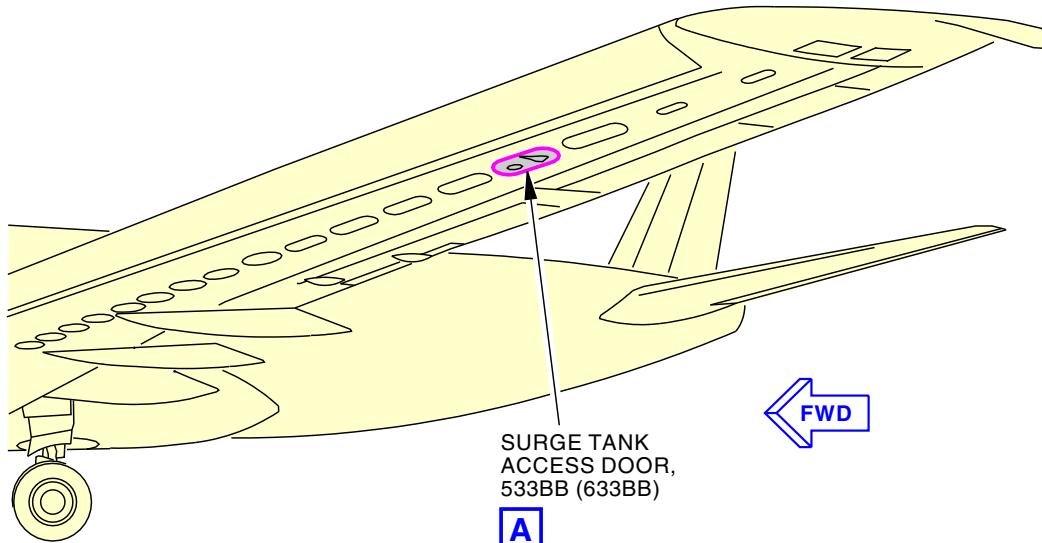
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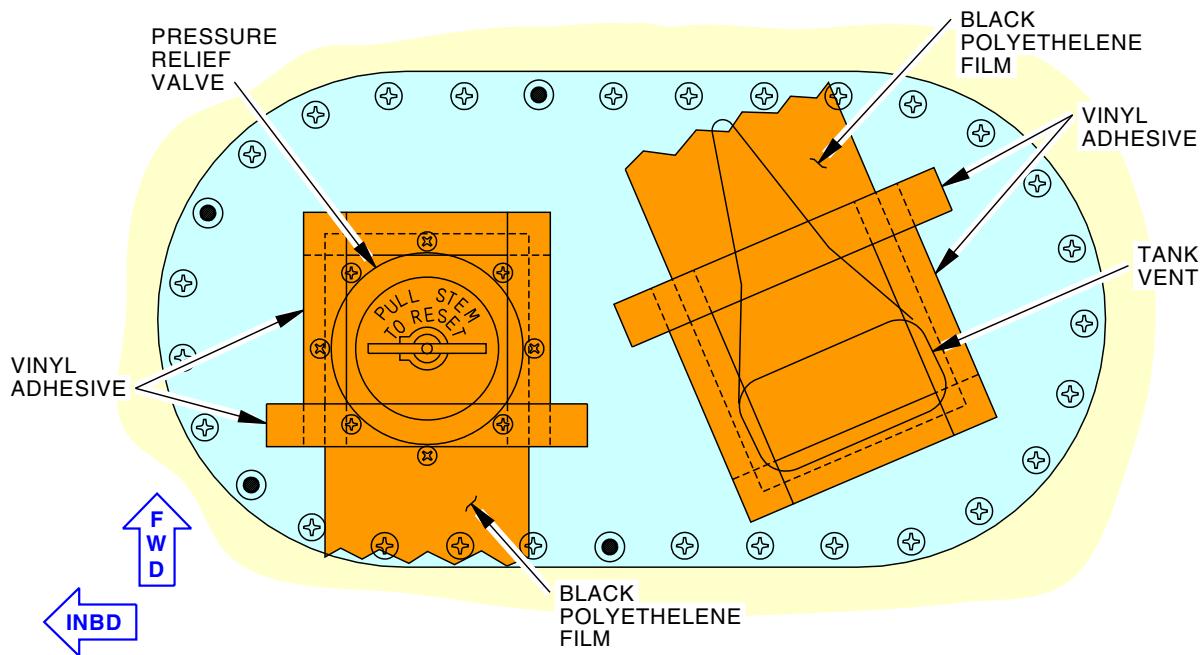
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LEFT WING
(RIGHT WING IS OPPOSITE)



SURGE TANK ACCESS DOOR
(VIEW IN THE UP DIRECTION)



2507883 S0000590644_V1

Surge Tank - Component Location
Figure 202/12-40-00-990-818



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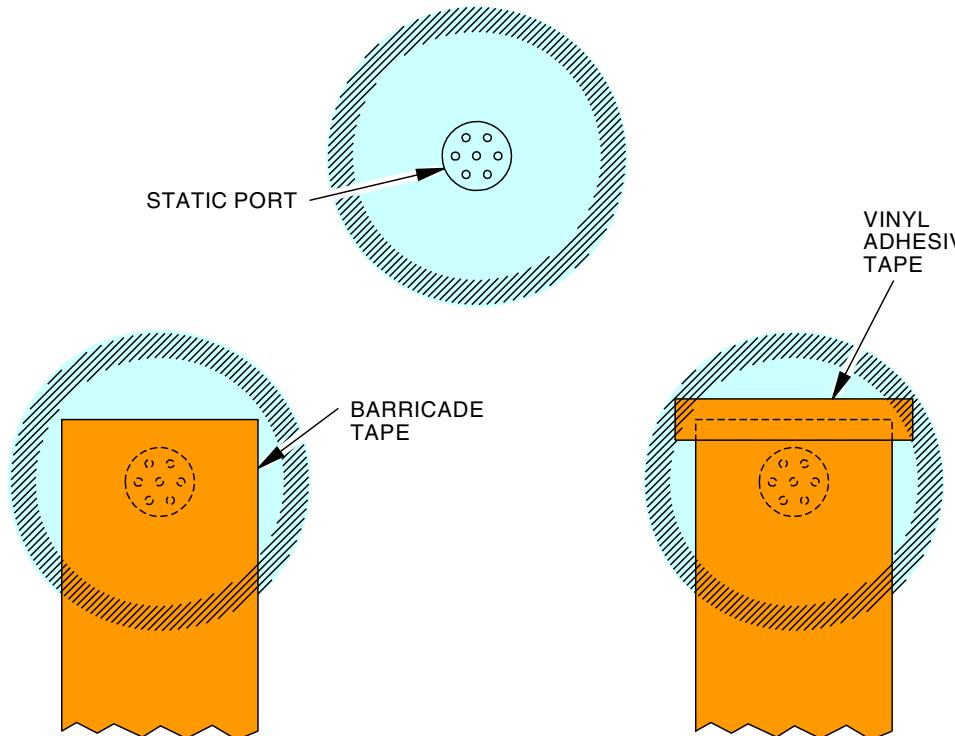
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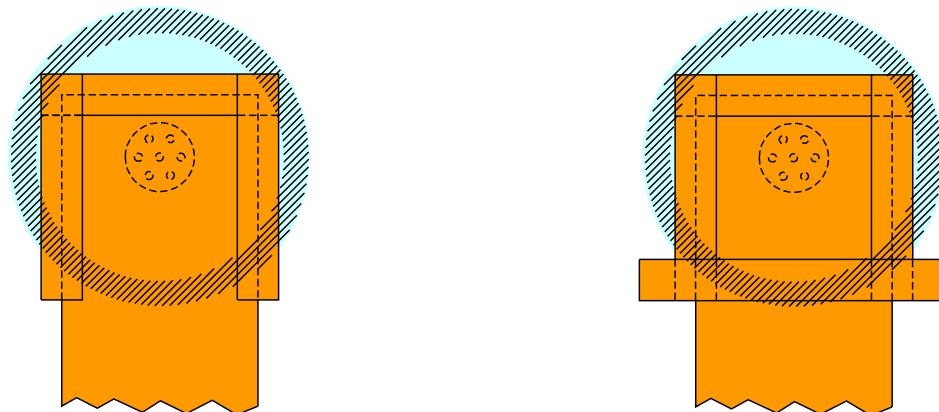


STEP 1

PUT ONE END OF THE BARRICADE TAPE OVER
THE STATIC PORT TO COVER THE HOLES

STEP 2

SECURE THE TOP EDGE OF THE BARRICADE
TAPE WITH 5 INCHES OF VINYL ADHESIVE TAPE



STEP 3

PUT TWO 5-INCH STRIPS OF VINYL ADHESIVE TAPE
OVER THE SIDES OF THE BARRICADE TAPE
OVERLAPPING THE TOP STRIP OF ADHESIVE TAPE

STEP 4

PUT AN 8-INCH HORIZONTAL STRIP OF VINYL
ADHESIVE TAPE OVER THE BARRICADE TAPE
BELOW THE STATIC PORT HOLES
OVERLAPPING THE TWO VERTICAL STRIPS

G55461 S0006561795_V3

Static Port Cover Procedure
Figure 203/12-40-00-990-811 (Sheet 1 of 2)

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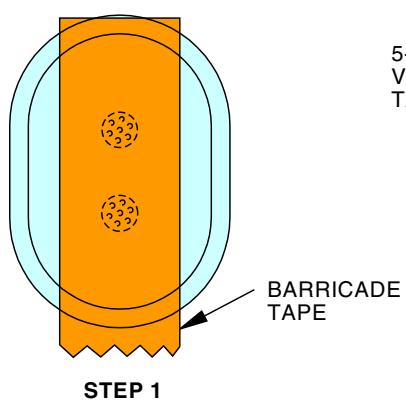
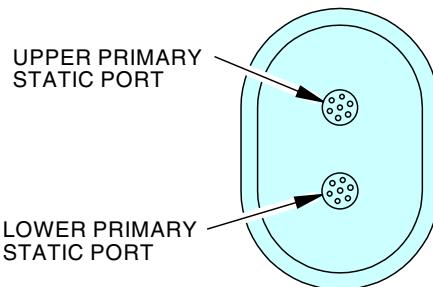
D633A101-LOM

ECCN 9E991 BOEING PROPRIETARY - See title page for details

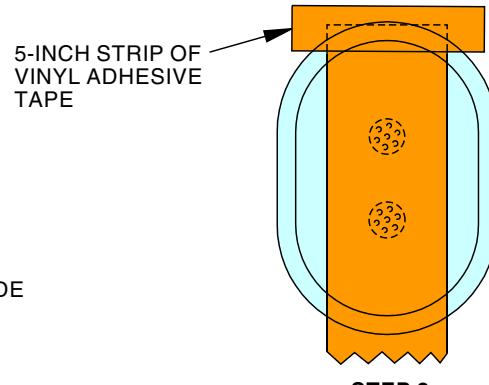
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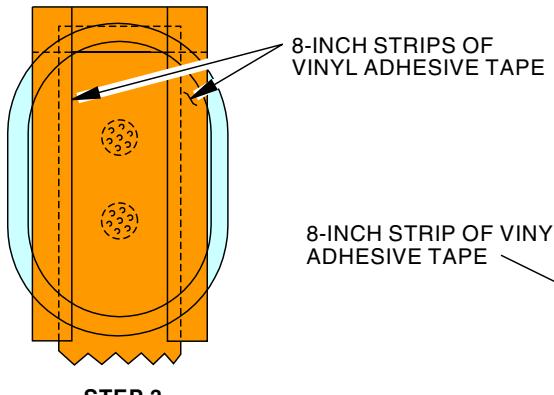
737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL



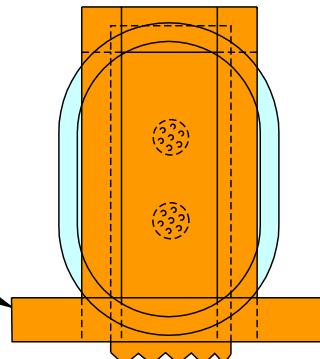
PUT ONE END OF THE BARRICADE TAPE OVER THE STATIC PORTS TO COVER BOTH STATIC PORTS



SECURE THE TOP EDGE OF THE BARRICADE TAPE WITH 5 INCHES OF VINYL ADHESIVE TAPE



PUT TWO STRIPS OF VINYL ADHESIVE TAPE, EACH A MINIMUM OF 8 INCHES IN LENGTH, OVER THE SIDES OF THE BARRICADE TAPE, OVERLAPPING THE TOP STRIP OF ADHESIVE TAPE



PUT AN 8-INCH STRIP OF VINYL ADHESIVE TAPE HORIZONTALLY OVER THE BARRICADE TAPE BELOW THE STATIC PORT HOLES, OVERLAPPING THE TWO VERTICAL STRIPS

H51093 S0006561796_V3

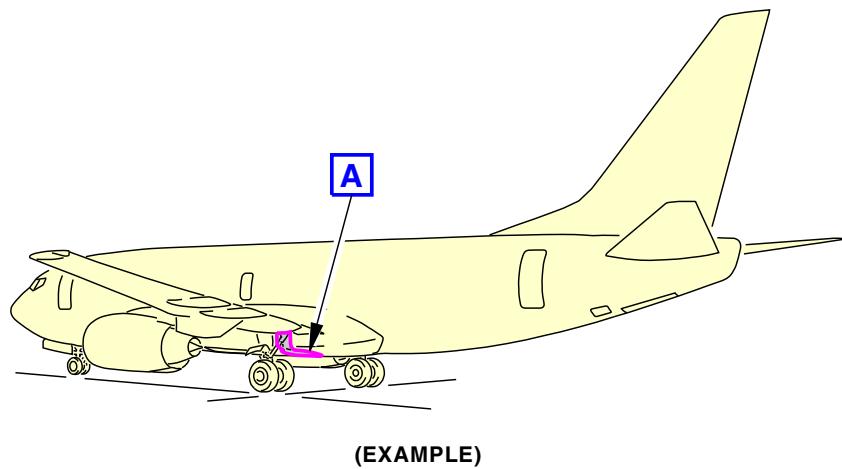
Static Port Cover Procedure
Figure 203/12-40-00-990-811 (Sheet 2 of 2)

EFFECTIVITY
LOM ALL

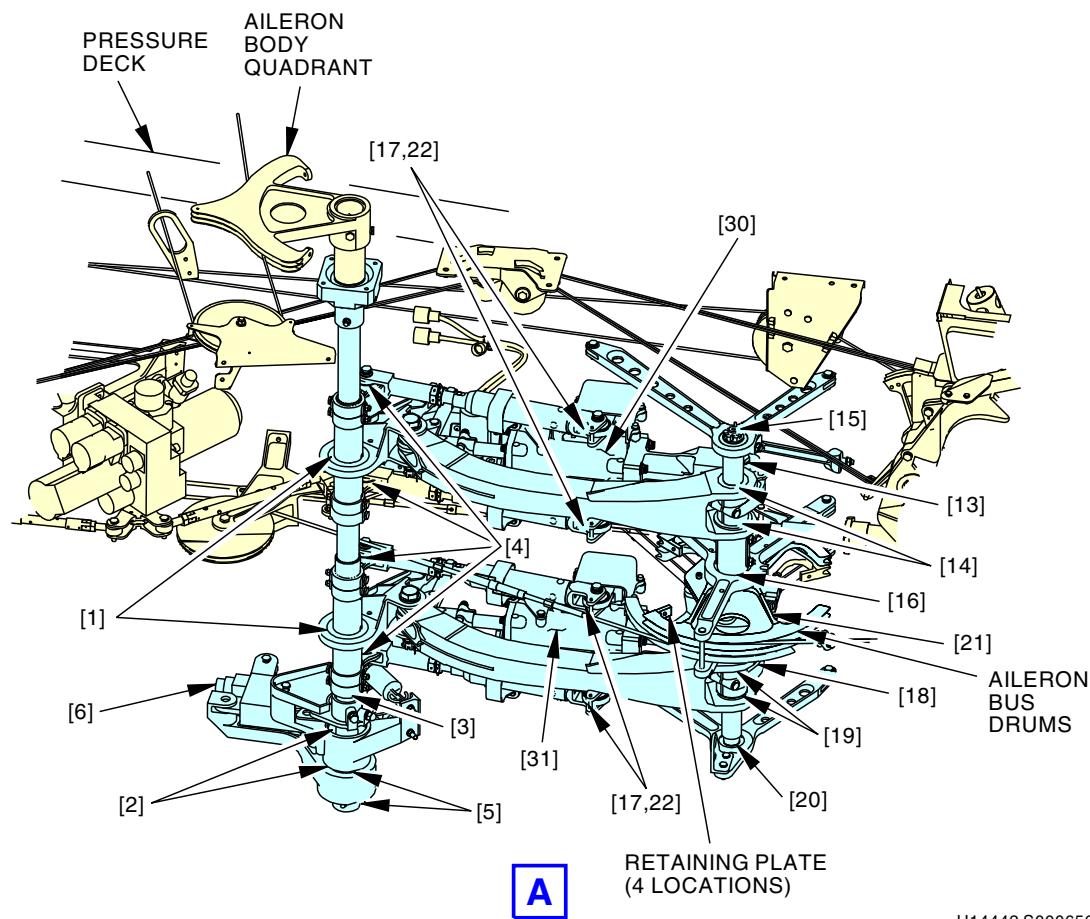
12-40-00



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(EXAMPLE)



H14442 S0006561797_V4

Aileron Power Control Unit
Figure 204/12-40-00-990-812

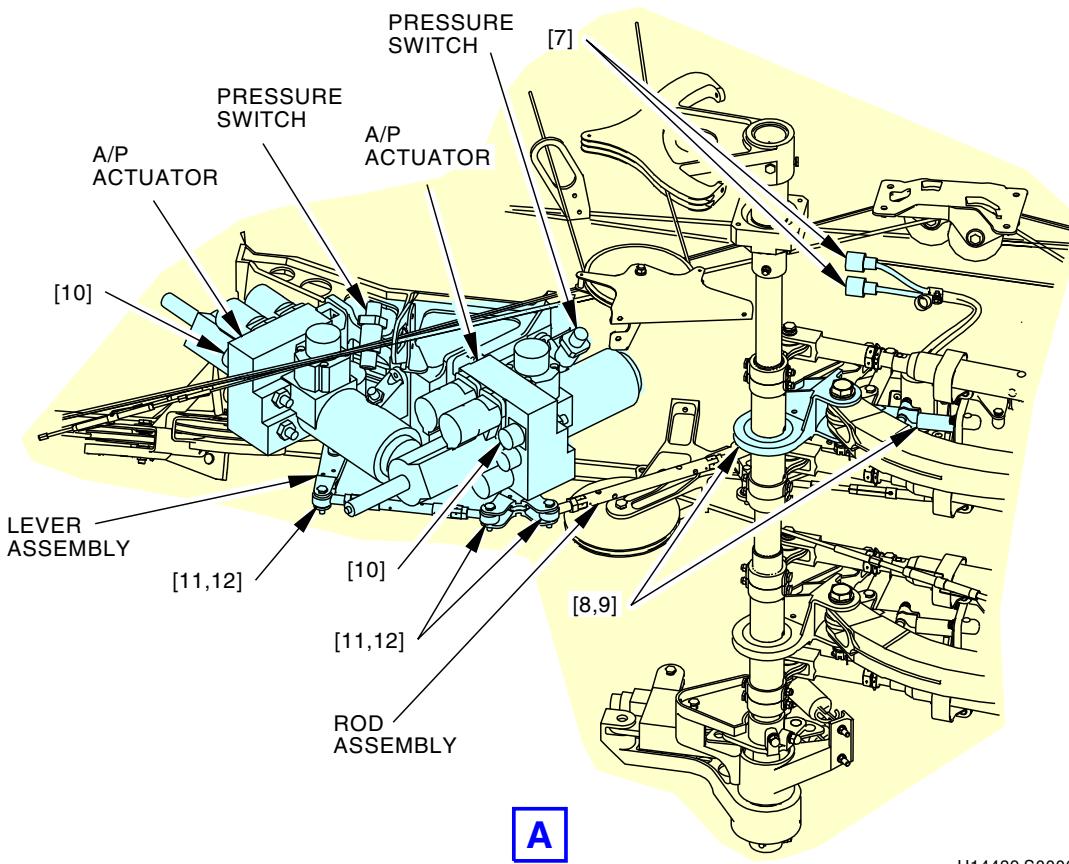
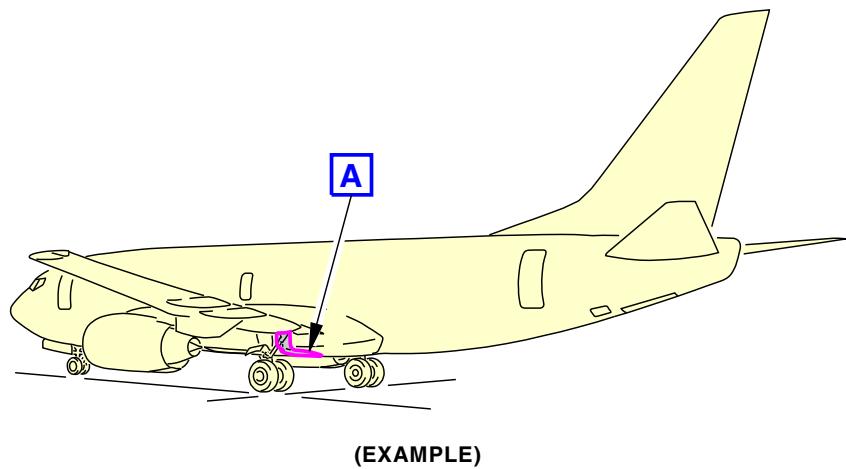
EFFECTIVITY
LOM ALL

12-40-00

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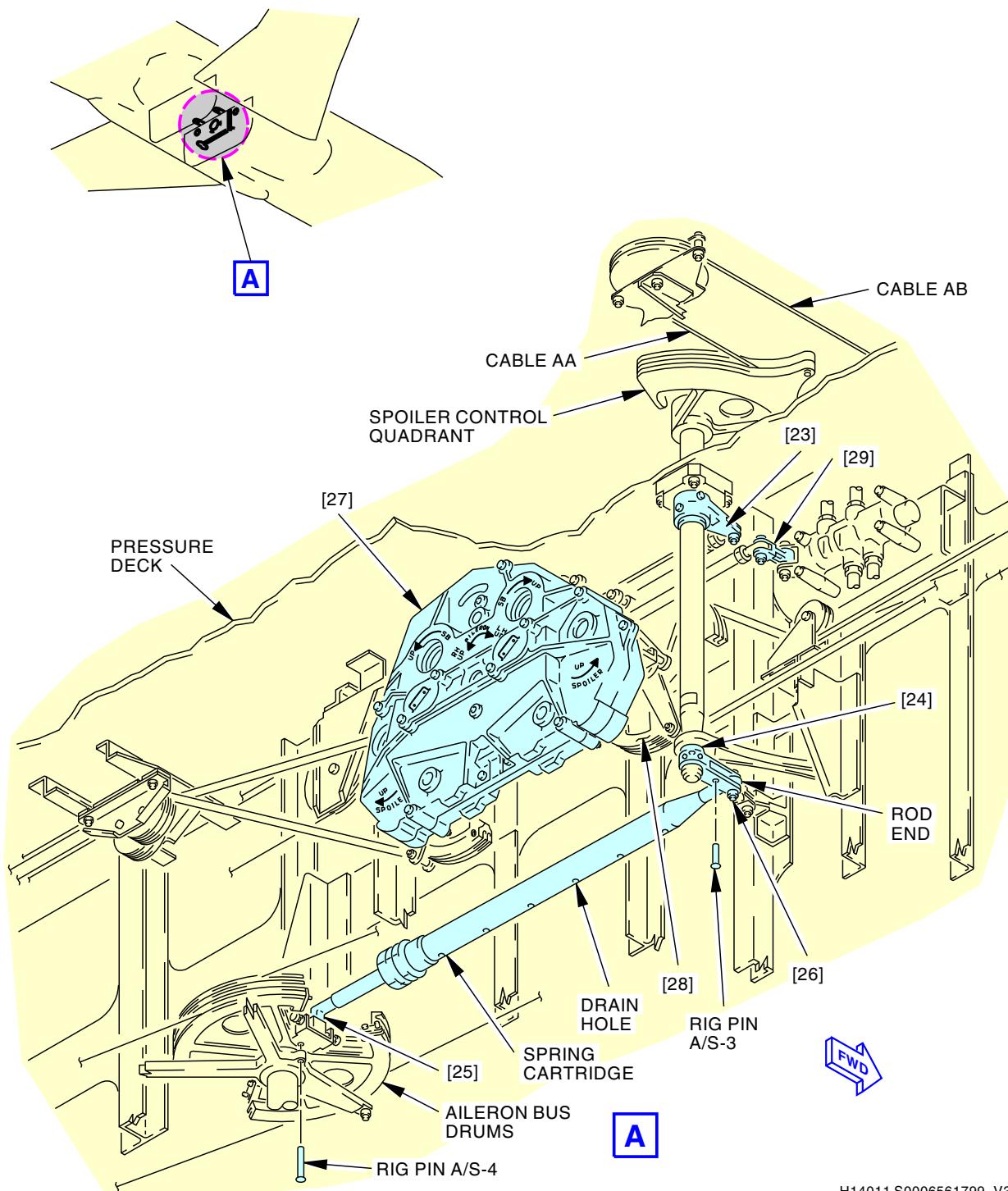
H14439 S0006561798_V4

A/P Aileron Actuator
Figure 205/12-40-00-990-813

EFFECTIVITY
LOM ALL

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H14011 S0006561799_V3

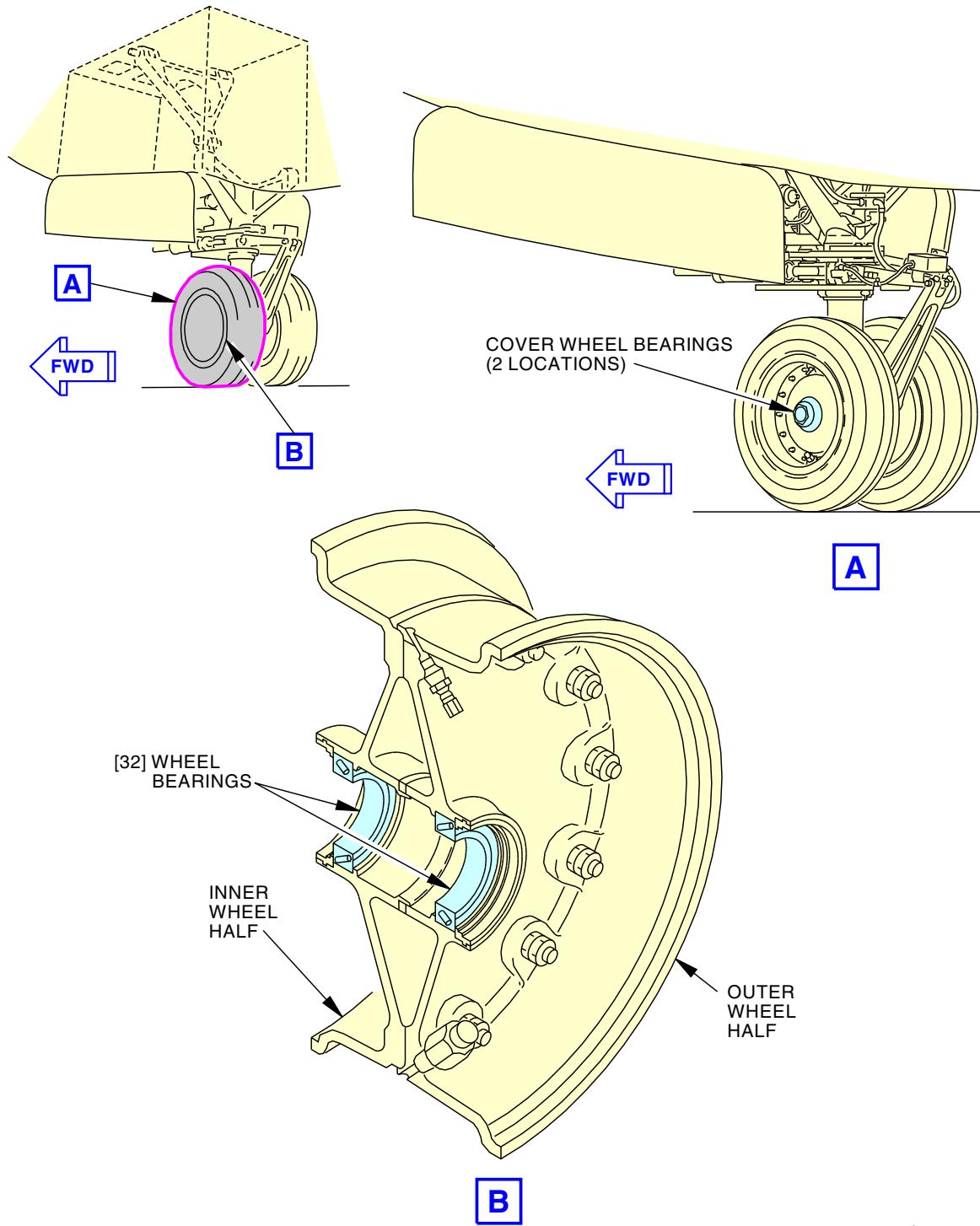
Spring Cartridge
Figure 206/12-40-00-990-814

EFFECTIVITY
LOM ALL

12-40-00



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D38294 S0000154870_V3

Nose Gear Wheel Bearings
Figure 207/12-40-00-990-815

EFFECTIVITY
LOM ALL

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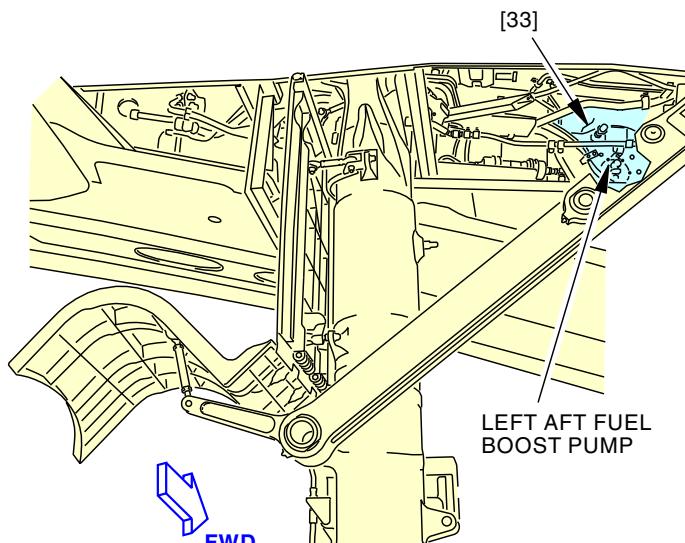
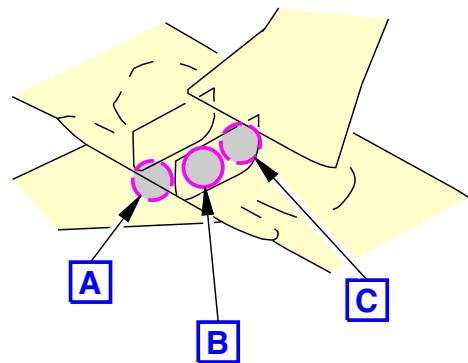
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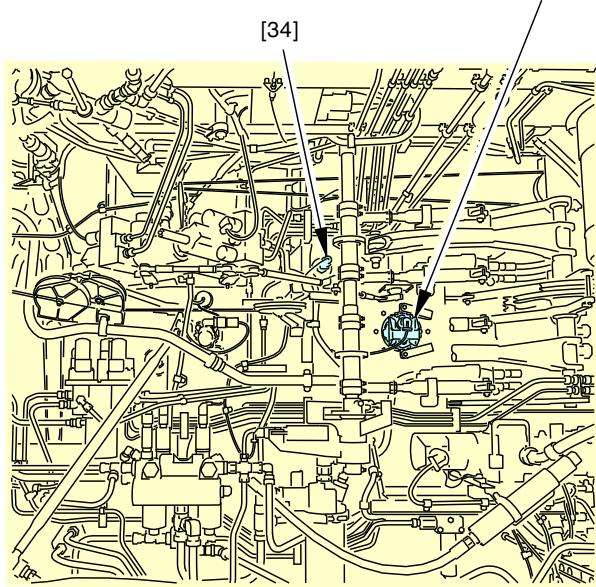
737-600/700/800/900
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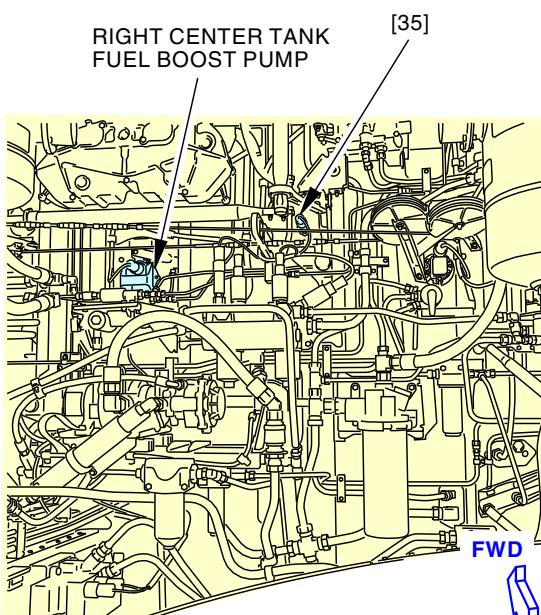
LEFT WING
(RIGHT WING IS OPPOSITE)



LEFT CENTER
FUEL BOOST PUMP



FWD
INBD



FWD
INBD

1955456 S0000373869_V3

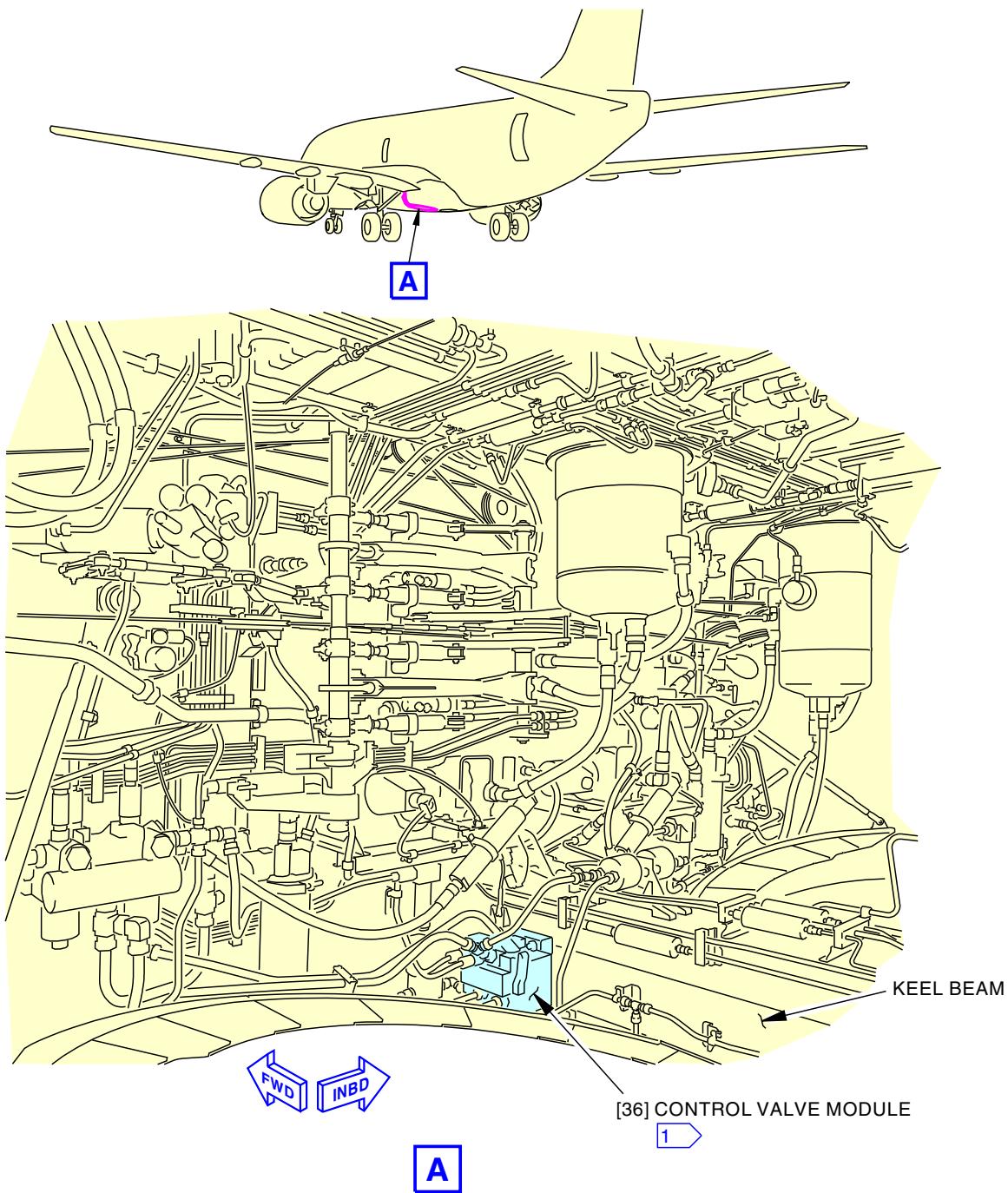
Boost Pump Low Pressure Switches
Figure 208/12-40-00-990-816

EFFECTIVITY
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 ENGINE 1 CONTROL VALVE MODULE IS SHOWN, ENGINE 2 CONTROL VALVE IS ON THE RIGHT SIDE OF THE KEEL BEAM.

3027692 S0000799111_V1

**Thrust Reverser Control Valve Module
Figure 209/12-40-00-990-821**

EFFECTIVITY
LOM ALL

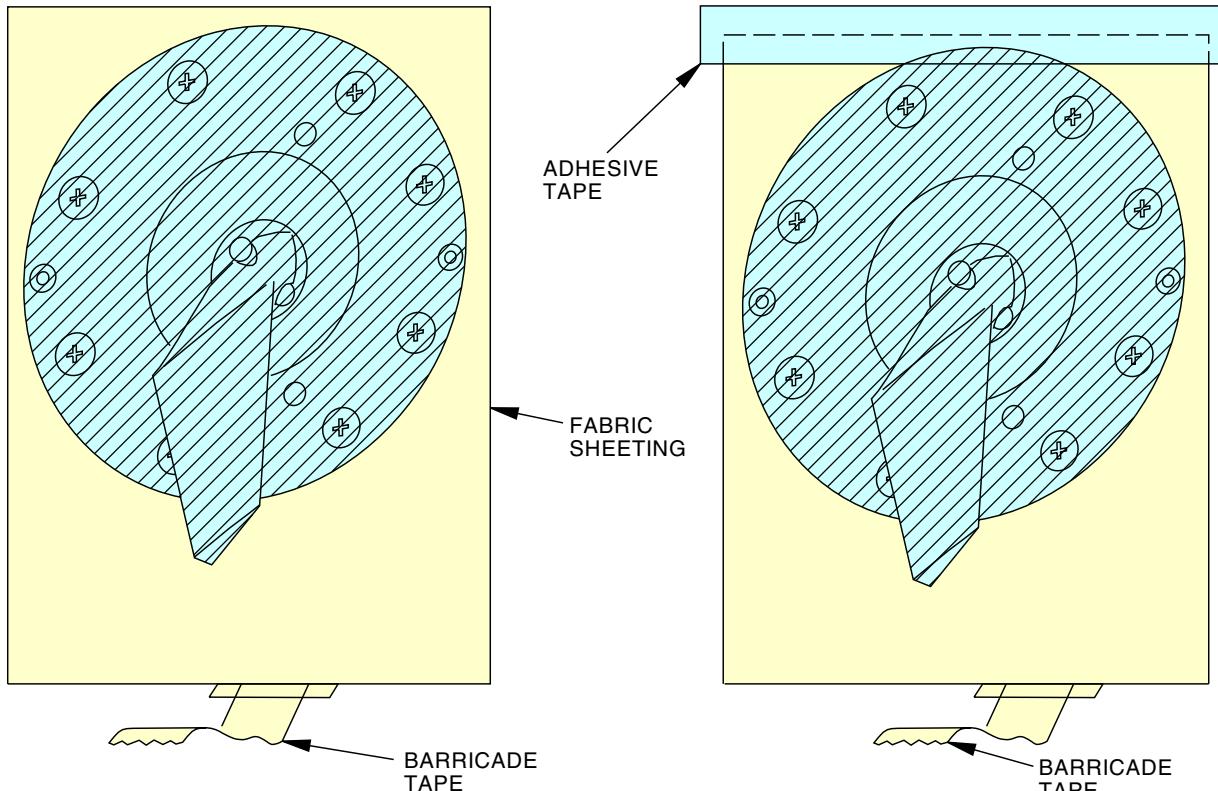
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STEP 1
PUT THE FABRIC SHEETING OVER THE
ANGLE-OF-ATTACK VANE WITH THE END WITH THE
BARRICADE TAPE ATTACHED DOWN.

STEP 2
ATTACH THE TOP EDGE OF THE FABRIC
SHEETING WITH ADHESIVE TAPE.

2258748 S0000505762_V3

Angle-of-Attack Sensor Cover Procedure
Figure 210/12-40-00-990-817 (Sheet 1 of 2)

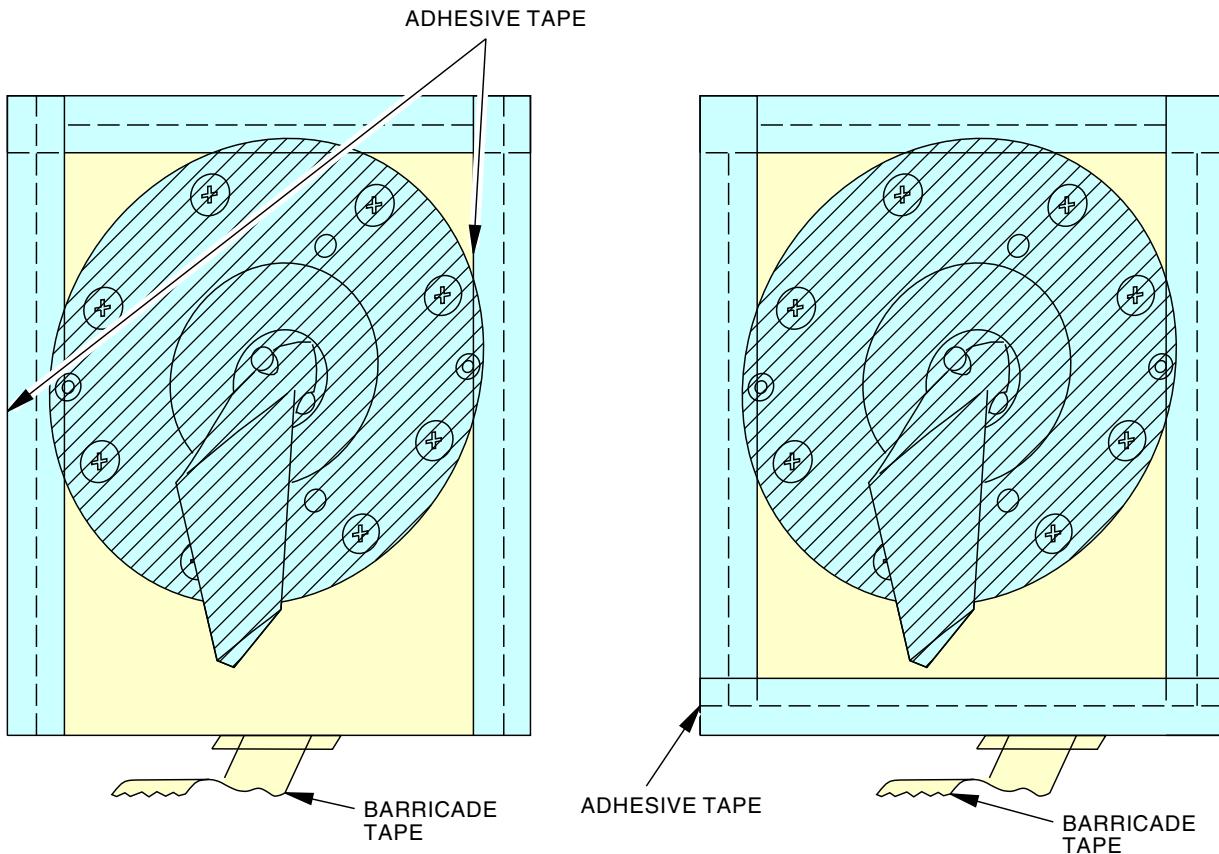
EFFECTIVITY
LOM ALL

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STEP 3
ATTACH THE FABRIC SHEETING WITH ONE PIECE OF ADHESIVE TAPE ON EACH VERTICAL EDGE, OVERLAPPING THE HORIZONTAL AT THE TOP STRIP OF TAPE.

STEP 4
ATTACH THE FABRIC SHEETING ON THE LOWER EDGE WITH ONE PIECE OF ADHESIVE TAPE, OVERLAPPING EACH VERTICAL STRIP OF TAPE.

2259081 S0000506509_V3

**Angle-of-Attack Sensor Cover Procedure
Figure 210/12-40-00-990-817 (Sheet 2 of 2)**

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TASK 12-40-00-100-803

3. Clean (Waterless Wash) the External Surfaces of the Airplane

A. General

- (1) For all dry wash materials and dry wash systems, Boeing recommends diluting the dry wash material and washing the airplane according to the manufacturer's instructions.
- (2) To clean the windows in the flight compartment, do this task: Clean the Glass Flight Compartment Windows - Inner Surface, TASK 12-16-02-100-801.
- (3) To clean the windows in the passenger compartment, do this task: Clean The Passenger Compartment Windows, TASK 12-16-03-100-801.
- (4) Dry wash materials should not be used near the static ports.
- (5) All dry wash cleaning materials should meet the requirements of BSS7432, Evaluation of Airplane Maintenance Materials.

B. References

Reference	Title
12-16-02-100-801	Clean the Glass Flight Compartment Windows - Inner Surface (P/B 301)
12-16-03-100-801	Clean The Passenger Compartment Windows (P/B 301)
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1086	Gloves - Rubber
STD-1137	Glasses - Safety

D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	

E. Prepare to Clean the Airplane

SUBTASK 12-40-00-860-002

- (1) Do this task: Static Grounding, TASK 20-40-11-910-801

SUBTASK 12-40-00-860-004

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812

SUBTASK 12-40-00-840-018

- (3) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.

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SUBTASK 12-40-00-840-019



WARNING

WHEN THERE ARE COVERS ON THE STATIC PORTS, MAKE SURE THAT PERSONNEL CAN SEE THAT CONDITION FROM THE GROUND. ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT COMPARTMENT TO SHOW THAT THE STATIC PORTS HAVE COVERS. COVERS ON THE STATIC PORTS CAN CAUSE LARGE ERRORS IN AIRSPEED AND ALTITUDE SIGNALS. THIS IS DANGEROUS DURING FLIGHT.



WARNING

DO NOT PUT VINYL ADHESIVE TAPE ON THE STATIC PORTS. THE TAPE, OR THE REMAINING CONTAMINATION AFTER YOU REMOVE THE TAPE CAN CAUSE LARGE ERRORS IN AIRSPEED, AND ALTITUDE SIGNALS. THIS MAKES FLIGHT DANGEROUS.

- (4) Use yellow vinyl adhesive Scotch Brand No.471 tape, G02219, and orange barricade tape, G02443 that has "REMOVE BEFORE FLIGHT" printed on it in black letters to cover the static ports in the following manner (see (Figure 201) for locations of the static ports, and (Figure 203) for illustrations of the static port cover procedure):
- Clean the area around each static port with naphtha solvent, B00083 or equivalent, and a clean dry rag where you will put the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 203).
 - Put one end of approximately a 4-foot piece of the orange barricade tape, G02443 over the holes of the static port and secure the upper edge with 5 inches of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 203) steps 1 and 2.
NOTE: Smooth the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on the airplane surface to make sure the bond is satisfactory.
 - Put a five-inch piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on each vertical edge of the barricade tape overlapping the first strip of adhesive tape (Figure 203) step 3.
 - Put an 8-inch piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 horizontally over the orange barricade tape, G02443, below the static port holes, overlapping the vertical strips of adhesive tape (Figure 203) step 4.
 - The orange barricade tape, G02443, should be allowed to stream down so it is visible from the ground.

SUBTASK 12-40-00-840-020

- (5) Attach a "STATIC PORTS COVERED" tag, G02444 printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

SUBTASK 12-40-00-840-021

- (6) Wear rubber glove, STD-1086 and safety glasses, STD-1137 to prevent injury to your skin and eyes.

F. Clean the Airplane

SUBTASK 12-40-00-110-010

- Clean the airplane using the dry wash material.
 - Move the flaps to the fully retracted position.
 - Apply the dry wash material to the area that you will clean with a clean cloth or white 3M scotch-brite pad.
 - Allow the cleaning material to dry per the manufacturer's recommendations.

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- (d) Wipe the area with a clean, dry cloth.
- (e) Check the area that has just been cleaned to make sure that all dirt and contaminants have been removed.

G. Put the Airplane Back In Its Usual Condition

SUBTASK 12-40-00-840-022



WARNING

MAKE SURE THAT ALL BARRICADE TAPE, VINYL ADHESIVE TAPE, AND TAPE RESIDUE IS REMOVED FROM THE STATIC PORTS. IF THE HOLES BECOME CLOGGED WITH TAPE RESIDUE, INCORRECT AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS CAN OCCUR. THIS CAN CAUSE DANGEROUS FLIGHT CONDITIONS.

- (1) Remove all orange barricade tape, G02443 and yellow vinyl adhesive Scotch Brand No.471 tape, G02219 from the static ports.
 - (a) Inspect each static port and if necessary use naphtha solvent, B00083, or equivalent, and a clean dry rag to remove residue, dirt and other contaminants from around the ports.

SUBTASK 12-40-00-840-023

- (2) Remove the "STATIC PORTS COVERED" tag, G02444 from the left control wheel in the flight deck.

———— END OF TASK ————

TASK 12-40-00-100-802

4. Polish the External Surfaces of the Airplane

A. General

- (1) This task is for polishing unpainted clad aluminum surfaces. Anodized surfaces do not get polished.
- (2) Any polish that is listed in BAC5615 is acceptable for polishing.
- (3) To buff (polish) painted surfaces, do the applicable task in this procedure: DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING, PAGEBLOCK 51-21-99/701.

B. References

Reference	Title
51-21-41-370-801	Bonderite M-CR 1001 Aero Application Process (P/B 701)
51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING

C. Tools/Equipment

Reference	Description
STD-1205	Wheel - Buffer, Cotton Cloth, 80/92 Thread Count, Spiral Sewn, 6 Inch Diameter, 7/8 Inch Thick, 1/4 Inch Arbor Hole
STD-1206	Tool - Burnishing
STD-1207	Sander/Polisher - Orbital, Air-Driven

D. Consumable Materials

Reference	Description	Specification
B00047	Acid - Technical Grade, Nitric (61%-68.2% Purity)	A-A-59105

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(Continued)

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00232	Cleaner - Sodium Hydroxide	P-S-631
B00570	Polish - Exterior Aircraft - Bonderite C-MC 1495 X polish (Formerly Turco 1495-X)	
C50153	Coating - Chemical Conversion - Bonderite M-CR 1001 Aero (Formerly Alodine 1001)	BAC5719 Class B, MIL-DTL-81706 Type I Class 3
D00504	Grease - Petrolatum	VV-P-236
E00056	Compound - Potassium Nitrate	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersedes BMS15-5 CLA)
G00116	Sponge - Synthetic	
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G01659	Swab - Cotton Or Rayon, (Disposable)	
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G02447	Tag - Red Paper, "PITOT PROBES COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G50398	Pad - Abrasive, Scotch-Brite Type S, Abrasive Pad	

E. Prepare to Polish the Surface



WARNING DO NOT POLISH THE STATIC PORTS. IF MATERIAL GOES INTO THE STATIC PORTS, IT CAN CAUSE LARGE ERRORS IN AIR DATA. INCORRECT AIR DATA CAN MAKE FLIGHT DANGEROUS.

SUBTASK 12-40-00-100-001

- (1) Do the procedure to Clean the External Surfaces of the Airplane to clean the surfaces you will polish. (TASK 12-40-00-100-801 or TASK 12-40-00-100-803)

F. Polish the Surface

SUBTASK 12-40-00-600-001

- (1) PROCEDURE I - Polish the surface to repair light stains or to make the surface bright.



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- (a) Use the cotton wiper, G00034 to remove any outer layer of protection as necessary.
- (b) Manually or mechanically polish the surface as follows:
 - 1) ALTERNATIVE I - Manually polish the surface.
 - a) Apply Bonderite C-MC 1495 X polish, B00570 to the cotton wiper, G00034.
 - b) Rub the damaged area of the surface with the cotton wiper, G00034.
NOTE: Rub in the direction of the grain of the metal until you get the necessary finish.
 - 2) ALTERNATIVE II - Mechanically polish the surface.
 - a) Apply Bonderite C-MC 1495 X polish, B00570 to the cotton cloth buffer wheel, STD-1205.
 - b) Polish the damaged area of the surface with the orbital air-driven sander/polisher, STD-1207 and cotton cloth buffer wheel, STD-1205.
- (c) Remove the remaining polish material with solvent and wipers.
NOTE: Always wipe in the direction of the grain of the metal.
- (d) If necessary, use ALTERNATIVE I or II to polish the surface again.
NOTE: If the polished area is too bright, rub the area with an ultra fine abrasive mat, G00251. Remove the dried polish with solvent and wipers.
- (e) Rub the area around the polished area to get a constant finish.
- (f) Clean the external surfaces of the airplane in the polished area.
- (g) Put some water on the surface, and make sure the water becomes drops.
- (h) If the surface was conversion coated before it was polished, do this task: Bonderite M-CR 1001 Aero Application Process, TASK 51-21-41-370-801.

SUBTASK 12-40-00-600-002

- (2) PROCEDURE II - Polish the surface to remove heavy stains or scratches that do not penetrate the clad aluminum.

- (a) Use these steps to find if the scratch penetrated the clad aluminum:

- 1) Apply solvent, B00083 to a cotton wiper, G00034.
 - 2) Use the cotton wiper, G00034 to clean the area around the scratch.
 - 3) Dry the surface.
 - 4) Apply Scotch Flatback Masking Tape 250, G00270 around the scratch.

NOTE: Make sure there is no more than 1/32 inch (.794 mm) of bare metal around the scratch.



WARNING

MAKE SURE THAT YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD AND CHEMICAL RESISTANT GLOVES WHEN YOU APPLY THE CLAD PENETRATING SOLUTION. IF YOU GET THE CLAD PENETRATING SOLUTION IN YOUR EYES OR ON YOUR SKIN, IMMEDIATELY FLUSH IT WITH CLEAN WATER. INJURIES TO PERSONNEL CAN OCCUR.

- 5) Prepare one of the clad penetration solutions as follows:
 - a) Mix 200 grams of potassium nitrate compound, E00056 and 100 grams of cleaner, B00232 with sufficient water to make one liter of clad penetrating solution.

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- b) Alternatively, mix 100 grams of cleaner, B00232 with sufficient water to make one liter of clad penetrating solution.



WARNING

MAKE SURE THAT YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD AND CHEMICAL RESISTANT GLOVES WHEN YOU APPLY THE CLAD PENETRATING SOLUTION. IF YOU GET THE CLAD PENETRATING SOLUTION IN YOUR EYES OR ON YOUR SKIN, IMMEDIATELY FLUSH IT WITH CLEAN WATER. INJURIES TO PERSONNEL CAN OCCUR.



CAUTION

MAKE SURE THAT YOU PUT THE CLAD PENETRATING SOLUTION ONLY ON THE SCRATCH. THE SOLUTION WILL CAUSE DAMAGE TO THE SURFACE WHERE IT IS APPLIED.

- 6) Apply one drop of clad penetrating solution with the point of a toothpick to the deepest part of the scratch.

NOTE: Use the minimum quantity of the clad penetrating solution necessary to flow to the bottom of the scratch.

- 7) If there is a positive reaction, immediately flush the scratch with water. Do not let the clad penetrating solution stay on the scratch for more than three minutes.

NOTE: If the bottom of the scratch becomes black, then the scratch penetrated the clad to the base metal.



WARNING

ALWAYS ADD ACID TO WATER WHEN YOU MIX THEM. IF YOU ADD WATER TO ACID, THE ACID WILL BECOME VERY HOT AND WILL NOT BE STABLE. THIS CAN CAUSE INJURY TO PERSONS.



WARNING

DO NOT GET THE NITRIC ACID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ACID. PUT ON SPLASH GOGGLES, AND GLOVES FOR PROTECTION WHEN YOU USE THE NITRIC ACID. KEEP THE ACID AWAY FROM SPARKS, FLAME, AND HEAT. NITRIC ACID IS A POISONOUS AND FLAMMABLE SOLVENT. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 8) Prepare the nitric acid solution as follows:

- a) Mix one volume of acid, B00047 with two to three volumes of water.



WARNING

DO NOT GET THE NITRIC ACID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ACID. PUT ON SPLASH GOGGLES, AND GLOVES FOR PROTECTION WHEN YOU USE THE NITRIC ACID. KEEP THE ACID AWAY FROM SPARKS, FLAME, AND HEAT. NITRIC ACID IS A POISONOUS AND FLAMMABLE SOLVENT. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 9) Apply one drop of the nitric acid solution to the scratch.

- 10) Let the nitric acid solution stay on the scratch for one-half to one minute.

- 11) Flush the scratch with clean water.

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WARNING

DO NOT GET CHEMICAL CONVERSION COATING SOLUTION IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. AIR MUST FLOW FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (12) Apply a new coating (Bonderite M-CR 1001 Aero coating, C50153) to the scratch with a swab, G01659, cotton wiper, G00034, or sponge, G00116, do this task: Bonderite M-CR 1001 Aero Application Process, TASK 51-21-41-370-801.

- (b) If the scratch penetrated the clad aluminum, do PROCEDURE III.
- (c) Clean the area around the scratch.
- (d) If the surface is badly scratched, rub it with fine or ultrafine abrasive mat, G00251 to make it smoother.
- (e) Polish with the air-driven sander/polisher as follows:

NOTE: Polish with the Schaffner No. 521 white bar compound until all of the gray undercast is removed. Then apply the No 4094 green coloring bar compound.

NOTE: Always clean the surface with solvent before you change to a different bar compound.

- 1) Remove the dried polish material from the buffer wheel with a wheel rasp or a coarse file.
 - 2) Apply the applicable polishing compound to the buffer wheel.
 - 3) Hold the buffer wheel parallel to the direction that you polish.
 - 4) Polish in the forward-to-aft direction.
 - 5) Use sufficient pressure to remove the stains and scratches.
 - 6) Move the buffer wheel in the correct direction to keep the finish in a good condition.
 - 7) Apply the applicable polishing compound to the buffer wheel frequently.
 - 8) Remove the dried polish material from buffer wheel frequently.
 - 9) Remove the dried polish material from the airplane surface with the wipers and solvent.
- NOTE: Put solvent on the heavy polish material to make it soft before you wipe it off.
- 10) Clean the external surfaces of the airplane in the polished area.
 - 11) Put some water on the surface, and make sure the water becomes drops.
 - 12) If the surface was conversion coated before it was polished, do this task: Bonderite M-CR 1001 Aero Application Process, TASK 51-21-41-370-801.

SUBTASK 12-40-00-600-003

- (3) PROCEDURE III - Polish the surface to repair damage that penetrates the clad aluminum.

NOTE: There is a test in PROCEDURE II to find if a scratch penetrates the clad aluminum.

- (a) Use the cotton wiper, G00034 to clean the damaged area.

NOTE: Wipe the damaged area carefully to prevent scratches.

- (b) Remove the burr edge as follows:

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- 1) Apply the grease, D00504 to the burnishing tool, STD-1206.
- 2) Move the burnishing tool in the direction of the scratch so that the clad aluminum material is moved into the defective area.
NOTE: Keep the area that you burnish to a minimum.
- 3) Move the burnishing tool on the repaired area so the area has a smooth surface, and so the stress is applied on a large area.
- 4) If the burnished area blends in with the adjacent surface, no further work is necessary.
- 5) If the burnished area does not blend in with the adjacent surface, continue as shown in PROCEDURE II.

SUBTASK 12-40-00-120-001

- (4) PROCEDURE IV - Clean (waterless wash) the external surfaces of the airplane.
 - (a) Clean the airplane using the dry wash material.
 - (b) Move the flaps to the fully retracted position.
 - (c) Apply the dry wash material to the area that you will clean with a clean cloth or Scotch-Brite Type S pad, G50398 pad.
 - (d) Allow the cleaning material to dry per the manufacturer's recommendations.
 - (e) Wipe the area with a clean, dry cloth.
 - (f) Check the area that has just been cleaned to make sure that all dirt and contaminants have been removed.

G. Put the Airplane Back In Its Usual Condition

SUBTASK 12-40-00-020-002



WARNING

FAILURE TO REMOVE COVERS FROM PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

REMOVE ALL COVERS. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.



CAUTION

MAKE SURE THE PROBE COVER IS IN GOOD WORKING CONDITION WITH NO EVIDENCE OF DAMAGE, ESPECIALLY FRAYING AROUND THE COVER OPENING. FRAYED FIBERS FROM THE COVER COMBINED WITH OTHER SUBSTANCES SUCH AS DIRT, GREASE AND FLUIDS CAN CAUSE OBSTRUCTION IN THE PROBE.

- (1) Remove all covers from the following components:
 - (a) Pitot probes
 - (b) Ice detector probes
 - (c) Angle-of-attack vane
 - (d) Engine inlet
 - (e) Turbine exhaust
 - (f) Each landing gear wheel/brake

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SUBTASK 12-40-00-840-015

- (2) Remove the "PITOT PROBES COVERED" tag, G02447 from the left control wheel in the flight deck.

SUBTASK 12-40-00-840-016



WARNING

FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM ALL OF THE STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

REMOVE ALL BARRICADE TAPE AND VINYL ADHESIVE TAPE. ENGINES SHOULD NOT BE OPERATED WITH COVERINGS IN PLACE BECAUSE THE COVERINGS CAN COME OFF AND DAMAGE THE ENGINES.

- (3) Remove all barricade tape, G02443, covers, polyethylene sheet polyethylene film, G00252, and vinyl adhesive Scotch Brand No.471 tape, G02219 from the following openings:

- (a) Static ports
 - 1) Inspect each static port and if necessary use solvent, B00083 or equivalent, to remove all tape residue, dirt, and other contaminants from around the static ports.
- (b) Surge tank and fuel tank vents
- (c) Auxiliary Power Unit (APU) exhaust duct outlet port
- (d) Ram air inlet and outlet doors
- (e) Outflow valve
- (f) Positive Pressure Relief Valve (PPRV) pressure ports

SUBTASK 12-40-00-840-017

- (4) Remove the "STATIC PORTS COVERED" tag, G02444 from the left control wheel in the flight deck.

— END OF TASK —

TASK 12-40-00-100-805

5. Clean the Exterior Surface of Volcanic and Fire Ash

A. General

- (1) Fallout is identified as ash drifting down from the air, or is blown about by the wind. Fallout is also caused by the ash being blown or moved about because of the movement of airplanes and ramp vehicles.
- (2) For airplanes parked in fallout conditions, protect all inlets of systems, probes, static ports, engines, gaps, etc. with suitable covers.
 - (a) Any covered areas should have appropriate streamers or markings, to be removed before operation.
- (3) Volcanic ash has the qualities that follow:
 - (a) It is hard and highly abrasive.
 - (b) It usually contains trace amounts of acidic chemicals (pH level of 2 to neutral).
 - (c) It can cause erosion/abrasion, etching or shot peening on exposed surfaces and remove protective finishes.

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- (d) The dimensions of most ash particles are less than 5 microns with trace amounts that are more than 50 microns.
 - (e) It resembles talcum powder.
 - (f) It stays on exposed lubricated surfaces.
 - (g) Able to enter small orifices and pass by seals.
 - (h) Can cause unusual wear and contamination of many airplane systems and filter elements.
- (4) Fire ash has the qualities that follow:
- (a) It is light weight and white to gray in color.
 - (b) It usually contains trace amounts of acidic chemicals (pH level of 2 to neutral).
 - (c) It can cause corrosion or etching on exposed surfaces and remove protective finishes.
 - (d) The dimensions of most ash particles are less than 5 microns with trace amounts that are more than 50 microns.
 - (e) It stays on exposed lubricated surfaces.
 - (f) Able to enter small orifices and pass by seals.
 - (g) Can cause contamination of airplane systems and filter elements.



WARNING

DO NOT GET VOLCANIC ASH IN YOUR MOUTH, EYES, OR ON YOUR SKIN.
PUT ON A RESPIRATOR MASK THAT REMOVES VOLCANIC ASH PARTICLES
SUFFICIENTLY. PUT ON CLOTHES AND GOGGLES (OR OTHER APPROVED
EYE PROTECTION) THAT KEEP VOLCANIC ASH OFF YOU. VOLCANIC ASH
CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) Volcanic ash can cause discomfort and injury to persons during fallout conditions, and during inspection and cleaning.
- (a) Precautions must be followed when you work in a volcanic ash environment. This will prevent the entry of volcanic ash into your eyes and your respiratory (breathing) system.
- (6) The following is a guide to help identify positive volcanic ash findings versus false positive findings. Minimum experience inspecting for volcanic ash may induce a number of probable findings which have not been recognized previously, but are well known findings caused by normal operation.
- (a) Black or dark debris on the aircraft skin, engine and fan blades are normal debris usually caused by industrial dust.
 - (b) Yellow or green debris inside of pitot tubes and/or similar sensors are typical of plant pollen.
 - (c) White debris on acoustic panels of the engine inlet, fan blades, outlet guide vanes etc. can be residuals of water.
 - (d) White signs on the fuselage and wings can be caused by aircraft dry cleaning.

B. References

Reference	Title
10-11-01-580-801	Airplane Parking (P/B 201)
10-11-07 P/B 201	ACTIVE STORAGE - MAINTENANCE PRACTICES
10-12-02 P/B 201	PROLONGED PARKING - MAINTENANCE PRACTICES
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

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(Continued)

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-200-802-F00	Inspection of the Engine After Volcanic Ash, Dust or Sand Ingestion (P/B 601)

C. Tools/Equipment

Reference	Description
STD-1086	Gloves - Rubber
STD-1137	Glasses - Safety
STD-6636	Vacuum Cleaner - wet and dry type

D. Consumable Materials

Reference	Description	Specification
G50412	Paper - Litmus (Used to find the acidity or alkalinity of a liquid solution)	

E. Prepare to Clean the Airplane

SUBTASK 12-40-00-910-001

- (1) Make sure that the covers are installed and the static ports are sealed (Airplane Parking, TASK 10-11-01-580-801).

SUBTASK 12-40-00-480-001



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

- (2) 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 12-40-00-910-002

- (3) Do this task: Static Grounding, TASK 20-40-11-910-801.

SUBTASK 12-40-00-860-005

- (4) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 12-40-00-910-003

- (5) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.

NOTE: If the doors cannot be closed because of other servicing, be careful that no dry wash material gets into the cabin area.

SUBTASK 12-40-00-910-004

- (6) Wear rubber gloves, STD-1086, and safety glasses, STD-1137, to prevent injury to your skin and eyes.

F. Procedure

SUBTASK 12-40-00-160-001



MAKE SURE ALL VOLCANIC ASH IS REMOVED FROM THE AIRCRAFT EXTERNAL SURFACE BEFORE YOU DO THE WASHING PROCEDURES. WHEN VOLCANIC ASH IS WET, IT BECOMES A CORROSIVE PASTE. THIS CAN CAUSE DAMAGE TO THE SURFACE OF THE AIRCRAFT.

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(CAUTION PRECEDES)



CAUTION

DO NOT RUB THE SURFACE WITH A BRUSH OR COTTON WIPER.
VOLCANIC ASH IS ABRASIVE. THIS CAN CAUSE ABRASIONS AND
SCRATCHES THAT CAN CAUSE DAMAGE TO THE SURFACE.

- (1) If any ash is found, remove all traces of the ash, including areas such as the fuselage crown, horizontal surfaces, inlets, wheel wells, and exposed chrome common to landing gear.
 - (a) If the ash is not wet, use the vacuum cleaner, STD-6636, to remove the ash contamination from the airplane surfaces.
 - (b) Rinse the ash from the airplane exterior surfaces.

NOTE: Ash is known to contain trace amounts of Sulfur Dioxide and/or nitrates. Mixture of ash and water can result in an acidic solution.



CAUTION

DO NOT WATER WASH AN ENGINE WHICH HAS HAD VOLCANIC ASH INGESTION, SEVERE DUST OR SAND CONDITIONS UNTIL THIS MATERIAL HAS BEEN REMOVED FROM THE ENGINE AND WAIT A MINIMUM OF 5 FLIGHTS BEFORE WATER WASH. WATER WASH CAN CAUSE VOLCANIC ASH TO COLLECT IN THE HPT NOZZLE AND BLADE COOLING PATHS. THIS CAN RESULT IN REDUCED COOLING FLOW AND CAN ALSO CAUSE ROTOR IMBALANCE FROM COLLECTION OF MATERIAL SETTLING AND DRYING IN THE ROTOR SPOOLS.

- 1) Make sure that the ash from engine and Auxiliary Power Unit (APU) inlets, inside the tail cone, areas around probes and ports, and ram air ducts are removed.
 - a) If the engine has ingested volcanic ash, and/or heavy sand/dust do this task: Inspection of the Engine After Volcanic Ash, Dust or Sand Ingestion, TASK 71-00-00-200-802-F00.

SUBTASK 12-40-00-100-002

- (2) Do the water wash with water base alkaline cleaners (Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-40-00-100-801 or Clean (Waterless Wash) the External Surfaces of the Airplane, TASK 12-40-00-100-803).

SUBTASK 12-40-00-280-001

- (3) Do a test of the aircraft with litmus paper strips as follows:
 - (a) Tape litmus paper, G50412, on different parts of the aircraft. Wet the strips with distilled water.
 - (b) Make sure that the pH factor is above 4.
 - 1) If the pH factor is 4 or below, do the water wash with water base alkaline cleaners again until the pH factor is above 4 (Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-40-00-100-801 or Clean (Waterless Wash) the External Surfaces of the Airplane, TASK 12-40-00-100-803).

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G. Put the Airplane Back To Usual Condition

SUBTASK 12-40-00-840-030

- (1) If the airplane was in a Parking or Storage configuration, install new tape and covers and follow the applicable lubrication steps in the storage prep procedures (ACTIVE STORAGE - MAINTENANCE PRACTICES, PAGEBLOCK 10-11-07/201, PROLONGED PARKING - MAINTENANCE PRACTICES, PAGEBLOCK 10-12-02/201).

———— END OF TASK ——

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BIRD STRIKE CLEANING - MAINTENANCE PRACTICES

1. **General**

- A. This procedure contains one task.
 - (1) This procedure is to safely remove the remains of a bird strike from an airplane exterior.

TASK 12-40-04-100-801

2. **Bird Strike Cleaning**

A. **General**

- (1) This procedure contains the steps for the safe removal of bird remains from an airplane exterior.

B. **References**

Reference	Title
05-51-18-210-801	Bird Strike and In-flight Hail Strike Conditional Inspection (P/B 201)

C. **Consumable Materials**

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
B50167	Cleaner - Zip-Chem Products Calla 7127 Disinfectant	
B50280	Cleaner - Disinfectant - Zip-Chem Products Calla 1452	BAC5150
G01043	Cloth - Lint-free	
G50140	Gloves - Protective, Latex or Nitrile	
G50436	Disinfectant - EnviroTru 1453 (Supersedes EcoTru 1453)	

D. **Procedure**

SUBTASK 12-40-04-010-001

- (1) Gain access to the suspected bird strike area.

SUBTASK 12-40-04-940-001



PUT ON EQUIPMENT FOR PROTECTION BEFORE YOU TOUCH THE BIRD CARCASS, BLOOD, GUTS, AND RESIDUE. THIS CAN CONTAIN BACTERIA AND VIRUSES THAT CAN CAUSE ILLNESSES, AND INJURIES TO PERSONNEL.



DO NOT LET THE BIRD CARCASS OR OTHER PIECES OF THE BIRD TOUCH YOUR SKIN. DISCARD THE BIRD PIECES IN A PLASTIC DISPOSAL BAG. THE BIRD PIECES CAN CONTAIN INFECTIOUS MATERIALS (BACTERIA AND VIRUSES). THEY CAN CAUSE ILLNESSES, AND INJURIES TO PERSONNEL.

- (2) Before you touch any of the bird remains, put on protective gloves, G50140.

SUBTASK 12-40-04-140-001

- (3) Clean the bird pieces from the airplane.

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WARNING

PUT THE BIRD PIECES INTO PLASTIC DISPOSAL BAGS WHEN YOU REMOVE THEM FROM THE AIRPLANE. OBEY THE AIRLINE POLICY, LOCAL HEALTH DEPARTMENT, AND LAW ENFORCEMENT REGULATIONS WHEN YOU DISCARD THIS MATERIAL. OBEY THESE INSTRUCTIONS TO PREVENT INJURIES TO PERSONNEL.

- (a) Discard the bird pieces in a plastic bag.
- (b) Using a lint-free cloth, G01043, clean the area with alcohol, B00130 and EnviroTru 1453 Disinfectant, G50436 or Calla 7127 cleaner, B50167 or Calla 1452 cleaner, B50280.
- (c) Make sure that you remove all of the bird material from the airplane.

SUBTASK 12-40-04-940-002

- (4) After you remove the bird pieces from the airplane, do this task: Bird Strike and In-flight Hail Strike Conditional Inspection, TASK 05-51-18-210-801

———— END OF TASK ————

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