CHAPTER

22

AUTOFLIGHT

CHAPTER 22
AUTOFLIGHT

Subject/Page	Date	COC
22-EFFECTIVE PAGES		
1 thru 8	Feb 15/2025	
22-CONTENTS		
1	Jun 15/2024	
2	Oct 15/2024	
3	Oct 15/2024	
4	Jun 15/2023	
O 5	Feb 15/2025	
6	Oct 15/2022	
7	Feb 15/2024	
O 8	Feb 15/2025	
9	Oct 15/2022	
O 10	Feb 15/2025	
O 11	Feb 15/2025	
12	Oct 15/2022	
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16	Oct 15/2023	
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202	Feb 15/2023	
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204	Feb 15/2023	
R 205	Feb 15/2025	
O 206	Feb 15/2025	
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208	Oct 15/2021	
22-11-00		
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502	Oct 15/2022	
22-11-00 (cont)		
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O 517	Feb 15/2025	
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538	Feb 15/2024	
22-11-00 (cont)		
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541	Oct 15/2024	
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R 564	Feb 15/2025	
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568	Feb 15/2024	
R 569	Feb 15/2025	
570	Feb 15/2024	
R 571	Feb 15/2025	
R 572	Feb 15/2025	
573	Oct 15/2024	
574	Oct 15/2024	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
22-11-00 (cont)		
575	Oct 15/2024	
576	Oct 15/2024	
R 577	Feb 15/2025	
578	Oct 15/2024	
R 579	Feb 15/2025	
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R 598.3	Feb 15/2025	
R 598.4	Feb 15/2025	
598.5	Oct 15/2024	
R 598.6	Feb 15/2025	
R 598.7	Feb 15/2025	
R 598.8	Feb 15/2025	
598.9	Oct 15/2024	
598.10	Oct 15/2024	
598.11	Oct 15/2024	
598.12	Oct 15/2024	
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R 598.14	Feb 15/2025	
R 598.15	Feb 15/2025	
R 598.16	Feb 15/2025	
R 598.17	Feb 15/2025	
R 598.18	Feb 15/2025	
R 598.19	Feb 15/2025	
O 598.20	Feb 15/2025	
O 598.21	Feb 15/2025	
O 598.22	Feb 15/2025	
O 598.23	Feb 15/2025	
O 598.24	Feb 15/2025	
O 598.25	Feb 15/2025	
R 598.26	Feb 15/2025	
R 598.27	Feb 15/2025	
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R 598.29	Feb 15/2025	
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509	Oct 15/2017	
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404	Oct 15/2022	
405	Oct 15/2022	
406	Jun 15/2023	
407	Oct 15/2022	
408	Oct 15/2023	
R 409	Feb 15/2025	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
22-11-12 (cont)		
O 410	Feb 15/2025	
O 411	Feb 15/2025	
O 412	Feb 15/2025	
22-11-14		
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205	Oct 15/2015	
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R 402	Feb 15/2025	
403	Jun 15/2018	
404	Oct 15/2015	
405	Oct 15/2014	
R 406	Feb 15/2025	
407	Oct 15/2021	
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R 503	Feb 15/2025	
R 504	Feb 15/2025	
R 505	Feb 15/2025	
O 506	Feb 15/2025	
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22-11-22		
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R 402	Feb 15/2025	
R 403	Feb 15/2025	
R 404	Feb 15/2025	
R 405	Feb 15/2025	
O 406	Feb 15/2025	
O 407	Feb 15/2025	
O 408	Feb 15/2025	
22-11-23		
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22-11-23		
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R 402	Feb 15/2025	
R 403	Feb 15/2025	
404	Oct 15/2022	
R 405	Feb 15/2025	
O 406	Feb 15/2025	
D 407	Feb 15/2025	
D 408	BLANK	
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R 504	Feb 15/2025	
R 505	Feb 15/2025	
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207	Jun 15/2024	
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22-11-24		
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402	Oct 15/2024	
403	Jun 15/2016	
404	Oct 15/2015	
405	Oct 15/2015	
406	Oct 15/2024	
407	Oct 15/2024	
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22-11-24		
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502	Jun 15/2015	
22-11-25		
201	Jun 15/2019	
202	Feb 15/2024	
203	Jun 15/2019	
204	Oct 15/2015	
205	Oct 15/2015	
206	Oct 15/2021	
207	Oct 15/2021	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
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410	Oct 15/2024	
411	Oct 15/2023	
412	Oct 15/2024	
413	Oct 15/2024	
414	Oct 15/2024	
22-11-25		
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502	Jun 15/2023	
503	Jun 15/2023	
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507	Feb 15/2024	
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509	Oct 15/2024	
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602	Oct 15/2015	
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22-11-26 (cont)		
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205	Oct 15/2015	
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207	Oct 15/2021	
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22-11-26		
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402	Jun 15/2023	
403	Oct 15/2015	
404	Jun 15/2023	
405	Jun 15/2020	
406	Jun 15/2023	
407	Jun 15/2023	
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R 502	Feb 15/2025	
R 503	Feb 15/2025	
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507	Feb 15/2020	
508	Feb 15/2020	
509	Feb 15/2020	
510	Jun 15/2024	
511	Oct 15/2024	
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22-11-26		
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602	Jun 15/2021	
603	Jun 15/2024	
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607	Jun 15/2024	
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22-11-26 (cont)		
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22-11-27		
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22-11-27		
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402	Feb 15/2023	
403	Oct 15/2024	
404	Oct 15/2015	
405	Oct 15/2015	
406	Oct 15/2024	
407	Oct 15/2024	
408	Oct 15/2024	
409	Oct 15/2024	
410	BLANK	
22-11-27		
R 501	Feb 15/2025	
R 502	Feb 15/2025	
R 503	Feb 15/2025	
R 504	Feb 15/2025	
O 505	Feb 15/2025	
O 506	Feb 15/2025	
O 507	Feb 15/2025	
O 508	Feb 15/2025	
D 509	Feb 15/2025	
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22-11-29		
201	Jun 15/2019	
202	Feb 15/2024	
203	Jun 15/2019	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
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22-11-29		
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404	Oct 15/2021	
405	Oct 15/2021	
406	Oct 15/2021	
407	Oct 15/2021	
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22-11-29		
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502	Oct 15/2019	
503	Oct 15/2019	
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505	Oct 15/2015	
506	Oct 15/2015	
507	Oct 15/2017	
508	Oct 15/2015	
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205	Oct 15/2015	
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403	Oct 15/2015	
404	Oct 15/2015	
22-11-30 (cont)		
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R 407	Feb 15/2025	
R 408	Feb 15/2025	
R 409	Feb 15/2025	
410	Oct 15/2023	
411	Oct 15/2023	
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22-11-30		
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R 502	Feb 15/2025	
R 503	Feb 15/2025	
R 504	Feb 15/2025	
R 505	Feb 15/2025	
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507	Jun 15/2018	
508	Oct 15/2015	
509	Oct 15/2015	
510	Oct 15/2017	
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405	Oct 15/2021	
406	Oct 15/2021	
22-11-31 (cont)		
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R 410	Feb 15/2025	
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22-11-31		
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R 503	Feb 15/2025	
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510	Oct 15/2017	
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204	Oct 15/2021	
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22-11-32		
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303	Jun 15/2015	
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22-11-32		
401	Jun 15/2016	
402	Oct 15/2014	
403	Oct 15/2015	
404	Oct 15/2021	
405	Oct 15/2021	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
22-11-32 (cont)		
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O 202	Feb 15/2025	
O 203	Feb 15/2025	
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O 205	Feb 15/2025	
R 206	Feb 15/2025	
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R 231	Feb 15/2025	
O 232	Feb 15/2025	
R 233	Feb 15/2025	
R 234	Feb 15/2025	
22-11-33 (cont)		
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R 236	Feb 15/2025	
R 237	Feb 15/2025	
R 238	Feb 15/2025	
R 239	Feb 15/2025	
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R 265	Feb 15/2025	
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O 269	Feb 15/2025	
R 270	Feb 15/2025	
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22-11-33		
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407	Feb 15/2024	
R 408	Feb 15/2025	
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204	Oct 15/2015	
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206	Oct 15/2021	
207	Oct 15/2021	
208	Jun 15/2019	
22-11-34		
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403	Oct 15/2015	
404	Oct 15/2020	
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22-11-34		
501	Feb 15/2024	
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22-11-34		
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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Subject/Page	Date	COC
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203	Oct 15/2015	
204	Oct 15/2021	
22-11-39		
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403	Oct 15/2015	
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22-11-40		
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205	Oct 15/2017	
206	Oct 15/2021	
207	Oct 15/2021	
22-11-40 (cont)		
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22-11-40		
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407	Oct 15/2024	
408	Feb 15/2024	
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410	Oct 15/2024	
411	Oct 15/2024	
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22-11-41		
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203	Oct 15/2015	
204	Oct 15/2021	
22-11-41		
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402	Feb 15/2021	
403	Oct 15/2015	
404	Oct 15/2024	
405	Oct 15/2021	
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407	Oct 15/2021	
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204	Oct 15/2024	
22-23-00		
401	Oct 15/2024	
402	Oct 15/2024	
403	Oct 15/2024	
404	Oct 15/2024	

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22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

Subject/Page	Date	COC
22-23-00		
501	Feb 15/2017	
502	Oct 15/2021	
503	Oct 15/2017	
504	Oct 15/2017	
505	Oct 15/2024	
506	Oct 15/2017	
507	Oct 15/2017	
508	Oct 15/2021	
509	Oct 15/2021	
510	BLANK	
22-23-11		
401	Oct 15/2022	
402	Oct 15/2023	
403	Oct 15/2015	
404	Oct 15/2015	
405	Oct 15/2023	
406	Oct 15/2023	
407	Oct 15/2023	
408	Oct 15/2023	
22-23-11		
501	Oct 15/2017	
502	Oct 15/2017	
503	Oct 15/2017	
504	Oct 15/2017	
22-23-21		
401	Oct 15/2014	
402	Feb 15/2021	
403	Oct 15/2015	
404	Oct 15/2015	
405	Oct 15/2023	
406	Oct 15/2023	
407	Oct 15/2023	
408	BLANK	
22-23-21		
501	Oct 15/2021	
502	Oct 15/2017	
503	Oct 15/2024	
22-23-21 (cont)		
504	Oct 15/2021	
22-31-00		
201	Feb 15/2020	
202	Feb 15/2021	
22-31-00		
501	Oct 15/2023	
502	Feb 15/2024	
503	Oct 15/2022	
504	Oct 15/2020	
505	Oct 15/2020	
506	Feb 15/2024	
507	Feb 15/2024	
R 508	Feb 15/2025	
R 509	Feb 15/2025	
510	Oct 15/2023	
22-31-51		
401	Oct 15/2023	
402	Oct 15/2015	
403	Oct 15/2015	
404	Oct 15/2023	
405	Oct 15/2023	
406	BLANK	
22-31-81		
401	Oct 15/2023	
402	Oct 15/2015	
403	Oct 15/2015	
404	Oct 15/2023	
22-31-91		
401	Oct 15/2023	
402	Oct 15/2023	
403	Oct 15/2023	
404	Oct 15/2023	
405	Oct 15/2023	
406	Oct 15/2023	
407	Oct 15/2023	
408	Oct 15/2023	
409	Feb 15/2024	
22-31-91 (cont)		
410	BLANK	

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

22-EFFECTIVE PAGES

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
AUTOFLIGHT - DDPG MAINTENANCE PROCEDURES	22-00-00		901	LOM ALL
MMEL 22-5 (DDPG) Preparation - Mach Trim Systems Inoperative TASK 22-00-00-500-801			901	LOM ALL
MMEL 22-5 (DDPG) Restoration - Mach Trim Systems Inoperative TASK 22-00-00-890-801			902	LOM ALL
DIGITAL FLIGHT CONTROL SYSTEM - MAINTENANCE PRACTICES	22-11-00		201	LOM ALL
Land Verify Test TASK 22-11-00-700-801			201	LOM ALL
Reset Latches Procedure TASK 22-11-00-700-802			208	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306
DIGITAL FLIGHT CONTROL SYSTEM - ADJUSTMENT/TEST	22-11-00		501	LOM ALL
Digital Flight Control System (DFCS) - Operational Test TASK 22-11-00-740-801			502	LOM ALL
Digital Flight Control System (DFCS) - System Test TASK 22-11-00-740-802			513	LOM ALL
Flight Control Computer Option Pins Test TASK 22-11-00-740-814			514	LOM ALL
BITE Library Test TASK 22-11-00-740-806			516	LOM ALL
Wheel Spin Up Test TASK 22-11-00-740-807			523	LOM ALL
Power Bus Transfer Test TASK 22-11-00-740-808			525	LOM ALL
Power Bus Isolation Test TASK 22-11-00-740-809			527	LOM ALL
Circuit Breaker Interface Test TASK 22-11-00-740-810			532	LOM ALL
Air/Ground Discrete Test TASK 22-11-00-740-811			537	LOM ALL

22-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Other Discrete Inputs Test TASK 22-11-00-740-812			539	LOM ALL
Sensor Excitation Test TASK 22-11-00-820-801			541	LOM ALL
Maintenance Monitor Test TASK 22-11-00-740-813			545	LOM ALL
Master Caution Test TASK 22-11-00-800-801			552	LOM ALL
Autoland Warning Light Test TASK 22-11-00-800-802			555	LOM 445
Elevator Rigging Test TASK 22-11-00-820-802			562	LOM ALL
Elevator Single Authority Test TASK 22-11-00-820-815			569	LOM ALL
Elevator Dual Authority Test TASK 22-11-00-820-816			588	LOM ALL
Aileron Rigging Test TASK 22-11-00-820-803			594	LOM ALL
Flaps Rigging Test TASK 22-11-00-820-804			598	LOM ALL
Stabilizer Rigging Test TASK 22-11-00-820-805			598.2	LOM ALL
Pitch Control Wheel Steering Rigging Test TASK 22-11-00-820-806			598.6	LOM ALL
Roll Control Wheel Steering Rigging Test TASK 22-11-00-820-807			598.10	LOM ALL
Mach Trim Rigging Test TASK 22-11-00-820-808			598.12	LOM ALL
Rudder Rigging Test TASK 22-11-00-820-810			598.20	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306
Alpha Vane Rigging Test TASK 22-11-00-820-809			598.23	LOM ALL
Remote Light Sensor Input Test TASK 22-11-00-820-811			598.25	LOM ALL

22-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Elevator Centering Unit Test TASK 22-11-00-820-812			598.26	LOM ALL
Digital Flight Control System LRU Replacement Tests TASK 22-11-00-740-815			598.30	LOM ALL
ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - MAINTENANCE PRACTICES	22-11-11		201	LOM ALL
Roll Control Wheel Steering Force Transducer - Deactivation TASK 22-11-11-040-801			201	LOM ALL
Roll Control Wheel Steering Force Transducer - Activation TASK 22-11-11-440-801			206	LOM ALL
ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - REMOVAL/INSTALLATION	22-11-11		401	LOM ALL
Roll Force Transducer Removal TASK 22-11-11-000-801			401	LOM ALL
Roll Force Transducer Installation TASK 22-11-11-400-801			410	LOM ALL
ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST	22-11-11		501	LOM ALL
Roll Force Transducer Adjustment and Test TASK 22-11-11-820-801			501	LOM ALL
Roll Force Transducer Test TASK 22-11-11-740-801			509	LOM ALL
A/P ACTUATOR SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - MAINTENANCE PRACTICES	22-11-12		201	LOM ALL
A/P Actuator Solenoid and Electrohydraulic Servo Valves - Deactivation TASK 22-11-12-040-801			201	LOM ALL
A/P Actuator Solenoid and Electrohydraulic Servo Valves - Activation TASK 22-11-12-440-801			208	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
A/P ACTUATOR SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION	22-11-12		401	LOM ALL
A/P Solenoid and Electrohydraulic Servo Valves Removal TASK 22-11-12-000-801			401	LOM ALL
A/P Solenoid and Electrohydraulic Servo Valves Installation TASK 22-11-12-400-801			407	LOM ALL
ELEVATOR NEUTRAL SHIFT SENSOR - MAINTENANCE PRACTICES	22-11-14		201	LOM ALL
Elevator Neutral Shift Sensor - Deactivation TASK 22-11-14-040-801			201	LOM ALL
Elevator Neutral Shift Sensor - Activation TASK 22-11-14-440-801			206	LOM ALL
ELEVATOR NEUTRAL SHIFT SENSOR - REMOVAL/INSTALLATION	22-11-14		401	LOM ALL
Elevator Neutral Shift Sensor Removal TASK 22-11-14-000-801			401	LOM ALL
Elevator Neutral Shift Sensor Installation TASK 22-11-14-400-801			405	LOM ALL
ELEVATOR NEUTRAL SHIFT SENSOR - ADJUSTMENT/TEST	22-11-14		501	LOM ALL
Elevator Neutral Shift Sensor Adjustment and Test TASK 22-11-14-820-801			501	LOM ALL
Elevator Neutral Shift Sensor Test TASK 22-11-14-710-801			512	LOM ALL
RUDDER ROLLOUT GUIDANCE ACTUATOR - MAINTENANCE PRACTICES	22-11-22		201	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Rudder Rollout Guidance Actuator - Deactivation TASK 22-11-22-040-801			201	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL

22-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Rudder Rollout Guidance Actuator - Activation TASK 22-11-22-440-801			206	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
RUDDER ROLLOUT GUIDANCE ACTUATOR - REMOVAL/INSTALLATION	22-11-22		401	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Rudder Rollout Guidance Actuator - Removal TASK 22-11-22-000-801			401	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Rudder Rollout Guidance Actuator - Installation TASK 22-11-22-400-801			404	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Rudder Rollout Guidance Actuator Test TASK 22-11-22-710-801			406	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
AUTOPILOT RUDDER POSITION SENSOR - MAINTENANCE PRACTICES	22-11-23		201	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Autopilot Rudder Position Sensor - Deactivation TASK 22-11-23-040-801			201	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Autopilot Rudder Position Sensor - Activation TASK 22-11-23-440-801			206	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
AUTOPILOT RUDDER POSITION SENSOR - REMOVAL/INSTALLATION	22-11-23		401	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Autopilot Rudder Position Sensor Removal TASK 22-11-23-000-801			401	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Autopilot Rudder Position Sensor Installation TASK 22-11-23-400-801			405	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL

22-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
RUDDER POSITION SENSOR - ADJUSTMENT/TEST	22-11-23		501	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Rudder Position Sensor Adjustment and Test TASK 22-11-23-820-801			501	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
Autopilot Rudder Position Sensor Test TASK 22-11-23-710-801			506	LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL
MACH TRIM ACTUATOR - MAINTENANCE PRACTICES	22-11-24		201	LOM ALL
Mach Trim Actuator - Deactivation TASK 22-11-24-040-801			201	LOM ALL
Mach Trim Actuator - Activation TASK 22-11-24-440-801			207	LOM ALL
MACH TRIM ACTUATOR - REMOVAL/INSTALLATION	22-11-24		401	LOM ALL
Mach Trim Actuator Removal TASK 22-11-24-000-801			401	LOM ALL
Mach Trim Actuator Installation TASK 22-11-24-400-801			406	LOM ALL
MACH TRIM ACTUATOR - ADJUSTMENT/TEST	22-11-24		501	LOM ALL
Mach Trim Actuator Installation Test TASK 22-11-24-740-801			501	LOM ALL
AUTOPILOT AILERON ACTUATOR - MAINTENANCE PRACTICES	22-11-25		201	LOM ALL
Autopilot Aileron Actuator - Deactivation TASK 22-11-25-040-801			201	LOM ALL
Autopilot Aileron Actuator - Activation TASK 22-11-25-440-801			206	LOM ALL
AUTOPILOT AILERON ACTUATOR - REMOVAL/INSTALLATION	22-11-25		401	LOM ALL
Autopilot Aileron Actuator Removal TASK 22-11-25-000-801			401	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Autopilot Aileron Actuator Installation TASK 22-11-25-400-801			410	LOM ALL
AUTOPILOT AILERON ACTUATOR - ADJUSTMENT/TEST	22-11-25		501	LOM ALL
Autopilot Aileron Actuator Adjustment TASK 22-11-25-820-801			501	LOM ALL
Autopilot Aileron Actuator Test TASK 22-11-25-710-801			508	LOM ALL
AUTOPILOT AILERON ACTUATOR - INSPECTION/CHECK	22-11-25		601	LOM ALL
Autopilot Aileron Actuator Linkage Inspection TASK 22-11-25-200-801			601	LOM ALL
AUTOPILOT ELEVATOR ACTUATOR - MAINTENANCE PRACTICES	22-11-26		201	LOM ALL
Autopilot Elevator Actuator - Deactivation TASK 22-11-26-040-801			201	LOM ALL
Autopilot Elevator Actuator - Activation TASK 22-11-26-440-801			206	LOM ALL
AUTOPILOT ELEVATOR ACTUATOR - REMOVAL/INSTALLATION	22-11-26		401	LOM ALL
Autopilot Elevator Actuator - Removal TASK 22-11-26-000-801			401	LOM ALL
Autopilot Elevator Actuator - Installation TASK 22-11-26-400-801			405	LOM ALL
AUTOPILOT ELEVATOR ACTUATOR - ADJUSTMENT/TEST	22-11-26		501	LOM ALL
Autopilot Elevator Actuator Adjustment and Test TASK 22-11-26-820-801			501	LOM ALL
Autopilot Elevator Actuator Test TASK 22-11-26-710-801			510	LOM ALL
AUTOPILOT ELEVATOR ACTUATOR - INSPECTION/CHECK	22-11-26		601	LOM ALL
Autopilot Elevator Actuator Linkage Inspection TASK 22-11-26-200-802			601	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
SPOILER POSITION SENSOR - MAINTENANCE PRACTICES	22-11-27		201	LOM ALL
Spoiler Position Sensor - Deactivation TASK 22-11-27-040-801			201	LOM ALL
Spoiler Position Sensor - Activation TASK 22-11-27-440-801			206	LOM ALL
SPOILER POSITION SENSOR - REMOVAL/INSTALLATION	22-11-27		401	LOM ALL
Spoiler Position Sensor Removal TASK 22-11-27-000-801			401	LOM ALL
Spoiler Position Sensor Installation TASK 22-11-27-400-801			406	LOM ALL
SPOILER POSITION SENSOR - ADJUSTMENT/TEST	22-11-27		501	LOM ALL
Spoiler Position Sensor Adjustment TASK 22-11-27-820-801			501	LOM ALL
Spoiler Position Sensor Test TASK 22-11-27-710-801			507	LOM ALL
AILERON POSITION SENSOR - MAINTENANCE PRACTICES	22-11-29		201	LOM ALL
Aileron Position Sensor - Deactivation TASK 22-11-29-040-801			201	LOM ALL
Aileron Position Sensor - Activation TASK 22-11-29-440-801			206	LOM ALL
AILERON POSITION SENSOR - REMOVAL/INSTALLATION	22-11-29		401	LOM ALL
Aileron Position Sensor Removal TASK 22-11-29-000-801			401	LOM ALL
Aileron Position Sensor Installation TASK 22-11-29-400-801			405	LOM ALL
AILERON POSITION SENSOR - ADJUSTMENT/TEST	22-11-29		501	LOM ALL
Aileron Position Sensor Adjustment TASK 22-11-29-820-801			501	LOM ALL
Aileron Position Sensor Test TASK 22-11-29-710-801			507	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
ELEVATOR POSITION SENSOR - MAINTENANCE PRACTICES	22-11-30		201	LOM ALL
Elevator Position Sensor - Deactivation TASK 22-11-30-040-801			201	LOM ALL
Elevator Position Sensor - Activation TASK 22-11-30-440-801			206	LOM ALL
ELEVATOR POSITION SENSOR - REMOVAL/INSTALLATION	22-11-30		401	LOM ALL
Elevator Position Sensor Removal TASK 22-11-30-000-801			401	LOM ALL
Elevator Position Sensor Installation TASK 22-11-30-400-801			407	LOM ALL
ELEVATOR POSITION SENSOR - ADJUSTMENT/TEST	22-11-30		501	LOM ALL
Elevator Position Sensor Adjustment and Test TASK 22-11-30-820-801			501	LOM ALL
Elevator Position Sensor Test TASK 22-11-30-710-801			510	LOM ALL
STABILIZER POSITION SENSOR - MAINTENANCE PRACTICES	22-11-31		201	LOM ALL
Stabilizer Position Sensor - Deactivation TASK 22-11-31-040-801			201	LOM ALL
Stabilizer Position Sensor - Activation TASK 22-11-31-440-801			206	LOM ALL
STABILIZER POSITION SENSOR - REMOVAL/INSTALLATION	22-11-31		401	LOM ALL
Stabilizer Position Sensor Removal TASK 22-11-31-000-801			401	LOM ALL
Stabilizer Position Sensor Installation TASK 22-11-31-400-801			407	LOM ALL
STABILIZER POSITION SENSOR - ADJUSTMENT/TEST	22-11-31		501	LOM ALL
Stabilizer Position Sensor Adjustment and Test TASK 22-11-31-820-801			501	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Stabilizer Position Sensor Test TASK 22-11-31-710-801			510	LOM ALL
AUTOFLIGHT STATUS ANNUNCIATOR - MAINTENANCE PRACTICES	22-11-32		201	LOM ALL
Autoflight Status Annunciator - Deactivation TASK 22-11-32-040-801			201	LOM ALL
Autoflight Status Annunciator - Activation TASK 22-11-32-440-801			204	LOM ALL
AUTOFLIGHT STATUS ANNUNCIATOR - SERVICING	22-11-32		301	LOM ALL
Lamp Replacement TASK 22-11-32-960-801			301	LOM ALL
Annunciator Test TASK 22-11-32-710-801			303	LOM ALL
AUTOFLIGHT STATUS ANNUNCIATOR - REMOVAL/INSTALLATION	22-11-32		401	LOM ALL
Annunciator - Removal TASK 22-11-32-000-801			401	LOM ALL
Annunciator - Installation TASK 22-11-32-400-801			404	LOM ALL
FLIGHT CONTROL COMPUTER - MAINTENANCE PRACTICES	22-11-33		201	LOM ALL
Flight Control Computer - Deactivation TASK 22-11-33-040-802			201	LOM ALL
Flight Control Computer - Activation TASK 22-11-33-440-802			205	LOM ALL
FCC Software Installation with an Airborne Data Loader TASK 22-11-33-470-814			206	LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438
FCC Inflight Faults Memory Download with an Airborne Data Loader TASK 22-11-33-470-815			209	LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438
FCC BITE Test Data Download with an Airborne Data Loader TASK 22-11-33-470-816			212	LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FCC Software Installation with an Enhanced Airborne Data Loader (eADL) TASK 22-11-33-470-817			219	LOM 429-431, 440, 442-447, 450-460, 464-999
FCC Inflight Faults Memory Download with an Enhanced Airborne Data Loader (eADL) TASK 22-11-33-470-818			224	LOM 429-431, 440, 442-447, 450-460, 464-999
FCC BITE Test Data Download with an Enhanced Airborne Data Loader (eADL) TASK 22-11-33-470-819			233	LOM 429-431, 440, 442-447, 450-460, 464-999
FCC Software Installation from the Flight Compartment with a Portable Data Loader TASK 22-11-33-470-820			244	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
FCC Inflight Faults Memory Download with a Portable Data Loader TASK 22-11-33-470-821			249	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
FCC BITE Test Data Download from the Flight Compartment with a Portable Data Loader TASK 22-11-33-470-822			255	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
FCC Software Installation from the Electrical and Electronics Compartment with a Portable Data Loader TASK 22-11-33-470-823			263	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
FCC Software Installation using the Cross-load Function TASK 22-11-33-470-824			268	LOM ALL
FLIGHT CONTROL COMPUTER - REMOVAL/INSTALLATION	22-11-33		401	LOM ALL
Flight Control Computer Removal TASK 22-11-33-000-801			401	LOM ALL
Flight Control Computer Installation TASK 22-11-33-400-801			404	LOM ALL
DFCS MODE CONTROL PANEL - CLEANING/PAINTING	22-11-34		701	LOM ALL
DFCS Mode Control Panel Cleaning TASK 22-11-34-100-801			701	LOM ALL

22-CONTENTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
DFCS MODE CONTROL PANEL - REMOVAL/INSTALLATION	22-11-34		401	LOM ALL
DFCS Mode Control Panel Removal TASK 22-11-34-000-801			401	LOM ALL
DFCS Mode Control Panel Installation TASK 22-11-34-400-801			404	LOM ALL
DFCS MODE CONTROL PANEL - ADJUSTMENT/TEST	22-11-34		501	LOM ALL
Mode Control Panel Installation Test TASK 22-11-34-740-801			501	LOM ALL
DFCS MODE CONTROL PANEL - MAINTENANCE PRACTICES	22-11-34		201	LOM ALL
DFCS Mode Control Panel - Deactivation TASK 22-11-34-040-801			201	LOM ALL
DFCS Mode Control Panel - Activation TASK 22-11-34-440-801			205	LOM ALL
DFCS Mode Control Panel Knobs - Replacement TASK 22-11-34-900-801			205	LOM ALL
INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - MAINTENANCE PRACTICES	22-11-37		201	LOM ALL
Integrated Flight System Accessory Unit - Deactivation TASK 22-11-37-040-801			201	LOM ALL
Integrated Flight System Accessory Unit - Activation TASK 22-11-37-440-801			206	LOM ALL
INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - REMOVAL/INSTALLATION	22-11-37		401	LOM ALL
Integrated Flight System Accessory Unit (IFSAU) Removal TASK 22-11-37-000-801			401	LOM ALL
Integrated Flight System Accessory Unit Installation TASK 22-11-37-400-801			405	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
TAKEOFF/GO-AROUND SWITCH - MAINTENANCE PRACTICES	22-11-39		201	LOM ALL
Takeoff/Go-Around Switch - Deactivation TASK 22-11-39-040-801			201	LOM ALL
Takeoff/Go-Around Switch - Activation TASK 22-11-39-440-801			204	LOM ALL
TAKEOFF/GO-AROUND SWITCH - REMOVAL/INSTALLATION	22-11-39		401	LOM ALL
Takeoff/Go-Around Switch Removal TASK 22-11-39-000-801			401	LOM ALL
TOGA Switch Installation TASK 22-11-39-400-801			404	LOM ALL
HYDRAULIC PRESSURE SWITCH - MAINTENANCE PRACTICES	22-11-40		201	LOM ALL
Hydraulic Pressure Switch - Deactivation TASK 22-11-40-040-801			201	LOM ALL
Hydraulic Pressure Switch - Activation TASK 22-11-40-440-801			206	LOM ALL
HYDRAULIC PRESSURE SWITCH - REMOVAL/INSTALLATION	22-11-40		401	LOM ALL
Hydraulic Pressure Switch Removal TASK 22-11-40-000-801			401	LOM ALL
Hydraulic Pressure Switch - Installation TASK 22-11-40-400-801			407	LOM ALL
AUTOPILOT DISENGAGE SWITCH - MAINTENANCE PRACTICES	22-11-41		201	LOM ALL
Autopilot Disengage Switch - Deactivation TASK 22-11-41-040-801			201	LOM ALL
Autopilot Disengage Switch - Activation TASK 22-11-41-440-801			204	LOM ALL
AUTOPILOT DISENGAGE SWITCH - REMOVAL/INSTALLATION	22-11-41		401	LOM ALL
Autopilot Disengage Switch Removal TASK 22-11-41-000-801			401	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Autopilot Disengage Switch Installation TASK 22-11-41-400-801			404	LOM ALL
STABILIZER TRIM MOTOR (AUTOPILOT TEST) - ADJUSTMENT/TEST	22-11-81		501	LOM ALL
Stabilizer Trim Motor Autopilot Test TASK 22-11-81-710-801			501	LOM ALL
PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - MAINTENANCE PRACTICES	22-11-92		201	LOM ALL
Pitch Control Wheel Steering Force Transducer - Deactivation TASK 22-11-92-040-801			201	LOM ALL
Pitch Control Wheel Steering Force Transducer - Activation TASK 22-11-92-440-801			205	LOM ALL
PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - REMOVAL/INSTALLATION	22-11-92		401	LOM ALL
Pitch Force Transducer Removal TASK 22-11-92-000-801			401	LOM ALL
Pitch Force Transducer Installation TASK 22-11-92-400-801			406	LOM ALL
PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST	22-11-92		501	LOM ALL
Pitch Force Transducer Adjustment (DFCS BITE Test) TASK 22-11-92-820-801			501	LOM ALL
Pitch Force Transducer Test TASK 22-11-92-730-801			512	LOM ALL
YAW DAMPER INDICATOR - MAINTENANCE PRACTICES	22-23-00		201	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213
Yaw Damper Indicator - Deactivation TASK 22-23-00-040-801			201	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213
Yaw Damper Indicator - Activation TASK 22-23-00-440-801			204	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Yaw Damper Indicator-Removal/Installation	22-23-00		401	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213
Yaw Damper Indicator Removal TASK 22-23-00-000-801			401	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213
Yaw Damper Indicator Installation TASK 22-23-00-400-801			403	LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213
YAW DAMPER SYSTEM - ADJUSTMENT/TEST	22-23-00		501	LOM ALL
Yaw Damper System - Operational Test TASK 22-23-00-710-801			501	LOM ALL
Yaw Damper System - System Test TASK 22-23-00-710-802			502	LOM ALL
STANDBY RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION	22-23-11		401	LOM ALL
Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves - Removal TASK 22-23-11-000-801			401	LOM ALL
Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves - Installation TASK 22-23-11-400-801			405	LOM ALL
STANDBY RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - ADJUSTMENT/TEST	22-23-11		501	LOM ALL
Rudder Solenoid and Electrohydraulic Servo Valves - Installation Test TASK 22-23-11-740-801			501	LOM ALL
MAIN RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION	22-23-21		401	LOM ALL
Main Rudder PCU Solenoid and Electrohydraulic Servo Valves - Removal TASK 22-23-21-000-801			401	LOM ALL
Main Rudder PCU Solenoid and Electrohydraulic Servo Valves - Installation TASK 22-23-21-400-801			405	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CHAPTER 22
AUTOFLIGHT

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
MAIN RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - ADJUSTMENT/TEST	22-23-21		501	LOM ALL
Rudder Solenoid and Electrohydraulic Servo Valves - Post Installation Test TASK 22-23-21-740-801			501	LOM ALL
AUTOTHROTTLE SYSTEM - MAINTENANCE PRACTICES	22-31-00		201	LOM ALL
Autothrottle System - Deactivation TASK 22-31-00-040-801			201	LOM ALL
Autothrottle System - Activation TASK 22-31-00-440-801			202	LOM ALL
AUTOTHROTTLE SYSTEM - ADJUSTMENT/TEST	22-31-00		501	LOM ALL
Autothrottle System - Operational Test TASK 22-31-00-710-801			501	LOM ALL
Autothrottle System - System Test TASK 22-31-00-710-802			502	LOM ALL
AUTOTHROTTLE DISENGAGE SWITCH - REMOVAL/INSTALLATION	22-31-51		401	LOM ALL
Autothrottle Disengage Switch Removal TASK 22-31-51-000-801			401	LOM ALL
Autothrottle Disengage Switch Installation TASK 22-31-51-400-801			404	LOM ALL
AUTOTHROTTLE BRAKE ASSEMBLY - REMOVAL/INSTALLATION	22-31-81		401	LOM ALL
Autothrottle Brake Assembly - Removal TASK 22-31-81-000-801			401	LOM ALL
Autothrottle Brake Assembly - Installation TASK 22-31-81-400-801			404	LOM ALL
AUTOTHROTTLE SERVO MOTOR AND GEARBOX - REMOVAL/INSTALLATION	22-31-91		401	LOM ALL
Autothrottle Servo Motor and Gearbox Removal TASK 22-31-91-020-801			401	LOM ALL
Autothrottle Servo Motor and Gearbox Installation TASK 22-31-91-400-801			407	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1. General

A. This procedure has maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with certain systems/components inoperative.

B. This procedure also contains the tasks that put the airplane to its usual position.

C. These are the tasks for the components in the autoflight system:

(1) MMEL 22-5 (DDPG) Preparation - Mach Trim System Inoperative

(2) MMEL 22-5 (DDPG) Restoration - Mach Trim System Inoperative

TASK 22-00-00-500-801

2. MMEL 22-5 (DDPG) Preparation - Mach Trim Systems Inoperative

A. General

(1) This task contains the maintenance procedure that prepares the airplane for flight when one or both of the Mach Trim Systems are inoperative.

B. References

Reference	Title
22-11-00-740-806	BITE Library Test (P/B 501)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Location Zones

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

D. Single Mach Trim System Deactivation

SUBTASK 22-00-00-860-003

(1) Do these steps to make sure that the remaining Mach Trim System and MACH TRIM FAIL light operate normally:

(a) If channel A fails, open these circuit breakers and install safety locks:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

(b) If channel B fails, open these circuit breakers and install safety locks:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

(c) Make sure that electrical power is supplied (TASK 24-22-00-860-811).

(d) If channel A fails, do the DFCS library test No. 33, Mach Trim, for channel B, do this task: BITE Library Test, TASK 22-11-00-740-806.

1) Make sure that the test passes.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) If channel B fails, do the DFCS library test No. 33, Mach Trim, for channel A, do this task: BITE Library Test, TASK 22-11-00-740-806.

1) Make sure that the test passes.

E. Dual Mach Trim System Deactivation

SUBTASK 22-00-00-860-001

(1) Do these steps to deactivate the mach trim systems:

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(b) Make sure that the flaps are set to 0.

(c) Put the stabilizer to 4 units of trim.

(d) Move the control column slightly to put the elevators in the detent position.

(e) Make sure that the elevator trailing edge is aligned with the elevator index mark on the tailcone at 0.00 ±0.06 in. (0.0 ±1.5 mm).

NOTE: If the elevator trailing edge is out of alignment, a Mach Trim Actuator and Mach Trim System are required to position it. An actuator or accessory box that does not operate must be replaced.

NOTE: If the elevator trailing edge is not aligned with the index mark on the fuselage, dispatch with both Mach Trim Systems inoperative is not allowed.

(f) Open these circuit breakers and install safety locks:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

(g) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

TASK 22-00-00-890-801

3. MMEL 22-5 (DDPG) Restoration - Mach Trim Systems Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with the Mach Trim Systems inoperative.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

B. References

Reference	Title
22-11-24 P/B 401	MACH TRIM ACTUATOR - REMOVAL/INSTALLATION
22-11-33-000-801	Flight Control Computer Removal (P/B 401)
22-11-33-400-801	Flight Control Computer Installation (P/B 401)
22-11-37 P/B 401	INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - REMOVAL/INSTALLATION
WDM 22-18-11	Wiring Diagram Manual

C. Location Zones

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

D. Mach Trim System Test

SUBTASK 22-00-00-860-002

(1) Remove the safety locks and close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-00-00-740-001

(2) Do these steps to do a test of the mach trim system:

(a) From the INIT/REF INDEX screen on the CDU, make these selections:

1) MAINT>
2) <DFCS
3) <FAULT REVIEW
4) <CURRENT STATUS
5) Do steps as required on CDU screen.
6) <CONTINUE

(b) If the CURRENT STATUS test fails, correct the fault shown on the CDU.

(c) If the CURRENT STATUS test passes, continue.

(d) Make these selections on the CDU:

1) <CHANNEL A AND B
2) <MACH TRIM SYSTEM
3) Do steps as required on CDU screen.
4) <CONTINUE

(e) If the surface test passes, then there was an intermittent fault.

(f) If the surface test fails, then make this selection.

1) <TEST RESULTS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(g) Replace the mach trim actuator (MACH TRIM ACTUATOR - REMOVAL/INSTALLATION, PAGEBLOCK 22-11-24/401).

(h) Select RERUN on the CDU.

(i) If the test passes, you corrected the fault.

(j) If the test fails, continue.

(k) Replace the integrated flight accessory unit(INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - REMOVAL/INSTALLATION, PAGEBLOCK 22-11-37/401).

(l) Select RERUN on the CDU.

(m) If the test passes, you corrected the fault.

(n) If the test fails, continue.

(o) Disconnect connector D545 from the mach trim actuator.

(p) For a CHANNEL A problem, do these steps:

1) Remove the FCC-A (M1875). To remove it, do this task: Flight Control Computer Removal, TASK 22-11-33-000-801.

2) Do these steps to check the wiring of connector D10135C at the E1-1 shelf and connector D545 in the tailcone (WDM 22-18-11):

a) Examine the connectors for contamination, damage, and bent or pushed back pins.

b) Do a continuity check from pin to pin. Check for short circuits between the pins, and from each pin to structure ground.

Table 901/22-00-00-993-809

D10135C	D545
pin E4	pin 26
pin D4	pin 25

(q) For a CHANNEL B problem, do these steps:

1) Remove the FCC-B (M1876). To remove it, do this task: Flight Control Computer Removal, TASK 22-11-33-000-801.

2) Do these steps to check the wiring of connector D10137C at the E1-1 shelf and connector D545 in the tailcone (WDM 22-18-11):

a) Examine the connectors for contamination, damage, and bent or pushed back pins.

b) Do a continuity check from pin to pin. Check for short circuits between the pins, and from each pin to structure ground.

Table 902/22-00-00-993-810

D10137C	D545
pin E4	pin 26
pin D4	pin 25

(r) If you find a problem with the wiring, then do this step:

1) Repair the wiring.

(s) Re-connect D545.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(t) Re-install the FCC, M1875 or M1876. To install it, do this task: Flight Control Computer Installation, TASK 22-11-33-400-801.

(u) Select RERUN on the CDU.

(v) If the test passes, you corrected the fault.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DIGITAL FLIGHT CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure contains these tasks:

(1) Land Verify Test - Maintenance Practices

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

(2) Reset Latches Procedure - Maintenance Practices

LOM ALL

B. You use the Flight Management Computer Control Display Unit (FMC CDU) to do the Built-In-Test Equipment (BITE) tests in these procedures.

NOTE: The A/P - P/RST and the A/T - P/RST lights will stay on during DFCS BITE testing.

(1) FMC CDU (Figure 201)

(a) The FMC CDU has 12 line-select keys (LSKs). There are six keys on the left hand side and six keys on the right hand side of the CDU display. These keys are defined as 1L through 6L and 1R through 6R. The 6L (or 6R) refers to the sixth key down on the left (or right) hand side of the CDU display.

(b) If data is shown on the CDU display with a prompt (< or >) adjacent to it, then it is a selection. You can push the LSK that is adjacent to the prompt and make the selection. It lets you get access to tests or options.

(c) Some selections that you often make when you do the BITE test are the CONTINUE, PREV MENU, EXIT prompts on the CDU display and the NEXT PAGE and PREV PAGE keys on the CDU keyboard.

1) CONTINUE

a) If you push the LSK that is adjacent to CONTINUE, then the BITE will take you to the subsequent page of the test.

2) PREV MENU

a) If you push the LSK that is adjacent to PREV MENU, then the BITE will take you to the previous selection page.

3) EXIT

a) If you push the LSK that is adjacent to EXIT, then the BITE will take you out of BITE test and put the airplane back to its usual condition.

4) NEXT PAGE or PREV PAGE key

a) If it is necessary to change page, then you push the NEXT PAGE or PREV PAGE key on the CDU keyboard. The BITE lets you change page when there is more than one screen page.

TASK 22-11-00-700-801

2. Land Verify Test

A. General

(1) The Land Verify Test does a check on the interfaces between the Digital Flight Control System (DFCS) and its Line Replaceable Unit (LRU).

(2) The Land Verify Test contains a quick test (autotest), an interactive test and a surface test.

(a) The sequence of the Land Verify Test is as follows:

1) Autotests

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Interactive Tests

3) Surface Tests

(b) The autotests are automatic.

(c) The interactive tests are not automatic. You must do the instructions that show on the Control Display Unit (CDU) display to complete the interactive tests.

(d) The surface tests are not automatic and hydraulic power is necessary for the surface tests. You must do the instructions that show on the CDU display to complete the surface tests.

(3) Autotests

Table 201/22-11-00-993-801

Test Name	Group No./ Test No.
ADIRU	49.01
Autothrottle	49.04
DME	49.05
LRRA	49.07
LNAV	49.11*[1]
MCP INTERF	49.16
FMC	49.18
Analog Sensors	49.21
SMYDC	49.22
VOR	49.23
MMR/ILS	49.24
CDS	49.25
MCP Display/Selftest	49.57
Discrete Input	49.70

*[1] Library test 49.11 is available for airplanes with Honeywell Flight Control Computer (FCC)s and with these program pins:

• For Flight Control Computer A (FCC-A): D10135A –A05/G05 both open or D10135A –A05 is open and D10135A –G05 is ground

• For FCC-A: D10137A –A05/G05 both open or D10137A –A05 is open and D10137A –G05 is ground.

(4) Interactive Tests

Table 202/22-11-00-993-802

Test Name	Group No./ Test No.
MCP CMD/CWS Interlock	49.58
Disengage Warning	49.62

(5) Surface Tests

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 203/22-11-00-993-803

Test Name	Group No./ Test No.
Speed/Stab Trim	49.32
Flaps	49.34
Dual Stab	49.35
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306	
Rudder	49.36
LOM ALL	

B. References

Reference	Title
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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-306

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-266

(2) Set the AUTOPILOT STAB TRIM CUTOUT switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-267

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-268

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

E. Land Verify Test

SUBTASK 22-11-00-740-045

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change the page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) LAND VERIFY

(b) Autotest:

1) Do the instructions that show on the CDU display.

NOTE: If the initialization setup is correct, AUTOTEST IN PROGRESS will show on the CDU display.

2) If AUTOTEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: Some autotests can be completed very fast and you cannot see the AUTOTEST PASSED message. The autotest passed if you do not see the AUTOTEST FAILED message.

NOTE: When all the autotests are completed, the summary page shows AUTOTEST PASSED or AUTOTEST FAILED.

3) If AUTOTEST FAILED shows, do the library test(s) that shows on the CDU display.

4) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the Flight Control Computer B (FCC-B). If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

a) If it is necessary to do the test again, do these steps:

b) Push the LSK adjacent to TEST DATA.

c) Push the LSK adjacent to RERUN.

5) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

a) Push the LSK adjacent to CONTINUE.

(c) Interactive Test:

NOTE: The interactive tests come immediately after the last autotest is completed.

1) Do the instructions that show on the CDU display to complete all the interactive tests.

2) If INTERACTIVE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After the last interactive test is completed, the summary page shows TEST FAILED or ALL TESTS PASSED.

3) If INTERACTIVE TEST FAILED shows on the CDU display, do these steps:

a) Push the LSK adjacent to TEST RESULTS.

4) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

a) If it is necessary to do the test again, do these steps:

b) Push the LSK adjacent to TEST DATA.

c) Push the LSK adjacent to RERUN.

5) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

(d) Surface Test:

NOTE: The surface tests come immediately after you complete the last interactive test.

WARNING	MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT

1) Supply hydraulic power to hydraulic systems A and B. Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

WARNING	MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT

2) Do the instructions that show on the CDU display to complete all the surface tests.

3) If SURFACE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After you complete the last surface test, the summary page shows TEST FAILED or ALL TESTS PASSED.

4) If SURFACE TEST FAILED shows on the CDU display, do these steps:

a) Push the LSK adjacent to TEST RESULTS.

LOM 453-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452 WITH COLLINS E-FCC SOFTWARE P8.0 OR WITH COLLINS E-FCC SOFTWARE P9.0 OR WITH COLLINS E-FCC SOFTWARE P11.1

NOTE: If the user does not shake the control column before they continue the test, then the land verify can fail tests 32 and 35.

LOM ALL

5) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

a) If it is necessary to do the test again, do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

b) Push the LSK adjacent to TEST DATA.

c) Push the LSK adjacent to RERUN.

6) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-270

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-271

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-272

(3) Set the AUTOPILOT STAB TRIM CUTOUT switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-273

(4) Remove hydraulic power from hydraulic systems A and B. Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-337

(5) Turn the ADIRU's off on the Nav Mode select panel, by turning the IRS select switches to off.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 201/22-11-00-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

TASK 22-11-00-700-802

3. Reset Latches Procedure

A. General

(1) The Reset Latches Procedure tells you how to remove the latches that you may find in DFCS BITE for Category IIIb flight deck effects (FDEs).

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. Prepare for the Procedure

SUBTASK 22-11-00-860-275

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

E. Procedure

SUBTASK 22-11-00-740-046

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change the page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) FAULT REVIEW
5) ERASE FAULTS/RESET FDE
6) RESET LATCHED FDE

NOTE: Make sure that you have corrected all the faults that you see on the RESET FDE page before you remove them.

a) Push the LSK adjacent to the FDE(s) where you want to remove the latch(es).
b) Push the LSK adjacent to YES.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-276

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DIGITAL FLIGHT CONTROL SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains these tasks:

(1) Digital Flight Control System - Operational Test
(2) Digital Flight Control System - System Test
(3) Option Pins Test
(4) BITE Library Test
(5) Wheel Spin Up Test
(6) Power Bus Transfer Test
(7) Power Bus Isolation Test
(8) Circuit Breaker Interface Test
(9) Air/Ground Discrete Test
(10) Other Discrete Inputs Test
(11) Sensor Excitation Test
(12) Maintenance Monitor Test
(13) Master Caution Test

LOM 445

(14) Autoland Warning Light Test

LOM ALL

(15) Elevator Rig Test
(16) Elevator Single Authority Test
(17) Elevator Dual Authority Test
(18) Aileron Rigging Test
(19) Flaps Rigging Test
(20) Stabilizer Rigging Test
(21) Pitch Control Wheel Steering Rigging Test
(22) Roll Control Wheel Steering Rigging Test
(23) Mach Trim Rigging Test

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

(24) Rudder Rigging Test

LOM ALL

(25) Alpha Vane Rigging Test
(26) Remote Light Sensor Input Test
(27) Digital Flight Control System LRU Replacement Test

B. You use the Flight Management Computer Control Display Unit (FMC CDU) to do the Built-In-Test Equipment (BITE) tests in this procedure.

NOTE: The A/P - P/RST and the A/T - P/RST lights will stay on during DFCS BITE testing.

(1) FMC CDU (Figure 501)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) The FMC CDU has 12 line-select keys (LSKs). There are six keys on the left hand side and six keys on the right hand side of the CDU display. These keys are defined as 1L through 6L and 1R through 6R. The 6L (or 6R) refers to the sixth key down on the left (or right) hand side of the CDU display.

(b) If the data that is shown on the CDU display with a prompt (< or >) adjacent to it, then it is a selection. You can push the LSK that is adjacent to the prompt and make the selection. It lets you get access to tests or options.

(c) Some selections that you often make when you do the BITE test are the CONTINUE, PREV MENU, EXIT prompts on the CDU display and the NEXT PAGE and PREV PAGE keys on the CDU keyboard.

1) CONTINUE

a) If you push the LSK that is adjacent to CONTINUE, then the BITE will take you to the subsequent page of the test.

2) PREV MENU

a) If you push the LSK that is adjacent to PREV MENU, then the BITE will take you to the previous selection page.

3) EXIT

a) If you push the LSK that is adjacent to EXIT, then the BITE will take you out of BITE test and put the airplane back to its usual condition.

4) NEXT PAGE or PREV PAGE key

a) If it is necessary to change page, then you push the NEXT PAGE or PREV PAGE key on the CDU keyboard. The BITE lets you change page when there is more than one screen page.

TASK 22-11-00-740-801

2. Digital Flight Control System (DFCS) - Operational Test

A. General

(1) The Digital Flight Control System (DFCS) operational test does a quick check of the serviceable condition of the DFCS. It uses no external equipment. Electrical power and hydraulic power are the only power sources that are necessary for this test.

(2) Do the DFCS operational test from the Control Display Unit (CDU). The first test is a check of the Flight Control Computer (FCC) software part number. Then use the current status quick test and five additional tests under the CURRENT STATUS item on the DFCS BITE TEST Fault Review menu.

(3) The CURRENT STATUS item on the DFCS BITE TEST FAULT REVIEW menu contains these tests:

(a) Current Status Quick Test (Group 10)

(b) Additional Tests:

1) Autopilot (Group 11)

2) Flight Director (Group 12)

3) Mach Trim System (Group 13)

4) Speed Trim System (Group 14)

5) Altitude Alert (Group 15)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) The current status quick test comes before the additional tests. In each additional test, if there are interactive and surface tests, then the interactive tests come before the surface tests. The sequence of the Current Status test is as follows:

1) Current Status Quick Test

2) Additional test

a) Interactive tests

b) Surface tests

(4) The current status quick test contains a number of library tests.

NOTE: These library tests are automatic and they are referred to as autotests.

(5) There are five additional tests.

NOTE: Each additional test contains a number of library tests. These library tests are interactive and/or surface tests.

(a) The interactive tests are not automatic.

NOTE: You must do the instructions that show on the CDU display to complete the interactive tests.

(b) The surface tests are not automatic and hydraulic power is necessary for the surface tests.

NOTE: You must do the instructions that show on the CDU display to complete the surface tests.

(6) Current Status Quick Test (Group 10)

Table 501/22-11-00-993-A04

Library Test Name	Group No./ Library Test No.
Discrete Input	10.70
ADIRU	10.01
A/T (Autothrottle)	10.04
DME	10.05
LRRA	10.07
LNAV	10.11*[1]
MCP INT (MCP Interface)	10.16
FMC	10.18
ANLG SEN (Analog Sensor)	10.21
SMYDC	10.22
VOR	10.23
MMR/ILS	10.24
CDS	10.25
MCP Display /Self Test	10.57
GPS (If installed)	10.27

*[1] Library test 10.11 is available for airplanes with Honeywell FCCs and with these program pins:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

• For FCC-A (B): D10135A (D10137A) – pins A05/G05 both open, or pin A05 is open and pin G05 is ground (SSM 22-11-14).

(7) Autopilot (Group 11)

Table 502/22-11-00-993-A05

Library Test Name	Group No./ Library Test No.
Interactive	
ADIRU	11.01
LNAV*[1]	11.11*[2]
FMC*[3]	11.18
VOR	11.23
MMR/ILS	11.24
MCP Pushbuttons	11.50
MCP IAS/Mach Changeover	11.52
MCP Speed Select	11.54
MCP Bank Angle Limit	11.53
MCP Altitude Select Knob	11.55
MCP Vertical Speed Knob	11.56
MCP CMD/CWS Interlock	11.58
MCP Displays/Self-Test	11.57
MCP Course/Heading Select	11.59
ALT Alert	11.61
Disengage Warning	11.62
GPS (If installed)	11.27
Surface	
Elevator	11.30
Aileron	11.31
Speed/Stab Trim	11.32
Mach Trim	11.33
Flaps	11.34
Dual Stab	11.35
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306; AIRPLANES WITH ROLLOUT CONTROL	
Rudder	11.36
LOM ALL	

*[1] For airplanes with Honeywell FCCs and the LNAV option enabled

*[2] Library test 11.11 is available for airplanes with Honeywell FCCs and with these program pins:

• For FCC-A (B): D10135A (D10137A) – pins A05/G05 both open, or pin A05 is open and pin G05 is ground (SSM 22-11-14).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

*[3] For airplanes with Collins FCCs

(8) Flight Director (Group 12)

Table 503/22-11-00-993-A06

Library Test Name	Group No./ Library Test No.
Interactive	
LNAV	12.11*[1]
MCP Pushbuttons	12.50
MCP F/D Switches	12.51
MCP IAS/Mach Changeover	12.52
MCP Speed select	12.54
MCP Bank Angle Limit	12.53
MCP Altitude Select Knob	12.55
MCP Vertical Speed Knob	12.56
MCP Displays/Self-Test	12.57
MCP Course/Heading Select	12.59
Surface	
Flaps	12.34

*[1] Library test 12.11 is available for airplanes with Honeywell FCCs and with these program pins:

• For FCC-A (B): D10135A (D10137A) – pins A05/G05 both open, or pin A05 is open and pin G05 is ground (SSM 22-11-14).

(9) Mach Trim System (Group 13)

Table 504/22-11-00-993-807

Library Test Name	Group No./ Library Test No.
Interactive	
None	
Surface	
Mach Trim	13.33

(10) Speed Trim System (Group 14)

Table 505/22-11-00-993-808

Library Test Name	Group No./ Library Test No.
Interactive	
Speed/Stab Trim	14.32
Surface	
Speed/Stab Trim	14.32

(11) Altitude Alert (Group 15)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 506/22-11-00-993-809

Library Test Name	Group No./ Library Test No.
Interactive	
MCP Altitude Select Knob	15.55
MCP Displays/Self-Test	15.57
ALT Alert	15.61
Surface	
None	

B. References

Reference	Title
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)
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)
SSM 22-11-14	System Schematics Manual

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-287

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-309

(2) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-860-002

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-228

(4) Make sure that the left and right ADIRU's are aligned in the NAV mode (TASK 34-21-00-820-802 or TASK 34-21-00-820-801).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-003

(5) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-005

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B (TASK 29-11-00-860-801).

NOTE: Hydraulic power is necessary for surface test.

E. FCC Software Part Number Test

SUBTASK 22-11-00-420-001

(1) Do these steps to test the software part number:

(a) If you are not at one of the DFCS BITE TEST displays, do these steps:

1) Push the INIT REF key on the CDU keyboard.

2) If the POS INIT display shows, push the Line Select Key (LSK) adjacent to INDEX.

NOTE: This makes the INIT/REF INDEX show.

3) Push the LSK adjacent to MAINT.

(b) From the MAINT BITE INDEX, push the LSK adjacent to DFCS.

NOTE: The DFCS will do a self-test.

(c) When the self-test is complete, push the LSK adjacent to IDENTIFICATION AND CONFIGURATION.

(d) Push the LSK adjacent to CHANNEL A.

1) Make sure that the software part number for Flight Control Computer A (FCC-A) is correct.

NOTE: The software part number shows below FCC Operational Program Software (OPS).

(e) Push the LSK adjacent to PREV MENU.

(f) Push the LSK adjacent to CHANNEL B.

1) Make sure that the software part number for Flight Control Computer B (FCC-B) is correct.

NOTE: The software part number shows below FCC OPS.

F. Current Status Tests

SUBTASK 22-11-00-740-001

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the LSK that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) DFCS

4) FAULT REVIEW

5) CURRENT STATUS

6) Select channel A, B, or A and B.

(b) Autotest:

1) Do the instructions that show on the CDU display.

NOTE: If the initialization setup is correct, AUTOTEST IN PROGRESS will show on the CDU display.

2) If AUTOTEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: Some autotests can be completed very fast and you cannot see the AUTOTEST PASSED message. The autotest passed if the AUTOTEST FAILED message is not seen.

NOTE: When all the autotests are completed, the summary page shows AUTOTEST PASSED or AUTOTEST FAILED.

3) If AUTOTEST FAILED shows, do the library test(s) that shows on the CDU display.

4) Make a record of the channel (A, B, or A/B), suspect Line Replaceable Unit (LRU)s and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

a) If it is necessary to do the test again, do these steps:

b) Push the LSK adjacent to TEST DATA.

c) Push the LSK adjacent to RERUN.

5) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

(c) Additional Test:

NOTE: The additional test comes immediately after you complete the last autotest.

1) Push the LSK that is adjacent to the additional test.

NOTE: When the test is completed and to make the selection for the next additional test, you can push the LSK adjacent to PREV MENU until you see the CURRENT STATUS SELECT ADDITIONAL TEST menu again.

a) Make sure that the autopilot, flight director, mach trim system, speed trim system, and alt alert tests are done.

2) AUTOPILOT

a) Do the interactive tests.

b) Do the surface tests.

c) Make sure that the Autopilot Test is completed with no failure.

3) FLIGHT DIRECTOR

a) Do the interactive tests.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

b) Do the surface test.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428

NOTE: No corrective action is required if the library test 62 fails for channel A only and only maintenance message 22-11540 shows on the CDU display. This is a nuisance fault

LOM ALL

c) Make sure that the Flight Director Test is completed with no failure.

4) MACH TRIM SYSTEM

a) Do the surface test.

NOTE: There is no interactive test for the Mach Trim Test, thus the BITE goes directly to the surface test.

b) Make sure that the Mach Trim System Test is completed with no failure.

5) SPEED TRIM SYSTEM

a) Do the interactive test.

b) Do the surface test.

c) Make sure that the Speed Trim System Test is completed with no failure.

6) ALT ALERT

a) Do the interactive tests.

NOTE: There is no surface test for the Alt Alert Test.

b) Make sure that the Alt Alert Test is completed with no failure.

(d) Interactive Test:

1) Do the instructions that show on the CDU display to complete all the interactive tests.

2) If INTERACTIVE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After the last interactive test is completed, the summary page shows TEST FAILED or ALL TESTS PASSED.

3) If INTERACTIVE TEST FAILED shows on the CDU display, do these steps:

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452

NOTE: No corrective action is required if the library test 61 shows TEST FAILED for channel B only and only maintenance message 22–11115 shows on the CDU display. This is a nuisance fault.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428

NOTE: No corrective action is required if library test 62 shows TEST FAILED for channel A only and only maintenance message 22-11540 shows on the CDU display. This is a nuisance fault.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452

NOTE: No corrective action is required if the library test 32 shows TEST FAILED with only maintenance messages 22–11176 and 22–11216 show on the CDU display. This is a nuisance fault.

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

a) Push the LSK adjacent to TEST RESULTS.

b) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

c) If it is necessary to do the test again, do these steps:

d) Push the LSK adjacent to TEST DATA.

e) Push the LSK adjacent to RERUN.

4) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

(e) Surface Test:

NOTE: The surface test comes immediately after you complete the last interactive test.

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

1) Do the instructions that show on the CDU display to complete all the surface tests.

2) If SURFACE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After the last surface test is completed, the summary page shows TEST FAILED or ALL TESTS PASSED.

3) If SURFACE TEST FAILED shows on the CDU display, do these steps:

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452

NOTE: No corrective action is required if the library test 32 shows TEST FAILED and only maintenance messages 22–11176 and 22–11216 show on the CDU display. This is a nuisance fault.

LOM ALL

a) Push the LSK adjacent to TEST RESULTS.

b) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDUdisplay. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

c) If it is necessary to do the test again, do these steps:

d) Push the LSK adjacent to TEST DATA.

e) Push the LSK adjacent to RERUN.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-006

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-208

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-008

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-00-860-388

(4) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the DFCS Built-In-Test Equipment (BITE) test.

LOM ALL

SUBTASK 22-11-00-860-009

(5) Remove hydraulic power from hydraulic systems A and B (TASK 29-11-00-860-805).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 501/22-11-00-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-740-802

3. Digital Flight Control System (DFCS) - System Test

A. General

(1) The DFCS System Test does a check on all of the DFCS's interfaces. It makes sure that the DFCS operates correctly.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-00-740-002

(1) Do this task: Flight Control Computer Option Pins Test, TASK 22-11-00-740-814.

SUBTASK 22-11-00-740-005

(2) Do this task: BITE Library Test, TASK 22-11-00-740-806.

SUBTASK 22-11-00-740-006

(3) Do this task: Wheel Spin Up Test, TASK 22-11-00-740-807.

SUBTASK 22-11-00-740-007

(4) Do this task: Power Bus Transfer Test, TASK 22-11-00-740-808.

SUBTASK 22-11-00-740-008

(5) Do this task: Power Bus Isolation Test, TASK 22-11-00-740-809.

SUBTASK 22-11-00-740-009

(6) Do this task: Circuit Breaker Interface Test, TASK 22-11-00-740-810.

SUBTASK 22-11-00-740-010

(7) Do this task: Air/Ground Discrete Test, TASK 22-11-00-740-811.

SUBTASK 22-11-00-740-011

(8) Do this task: Other Discrete Inputs Test, TASK 22-11-00-740-812.

SUBTASK 22-11-00-740-012

(9) Do this task: Sensor Excitation Test, TASK 22-11-00-820-801.

SUBTASK 22-11-00-740-013

(10) Do this task: Maintenance Monitor Test, TASK 22-11-00-740-813.

SUBTASK 22-11-00-740-014

(11) Do this task: Master Caution Test, TASK 22-11-00-800-801.

LOM 445

SUBTASK 22-11-00-740-041

(12) Do this task: Autoland Warning Light Test, TASK 22-11-00-800-802.

LOM ALL

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-740-814

4. Flight Control Computer Option Pins Test

A. General

(1) The Option Pins Test lets you do a check on the option and program pins for the flight control computers A (FCC-A) and FCC-B.

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-00-862-001

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-313

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-314

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-315

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

D. Procedure

SUBTASK 22-11-00-740-049

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES.

NOTE: The value that shows on the CDU screen for each FCC is a 10-digits Hex representation of all the FCC program pin options associated with the parity pin.

6) OPTION/PROG PINS

NOTE: Push the NEXT PAGE button on the CDU scratch pad to see more options.

LOM ALL; WITH ROCKWELL COLLINS E-FCC

a) Make sure that these pin options show on the CDU display:

NOTE: Ignore FMC LNAV and BL-01 because they are not part of the DFCS BITE test.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; WITH ROCKWELL COLLINS E-FCC (Continued)

Table 507/22-11-00-993-948 FCC Program Pin Options

LOM ALL
737-800
AIRPLANE CONFG 1
LOM 402, 404, 406, 407, 416, 432, 437, 438, 445, 461-463; LOM 457 POST SB 737-31-2184
ALT ALERT STD
LOM 450
ALT ALERT OPT 2
LOM 411, 412, 415, 420, 422-431, 433, 434, 439-444, 446, 447, 451-456, 458-460, 464-999; LOM 457 PRE SB 737-31-2184
ALT ALERT OPT 3
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450, 453-456, 458-460, 464; LOM 457 PRE SB 737-31-2184
A/S WARN
LOM 402, 404, 406, 407, 412, 415, 416, 422-425, 432-434, 437-442, 445-447, 466-999; LOM 420 PRE SB 737-22-1218
CWS OVERRIDE*[1]
LOM 466-999; LOM 402, 404, 406, 407, 412, 415, 416, 422-425, 432-434, 437-442, 445-447 WITH COLLINS E-FCC SOFTWARE P8.0 OR WITH COLLINS E-FCC SOFTWARE P9.0 OR WITH COLLINS E-FCC SOFTWARE P11.1; LOM 420 PRE SB 737-22-1218 AND (WITH COLLINS E-FCC SOFTWARE P8.0 OR WITH COLLINS E-FCC SOFTWARE P9.0 OR WITH COLLINS E-FCC SOFTWARE P11.1)
RESRV1*[1]
LOM 404, 411, 412, 415, 416, 422-426, 429-434, 437-445, 450-454, 464; LOM 457 PRE SB 737-31-2184
CWS WARN
LOM 422, 425, 427, 428, 434, 440, 442, 453, 454, 465-999; LOM 433 POST SB 737-22-1464
IRU-A/P INTLK ENABLE
LOM ALL; WITH ROCKWELL COLLINS E-FCC
BL-01
FMC LNAV
DUAL CHAN
LOM 427-431, 439, 441, 446, 447, 450, 455, 456, 461-464
MMR/GLS
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-444, 446, 447, 450-999; LOM 445 POST SB 737-22-1448
INHIBIT GS BEFORE LOC
LOM 422, 425, 427, 428, 433, 434, 437, 438, 440, 442, 450-454, 457, 465-999
HDG SEL TOGA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 422, 425, 427, 428, 433, 434, 437, 438, 440, 442, 450-454, 457, 465-999 (Continued)

Table 507/22-11-00-993-948 FCC Program Pin Options (Continued)

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 423, 424, 426, 429-432, 439, 441, 443-447, 455, 456, 458-464
WING LEVEL TOGA
LOM 406, 407, 411, 412, 415, 420, 422-425, 427-434, 437-447, 450-999
SPD/ALT INTERVENTION
LOM ALL
EDFCS
WINGLETS INSTALLED*[2]
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306
CAT IIIB AIRPLANE
LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999
SFP
LOM ALL; WITH ROCKWELL COLLINS E-FCC

*[1] If the pin number 5 is ON and FCC has OPS 8 or newer, CDU shows "RESRV1". If the pin number 5 is ON and FCC has OPS 7 or older, CDU shows "CWS OVERRIDE". If the pin number 5 is OFF and FCC has OPS 8 or newer, CDU does not show "RESRV1" or "CWS OVERRIDE".

*[2] This label will not show if the applicable FCC programming pin is not set. It is not necessary to set the pin if the APB winglets are installed.

LOM ALL

7) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display it is necessary to do the instructions that show on the CDU display.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-861-002

(1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-317

(2) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

END OF TASK

TASK 22-11-00-740-806

5. BITE Library Test

A. General

(1) The BITE library Test does a check on the interfaces between the Digital Flight Control System (DFCS) and its Line Replaceable Unit (LRU)s.

(2) The BITE Library Test contains three types of tests. The quick test (autotest), interactive test and surface test. The autotest comes before the interactive test, and the interactive test comes before the surface test.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) The sequence of the BITE Library Test is as follows:

1) Autotests
2) Interactive Tests
3) Surface Tests

(b) The autotests are automatic.

(c) The interactive tests are not automatic. You must do the instructions that show on the Control Display Unit (CDU) display to complete the interactive tests.

(d) The surface tests are not automatic and hydraulic power is necessary for the surface tests. You must do the instructions that show on the CDU display to complete the surface tests.

(3) Autotests

Table 508/22-11-00-993-815

Library Test Name	Group No./ Library Test No.
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426, 432-434, 437-447, 451-464; LOM 427 POST SB 737-22-1306	
ADIRU	60.01
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306	
ADIRU/ISFD	60.01
LOM ALL	
Autothrottle	60.04
DME	60.05
LRRA	60.07
LNAV	60.11*[1]
MCP INTERF	60.16
FMC	60.18
Analog Sensors	60.21
SMYDC	60.22
VOR	60.23
MMR/ILS	60.24
CDS	60.25
MCP Display/Selftest	60.57
Discrete Input	60.70

*[1] Library test 60.11 is available for airplanes with Honeywell Flight Control Computer (FCC)s and with these program pins:

• For Flight Control Computer A (FCC-A): D10135A –A05/G05 both open or D10135A –A05 is open and D10135A –G05 is ground

• For FCC-A: D10137A –A05/G05 both open or D10137A –A05 is open and D10137A –G05 is ground.

(4) Interactive Tests

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 509/22-11-00-993-816

Library Test Name	Group No./ Library Test No.
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426, 432-434, 437-447, 451-464; LOM 427 POST SB 737-22-1306	
ADIRU	60.01
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306	
ADIRU/ISFD	60.10
LOM ALL	
VOR	60.23
MMR/ILS *[1]	60.24
MCP Pushbuttons	60.50
MCP F/D Switches	60.51
MCP IAS/Mach Changeover	60.52
MCP Bank Angle Limit	60.53
MCP Speed Select	60.54
MCP Altitude Select Knob	60.55
MCP Vertical Speed Knob	60.56
MCP Displays/Selftest	60.57
MCP CMD/CWS Interlock	60.58
MCP Course/Heading Select	60.59
ALT Alert	60.61
Disengage Warning	60.62

*[1] NOTE: If the airplane has a heads-up guidance system (HGS) installed and is powered ON, make sure that the HGS is not operating in primary (PRI) or autoland (AIII) mode before performing the interactive test 60.24, otherwise the test can fail.

(5) Surface Tests

Table 510/22-11-00-993-817

Library Test Name	Group No./ Library Test No.
Elevator	60.30
Aileron	60.31
Speed/Stab Trim	60.32
Mach Trim	60.33
Flaps	60.34
Dual Stab	60.35
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306	
Rudder	60.36

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306 (Continued)

Table 510/22-11-00-993-817 (Continued)

Library Test Name	Group No./ Library Test No.
LOM ALL	

B. References

Reference	Title
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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-303

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-040

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-041

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-042

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-043

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B. Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

E. BITE Library Test

SUBTASK 22-11-00-740-018

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) BITE LIBRARY TESTS
6) CHANNEL A AND B
7) RUN ALL LIBRARY TESTS

(b) Autotest:

1) Do the instructions that show on the CDU display.

NOTE: If the initialization setup is correct, AUTOTEST IN PROGRESS will show on the CDU display.

2) If AUTOTEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: Some autotests can be completed very fast and you cannot see the AUTOTEST PASSED message. The autotest passed if you do not see the AUTOTEST FAILED message.

NOTE: When all the autotests are completed, the summary page shows AUTOTEST PASSED or AUTOTEST FAILED.

3) If AUTOTEST FAILED shows, do the library test(s) that shows on the CDU display.

4) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the Flight Control Computer B (FCC-B). If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

a) If it is necessary to do the test again, do these steps:

b) Push the LSK adjacent to TEST DATA.

c) Push the LSK adjacent to RERUN.

5) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

(c) Interactive Test:

NOTE: The interactive tests come immediately after you complete the last autotest.

1) Do the instructions that show on the CDU display to complete all the interactive tests.

NOTE: If the airplane is equipped with a Rockwell Collins MCP (mode control panel), only 7 segments will be displayed during the DFCS BITE Library Test 57 and the check can pass. If the airplane is equipped with a Honeywell MCP and only 7 segments are displayed during the DFCS BITE Library Test 57, the MCP should be replaced.

NOTE: The A/P disengage aural warning may sound during DFCS BITE Library Test 58. This warning does not affect performance and test result. Push the captain or first officer autopilot disengage switch to clear the A/P disengage aural warning after Library Test 58 is completed.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) If INTERACTIVE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After you complete the last interactive test, the summary page shows TEST FAILED or ALL TESTS PASSED.

3) If INTERACTIVE TEST FAILED shows on the CDU display, do these steps:

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428

NOTE: No corrective action is required if the library test 62 shows TEST FAILED for channel A only and only maintenance message 22-11540 shows on the CDU display. This is a nuisance fault.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452

NOTE: No corrective action is required if the INTERACTIVE TEST 32 shows TEST FAILED and only maintenance messages 22–11176 and 22–11216 show on the CDU display. This is a nuisance fault.

LOM ALL

a) Push the LSK adjacent to TEST RESULTS.

b) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

c) If it is necessary to do the test again, do these steps:

d) Push the LSK adjacent to TEST DATA.

e) Push the LSK adjacent to RERUN.

4) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

(d) Surface Test:

NOTE: The surface tests come immediately after the you complete the last interactive test.

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

1) Do the instructions that show on the CDU display to complete all the surface tests.

2) If SURFACE TEST PASSED shows on the CDU display, the test is completed with no failure.

NOTE: After you complete the last surface test, the summary page shows TEST FAILED or ALL TESTS PASSED.

3) If SURFACE TEST FAILED shows on the CDU display, do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-428

NOTE: No corrective action is required if the library test 62 shows TEST FAILED for channel A only and only maintenance message 22-11540 shows on the CDU display. This is a nuisance fault.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-452

NOTE: No corrective action is required if the library test 61 shows TEST FAILED for channel B only and only maintenance message 22–11115 shows on the CDU display. This is a nuisance fault.

NOTE: No corrective action is required if the library test 32 shows TEST FAILED and only maintenance messages 22–11176 and 22–11216 show on the CDU display. This is a nuisance fault.

NOTE: If EDFCS-BITE library test 30 fails, the operator should select the LSK associated with “TEST DATA”. If only subtests S052 and/or S152 fail and the data field displays a value between 4.00 and 5.57, the test should be considered a PASS. If the value is outside these limits, troubleshoot per the applicable FIM instructions.

LOM ALL

NOTE: If EDFCS-BITE library test 32 fails, the operator should select the LSK associated with “TEST DATA”. If only subtests S035 and/or S135 fail and the data field displays a value between 1.00 and 1.5, the test should be considered a PASS. If the value is outside these limits, troubleshoot per the applicable FIM instructions. (Applicable to fault messages 22-11167, 22-11173, and 22-11181).

NOTE: When EDFCS-BITE displays the message “*SET STAB TO VAC BELOW (STAB AT 8.0 UNITS)” in library test 32 or “*SET STAB TO VAC BELOW (STAB AT 11.0 UNITS)” in library test 35, the operator should manually jiggle the control column near neutral after setting the stab position to ensure the system in centered, and then push LSK 6L “CONTINUE”. The system will be centered and the test should pass. If not, troubleshoot the airplane per the displayed fault information and associated FIM instructions.

a) Push the LSK adjacent to TEST RESULTS.

b) Make a record of the channel (A, B, or A/B), suspect LRUs and the pin numbers that show on the CDU display.

NOTE: You can find the channel data adjacent to the INPUT/OUTPUT PINS that shows on the CDU display. Channel A is for the FCC-A and channel B is for the FCC-B. If there is no pin number for the suspect LRU, the channel data does not show.

NOTE: Each suspect LRU is referred to as a maintenance message.

c) If it is necessary to do the test again, do these steps:

d) Push the LSK adjacent to TEST DATA.

e) Push the LSK adjacent to RERUN.

4) Refer to 22-Maintenance Message Index in the FIM to find the fault isolation task for the applicable maintenance message.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-044

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-045

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-391

(3) Set the left and right IRS select switches, on the P5 aft overhead panel, to the OFF position.

SUBTASK 22-11-00-860-046

(4) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-047

(5) Remove hydraulic power from hydraulic systems A and B. Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

TASK 22-11-00-740-807

6. Wheel Spin Up Test

A. General

(1) The Wheel Spin Up Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the wheel spin logic circuit.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-049

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

SUBTASK 22-11-00-860-302

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-050

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-051

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-052

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

E. Procedure

SUBTASK 22-11-00-740-019

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DISCRETE INPUTS
7) J1A
8) Find the "WHEEL SPIN J10" discrete name and pin that shows on the CDU display.
9) Make sure that the CDU display shows "OP" on the A side and B side for the "WHEEL SPIN J10".
10) Set the switch on antiskid/autobrake control unit, on the E1-2 shelf, to the OUTBD position.
11) Push and hold the PRESS/TEST switch.
12) Push and hold the ENABLE/VERIFY switch.
13) Make sure that the CDU display shows "28" on the A side and B side for the "WHEEL SPIN J10".
14) Release the PRESS/TEST and ENABLE/VERIFY switches.
15) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-053

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-211

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-055

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-056

(4) Remove hydraulic power from hydraulic systems A and B if hydraulic power is on. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-057

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

TASK 22-11-00-740-808

7. Power Bus Transfer Test

A. General

(1) The Power Bus Transfer Test does a check on the interface between the Digital Flight Control System (DFCS) and the bus transfer relay.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-058

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

SUBTASK 22-11-00-860-301

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-059

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-060

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-061

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-062

(6) Start the APU. To start the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(a) Set the two APU generator switches, on the P5 forward overhead panel, to the ON position.

(b) Make sure that the BUS TRANSFER switch, on the P5 forward overhead panel, is in the AUTO position.

E. Procedure

SUBTASK 22-11-00-740-020

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) SENSOR VALUES

6) DISCRETE INPUTS

7) J1B

8) Find the "BUS TRANSFER H14" discrete name and pin that shows on the CDU display.

9) Do this check for the APU GEN 1:

a) Set the APU GEN 1 switch, on the P5 forward overhead panel, to the OFF position.

b) Make sure that the CDU display shows "OP" on the A side for the "BUS TRANSFER H14".

c) Set the APU GEN 1 switch, on the P5 forward overhead panel, to the ON position.

d) Make sure that the CDU display shows "28" on the A side for the "BUS TRANSFER H14".

10) Do this check for the APU GEN 2:

a) Set the APU GEN 2 switch, on the P5 forward overhead panel, to the OFF position.

b) Make sure that the CDU display shows "OP" on the B side for the "BUS TRANSFER H14".

c) Set the APU GEN 2 switch, on the P5 forward overhead panel, to the ON position.

d) Make sure that the CDU display shows "28" on the B side for the "BUS TRANSFER H14".

ECCN 9E991 BOEING PROPRIETARY - See title page for details

11) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-063

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

SUBTASK 22-11-00-860-064

(2) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-212

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-066

(4) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-067

(5) Remove hydraulic power from hydraulic systems A and B if hydraulic power is on. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-068

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

TASK 22-11-00-740-809

8. Power Bus Isolation Test

A. General

(1) The Power Bus Isolation Test does a check on the interface between the Digital Flight Control System (DFCS) and the bus isolation relay.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Location Zones

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

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Prepare for the Test

SUBTASK 22-11-00-860-069

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

SUBTASK 22-11-00-860-300

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-070

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-071

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-072

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

F. Power Bus Isolation Test

SUBTASK 22-11-00-860-073

(1) Set the DC meter selector switch, on the P5 forward overhead panel, to the TR 1 position.

SUBTASK 22-11-00-860-389

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-00-010-007

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

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-00-860-074

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.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(WARNING PRECEDES)

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

(4) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	6	C00806	TRU 1

SUBTASK 22-11-00-860-075

(5) Make sure that the DC VOLTS meter display, on the P5 forward overhead panel, shows 22 to 30 VDC.

SUBTASK 22-11-00-740-021

(6) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DISCRETE OUTPUTS
7) DC BUS ISOLATION OUTPUT
8) DC BUS ISOLATION OUTPUT

(b) Make sure that the CDU display shows "STATE=ON (28 VDC)".

(c) Make sure that the DC VOLTS meter display, on the P5 forward overhead panel, shows -2.0 to +2.0 VDC.

(d) Push the LSK adjacent to "DC BUS ISOLATION OUTPUT".

(e) Make sure that the DC VOLTS meter display, on the P5 forward overhead panel, shows 22 to 30 VDC.

(f) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

SUBTASK 22-11-00-860-225

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-00-860-226

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-860-079

(9) Make sure that the DC VOLTS meter display, on the P5 forward overhead panel, shows 22 to 30 VDC.

SUBTASK 22-11-00-860-227

(10) Make sure that the word "F/D" goes out of view on the Captains Primary Flight Display.

NOTE: This can take up to 50 seconds to occur.

SUBTASK 22-11-00-740-022

(11) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DISCRETE OUTPUTS
7) DC BUS ISOLATION OUTPUT
8) DC BUS ISOLATION OUTPUT
9) Make sure that the CDU display shows "DFCS BITE INOP CHECK INTERFACE".

(b) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

SUBTASK 22-11-00-860-080

WARNING

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(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.

(12) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	6	C00806	TRU 1

SUBTASK 22-11-00-410-008

(13) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-00-860-390

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-081

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-213

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-083

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-084

(4) Remove hydraulic power from hydraulic systems A and B if hydraulic power is on, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-085

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-740-810

9. Circuit Breaker Interface Test

A. General

(1) The Circuit Breaker Interface Test does a check on the interfaces between the Digital Flight Control System (DFCS) and all of its circuit breakers.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-086

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

SUBTASK 22-11-00-860-299

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-087

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-088

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-089

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

E. Procedure

SUBTASK 22-11-00-980-001

(1) Do a check on these circuit breakers for the Primary Flight Display:

(a) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

1) Make sure that the "F/D" (in amber box) shows on the captain's primary flight display.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

1) Make sure that the "F/D" (in amber box) does not show on the captain's primary flight display.

NOTE: It can take approximately 20 seconds for this to happen after you close the circuit breaker.

(c) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

1) Make sure that the "F/D" (in amber box) shows on the first officer's primary flight display.

(d) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

1) Make sure that the "F/D" (in amber box) does not show on the first officer's primary flight display.

NOTE: It can take approximately 20 seconds for this to occur after you close the circuit breaker.

SUBTASK 22-11-00-740-023

(2) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DISCRETE INPUTS
7) CIRCUIT BREAKER CHECK

(b) Do a check on these circuit breakers for the FCCA side:

1) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	3	C01048	AFCS SYS A ENGAGE INTLK

a) Make sure that the CDU display shows "ENGAGE INTLK = 0 (±2)" on the FCCA side.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	3	C01048	AFCS SYS A ENGAGE INTLK

a) Make sure that the CDU display shows "ENGAGE INTLK = 28 (±2)" on the FCCA side.

3) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	4	C00457	AFCS SYS A MACH TRIM DC

a) Make sure that the CDU display shows "MACH TRIM DC = 0 (±2)" on the FCCA side.

4) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	4	C00457	AFCS SYS A MACH TRIM DC

a) Make sure that the CDU display shows "MACH TRIM DC = 28 (±2)" on the FCCA side.

5) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC

a) Make sure that the CDU display shows "MACH TRIM AC = 0 (±3)" on the FCCA side.

6) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC

a) Make sure that the CDU display shows "MACH TRIM AC = 115 (±3)" on the FCCA side.

(c) Do a check on these circuit breakers for the FCCB side:

1) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK

a) Make sure that the CDU display shows "ENGAGE INTLK = 0 (±2)" on the FCCB side.

2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

a) Make sure that the CDU display shows "ENGAGE INTLK = 28 (±2)" on the FCCB side.

3) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC

a) Make sure that the CDU display shows "MACH TRIM DC = 0 (±2)" on the FCCB side.

4) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC

a) Make sure that the CDU display shows "MACH TRIM DC = 28 (±2)" on the FCCB side.

5) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC

a) Make sure that the CDU display shows "MACH TRIM AC = 0 (±3)" on the FCCB side.

6) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC

a) Make sure that the CDU display shows "MACH TRIM AC = 115 (±3)" on the FCCB side.

7) Use the NEXT PAGE key to find "SNSR EXC AC".

(d) Do a check on these circuit breakers for the FCCA side:

1) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

a) Make sure that the CDU display shows "SNSR EXC AC = 0 (±3)" on the FCCA side.

2) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

a) Make sure that the CDU display shows "SNSR EXC AC = 26 (±3)" on the FCCA side.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 0 (±2)" on the FCCA side.

4) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 28 (±2)" on the FCCA side.

(e) Do a check on these circuit breakers for the FCCB side:

1) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

a) Make sure that the CDU display shows "SNSR EXC AC = 0 (±3)" on the FCCB side.

2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

a) Make sure that the CDU display shows "SNSR EXC AC = 26 (±3)" on the FCCB side.

3) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 0 (±2)" on the FCCB side.

4) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 28 (±2)" on the FCCB side.

5) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-090

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-214

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-092

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-093

(4) Remove hydraulic power from hydraulic systems A and B if hydraulic power is on. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-094

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

TASK 22-11-00-740-811

10. Air/Ground Discrete Test

A. General

(1) The Air/Ground Discrete Test does a check on the interface between the Digital Flight Control System (DFCS) and the main landing gear squat switch logic circuit.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 22-11-00-860-095

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

SUBTASK 22-11-00-860-096

(2) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-740-024

(3) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) Make sure that these messages show on the CDU display:

Table 511/22-11-00-993-818

BITE ENTRY FOR FCC-A
AIR/GND SW INDICATES AIR MODE (J1A-B03)

(b) Push the INIT REF key on the CDU keyboard.

SUBTASK 22-11-00-860-097

(4) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-860-098

(5) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-00-740-025

(6) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) Make sure that these messages show on the CDU display:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 512/22-11-00-993-819

BITE ENTRY FOR FCC-B
AIR/GND SW INDICATES AIR MODE (J1A-B03)

(b) Push the INIT REF key on the CDU keyboard.

SUBTASK 22-11-00-860-099

(7) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-00-860-100

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

TASK 22-11-00-740-812

11. Other Discrete Inputs Test

A. General

(1) The Other Discrete Inputs Test does a check on the baro correct switch, auto/manual tune, DME hold and LNAV valid discrete inputs to the Digital Flight Control System (DFCS).

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-101

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

SUBTASK 22-11-00-860-298

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-102

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-103

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-104

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

E. Procedure

SUBTASK 22-11-00-740-026

(1) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DISCRETE INPUTS
7) J1B
8) Find the "AUTOTUNE C05" discrete name and pin that shows on the CDU display.
   a) Make sure that the CDU display shows "OP" on the A side and B side for the "AUTOTUNE C05".
9) Find the "BARO CORR SEL C07" discrete name and pin that shows on the CDU display.
   a) Make sure that the CDU display shows "OP" on the A side and B side for the "BARO CORR SEL C07".
10) Find the "DME HOLD A01" discrete name and pin that shows on the CDU display.
   a) Make sure that the CDU display shows "GD" on the A side and B side for the "DME HOLD A01".
11) Find the "LNAV VALID H05" discrete name and pin that shows on the CDU display.
   a) Make sure that the CDU display shows "OP" on the A side and B side for the "LNAV VALID H05".
12) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-105

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-215

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-107

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-00-860-364

(4) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the DFCS Built-In-Test Equipment (BITE) test.

LOM ALL

SUBTASK 22-11-00-860-108

(5) Remove hydraulic power from hydraulic systems A and B if hydraulic power is on. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

——— END OF TASK ———

TASK 22-11-00-820-801

12. Sensor Excitation Test

A. General

(1) The Sensor Excitation Test does a check on the sensor excitation voltages for the A flight control computer (FCC-A) and the B flight control computer (FCC-B).

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
27-31-64-400-802	Elevator Feel and Centering Spring 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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-110

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

SUBTASK 22-11-00-860-297

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-111

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-112

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-113

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-114

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

E. Sensor Excitation Test

SUBTASK 22-11-00-740-027

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent INDEX.

(b) Push the LSK that is adjacent to MAINT.

(c) Open these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

(d) Set the DISPLAYS SOURCE switch, on the P5 forward overhead panel, to the ALL ON 1 position.

(e) Continue to push the LSK that is adjacent to each selection:

1) DFCS

2) EXTENDED MAINTENANCE

3) BITE LIBRARY TESTS

4) CHANNEL A

5) RUN SELECT LIBRARY TESTS

6) Push the LSK that is adjacent to these library tests:

NOTE: After you push the LSK that is adjacent to each library test, the asterisk "*" shows. Use the NEXT PAGE or PREV PAGE key to change page.

Table 513/22-11-00-993-820

30 ELEVATOR
31 AILERON

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 513/22-11-00-993-820 (Continued)

32 SPD/STAB
34 FLAPS
59 MCP CRS/HDG
61 ALT ALERT

a) Push the LSK that is adjacent to EXECUTE.

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

b) Do the instructions that show on the CDU to complete each library test.

c) Make sure that "DFCS TEST PASSED" shows on the CDU display.

d) Push the LSK that is adjacent to PREV MENU on the "SUMMARY" screen.

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	2	C01045	AFCS SYS A FCC DC

(h) Set the DISPLAYS SOURCE switch, on the P5 forward overhead panel, to the ALL ON 2 position.

(i) Push the INIT REF key on the CDU keyboard.

(j) Push the LSK that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) BITE LIBRARY TESTS
6) CHANNEL B
7) RUN SELECT LIBRARY TESTS
8) Push the LSK that is adjacent to these library tests:

NOTE: After you push the LSK the is adjacent to each library test, the asterisk "*" shows. Use the NEXT PAGE or PREV PAGE key to change page.

Table 514/22-11-00-993-821

30 ELEVATOR
31 AILERON

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 514/22-11-00-993-821 (Continued)

32 SPD/STAB
34 FLAPS
59 MCP CRS/HDG
61 ALT ALERT

a) Push the LSK that is adjacent to EXECUTE.

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

b) Do the instructions that show on the CDU to complete each library test.

c) Make sure that "DFCS TEST PASSED" shows on the CDU display.

d) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

(k) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	2	C01045	AFCS SYS A FCC DC

(l) Set the DISPLAYS SOURCE switch, on the P5 forward overhead panel, to the AUTO position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-115

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-216

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-117

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-118

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-119

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-740-813

13. Maintenance Monitor Test

A. General

(1) The Maintenance Monitor Test does a check on the maintenance monitor of the BITE. It makes sure that the monitor can record faults. This test also does a check on the DC power of the mode control panel.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

C. Location Zones

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

D. Procedure

SUBTASK 22-11-00-860-120

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

SUBTASK 22-11-00-860-121

(2) Set the left and right IRS select switches, on the P5 aft overhead panel, to the NAV position.

SUBTASK 22-11-00-980-014

(3) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
A	12	C01375	RADIO NAVIGATION VOR 2

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-122

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-980-002

(5) Do these steps to set the autopilot engaged and disengaged conditions:

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI

(b) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	2	C01400	PSEU ALTN

(c) Stop for 5 seconds.

(d) Push the A/P engage switch on the Mode Control Panel (MCP) to engage the channel A autopilot to the CMD mode.

(e) Push the ALT HOLD button on the MCP.

(f) Push the HDG SEL button on the MCP.

(g) Set the captain's flight director switch on the MCP to on.

(h) Make sure that these occur:

1) F/D bars stay in view.

2) The autopilot stays engaged in the CMD mode.

(i) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

(j) Make sure that the autopilot disengages.

(k) Make sure that these occur:

1) The red A/P light on the Autoflight Status Annunciator (ASA) flashes.

2) The aural warning module makes an aural warning.

(l) Push the disconnect switch to reset.

1) Make sure that the red A/P light on the ASA no longer flashes.

2) Make sure that the aural warning stops from the aural warning module.

(m) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

(n) Stop for 5 seconds.

(o) Set the captain's flight director switch on the MCP to off.

(p) Push the A/P engage switch on the MCP to engage the channel B autopilot to the CMD mode.

(q) Push the ALT HOLD button on the MCP.

(r) Push the HDG SEL button on the MCP.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(s) Set the first officer's flight director switch on the MCP to on.

(t) Make sure that these occur:

1) F/D bars stay in view.

2) The autopilot stays engaged in the CMD mode.

(u) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

(v) Make sure that the autopilot disengages.

(w) Make sure that these occur:

1) The red A/P light on the ASA flashes.

2) The aural warning module makes an aural warning.

(x) Push the A/P disconnect switch to reset.

1) Make sure that the red A/P light on the ASA no longer flashes.

2) Make sure that the aural warning stops from the aural warning module.

(y) Set the first officer's flight director switch on the MCP to off.

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

(aa) Stop for 20 seconds.

SUBTASK 22-11-00-740-028

(6) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX

2) MAINT

3) DFCS

4) FAULT REVIEW

5) FAULT HISTORY SORTED BY FLIGHT LEG

6) CHANNEL A

7) LEG 01

a) Make sure that these messages show on the CDU display:

NOTE: Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 515/22-11-00-993-822

DFCS BITE TEST	
FAULT HISTORY -A	*01/ XX
LEG 01 xx xx:xxz	xx xxx xxx
CHAN-A* ALT HOLD* HDG SEL*	
400 HZ PWR INV	

8) PREV MENU
9) PREV MENU
10) CHANNEL B
11) LEG 01
    a) Make sure that these messages show on the CDU:

       NOTE: Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

Table 516/22-11-00-993-823

DFCS BITE TEST	
FAULT HISTORY -B	*01/ XX
LEG 01 XX XX : XXZ	DD MMM YY
CHAN-B* ALT HOLD* HDG SEL*	
400 HZ PWR INV	

12) PREV MENU
13) EXIT
14) EXIT

    NOTE: On the TEST COMPLETE screen.

    a) Do the instructions on the END OF DFCS BITE screen, except DO NOT turn off Hydraulic power.

15) EXIT

SUBTASK 22-11-00-980-003

(7) Do this check on the autopilot:
    (a) Stop for 50 seconds.
    (b) Make sure FD is removed from the Captain's and First Officer's Primary Flight Display.
    (c) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

    (d) Stop for 5 seconds.
    (e) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(f) Push the A/P engage switches on the MCP to make sure that the autopilot cannot be engaged.

(g) Stop for 5 seconds.

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

(i) Stop for 20 seconds.

SUBTASK 22-11-00-740-029

(8) Push the INIT REF key on the CDU keyboard.

(a) Push the LSK that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) FAULT REVIEW
5) FAULT HISTORY SORTED BY FLIGHT LEG
6) CHANNEL A
7) LEG 01

a) Make sure that these messages show on the CDU:

NOTE: Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

Table 517/22-11-00-993-824

DFCS BITE TEST	
FAULT HISTORY -A	XX / XX
LEG 01 * XX	DD MMM YY
CHAN-A* * *	
AUTO STAB TRIM CUTOUT	

8) PREV MENU
9) PREV MENU
10) CHANNEL B
11) LEG 01

a) Make sure that these messages show on the CDU:

NOTE: Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

Table 518/22-11-00-993-825

DFCS BITE TEST	
FAULT HISTORY -A	*XX / XX
LEG 01 *XX:XXZ	DD MMM YY

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 518/22-11-00-993-825 (Continued)

CHAN-B* * *
AUTO STAB TRIM CUTOUT

(b) Set the Auto Stab Trim Switch to NORMAL.

(c) Make these selections on the CDU:

1) PREV MENU

2) EXIT

3) EXIT

NOTE: On the TEST COMPLETE screen.

a) Do the instructions on the END OF DFCS BITE screen, except DO NOT turn off Hydraulic power.

4) EXIT

SUBTASK 22-11-00-980-004

(9) Do this check on the DC power of the mode control panel:

(a) Stop for 50 seconds.

(b) Make sure FD is removed from the Captain's and First Officer's Primary Flight Display.

(c) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

(d) Stop for 5 seconds.

(e) Push the A/P engage switch on the MCP to engage the channel A autopilot to the CMD mode.

(f) Push the HDG SEL button on the MCP.

(g) Make sure that the HDG SEL mode is engaged.

(h) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

(i) Make sure that the autopilot disengages.

(j) Make sure that these occur:

1) The red A/P light on the ASA flashes.

2) The aural warning module makes an aural warning.

(k) Push the A/P disconnect switch to reset.

1) Make sure that the red A/P light on the ASA no longer flashes.

2) Make sure that the aural warning stops from the aural warning module.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(l) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

(m) Push the A/P engage switch to engage the channel B autopilot to the CMD mode.

(n) Stop for 5 seconds.

(o) Push the HDG SEL button on the MCP.

(p) Make sure that the HDG SEL mode is engaged.

(q) Open this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

(r) Make sure that the autopilot disengages.

(s) Make sure that these occur:

1) The red A/P light on the ASA flashes.
2) The aural warning module makes an aural warning.

(t) Push the A/P disconnect switch to reset.

1) Make sure that the red A/P light on the ASA no longer flashes.
2) Make sure that the aural warning stops from the aural warning module.

(u) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-00-740-030

(10) Push the INIT REF key on the CDU keyboard.

(a) Push the LSK that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) FAULT REVIEW
5) ERASE FAULT HISTORY
6) CHANNEL A AND B
7) YES
8) Make sure that this message shows on the CDU:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 519/22-11-00-993-826

DFCS BITE TEST
ERASE FAULT HISTORY
FAULT HISTORY ERASED

(b) Push the LSK that is adjacent to this selection:

1) EXIT

2) EXIT

Table 520/22-11-00-993-946

DFCS BITE TEST
TEST COMPLETE
*SELECT “MAIN MENU” OF YOU WANT TO STAY IN DFCS BITE MENU

NOTE: On the TEST COMPLETE screen.

a) Do the instructions on the END OF DFCS BITE screen.

(c) Push the LSK that is adjacent to this selection:

1) EXIT

SUBTASK 22-11-00-860-123

(11) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-124

(12) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

TASK 22-11-00-800-801

14. Master Caution Test

A. General

(1) The Master Caution Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the master caution annunciators.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 22-11-00-860-125

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

SUBTASK 22-11-00-980-005

(2) Do this check on the captain's master caution annunciator:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

1) Stop for 7 seconds.
2) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, remains off.

(b) Push the left system annunciator lights on the P7 panel.

(c) Make sure that these lights come on:
1) MACH TRIM FAIL light on the P5 forward overhead panel.
2) Master caution FLT CONT annunciator on the P7 panel.
3) Captain's master caution annunciator on the P7 panel.
4) First officer's master caution annunciator on the P7 panel.

(d) Push the captain's master caution annunciator.

(e) Make sure that these lights go off:
1) MACH TRIM FAIL light on the P5 forward overhead panel.
2) Master caution FLT CONT annunciator on the P7 panel.
3) Captain's master caution annunciator on the P7 panel.
4) First officer's master caution annunciator on the P7 panel.

(f) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

(g) Stop for 50 seconds.

(h) Make sure FD is removed from the Captain's Primary Flight Display.

SUBTASK 22-11-00-980-006

(3) Do this check on the first officer's master caution annunciator:

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

1) Stop for 7 seconds.
2) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, stays off.

(b) Push the right system annunciator lights on the P7 panel.

(c) Make sure that these lights come on:
1) MACH TRIM FAIL light on the P5 forward overhead panel.
2) Master caution FLT CONT annunciator on the P7 panel.
3) Captain's master caution annunciator on the P7 panel.
4) First officer's master caution annunciator on the P7 panel.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(d) Push the first officer's master caution annunciator.

(e) Make sure that these lights go off:

1) MACH TRIM FAIL light on the P5 forward overhead panel.
2) Master caution FLT CONT annunciator on the P7 panel.
3) Captain's master caution annunciator on the P7 panel.
4) First officer's master caution annunciator on the P7 panel.

(f) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

(g) Stop for 7 seconds.

(h) Make sure that these lights come on:

1) MACH TRIM FAIL light on the P5 forward overhead panel.
2) Master caution FLT CONT annunciator on the P7 panel.
3) Captain's master caution annunciator on the P7 panel.
4) First officer's master caution annunciator on the P7 panel.

(i) Push the first officer's master caution annunciator.

1) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, stays on.

(j) Make sure that these lights go off.

1) Master caution FLT CONT annunciator on the P7 panel.
2) Captain's master caution annunciator on the P7 panel.
3) First officer's master caution annunciator on the P7 panel.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

(l) Stop for 50 seconds.

1) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, goes off.

SUBTASK 22-11-00-860-126

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-800-802

15. Autoland Warning Light Test

A. General

(1) The Autoland Warning Lights Test does a check on the interface to the Digital Flight Control System (DFCS).

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1913	Test Set - NAV/COMM Ramp Part #: 90000136 Supplier: 92606 Part #: ARTS-7000 Supplier: 0RDZ5 Part #: AVX-10K Supplier: 51190 Opt Part #: 402AP-110 Supplier: 51190 Opt Part #: 972Q-4 Supplier: 4V792 Opt Part #: IFR 4000 Supplier: 51190 Opt Part #: NAV-402AP-2 Supplier: 51190 Opt Part #: T-30C Supplier: 92606 Opt Part #: T-30D Supplier: 92606 Opt Part #: T-36C Supplier: 92606

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

(Continued)

Reference	Description
COM-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: ADSE 650 Supplier: 3BSK6 Part #: ADTS2000 Supplier: 52892 Part #: ADTS3350ER Supplier: 52892 Part #: ADTS405MKII Supplier: U0427 Part #: ADTS530 Supplier: U0427 Part #: ADTS552F Supplier: U0427 Part #: ADTS553F Supplier: U0427 Part #: ADTS554F Supplier: U0427 Part #: D60340MK Supplier: K1474 Part #: DPS1000 Supplier: 21844 Part #: MODEL 6300 Supplier: 0RDZ5 Part #: MPS34C Supplier: 48RQ2 Part #: MPS43B Supplier: A0197 Part #: MPS45 Supplier: 48RQ2 Part #: MPS49 Supplier: 48RQ2 Part #: TES9463 Supplier: 88277 Opt Part #: 01-0987-00 Supplier: 41364 Opt Part #: 18910480000 Supplier: 89944 Opt Part #: 18910920000 Supplier: 89944 Opt Part #: ADTS405F Supplier: U0427 Opt Part #: ADTS505 Supplier: U0427 Opt Part #: D60302 Supplier: K1474 Opt Part #: D60340 Supplier: K1474 Opt Part #: D60383 Supplier: K1474 Opt Part #: DPS350 Supplier: 21844 Opt Part #: DPS450 Supplier: 21844 Opt Part #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
COM-1922	Test Set - Radio Altimeter Part #: 110-0430-100-02 Supplier: L04V3 Part #: 110-0460-105 Supplier: L04V3 Part #: 9599-607-15902 Supplier: F0052 Opt Part #: 110-0430-100 Supplier: L04V3

D. Location Zones

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

E. Prepare for the Autoland Warning Light Test

SUBTASK 22-11-00-860-229

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

SUBTASK 22-11-00-840-001

(2) Do these steps to prepare the system for the test:

(a) Set the trim cutout switches to normal.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN
D	15	C01401	LANDING GEAR AIR/GND RELAY

(c) Stop for 20 seconds.

(d) Manually trim the stabilizer to 4 units of trim.

(e) Set the F/D switches on the mode control panel to the OFF position.

(f) Set the flap lever to 40 units.

(g) Connect the VOR/ILS test NAV/COMM ramp test set, COM-1913.

(h) Connect the pitot static air data model test set, COM-1914, to the digital air data computer pitot static source.

(i) Simulate an airspeed of 128 knots.

(j) Connect the radio altimeter radio altimeter test set, COM-1922.

NOTE: Radio Altimeter should be set at 800 feet/minute.

F. Procedure

SUBTASK 22-11-00-860-230

(1) Do these steps to set the test conditions.

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero localizer deviation.

(c) Engage the autopilot A system.

(d) Engage approach mode on the mode control panel.

1) Stop until localizer capture shows on the EADI.

(e) Simulate a zero glide slope deviation.

1) Stop until glide slope capture shows on the EADI.

(f) Engage the autopilot B system.

1) Stop until FLARE arm shows on the EADI.

SUBTASK 22-11-00-860-231

(2) Push and hold the captain's autoland warning light.

(a) Make sure the captain's and first officer's autoland warning lights are flashing red.

SUBTASK 22-11-00-860-232

(3) Release the captain's autoland warning light.

(a) Make sure the two autoland warning lights are off.

SUBTASK 22-11-00-860-233

(4) Adjust the two radio altimeters slowly to 550 feet.

SUBTASK 22-11-00-860-234

(5) Disengage the autopilot using the CMD A or CMD B switches on the MCP.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

(a) Make sure the autopilot warning lights on the flight management system warning annunciators are flashing red.

(b) Make sure the captain's and first officer's autoland warning lights are off.

SUBTASK 22-11-00-860-235

(6) Do these steps to set the test conditions:

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero deviation glide slope.

(c) Engage the autopilot A system.

(d) Engage the approach mode on the mode control panel.

(e) Simulate a zero localizer deviation.

1) Stop until localizer capture shows on the EADI.

2) Stop until glide slope capture shows on the EADI.

(f) Engage the autopilot B system.

1) Stop until FLARE arm shows on the EADI.

SUBTASK 22-11-00-860-236

(7) Simulate an altitude of 450 feet on radio altimeter number 1.

SUBTASK 22-11-00-860-237

(8) Disengage the autopilot using the CMD A or CMD B switches on the MCP.

(a) Make sure the autopilot warning lights on the flight management system warning annunciators are flashing red.

(b) Make sure the two autoland warning lights are flashing red.

SUBTASK 22-11-00-860-238

(9) Push the captain's column mounted autopilot disconnect switch to reset.

(a) Make sure the two autoland warning lights are off.

SUBTASK 22-11-00-860-239

(10) Do these steps to set the test conditions:

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero deviation glide slope.

(c) Engage the autopilot A system.

(d) Engage the approach mode on the mode control panel.

(e) Simulate a zero localizer deviation.

1) Stop until localizer capture shows on the EADI.

2) Stop until glide slope capture shows on the EADI.

(f) Engage the autopilot B system.

1) Stop until FLARE arm shows on the EADI.

SUBTASK 22-11-00-860-240

(11) Simulate an altitude of 450 feet on radio altimeter number 2.

SUBTASK 22-11-00-860-241

(12) Disengage the autopilot using the CMD A or CMD B switches on the MCP.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

(a) Make sure the autopilot warning lights on the flight management system warning annunciators are flashing red.

(b) Make sure the two autoland warning lights are flashing red.

SUBTASK 22-11-00-860-242

(13) Push the first officer's column mounted autopilot disconnect switch to reset.

(a) Make sure the two autoland warning lights are off.

SUBTASK 22-11-00-860-244

(14) Do these steps to set the test conditions:

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero deviation glide slope.

(c) Engage the autopilot A system.

(d) Engage the approach mode on the mode control panel.

(e) Simulate a zero localizer deviation.

1) Stop until localizer capture shows on the EADI.

2) Stop until glide slope capture shows on the EADI.

(f) Engage the autopilot B system.

1) Stop until FLARE arm shows on the EADI.

SUBTASK 22-11-00-860-245

(15) Simulate an altitude of 550 feet on the two radio altimeters.

SUBTASK 22-11-00-860-246

(16) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	2	C00849	AFCS STABILIZER TRIM

SUBTASK 22-11-00-860-247

(17) Slowly change the simulated glide slope deviation to +0.5 dot.

(a) Stop until the stab trim warning light comes on.

(b) Make sure the two autoland warning lights do not come on.

NOTE: Autopilot disengage lights on the flight management system warning annunciators come on steady red for STAB-OUT-OF-TRIM.

SUBTASK 22-11-00-860-248

(18) Slowly adjust the simulated altitude on radio altimeter number 1 to 450 feet.

(a) Make sure the two autoland warning lights are flashing red.

SUBTASK 22-11-00-860-249

(19) Push the takeoff or go around switch to reset.

(a) Make sure the two autoland warning lights are off.

SUBTASK 22-11-00-860-250

(20) Disengage the autopilot system.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

SUBTASK 22-11-00-860-251

(21) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	2	C00849	AFCS STABILIZER TRIM

SUBTASK 22-11-00-860-360

(22) Manually trim the stabilizer to 4 units.

SUBTASK 22-11-00-860-252

(23) Do these steps to set the test conditions:

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero deviation glide slope.

(c) Engage the autopilot A system.

(d) Engage the approach mode on the mode control panel.

(e) Simulate a zero localizer deviation.

1) Stop until localizer capture shows on the EADI.

2) Stop until glide slope capture shows on the EADI.

(f) Engage the autopilot B system.

1) Stop until FLARE arm shows on the EADI.

SUBTASK 22-11-00-860-253

(24) Push and hold the first officer's autoland warning light.

(a) Make sure the captain's and first officer's autoland warning lights are flashing red.

SUBTASK 22-11-00-860-254

(25) Release the first officer's autoland warning light.

(a) Make sure the two autoland warning lights are off.

SUBTASK 22-11-00-860-255

(26) Slowly adjust the simulated radio altitude on the two radio altimeters to 210 feet.

SUBTASK 22-11-00-860-256

(27) Adjust the simulated glide slope until the glide slope pointer is flashing on the two EAD's.

NOTE: If the stabilizer trim is at 8 units or more, adjust G/S pointer in the DOWN direction. If the stabilizer trim is at 7 units or less, adjust G/S pointer in the UP direction. The intent is to keep stabilizer trim from entering OUT OF TRIM condition.

(a) Make sure the glide slope pointer is flashing on the two EADI's.

(b) Make sure the two autoland warning lights do not come on.

SUBTASK 22-11-00-860-257

(28) Slowly adjust the simulated radio altitude on radio altimeter number 1 to 180 feet.

(a) Make sure the two autoland warning lights are flashing red.

SUBTASK 22-11-00-860-258

(29) Simulate a glide slope deviation of zero.

(a) Make sure the two autoland warning lights are off.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

SUBTASK 22-11-00-860-361

(30) Disengage the autopilot system.

SUBTASK 22-11-00-860-259

(31) Simulate an altitude of 210 feet on radio altimeter number 1.

SUBTASK 22-11-00-860-260

(32) If the autopilot disengages during steps 27 or 28, do these steps to reset the system then repeat the operation from step 27.

(a) Simulate an altitude of 1,000 feet on the two radio altimeters.

(b) Simulate a zero deviation glide slope.

(c) Engage the autopilot A system.

(d) Engage approach mode on the mode control panel.

(e) Simulate a zero localizer deviation.

(f) Stop until localizer capture shows on the EADI.

(g) Stop until glide slope capture shows on the EADI.

(h) Engage the autopilot B system.

(i) Stop until FLARE arm shows on the EADI.

(j) Simulate an altitude of 210 feet on the two radio altimeters.

SUBTASK 22-11-00-860-261

(33) Simulate a localizer until the localizer pointer is flashing on the two EADI's.

NOTE: Move the localizer pointer in the opposite direction of the control wheel position. The intent is to keep the autopilot from disengage.

(a) Make sure the localizer pointer is flashing on the two EADI's.

(b) Make sure the two autoland warning lights do not come on.

SUBTASK 22-11-00-860-262

(34) Slowly adjust the simulated radio altitude on radio altimeter number 2 to 180 feet.

(a) Make sure the two autoland warning lights are flashing red.

SUBTASK 22-11-00-860-263

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN
D	15	C01401	LANDING GEAR AIR/GND RELAY

(a) Make sure the two autoland warning lights are off.

G. Return the airplane to the initial condition:

SUBTASK 22-11-00-840-002

(1) Decrease the airspeed to 0 knots.

SUBTASK 22-11-00-840-003

(2) Disconnect all test equipment.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 445 (Continued)

SUBTASK 22-11-00-860-264

(3) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

LOM ALL

——— END OF TASK ———

TASK 22-11-00-820-802

16. Elevator Rigging Test

(Figure 502)

A. General

(1) The Elevator Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the elevator system wiring and sensors.

B. References

Reference	Title
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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
323	Vertical Fin - Front Spar To Rear Spar

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-296

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-128

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-129

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-130

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-010-006

(5) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-131

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-980-007

(7) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

(c) Make sure that the B dimension is 39.89 ±0.01 in. (101.32 ±0.03 cm).

G. Elevator Rigging Test

SUBTASK 22-11-00-740-031

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) ELEVATOR

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) ELEV RIG

NOTE: This selection contains the ELEV RIG test.

8) During this test, do the instructions that show on the CDU display.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

(b) Do the Elevator Rigging Check:

1) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 521/22-11-00-993-827

Test		Limits:
51.01	STAB POS (VAC)	-0.07 to 0.07

2) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

3) Make sure that the B dimension is 39.89 ±0.01 in. (101.32 ±0.03 cm).

Table 522/22-11-00-993-828

Test		Limits
51.02	MT ACT POS (VAC)	-8.70 to -6.35
Note: No value for B side; N/A		
51.03	MT ACT POS (VAC)	-0.20 to 0.20
Note: No value for B side; N/A		
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1; AIRPLANES WITH HONEYWELL FCC OR WITH COLLINS FCC P9.0 SOFTWARE AND LOWER		
51.04	ELEV POS (VAC)	-0.55 to -0.45
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1; AIRPLANES WITH COLLINS FCC P11.1 SOFTWARE		
51.04	NSS POS (VAC)	-1.77 to -1.67
LOM ALL		

4) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) in. (0.00 ±0.15 cm).

Table 523/22-11-00-993-831

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1; AIRPLANES WITH HONEYWELL FCC OR WITH COLLINS FCC P9.0 SOFTWARE AND LOWER		
51.05	NSS POS (VAC)	-1.77 to -1.67
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1; AIRPLANES WITH COLLINS FCC P11.1 SOFTWARE		
51.05	ELEV POS (VAC)	-0.55 to -0.45
LOM ALL		
51.06	ELEV LVDT (VAC)	-2.05 to -1.95
51.07	ELEV POS (VAC)	-0.55 to -0.45

5) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) in. (0.00 ±0.15 cm).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 524/22-11-00-993-833

Test		Limits
51.08	ELEV POS (VAC)	-0.55 to -0.45
51.09	ELEV POS (VAC)	-0.55 to -0.45
51.10	ELEV POS (VAC)	-0.55 to -0.45
51.11	ELEV POS (VAC)	-0.55 to -0.45

6) Set the B dimension to within the limit shown on the FMC CDU.

7) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

8) Make sure that the B dimension is within the limit shown on the FMC CDU.

Table 525/22-11-00-993-834

Test		Limits
51.12	STAB POS (VAC)	4.47 to 5.29
51.13	ELEV LVDT (VAC)	-0.06 to 0.06
51.14	ELEV POS (VAC)	-0.10 to 0.10
51.15	NSS POS (VAC)	-0.20 to 0.20

9) Do these steps to get out of the BITE test:

a) Push the LSK adjacent to PREV MENU on test 51.37 screen.

b) Push the LSK adjacent to PREV MENU on the ELEVATOR RIGGING screen.

c) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

d) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

e) Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.

f) Push the LSK adjacent to EXIT until you get out of the bite test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-132

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-217

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-134

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-135

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-410-001

(5) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G23233 S0006563817_V3

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-00-990-802 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G23234 S0006563818_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-00-990-802 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-820-815

17. Elevator Single Authority Test

(Figure 503, Figure 504)

A. General

(1) The Elevator Single Authority Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the elevator system wiring and sensors.

B. References

Reference	Title
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)

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-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: ADSE 650 Supplier: 3BSK6 Part #: ADTS2000 Supplier: 52892 Part #: ADTS3350ER Supplier: 52892 Part #: ADTS405MKII Supplier: U0427 Part #: ADTS530 Supplier: U0427 Part #: ADTS552F Supplier: U0427 Part #: ADTS553F Supplier: U0427 Part #: ADTS554F Supplier: U0427 Part #: D60340MK Supplier: K1474 Part #: DPS1000 Supplier: 21844 Part #: MODEL 6300 Supplier: 0RDZ5 Part #: MPS34C Supplier: 48RQ2 Part #: MPS43B Supplier: A0197 Part #: MPS45 Supplier: 48RQ2 Part #: MPS49 Supplier: 48RQ2 Part #: TES9463 Supplier: 88277 Opt Part #: 01-0987-00 Supplier: 41364 Opt Part #: 18910480000 Supplier: 89944 Opt Part #: 18910920000 Supplier: 89944 Opt Part #: ADTS405F Supplier: U0427 Opt Part #: ADTS505 Supplier: U0427 Opt Part #: D60302 Supplier: K1474 Opt Part #: D60340 Supplier: K1474 Opt Part #: D60383 Supplier: K1474 Opt Part #: DPS350 Supplier: 21844 Opt Part #: DPS450 Supplier: 21844 Opt Part #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
SPL-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Reference	Description
SPL-1742	Regulator - Air Pressure, Elevator Feel Computer Part #: F72928-109 Supplier: 81205 Part #: F72928-110 Supplier: 81205 Part #: F72928-111 Supplier: 81205 Opt Part #: F72928-58 Supplier: 81205 Opt Part #: F72928-62 Supplier: 81205 Opt Part #: F72928-63 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
323	Vertical Fin - Front Spar To Rear Spar

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-366

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-367

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT positions.

SUBTASK 22-11-00-860-368

(3) Make sure the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-369

(4) Set the left and right IRS select switches on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-390-002

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.

(5) At the two pitot probes on the vertical fin, do the following:

(a) Seal the drain hole on each pitot probe.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CAUTION

MAKE SURE THAT THE PITOT PROBE HAS NO ADDED WEIGHT ON IT FROM THE TEST HOSE. THE WEIGHT OF THE TEST HOSE CAN BEND OR TWIST THE PITOT PROBE OUT OF TOLERANCE.

(b) Connect the pressure lines from the air data model test set, COM-1914 or regulator, SPL-1742 to the two pitot probes on the vertical fin.

SUBTASK 22-11-00-010-008

(6) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-370

(7) Inside the aft unpressurized compartment, below the elevator feel computer, do the following:

(a) Remove the restrictor valves from the bottom of the pitot lines.

(b) If you are using the regulator, SPL-1742, or equivalent, do the following:

1) Connect the pressure gage lines from the regulator, SPL-1742, or equivalent, to the drain holes of the pitot lines.

(c) If you are using the air data model test set, COM-1914, then do the following:

1) Install plugs over the ends of the pitot lines.

2) Install a highly visible streamer on the opening of the aft unpressurized compartment.

NOTE: Make sure that you can easily see the streamer from the ground. This is to remind you to remove the plugs and install the restrictor valves again when the test is completed.

SUBTASK 22-11-00-860-371

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-930-001

(9) Do these steps to set the B dimension (Figure 503):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

(c) Make sure that the B dimension is 39.89 ±0.01 in. (101.32 ±0.03 cm).

G. Elevator Single Authority Test

SUBTASK 22-11-00-740-051

(1) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) ELEVATOR
7) ELEV AUTH SINGLE

   NOTE: This selection contains the ELEV AUTH SINGLE test.

8) During this test, do the instructions that show on the CDU display.
9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.
10) Test 51.16, set up the Feel System Condition II as follows:

> **CAUTION** OBEY THE LIMITS THAT FOLLOW. IF YOU DO NOT, DAMAGE TO THE ELEVATOR FEEL COMPUTER CAN OCCUR.

   a) Make sure that the pressure is no more then 5 psig (34.47 kPa), 474 knots (878 km/h) during the test.
   b) Operate the air data model test set, COM-1914, or regulator, SPL-1742, or equivalent, to pressurize the pitot system to 0.80 ±0.05 psig (5.52 ±0.34 kPa) = 180.16 ±10.00 knots (333.66 ±18.52 km/h).

11) Use the CDU keyboard to put code 100 into the scratchpad.
12) Push the LSK 6R.
13) Push the LSK that is adjacent to CONTINUE.
14) Make sure that the values for the A side are between the limits that show on the CDU display or in this task.
15) Do these steps:
   a) Set the B dimension to 38.46 ±0.01 in. (97.69 ±0.03 cm).
   b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.
   c) Make sure that the B dimension is 38.46 ±0.01 in. (97.69 ±0.03 cm).

Table 526/22-11-00-993-972

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20

16) Push the LSK that is adjacent to CONTINUE.
17) Remove hydraulic power from the hydraulic system B (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).
18) Engage autopilot A to CMD mode.

Table 527/22-11-00-993-973

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

19) Apply a mark on tail cone opposite the trailing edge of the elevator.

Table 528/22-11-00-993-974

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

20) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

21) Make sure that the deflection distance is between 1.25 in. (3.18 cm) and 2.32 in. (5.89 cm).

22) Write the number on a piece of paper (A=_____).

Table 529/22-11-00-993-975

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

23) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

24) Make sure that the deflection distance is between 1.13 in. (2.87 cm) and 2.2 in. (5.59 cm).

25) Write the number on a piece of paper (B=_____).

Table 530/22-11-00-993-976

Test		Limits:
51.22	SURF AUTH (DEG)	4.00 (MIN)

26) Add the two numbers A and B (absolute values) in tests 51.19 and 51.21.

27) Make sure that the total sum of the A and B is 2.38 in. (6.05 cm) (minimum).

28) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

29) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.

30) Keep the same pitot pressure and the B dimension.

WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

31) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

32) Engage autopilot A to CMD mode.

33) Make sure that the values are between the limits that show on the CDU display or in this task.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 531/22-11-00-993-977

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

34) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 532/22-11-00-993-998

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

35) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

36) Make sure that the deflection distance is between 1.25 in. (3.18 cm) and 2.20 in. (5.59 cm).

37) Write the number on a piece of paper (C=_____).

Table 533/22-11-00-993-978

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

38) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

39) Make sure that the deflection distance is between 1.13 in. (2.87 cm) and 2.2 in. (5.59 cm).

40) Write the number on a piece of paper (D=_____).

Table 534/22-11-00-993-979

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

41) Add the two numbers C and D (absolute values) in tests 51.19 and 51.21.

42) Make sure that the total sum of C and D is 2.38 in. (6.05 cm) (minimum).

43) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

44) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.

45) Keep the same pitot pressure and the B dimension.

46) Remove hydraulic power from the Hydraulic System A (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).

47) Engage autopilot B to CMD mode.

48) Make sure that the values are between the limits that show on the CDU display or in this task.

Table 535/22-11-00-993-980

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

49) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 536/22-11-00-993-981

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

50) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

51) Make sure that the deflection distance is between 1.25 in. (3.18 cm) and 2.32 in. (5.89 cm).

52) Write the number on a piece of paper (E=_____).

Table 537/22-11-00-993-982

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

53) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

54) Make sure that the deflection distance is between 1.13 in. (2.87 cm) and 2.2 in. (5.59 cm).

55) Write the number on a piece of paper (F=_____).

Table 538/22-11-00-993-983

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

56) Add the two numbers E and F (absolute values) in tests 51.19 and 51.21.

57) Make sure that the total sum of E and F is 2.38 in. (6.05 cm) (minimum).

58) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

59) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.

60) Keep the same pitot pressure and the B dimension.

WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

61) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

62) Engage autopilot B to CMD mode.

63) Make sure that the values are between the limits that show on the CDU display or in this task.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 539/22-11-00-993-984

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

64) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 540/22-11-00-993-985

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

65) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

66) Make sure that the deflection distance is between 1.25 in. (3.18 cm) and 2.32 in. (5.89 cm).

67) Write the number on a piece of paper (G=_____).

Table 541/22-11-00-993-986

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

68) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

69) Make sure that the deflection distance is between 1.13 in. (2.87 cm) and 2.2 in. (5.59 cm).

70) Write the number on a piece of paper (H=_____).

Table 542/22-11-00-993-987

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

71) Add the two numbers G and H (absolute values) in tests 51.19 and 51.21.

72) Make sure that the total sum of G and H is 2.38 in. (6.05 cm) (minimum).

73) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

74) Test 51.16, set up the Feel System Condition I as follows:

CAUTION DO NOT INCREASE THE PRESSURE TO MORE THAN 6 PSIG (41 KPA), 474 KNOTS (878 KM/H) DURING THE TEST. IF THE PRESSURE IS MORE THAN 6 PSIG (41 KPA), 474 KNOTS (878 KM/H), IT CAN CAUSE DAMAGE TO THE ELEVATOR FEEL COMPUTER.

75) Operate the air data model test set, COM-1914, or regulator, SPL-1742, or equivalent, to reduce the pitot pressure to 0 psig (0 kPa), then increase the pitot pressure to 0.45 ±0.05 psig (3.10 ±0.34 kPa) = 138 ±10 knots (256 ±19 km/h).

76) Use the CDU keyboard to put code 100 into the scratchpad.

77) Push the LSK 6R.

78) Push the LSK that is adjacent to CONTINUE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

79) Make sure that the values are between the limits that show on the CDU display or in this task.

80) Do these steps:

a) Set the B dimension to 38.46 ±0.01 in. (97.69 ±0.03 cm).

b) Use the trammel trammel bar, SPL-1677,to measure the B dimension.

c) Make sure that the B dimension is 38.46 ±0.01 in. (97.69 ±0.03 cm).

Table 543/22-11-00-993-988

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

81) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

82) Engage autopilot A to CMD mode.

Table 544/22-11-00-993-989

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

83) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 545/22-11-00-993-990

Test		Limits
51.19	SURF AUTH (DEG)	-12.0 to -7.30

84) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

85) Make sure that the deflection distance is between 4.34 in. (11.02 cm) and 7.14 in. (18.14 cm).

86) Write the number on a piece of paper (I=_____).

Table 546/22-11-00-993-991

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	4.10 to 6.40

87) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

88) Make sure that the deflection distance is between 2.44 in. (6.20 cm) and 3.80 in. (9.65 cm).

89) Write the number on a piece of paper (J=_____).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 547/22-11-00-993-992

Test		Limits
51.22	SURF AUTH (DEG)	11.40 (MIN)

90) Add the two numbers I and J (absolute values) in tests 51.19 and 51.21.

91) Make sure that the total sum of the I and J is 6.78 in. (17.22 cm) (minimum).

92) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

93) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.

Table 548/22-11-00-993-A07

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

94) Keep the same pitot pressure and the B dimension.

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

95) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

96) Engage autopilot B to CMD mode.

97) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 549/22-11-00-993-A08

Test		Limits
51.19	SURF AUTH (DEG)	-12.0 to -7.30

98) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

99) Make sure that the deflection distance is between 4.34 in. (11.02 cm) and 7.14 in. (18.14 cm).

100) Write the number on a piece of paper (K=_____).

Table 550/22-11-00-993-A09

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	4.10 to 6.40

101) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

102) Make sure that the deflection distance is between 2.44 in. (6.20 cm) and 3.80 in. (9.65 cm).

103) Write the number on a piece of paper (L=_____).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 551/22-11-00-993-A10

Test		Limits
51.22	SURF AUTH (DEG)	11.40 (MIN)

104) Add the two numbers K and L (absolute values) in tests 51.19 and 51.21.

105) Make sure that the total sum of the K and L is 6.78 in. (17.22 cm) (minimum).

106) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

107) Test 51.16, set up the Feel System Condition III as follows:

CAUTION DO NOT INCREASE THE PRESSURE TO MORE THAN 6 PSIG (41 KPA), 474 KNOTS (878 KM/H) DURING THE TEST. IF THE PRESSURE IS MORE THAN 6 PSIG (41 KPA), 474 KNOTS (878 KM/H), IT CAN CAUSE DAMAGE TO THE ELEVATOR FEEL COMPUTER.

a) Operate the air data model test set, COM-1914, or regulator, SPL-1742, or equivalent, to reduce the pitot pressure to 0 psig (0 kPa), then increase the pitot pressure to 4.10 ±0.05 psig (28.27 ±0.34 kPa) =402 ±5 knots (744.5 ±8.3 km/h).

108) Use the CDU keyboard to put code 100 into the scratchpad.

109) Push the LSK 6R.

110) Push the LSK that is adjacent to CONTINUE.

111) Make sure that the values are between the limits that show on the CDU display or in this task.

112) Do these steps:

a) Set the B dimension to 38.46 ±0.01 in. (97.69 ±0.03 cm).

b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

c) Make sure that the dimension is 38.46 ±0.01 in. (97.69 ±0.03 cm).

Table 552/22-11-00-993-993

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20

WARNING KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

113) Supply hydraulic power to hydraulic systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

114) Engage autopilot A to CMD mode.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 553/22-11-00-993-A11

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

115) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 554/22-11-00-993-A12

Test		Limits
51.19	SURF AUTH (DEG)	-2.20 to -1.20

116) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

117) Make sure that the deflection distance is between 0.71 in. (1.80 cm) and 1.31 in. (3.33 cm).

118) Write the number on a piece of paper (M=_____).

Table 555/22-11-00-993-A13

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.20 to 2.30

119) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

120) Make sure that the deflection distance is between 0.72 in. (1.83 cm) and 1.36 in. (3.45 cm).

121) Write the number on a piece of paper (N=_____).

Table 556/22-11-00-993-A14

Test		Limits
51.22	SURF AUTH (DEG)	2.40 (MIN)

122) Add the two numbers M and N (absolute values) in tests 51.19 and 51.21.

123) Make sure that the total sum of the M and N is 1.43 in. (3.63 cm) (minimum).

124) Push the LSK that is adjacent to YES (on second screen page of Test 51.22).

NOTE: The CDU display shows "DO YOU WANT TO INSERT ANOTHER HARDOVER CONDITION ?". After you make the YES selection, the BITE takes you back to previous test screen.

125) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.

126) Keep the same pitot pressure and the B dimension.

WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

127) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

128) Engage autopilot B to CMD mode.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 557/22-11-00-993-994

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

129) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 558/22-11-00-993-995

Test		Limits
51.19	SURF AUTH (DEG)	-2.20 to -1.20

130) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

131) Make sure that the deflection distance is between 0.71 in. (1.80 cm) and 1.31 in. (3.33 cm).

132) Write the number on a piece of paper (O=_____).

Table 559/22-11-00-993-996

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.20 to 2.30

133) Measure the elevator trailing edge deflection from the mark applied in test 51.18.

134) Make sure that the deflection distance is between 0.72 in. (1.83 cm) and 1.36 in. (3.45 cm).

135) Write the number on a piece of paper (P=_____).

Table 560/22-11-00-993-997

Test		Limits
51.22	SURF AUTH (DEG)	2.40 (MIN)

136) Add the two numbers O and P (absolute values) in tests 51.19 and 51.21.

137) Make sure that the total sum of the O and P is 1.43 in. (3.63 cm) (minimum).

138) Push the LSK that is adjacent to the NO (on second screen page of Test 51.22)

139) At the two pitot probes on the vertical fin, do these steps:

a) Remove the pressure lines from the air data model test set, COM-1914, or regulator, SPL-1742, or equivalent to the pitot probes.

b) Remove the seals from the drain holes in each pitot probe.

140) In the aft unpressurized compartment, below the elevator feel computer, do these steps:

a) If you use the regulator, SPL-1742, or equivalent, disconnect the pressure gage lines of the regulator, SPL-1742, or equivalent, from the drain holes of the pitot lines.

b) If you used the air data model test set, COM-1914, do these steps:

<1> Remove the plugs from the ends of the pitot lines.

<2> Remove the highly visible streamer on the opening of the aft unpressurized compartment.

<3> Install the restrictor valves on the bottom of the pitot lines.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

141) Do these steps to get out of the Built-In-Test Equipment (BITE) test:

a) Push the LSK adjacent PREV MENU on test 51.23 screen.

b) Push the LSK adjacent to PREV MENU on the ELEVATOR RIGGING screen.

c) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

d) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

e) Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.

f) Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-372

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-373

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-374

(3) Set the autopilot stab trim cutout switch, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-375

(4) Remove hydraulic power from hydraulic systems A and B (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).

SUBTASK 22-11-00-860-376

(5) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G23233 S0006563817_V3

Stabilizer Trim Jackscrew Setting
Figure 503/22-11-00-990-807 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G23234 S0006563818_V2

Stabilizer Trim Jackscrew Setting
Figure 503/22-11-00-990-807 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G20561 S0006569376_V5

Elevator Pitot-Static System Installation
Figure 504/22-11-00-990-808 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RESTRICTOR VALVE
(EXAMPLE, 2 LOCATIONS)

D

G20563 S0006569377_V5

Elevator Pitot-Static System Installation
Figure 504/22-11-00-990-808 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

L03807 S0006569378_V4

Elevator Pitot-Static System Installation
Figure 504/22-11-00-990-808 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-820-816

18. Elevator Dual Authority Test

(Figure 505)

A. General

(1) The elevator dual authority test does a check of the interfaces between the Digital Flight Control System (DFCS) and the elevator system wiring and sensors.

B. References

Reference	Title
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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
323	Vertical Fin - Front Spar To Rear Spar

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-377

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-378

(2) Set the autopilot stab trim cutout switch on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-379

(3) Make sure that the VHF NAV and IRS switches, on the forward overhead panel, P5, are in the NORMAL positions.

SUBTASK 22-11-00-860-380

(4) Set the left and right IRS select switches, on the aft overhead panel, P5, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-010-009

(5) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-381

> **WARNING**
> KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

SUBTASK 22-11-00-930-002

(7) Do these steps to set the B dimension:

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

(c) Make sure that the B dimension is 39.89 ±0.01 in. (101.32 ±0.03 cm).

G. Elevator Dual Authority Test

SUBTASK 22-11-00-740-052

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) ELEVATOR
7) ELEV AUTH DUAL

NOTE: This selection contains the ELEV AUTH DUAL test.

8) During this test, do the instructions that show on the CDU display.
9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.
10) Do the instructions that show on the CDU display.
11) Do these steps:

a) Set the B dimension to 39.89 ±0.01 in. (101.32 ±0.03 cm).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CAUTION MAKE SURE TO GIVE PROTECTION TO THE WIRE BUNDLES WHEN YOU USE THE TRAMMEL BAR, SPL-1677. THE TRAMMEL BAR HAS SHARP EDGES THAT CAN CAUSE DAMAGE TO THE WIRE BUNDLE INSULATION.

b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

c) Make sure that the B dimension is 39.89 ±0.01 in. (101.32 ±0.03 cm).

12) Make sure that the values for the A side and B side are between the limits that show on the CDU display or in this task.

Table 561/22-11-00-993-999

Test		Limits
51.23	STAB POS (VAC)	-0.07 to 0.07

Table 562/22-11-00-993-A00

Test		Limits
51.24	+SURF DELTA (DEG)	14.5 to 17.5
51.25	-SURF DELTA (DEG)	11.7 to 14.7
51.26	ELEV POS (VAC)	-0.40 to 0.40
51.27	ELEV LVDT (VAC)	-2.15 to -1.95
51.28	ELEV POS (VAC)	-0.55 to -0.45

13) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0.0 (±0.06) inch.

Table 563/22-11-00-993-A01

Test		Limits
51.29	+SURF DELTA (DEG)	0.00 to 1.00
51.30	-SURF DELTA (DEG)	-1.00 to 0.00
51.31	+SURF DELTA (DEG)	0.00 to 1.00
51.32	-SURF DELTA (DEG)	-1.00 to 0.00
51.33	ELEV POS (DEG)	1.80 to 2.20

14) Measure the distance of the elevator trailing edge deflection from the elevator index mark on the tail cone.

15) Make sure that the deflection distance is between 1.10 in. (2.79 cm) and 1.30 in. (3.30 cm) from the elevator index mark.

Table 564/22-11-00-993-A02

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
51.34	-SURF DELTA (DEG)	-1.00 to 0.00

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1 (Continued)

Table 564/22-11-00-993-A02 (Continued)

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
51.34	+SURF DELTA (DEG)	-1.00 to 0.00
LOM ALL		
51.35	ELEV POS (DEG)	-1.00 to 0.50
51.36	ELEV POS (DEG)	-1.00 to 0.50
51.37	-SURF DELTA (DEG)	-1.00 to 0.00

16) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent to PREV MENU on test 51.37 screen.

b) Push the LSK adjacent to PREV MENU on the ELEVATOR RIGGING screen.

c) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

d) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

e) Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.

f) Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-382

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-383

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-384

(3) Set the autopilot stab trim cutout switch on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-385

(4) Remove hydraulic power from hydraulic systems A and B (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).

SUBTASK 22-11-00-860-386

(5) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G23233 S0006563817_V3

Stabilizer Trim Jackscrew Setting
Figure 505/22-11-00-990-809 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G23234 S0006563818_V2

Stabilizer Trim Jackscrew Setting
Figure 505/22-11-00-990-809 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-820-803

19. Aileron Rigging Test

A. General

(1) The Aileron Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the aileron system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-137

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

SUBTASK 22-11-00-860-295

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-138

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-139

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-140

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-141

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-980-008

(7) Set the aileron trim to 0 unit.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-980-010

(8) Set the speed brake handle to the down position.

E. Procedure

SUBTASK 22-11-00-740-039

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) AILERON

NOTE: After you make this selection, then CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) COMPLETE AIL RIG

NOTE: This selection contains the AIL RIG, AIL AUTHORITY and SPOILER tests.

8) During this test, do the instructions that show on the CDU display.
9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

(b) Do the Aileron Rigging Check:

1) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 565/22-11-00-993-881

Test		Limits
52.01	AIL POS (VAC)	-0.06 to 0.06

2) Make sure that the outboard surfaces of the left and right aileron are 0.245 (±0.05) inches down from the adjacent fixed structure panel.
3) Test limits:

Table 566/22-11-00-993-882

Test 52.02 AIL POS (VAC) Limits: -0.06 to 0.06

4) Make sure that the left and right ailerons do not move.

Table 567/22-11-00-993-883

Test		Limits
52.03:	AIL POS (VAC)	-0.06 to 0.06
Test 52.04Limits	AIL LVDT (VAC) :	-0.08 to 0.08
Test 52.05Limits	AIL POS (VAC)	: -0.06 to 0.06

(c) Do the Aileron Authority Check:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Push the LSK that is adjacent to CONTINUE.

Table 568/22-11-00-993-884

Test		Limits
52.07	AIL LVDT (DEG)	4.90 to 5.10
52.08	AIL POS (VAC)	1.95 to 2.39

2) Make sure that the outboard surface of the right aileron is 0.98 (±0.15) inches above the adjacent fixed structure panel.

3) Make sure that the outboard surface of the left aileron is 1.47 (±0.15) inches below the adjacent fixed structure panel.

4) Test limits:

Table 569/22-11-00-993-885

Test 52.09 AIL LVDT (DEG) Limits: -5.10 to -4.90
Test 52.10 AIL POS (VAC) Limits: -2.47 to -2.00

5) Make sure that the outboard surface of the left aileron is 0.98 (±0.15) inches above the adjacent fixed structure panel.

6) Make sure that the outboard surface of the right aileron is 1.47 (±0.15) inches below the adjacent fixed structure panel.

7) Test limits:

Table 570/22-11-00-993-886

Test 52.11 SURF DELTA (VAC) Limits: 0.00 to 0.38
Test 52.12 AIL POS (VAC) Limits: -0.44 to 0.44
Test 52.13 SURF DELTA (VAC) Limits: 0.00 to 0.38
Test 52.14 AIL POS (VAC) Limits: -0.44 to 0.44
Test 52.15 AIL LVDT (VAC) Limits: -0.08 to 0.08
Test 52.16 AIL POS (VAC) Limits: -0.06 to 0.06
Test 52.17 AIL POS (VAC) Limits: -0.06 to 0.06
Test 52.18 AIL POS (VAC) Limits: -0.06 to 0.06
Test 52.19 AIL POS (VAC) Limits: -0.06 to 0.06
Test 52.20 AIL POS (VAC) Limits: -0.38 to 0.38
Test 52.21 AIL POS (VAC) Limits: -0.38 to 0.38

(d) Do the Spoiler Check:

1) Push the LSK that is adjacent to CONTINUE.

2) Make sure that the values for the A side and B side are between the limits that show on the CDU display or in this task.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 571/22-11-00-993-887

Test		Limits
52.23	SPOILER 4 (VAC)	-0.20 to 0.20
52.24	SPOILER 9 (VAC)	-0.20 to 0.20
LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463		
52.25	SPOILER 4 (VAC)	6.27 to 8.22
LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999		
52.25	SPOILER 4 (VAC)	4.15 to 5.39
LOM 402, 404, 406, 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463		
52.26	SPOILER 9 (VAC)	6.27 to 8.22
LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999		
52.26	SPOILER 9 (VAC)	4.15 to 5.39
LOM ALL		

3) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent to PREV MENU.

b) Push the LSK adjacent to CONTINUE on the test 52.00 screen.

c) Push the LSK adjacent to PREV MENU on the AILERON RIGGING screen.

d) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

e) Push the LSK adjacent to EXIT until you get out of the BITE test.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-142

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-218

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-144

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-145

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-146

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-820-804

20. Flaps Rigging Test

A. General

(1) The Flaps Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the flap system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-147

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

SUBTASK 22-11-00-860-294

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-148

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-149

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-150

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-151

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

E. Procedure

SUBTASK 22-11-00-740-033

(1) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) FLAPS

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) During this test, do the instructions that show on the CDU display.
8) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.
9) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 572/22-11-00-993-888

Test		Limits
53.01	FLAP SYNCRO (DEG)	315 to 8
53.02	FLAP SYNCRO (DEG)	26 to 42
53.03	FLAP SYNCRO (DEG)	71 to 84
53.04	FLAP SYNCRO (DEG)	105 to 122
53.05	FLAP SYNCRO (DEG)	146 to 159
53.06	FLAP SYNCRO (DEG)	171 to 193
53.07	FLAP SYNCRO (DEG)	199 to 219
53.08	FLAP SYNCRO (DEG)	234 to 246
53.09	FLAP SYNCRO (DEG)	266 to 315

10) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent PREV MENU on test 53.09 screen.
b) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.
c) Push the LSK adjacent to EXIT until you get out of the BITE test.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-152

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-219

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-154

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-155

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-156

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

TASK 22-11-00-820-805

21. Stabilizer Rigging Test

A. General

(1) The Stabilizer Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the stabilizer system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Prepare for the Test

SUBTASK 22-11-00-860-157

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

SUBTASK 22-11-00-860-293

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-158

(3) Make sure that the autopilot stab trim cutout switch, on the control stand, is in the NORMAL position.

NOTE: It is necessary that the switch is in the NORMAL position for the stabilizer rigging test.

SUBTASK 22-11-00-860-159

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-160

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-161

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-010-002

(7) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-980-011

(8) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677 to measure the B dimension.

(c) Make sure that the B dimension is 39.89 (±0.01) inches.

G. Procedure

SUBTASK 22-11-00-740-034

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) STABILIZER

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) During this test, do the instructions that show on the CDU display.
8) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.
9) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 573/22-11-00-993-889

Test		Limits
54.01	STAB POS (vac)	: -0.07 to 0.07

10) Use the trammel trammel bar, SPL-1677 to measure the B dimension.
11) Make sure that the B dimension is 39.89 (±0.01) inches.

Table 574/22-11-00-993-890

Test		Limits
54.02	STAB POS (VAC)	: -1.30 to -1.16
54.03	STAB POS (VAC)	-2.51 to -2.31

12) Do these steps when the stabilizer stops to move:
    a) Use the trammel trammel bar, SPL-1677 to measure the B dimension.
    b) Make sure that the B dimension is between 45.43 and 45.53 inches.
13) Push the LSK adjacent to NO if the test shows no failures.

Table 575/22-11-00-993-892

Test		Limits
54.04	STAB POS (VAC)	5.07 to 5.21
54.05	STAB POS (VAC)	6.47 to 7.07

14) Do these steps when the stabilizer stops to move:
    a) Use the trammel trammel bar, SPL-1677 to measure the B dimension.
    b) Make sure that the B dimension is between 24.75 and 24.85 inches.
15) Push the LSK adjacent to NO if the test shows no failures.

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

(b) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT (Continued)

Table 576/22-11-00-993-894

Test		Limits
54.06	STAB POS (VAC)	-0.07 to 0.07
54.07	ELEV POS (DEG)	4.10 to 6.20

LOM ALL; AIRPLANES WITH FEEL SHIFT MODULE STALL IDENTIFICATION

1) Use these limits:

Table 577/22-11-00-993-897

Test		Limits
54.08	ELEV POS (DEG)	-9.61 to -7.44

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

2) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent PREV MENU on the END OF STAB RIG screen.

b) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

c) Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.

d) Push the LSK adjacent to EXIT until you get out of the BITE test.

LOM ALL

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-162

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-220

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-164

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-165

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-166

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-00-410-002

(6) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

END OF TASK

TASK 22-11-00-820-806

22. Pitch Control Wheel Steering Rigging Test

A. General

(1) The Pitch Control Wheel Steering Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the pitch control wheel steering (CWS) system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

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-1557	Gauge - Force Part #: DG-200 Supplier: 92456 Part #: FDIX 100 Supplier: 0BFD9 Part #: FDIX 50 Supplier: 0BFD9 Part #: LG-050 Supplier: 92456 Part #: LG-100 Supplier: 92456 Opt Part #: DPP-500G Supplier: 92456 Opt Part #: DPPH-150 Supplier: 92456 Opt Part #: DPPH-200 Supplier: 92456 Opt Part #: DPPH-50 Supplier: 92456 Opt Part #: FDI 100 Supplier: 0BFD9 Opt Part #: FDI 50 Supplier: 0BFD9 Opt Part #: FDV 100 Supplier: 0BFD9 Opt Part #: FDV 50 Supplier: 0BFD9
SPL-1674	Assembly - Adapter, Control Wheel, Torque and Force Test Part #: C27060-22 Supplier: 81205 Opt Part #: C27060-1 Supplier: 81205 Opt Part #: F72867-1 Supplier: 81205
SPL-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-167

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

SUBTASK 22-11-00-860-292

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-168

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-169

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-170

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-171

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-010-003

(7) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-980-012

(8) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

(c) Make sure that the B dimension is 39.89 (±0.01) inches.

G. Procedure

SUBTASK 22-11-00-740-035

(1) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) CWS

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) PITCH CWS
8) During this test, do the instructions that show on the CDU display.
9) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.
10) When the CDU display shows "Pull or push the captain (or first officer) column to xx.x LBS on scale", use the push and pull spring force gauge, COM-1557, to measure the force that you put on the control column.

NOTE: Where xx.x is a number.

NOTE: You can use the torque wrench adapter, SPL-1674, and lock wire to attach the force gauge, COM-1557, to the control wheel on the control column.

11) Make sure that you apply the force at the center of the control wheel hub and it is perpendicular to the control column.

NOTE: It is not necessary to apply force to the control column for Test 55.01 through Test 55.04.

12) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

Table 578/22-11-00-993-898

Test		Limits
55.01	STAB POS (vac)	-0.07 to 0.07

I 13) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

14) Make sure that the B dimension is 39.89 (±0.01) inches.

Table 579/22-11-00-993-900

Test		Limits
55.02	PCWS FORCE (VAC)	-0.20 to +0.20
55.03	PCWS FORCE (VAC)	-0.20 to +0.20
55.04	PCWS FORCE (VAC)	-0.20 to +0.20
55.05	PCWS FORCE (LBS)	3.0 to 9.1
55.06	PCWS FORCE (LBS)	14.7 to 22.0
55.07	PCWS FORCE (LBS)	20.6 to 28.4
55.08	PCWS FORCE (LBS)	3.0 to 9.1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 579/22-11-00-993-900 (Continued)

55.09	PCWS FORCE (LBS)	14.7 to 22.0
55.10	PCWS FORCE (LBS)	20.6 to 28.4
55.11	PCWS FORCE (LBS)	3.0 to 9.1
55.12	PCWS FORCE (LBS)	14.7 to 22.0
55.13	PCWS FORCE (LBS)	20.6 to 28.4
55.14	PCWS FORCE (LBS)	3.0 to 9.1
55.15	PCWS FORCE (LBS)	14.7 to 22.0
55.16	PCWS FORCE (LBS)	20.6 to 28.4

15) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent to CONTINUE on test 55.16 screen.

b) Push the LSK adjacent to PREV MENU on the CWS RIGGING INDEX screen.

c) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

d) Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-172

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-221

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-174

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-175

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-176

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-00-410-003

(6) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-00-820-807

23. Roll Control Wheel Steering Rigging Test

A. General

(1) The Roll Control Wheel Steering Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the roll control wheel steering (CWS) system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

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-1674	Assembly - Adapter, Control Wheel, Torque and Force Test Part #: C27060-22 Supplier: 81205 Opt Part #: C27060-1 Supplier: 81205 Opt Part #: F72867-1 Supplier: 81205
STD-1293	Wrench - Torque (100 Lb-In)

D. Location Zones

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

E. Prepare for the Test

SUBTASK 22-11-00-860-177

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

SUBTASK 22-11-00-860-291

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-178

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-179

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-180

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-181

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-480-001

(7) Install the control wheel torque wrench adapter, SPL-1674.

F. Procedure

SUBTASK 22-11-00-740-036

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) CWS

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) ROLL CWS
8) During this test, do the instructions that show on the CDU display.
9) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.
10) When the CDU display shows "Torque wheel clockwise (or counter-clockwise) to x LBS on scale", use the control wheel torque wrench (100 Lb-In), STD-1293 to measure the force that you put on the control wheel.

NOTE: Where x is a number.

NOTE: It is not necessary to apply force to the control wheel for Test 55.18.

11) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

Table 580/22-11-00-993-902

Test		Limits
55.18	RCWS SENSOR (VAC)	-0.15 to 0.15
55.19	RCWS FORCE (IN-LBS)	14 to 26
55.20	RCWS FORCE (IN-LBS)	60 to 100
55.21	RCWS FORCE (IN-LBS)	14 to 26

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 580/22-11-00-993-902 (Continued)

55.22	RCWS FORCE (IN-LBS)	60 to 100

12) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent to PREV MENU on test 55.22 screen.

b) Push the LSK adjacent to PREV MENU on the CWS RIGGING INDEX screen.

c) Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.

d) Push the LSK adjacent to EXIT until you get out of the BITE test.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-080-001

(1) Remove the control wheel torque wrench adapter, SPL-1674.

SUBTASK 22-11-00-860-182

(2) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-222

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-184

(4) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-185

(5) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-860-186

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

TASK 22-11-00-820-808

24. Mach Trim Rigging Test

A. General

(1) The Mach Trim Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the Mach trim system wiring and sensors.

B. References

Reference	Title
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)

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.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Reference	Description
SPL-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-290

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-188

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-189

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-190

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-191

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-010-004

(6) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-980-013

(7) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677 to measure the B dimension.

(c) Make sure that the B dimension is 39.89 (±0.01) inches.

G. Procedure

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

SUBTASK 22-11-00-740-040

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) MACH TRIM

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) CHANNEL A
8) During this test, do the instructions that show on the CDU display.
9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.
10) Make sure that the values for the A side are between the limits that show on the CDU display or in this task.

Table 581/22-11-00-993-919

Test		Limits
57.01	STAB POS (vac)	-0.07 to 0.07

11) Use the trammel trammel bar, SPL-1677 to measure the B dimension.
12) Make sure that the B dimension is 39.89 (±0.01) inches.

Table 582/22-11-00-993-920

Test		Limits
57.02	MT ACT POS (vac)	-0.20 to +0.20

Table 583/22-11-00-993-921

Test		Limits
57.03	ELEV SENS (vac)	-0.55 to -0.45

13) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

Table 584/22-11-00-993-922

Test		Limits

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT (Continued)

Table 584/22-11-00-993-922 (Continued)

57.04	RETRACTION (sec)	8 to 20

Table 585/22-11-00-993-923

Test		Limits
57.05	MT ACT POS (deg)	4.55 to 4.90

LOM ALL

Table 586/22-11-00-993-924

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.06	-DELTA SURF (deg)	4.30 to 5.10
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.06	-DELTA SURF (deg)	4.30 to 5.20 NOM = 4.80

LOM ALL

NOTE: Ignore limits on FMC-CDU screen for test 57.06.

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

14) Measure the distance of the elevator trailing edge deflection from the elevator index mark on the tail cone.

15) Make sure that the deflection distance is between 2.55 and 3.05 inches from the elevator index mark.

Table 587/22-11-00-993-925

Test		Limits
57.07	EXTENSION (sec)	8 to 20

Table 588/22-11-00-993-926

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.08	MT ACT POS (vac)	-0.10 to +0.10
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.08	MT ACT POS (vac)	-0.20 to +0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		

Table 589/22-11-00-993-927

Test		Limits

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT (Continued)

Table 589/22-11-00-993-927 (Continued)

57.09	ELEV POS (vac)	-0.55 to -0.45

16) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

Table 590/22-11-00-993-928

Test		Limits
LOM ALL		
57.11	MT ACT POS (DEG)	-0.10 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		
57.13	MT ACT POS (DEG)	0.56 to 0.68
57.15	MT ACT POS (DEG)	1.31 to 1.60
57.17	MT ACT POS (DEG)	2.50 to 3.10
57.19	MT ACT POS (DEG)	4.55 to 4.90
57.21	MT ACT POS (DEG)	2.50 to 3.10
57.23	MT ACT POS (DEG)	1.31 to 1.60
57.25	MT ACT POS (DEG)	0.56 to 0.68
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.27	MT ACT POS (DEG)	0.10 to 0.20
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.27	MT ACT POS (DEG)	-0.20 to 0.20
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.29	MT ACT POS (DEG)	-0.10 to 0.20
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.29	MT ACT POS (DEG)	-0.20 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		
57.31	MT ACT POS (DEG)	-1.10 to -0.90
57.33	MT ACT POS (DEG)	-1.90 to -1.56
57.35	MT ACT POS (DEG)	-1.10 to -0.90
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.37	MT ACT POS (DEG)	-0.10 to 0.10
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.37	MT ACT POS (DEG)	-0.20 to 0.20

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1 (Continued)

Table 590/22-11-00-993-928 (Continued)

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

17) Push the LSK that is adjacent to PREV MENU.

NOTE: After you make this selection, the BITE takes you back to the SELECT CHANNEL FOR TEST screen.

18) Push the LSK that is adjacent to CHANNEL B.

NOTE: The BITE takes you back to Test 57.01. This lets you do the Mach trim rigging test again for the channel B.

19) Make sure that the values for the B side are between the limits that show on the CDU display or in this task.

Table 591/22-11-00-993-929

Test		Limits
57.01	STAB POS (vac)	-0.07 to 0.07

20) Use the trammel trammel bar, SPL-1677 to measure the B dimension.

21) Make sure that the B dimension is 39.89 (±0.01) inches.

Table 592/22-11-00-993-930

Test		Limits
57.02	MT ACT POS (vac)	-0.20 to +0.20

Table 593/22-11-00-993-931

Test		Limits
57.03	ELEV SENS (vac)	-0.55 to -0.45

22) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

Table 594/22-11-00-993-932

Test		Limits
57.04	RETRACTION (sec)	8 to 20

Table 595/22-11-00-993-933

Test		Limits
57.05	MT ACT POS (deg)	4.55 to 4.90

LOM ALL

Table 596/22-11-00-993-934

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.06	-DELTA SURF (deg)	4.30 to 5.10

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1 (Continued)

Table 596/22-11-00-993-934 (Continued)

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.06	-DELTA SURF (deg)	4.30 to 5.20 NOM = 4.80

LOM ALL

NOTE: Ignore limits on FMC-CDU screen for test 57.06.

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT

23) Measure the distance of the elevator trailing edge deflection from the elevator index mark on the tail cone.

24) Make sure that the deflection distance is between 2.55 and 3.05 inches from the elevator index mark.

Table 597/22-11-00-993-935

Test		Limits
57.07	EXTENSION (sec)	8 to 20

Table 598/22-11-00-993-936

Test		Limits
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.08	MT ACT POS (vac)	-0.10 to 0.10
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.08	MT ACT POS (vac)	-0.20 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		

Table 599/22-11-00-993-937

Test		Limits
57.09	ELEV POS (vac)	-0.55 to -0.45

25) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

Table 600/22-11-00-993-938

Test		Limits
LOM ALL		
57.11	MT ACT POS (DEG)	-0.10 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		
57.13	MT ACT POS (DEG)	0.56 to 0.68
57.15	MT ACT POS (DEG)	1.31 to 1.60

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT (Continued)

Table 600/22-11-00-993-938 (Continued)

57.17	MT ACT POS (DEG)	2.50 to 3.10
57.19	MT ACT POS (DEG)	4.55 to 4.90
57.21	MT ACT POS (DEG)	2.50 to 3.10
57.23	MT ACT POS (DEG)	1.31 to 1.60
57.25	MT ACT POS (DEG)	0.56 to 0.68
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.27	MT ACT POS (DEG)	0.10 to 0.20
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.27	MT ACT POS (DEG)	-0.20 to 0.20
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.29	MT ACT POS (DEG)	-0.10 to 0.20
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.29	MT ACT POS (DEG)	-0.20 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		
57.31	MT ACT POS (DEG)	-1.10 to -0.90
57.33	MT ACT POS (DEG)	-1.90 to -1.56
57.35	MT ACT POS (DEG)	-1.10 to -0.90
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1		
57.37	MT ACT POS (DEG)	-0.10 to 0.10
LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1		
57.37	MT ACT POS (DEG)	-0.20 to 0.20
LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT		

26) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent to CONTINUE on Test 57.37 screen.

b) Push the LSK adjacent to PREV MENU on the END OF MACH TRIM RIG screen.

c) Push the LSK adjacent to PREV MENU on the SELECT CHANNEL FOR TEST screen.

d) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

e) Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM ALL; AIRPLANES WITH FCC SOFTWARE -704 OR SUBSEQUENT (Continued)

f) Push the LSK adjacent to EXIT until you get out of the BITE test.

LOM ALL

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-192

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-223

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-194

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-195

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-00-410-005

(5) Close this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

——— END OF TASK ———

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

TASK 22-11-00-820-810

25. Rudder Rigging Test

A. General

(1) The Rudder Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the rudder rollout control system wiring and sensors.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-277

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-289

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-278

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-279

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-280

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-281

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

E. Procedure

SUBTASK 22-11-00-740-047

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) RUDDER
7) CONTINUE

NOTE: After you make this selection, the CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

8) CONTINUE
9) COMPLETE RUDDER RIG

(b) Do the Rudder Rigging Check:

1) During this test, do the instructions that show on the CDU display.
2) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 601/22-11-00-993-939

TEST		LIMITS
58.01	RUDDER POS (vac)	-0.30 to 0.30
58.02	RUDDER POS (deg)	-32.50 to 29.50
58.03	RUDDER POS (deg)	29.05 to32.50
58.04	RUDDER POS (vac)	-0.30 to 0.30
58.05	RUDDER POS (deg)	-32.50 to 29.50
58.06	RUDDER POS (deg)	29.50 to32.50
58.07	RUDDER POS (vac)	-0.30 to0.30
58.08	RUDDER POS (deg)	27.50 to30.50
58.09	RUDDER POS (deg)	-30.50 to -27.50
58.10	RUDDER POS (vac)	-0.30 to 0.30

4) Do these steps to get out of the BITE test:

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

a) Push the LSK adjacent CONTINUE on test screen 58.10.

b) Push the LSK adjacent PREV MENU on the END OF RUDDER RIG TEST screen.

c) Push the LSK adjacent PREV MENU on the RUDDER RIGGING menu.

d) Push the LSK adjacent to EXIT on the RIGGING INDEX screen.

e) Push the LSK adjacent CONTINUE on the END OF BITE RIGGING screen.

f) Push the LSK adjacent to EXIT until you get out of the BITE test.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-282

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-283

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-284

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-285

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-00-860-286

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

LOM ALL

——— END OF TASK ———

TASK 22-11-00-820-809

26. Alpha Vane Rigging Test

A. General

(1) The Alpha Vane Rigging Test does a check on the interfaces between the Digital Flight Control System (DFCS) and the alpha vane wiring.

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-1917	Fixture - Test, Angle of Attack Sensor, ROSEMOUNT AOA's Part #: J34002-19 Supplier: 81205 Opt Part #: A34012-19 Supplier: 81205 Opt Part #: A34012-24 Supplier: 81205 Opt Part #: J34002-18 Supplier: 81205

C. Prepare for the Test

SUBTASK 22-11-00-860-288

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-198

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-199

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-200

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-201

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

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
C	3	C01072	HEATERS ALPHA VANE LEFT
D	3	C01071	HEATERS ALPHA VANE RIGHT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Alpha Vane Rigging Test

SUBTASK 22-11-00-740-038

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) SENSOR VALUES
6) DIGITAL SIGNALS
7) ADIRU -LCL (ADC-BUS)
8) ALPHA (221)

(b) Install the angle of attack test angle of attack probe test fixture, SPL-1917, on the left alpha vane.

(c) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to 0.0°.

1) Make sure that the value for the A side is between the limits that show on the CDU display or in this task.

a) Limits: -1° to +1°

(d) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to +10.0°.

1) Make sure that the value for the A side is between the limits that show on the CDU display or in this task.

a) Limits: 9° to 11°

(e) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to -10.0°.

1) Make sure that the value for the A side is between the limits that show on the CDU display or in this task.

a) Limits: -11° to -9°

(f) Remove the angle of attack test angle of attack probe test fixture, SPL-1917, from the left alpha vane.

(g) Install the angle of attack test angle of attack probe test fixture, SPL-1917, on the right alpha vane.

(h) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to 0.0°.

1) Make sure that the value for the B side is between the limits that show on the CDU display or in this task.

a) Limits: -1° to +1°

(i) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to +10.0°.

1) Make sure that the value for the B side is between the limits that show on the CDU display or in this task.

a) Limits: 9° to 11°

(j) Set the angle of attack test angle of attack probe test fixture, SPL-1917, to -10.0°.

1) Make sure that the value for the B side is between the limits that show on the CDU display or in this task.

a) Limits: -11° to -9°

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) Remove the angle of attack test angle of attack probe test fixture, SPL-1917, from the right alpha vane.

1) Push the LSK adjacent to EXIT until you get out of the BITE test.

NOTE: If there are instructions on the CDU display, it is necessary to do the instructions that show on the CDU display.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-202

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

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
C	3	C01072	HEATERS ALPHA VANE LEFT
D	3	C01071	HEATERS ALPHA VANE RIGHT

SUBTASK 22-11-00-860-203

(2) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-224

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-205

(4) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

END OF TASK

TASK 22-11-00-820-811

27. Remote Light Sensor Input Test

A. General

(1) The Remote Light Sensor Input Test checks the input to the MCP that will change the LCD intensity.

(2) The remote light sensors are on the forward part of the glareshield. The sensors face forward.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-00-740-048

(1) Push the INIT REF key on the CDU keyboard.

(2) Push the Line Select Key (LSK) that is adjacent to each selection:

(a) INDEX

(b) MAINT

(c) DFCS

(d) EXTENDED MAINTENANCE

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) SENSOR VALUES

(f) DIGITAL SIGNALS

(g) MCP

(h) RLS-L.

(3) Point a flashlight at the notch on the front of the left remote light sensor (T507).

(4) Verify that the value of the B channel is greater than 5.00.

(5) Put an opaque lint-free fabric to the left remote light sensor (T507) so the sensor housing is completely covered.

(6) Verify that the value of the B channel is less than 3.00.

(7) Push the Line Select Key (LSK) that is adjacent to each selection:

(a) PREV MENU

(b) RLS-R.

(8) Point a flashlight at the notch on the front of the right remote light sensor (T508).

(9) Verify that the value of the B channel is greater than 5.00.

(10) Put an opaque lint-free fabric to the right remote light sensor (T508) so the sensor housing is completely covered.

(11) Verify that the value of the B channel is less than 3.00.

(12) Push the Line Select Key (LSK) that is adjacent to each selection:

(a) EXIT

(b) EXIT on TEST COMPLETE screen.

(c) EXIT after having complied with the instructions on END OF DFCS BITE screen.

——— END OF TASK ———

TASK 22-11-00-820-812

28. Elevator Centering Unit Test

A. General

(1) The elevator centering unit test does a check on the freeplay of the torque tube.

B. References

Reference	Title
22-11-00-700-801	Land Verify Test (P/B 201)
27-31-91-000-801	Elevator Neutral Shift Mechanism Removal (P/B 401)
27-31-91-400-801	Elevator Neutral Shift Mechanism Installation (P/B 401)
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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
323	Vertical Fin - Front Spar To Rear Spar

E. Prepare for the Test

SUBTASK 22-11-00-860-320

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-321

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-322

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-323

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-327

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, to this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-00-860-328

(6) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

(b) Use the trammel trammel bar, SPL-1677 to measure the B dimension.

(c) Make sure that the B dimension is 39.89 (± 0.01) inches.

F. Procedure

SUBTASK 22-11-00-860-329

(1) Push the INIT REF key on the CDU keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX

2) MAINT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) ELEVATOR

NOTE: After you make this selection, the Continue shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) ELEV RIG

NOTE: This selection contains the ELEV RIG, ELEV AUTH SINGLE and ELEV AUTH DUAL tests.

8) During this test, do the instructions that show on the CDU display.

9) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

(b) Do the elevator centering unit check:

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1

1) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task:

Test		Limits
51.01	STAB POS (VAC)	-0.07 to 0.07
51.02	MT ACT POS (VAC)	-8.70 to -6.35
Note: No value for B side; N/A		
51.03	MT ACT POST (VAC)	-0.20 to 0.20
Note: No value for B side; N/A		
51.04	ELEV POS (VAC)	-0.53 to -0.47

2) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

Test		Limits
51.05	NSS POS (VAC)	-1.75 to -1.69

3) Use the main stab trim switch to trim the Stabilizer system until the NSS POS on A and B sides of screen test 51.05 read 0.00 (± 0.2).

4) Jiggle the column to insure the system is in detent.

5) Make sure the Stabilizer is 11.60 units of trim.

6) Push the control column to the stop.

7) Make sure that the A and B values do not change more than ±0.25 from the values displayed on the FMC CDU test screen 51.05.

8) Pull the control column to the stop.

9) Make sure that the values do not change more than ±0.25 from the values displayed on the FMC CDU test screen 51.05.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1

10) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task:

Test		Limits
51.01	STAB POS (VAC)	-0.07 to 0.07
51.02	MT ACT POS (VAC)	-8.70 to -6.35
Note: No value for B side; N/A		
51.03	MT ACT POST (VAC)	-0.20 to 0.20
Note: No value for B side; N/A		
51.04	NSS POS (VAC)	-1.75 to -1.69

11) Use the main stab trim switch to trim the Stabilizer system until the NSS POS on A and B sides of screen test 51.04 read 0.00 (± 0.2).

12) Jiggle the column to insure the system is in detent.

13) Make sure the Stabilizer is 11.60 units of trim.

14) Push the control column to the stop.

15) Make sure that the A and B values do not change more than ±0.25 from the values displayed on the FMC CDU test screen 51.04.

16) Pull the control column to the stop.

17) Make sure that the values do not change more than ±0.25 from the values displayed on the FMC CDU test screen 51.04.

Test		Limits
51.05	ELEV POS (VAC)	-0.53 to -0.47

18) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 (±0.06) inch.

LOM ALL

(c) If the values disagrees, do the following steps.

NOTE: To do the following steps, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

1) Replace the torque tube. Do these tasks: Elevator Neutral Shift Mechanism Removal, TASK 27-31-91-000-801Elevator Neutral Shift Mechanism Installation, TASK 27-31-91-400-801.

NOTE: If the maintenance capability is not available, tighten all eight of the fasteners attaching the cranks to the torque tube to 105 in-lbs. Replace the torque tube at the next convenient maintenance opportunity.

SUBTASK 22-11-00-860-336

(2) Do the land verify test.

Do this task: Land Verify Test, TASK 22-11-00-700-801

NOTE: Only do this step if Elevator Neutral Shift Mechanism Removal, TASK 27-31-91-000-801 and Elevator Neutral Shift Mechanism Installation, TASK 27-31-91-400-801 have been completed.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Put the Airplane Back to its Usual Condition

SUBTASK 22-11-00-860-330

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel.

(a) make sure that the autopilot is disengaged.

SUBTASK 22-11-00-860-331

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-332

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-00-860-333

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

——— END OF TASK ———

TASK 22-11-00-740-815

29. Digital Flight Control System LRU Replacement Tests

A. General

(1) The Line Replaceable Unit (LRU) Replacement Test lets you do a quick test of the LRU that has been replaced to ensure that it is functioning.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-00-740-050

(1) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(a) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TEST
5) CHANNEL “A” and “B”

(b) Push LSK adjacent to the replaced LRU.

NOTE: Use “NEXT PAGE” or “PREVIOUS PAGE” key to change pages.

(c) Push “CONTINUE on “AUTOTEST INITIALIZATION” screen and run the test by following the instructions on the CDU.

(d) VERIFY, “ALL TEST PASSED” message displays on the CDU.

NOTE: Some test may be completed so fast that they may not be visible on the CDU.

NOTE: Test can be considered as having passed unless a “TEST FAILED” message appeared.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) Push “CONTINUE” on test “SUMMARY” screen.

(f) Push “CONTINUE” after having complied with the instructions “TURN OFF HYD A-B”.

(g) Push “EXIT” on “TEST COMPLETE” screen.

(h) Push “EXIT” after having complied with the instructions on “END OF DFCS BITE” screen.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-00-860-365

(2) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the Digital Flight Control System (DFCS) Built-In-Test Equipment (BITE) test.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Roll Control Wheel Steering Force Transducer Deactivation.

(2) Roll Control Wheel Steering Force Transducer Activation.

TASK 22-11-11-040-801

2. Roll Control Wheel Steering Force Transducer - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to the Roll Control Wheel Steering Force Transducer.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Roll Control Wheel Steering Force Transducer Deactivation

SUBTASK 22-11-11-020-005

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Remove hydraulic power from systems A and B.

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

SUBTASK 22-11-11-860-034

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-036

(3) Attach DO NOT OPERATE tag, STD-858, to the captain's and first officer's control columns.

F. Roll Control Wheel Steering Force Transducer - Tryout

NOTE: This tryout is to make sure the Roll Control Wheel Steering Force Transducer is in a zero energy state.

SUBTASK 22-11-11-860-035

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-11-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2375111 S0000542778_V1

Roll Force Transducer
Figure 202/22-11-11-990-806

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-11-440-801

3. **Roll Control Wheel Steering Force Transducer - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to the Roll Control Wheel Steering Force Transducer.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Roll Control Wheel Steering Force Transducer Activation**

SUBTASK 22-11-11-860-037

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Supply hydraulic power to hydraulic systems A and B.

(a) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-11-860-038

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-040

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the roll control wheel steering force transducer (Roll Force Transducer).

(2) The installation of the roll force transducer.

B. You can find the roll force transducer (M221) on the aileron drum at the bottom of the captain's control column.

TASK 22-11-11-000-801

2. Roll Force Transducer Removal

(Figure 401)

A. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

B. Access Panels

Number	Name/Location
112A	Forward Access Door

C. Prepare for the Removal

SUBTASK 22-11-11-860-024

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-025

(2) Install the DO-NOT OPERATE tags to the control columns.

SUBTASK 22-11-11-010-002

(3) To get access to the roll force transducer, open this access door:

Number	Name/Location
112A	Forward Access Door

D. Procedure

SUBTASK 22-11-11-020-001

(1) Disconnect the connectors of the roll force transducer [1].

SUBTASK 22-11-11-020-002

(2) For the upper spool, do these steps to remove the cable [5] of the roll force transducer [1]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Remove the screws [9], screw [15], bolt [14], washers [7], washers [10], nut [6], spacer [13], cable clamps [11] and plugs [12].

(b) Wind the cable [5] of the roll force transducer [1] off the shaft assembly of the upper spool.

NOTE: Write down the direction of the cable.

SUBTASK 22-11-11-020-003

(3) For the lower spool, do these steps to remove the cable [5] of the roll force transducer [1]:

(a) Remove the nuts [6], bolt [17], screws [9], washers [10], cable clamps [11], cable clamp [16] and plugs [12].

(b) Wind the cable [5] of the roll force transducer [1] off the shaft assembly of the lower spool.

NOTE: Write down the direction of the cable.

SUBTASK 22-11-11-020-004

(4) Do these steps to remove the roll force transducer [1]:

(a) Remove the mounting bolts [8], washers [7] and nuts [6] that attach the roll force transducer [1] to the aileron drum assembly.

(b) Remove the roll force transducer [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F70954 S0006563902_V2

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 1 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL FORCE TRANSDUCER

B

F81827 S0006563903_V2

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 2 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL FORCE TRANSDUCER

B

3018989 S0000791396_V1

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 3 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 4 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

UPPER SPOOL CABLE CLAMPS

D

F81986 S0006563905_V2

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 5 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOWER SPOOL CABLE CLAMPS

E

F82003 S0006563906_V2

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 6 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOWER SPOOL CABLE CLAMPS

E

3018245 S0000790506_V1

Roll Force Transducer Installation
Figure 401/22-11-11-990-804 (Sheet 7 of 7)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-11-400-801

3. Roll Force Transducer Installation

(Figure 401)

A. References

Reference	Title
22-11-11-740-801	Roll Force Transducer Test (P/B 501)
22-11-11-820-801	Roll Force Transducer Adjustment and Test (P/B 501)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1107	Gauge - Feeler, 0.0 - 0.5 Inch, Readable to 1/1000th

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 Installation

SUBTASK 22-11-11-860-028

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

F. Roll Force Transducer Installation

SUBTASK 22-11-11-800-001

(1) Use the 0.0 - 0.5 Inch feeler gauge, STD-1107, to make a clearance (two locations) between the sensor shaft and the aileron drum shaft.

LOM ALL; AIRPLANES WITH 251A1814-9, -10, -12 AILERON DRUM SHAFT ASSEMBLY.

(a) Make sure that each clearance is between 0.057 in. (1.448 mm) and 0.060 in. (1.524 mm).

LOM ALL

SUBTASK 22-11-11-820-001

(2) For the non-adjustable end of the roll force transducer [1], do these steps:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Hold the roll force transducer [1] in its position for installation.

(b) Install the mounting bolt [8], washer [7], and nut [6].

SUBTASK 22-11-11-420-001

(3) For the adjustable end of the roll force transducer [1], do these steps:

(a) Hold the roll force transducer [1] in its position for installation.

(b) Install the mounting bolt [8], washer [7], and nut [6].

SUBTASK 22-11-11-420-002

(4) Do these steps to install the lower cable [5] of the roll force transducer [1] in the upper spool:

(a) Attach the cable [5] with the cable clamp [11] below the roll force transducer [1].

1) Install the bolt [14], washers [7], spacer [13], nut [6], and plug [12].

2) Make sure that you do not pull the cable [5] tightly.

(b) Wind the cable [5] around the upper spool, approximately 4 turns, in the CCW direction (as seen from the bottom) from the top to the bottom of the spool.

(c) Turn the control wheel, to the limit, in the direction to tighten the cable [5] around the spool.

(d) Attach the cable [5] with the cable clamps [11] on the bracket.

1) Install the screw [9], screw [15], washers [10], and plugs [12].

(e) Turn the control wheel clockwise and then counter-clockwise, to the limit, for two or three times.

1) Make sure that the cable [5] does not prevent the movement.

2) If it is necessary, adjust the cable [5] in the bracket.

SUBTASK 22-11-11-420-003

(5) Do these steps to install the top cable [5] of the roll force transducer [1] in the lower spool:

(a) Attach the cable [5] with the cable clamp [11] adjacent to the roll force transducer [1].

1) Install the washer [10], nut [6], and plug [12].

(b) Attach the cable [5] with the cable clamp [11] on the spool bracket of the lower flange.

1) Install the bolt [17], washer [10], nut [6], and plug [12].

2) Make sure that you do not pull the cable [5] tightly.

(c) Wind the cable [5] around the lower spool, approximately 4.5 turns, in the CW direction (as seen from the bottom) from the top to the bottom of the spool.

(d) Turn the control wheel, to the limit, in the direction to tighten the cable [5] around the spool.

(e) Attach the cable [5] with the cable clamp [11], cable clamp [16] on the bracket.

1) Install the screws [9], washers [10], and plugs [12].

(f) Turn the control wheel clockwise and then counter-clockwise, to the limit, for two or three times.

1) Make sure that the cable [5] does not prevent the movement.

2) Make sure that the cable [5] is not too loose to contact bolt [17].

3) If it is necessary, adjust the cable [5] in the bracket.

SUBTASK 22-11-11-420-004

(6) Connect the roll force transducer connectors.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-11-800-002

(7) Remove the 0.0 - 0.5 Inch feeler gauge, STD-1107, (two locations) between the sensor shaft and the aileron drum shaft.

LOM ALL; AIRPLANES WITH 251A1814-9, -10, -12 AILERON DRUM SHAFT ASSEMBLY.

(a) Make sure that each clearance is between 0.057 in. (1.448 mm) and 0.060 in. (1.524 mm).

LOM ALL

SUBTASK 22-11-11-860-029

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-041

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-11-820-002

(10) Do this task: Roll Force Transducer Adjustment and Test, TASK 22-11-11-820-801.

SUBTASK 22-11-11-740-003

(11) Do this task: Roll Force Transducer Test, TASK 22-11-11-740-801.

SUBTASK 22-11-11-800-003

(12) Remove the DO NOT OPERATE tags, STD-858, from the control columns.

SUBTASK 22-11-11-410-002

(13) Close this access door:

Number	Name/Location
112A	Forward Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Roll Force Transducer Adjustment.

(2) Roll Force Transducer Test.

B. The adjustment of the roll force transducer is important. If the adjustment is not correct, you cannot engage the autopilot.

TASK 22-11-11-820-801

2. Roll Force Transducer Adjustment and Test

(Figure 501)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-807	Roll Control Wheel Steering Rigging Test (P/B 501)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (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)

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-1674	Assembly - Adapter, Control Wheel, Torque and Force Test Part #: C27060-22 Supplier: 81205 Opt Part #: C27060-1 Supplier: 81205 Opt Part #: F72867-1 Supplier: 81205
STD-1107	Gauge - Feeler, 0.0 - 0.5 Inch, Readable to 1/1000th
STD-1293	Wrench - Torque (100 Lb-In)

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Prepare for the Adjustment

SUBTASK 22-11-11-010-001

(1) To get access to the roll force transducer, open this access door:

Number	Name/Location
112A	Forward Access Door

SUBTASK 22-11-11-860-001

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

SUBTASK 22-11-11-860-032

(3) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-002

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-11-980-001

(5) Do these steps to put the control wheel to the center:

NOTE: The power control units must be serviceable for the correct adjustment of the cables in relation to the roll force transducer.

(a) Turn the control wheel clockwise 30 degrees.

(b) Turn the control wheel counter-clockwise 30 degrees.

(c) Slowly turn the control wheel to the center.

SUBTASK 22-11-11-860-003

(6) Attach the DO-NOT-OPERATE tags to the control columns.

SUBTASK 22-11-11-860-004

(7) Set the aileron trim to 0.0 unit.

SUBTASK 22-11-11-860-005

(8) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-11-860-006

(9) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-11-860-007

(10) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

F. Procedure

NOTE: Two persons are necessary for this task.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-11-740-001

(1) Do these steps to get access to DFCS BITE:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) CWS

7) ROLL CWS

8) Do the instructions that show on the CDU display until test 55.18.

a) Test 55.18, RCWS SENSOR (VAC), Limits: -0.15 to +0.15.

NOTE: Use this CDU display to do the adjustment for the roll force transducer.

SUBTASK 22-11-11-820-003

WARNING	DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE ON TEST 55.18 WHEN YOU ADJUST THE ROLL FORCE TRANSDUCER. THE CABLES, CONTROL WHEEL AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do these steps to adjust the roll force transducer:

(a) Use the 0.0 - 0.5 Inch feeler gauge, STD-1107 to make a clearance (two locations) between the sensor shaft and the aileron drum shaft.

NOTE: If you cannot get access to this area, then remove the bolt [4], nut [1], washers [5], spacer [8], clamp [7] and plug [6].

(b) Make sure that each clearance is between 0.057 in. (1.448 mm) and 0.060 in. (1.524 mm).

(c) Remove the mounting bolt [3], washer [2] and nut [1].

(d) If the voltages on the CDU display (Test 55.18) for the A and B sides are more than 0.08 VAC, do these steps:

NOTE: For minimum error, you must hold the roll force transducer horizontally when you read the voltage.

1) Make sure that there is no external force applied to the roll force transducer (For example, if the cable is tightly pulled, then it can cause the voltage to increase).

2) Remove lockwires from the locknuts, fine adjustment nut and the tab washer. To remove it, do this task: Lockwire, Cotter Pins, and Lockrings - Removal, TASK 20-10-44-000-801.

3) Loosen the locknuts.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) Turn the coarse adjustment (rod end) until the voltages on the CDU for the A and B sides are less than .08 VAC.

NOTE: The coarse adjustment is approximately 0.016 in. (0.406 mm) for each turn.

(e) Record the voltage.

(f) Turn the coarse adjustment (rod end) until the mounting hole is parallel to the mounting hole.

(g) Install the mounting bolt [3], washer [2] and nut [1].

(h) Make sure that the voltage is within ±0.01 VAC of the voltage you recorded earlier.

NOTE: Use the fine adjustment nut if necessary.

(i) Push the tab washer against the end of the roll force transducer.

(j) Tighten the locknut on the adjustable sleeve.

(k) Tighten the locknut on the rod end.

(l) For the locknuts, fine adjustment nut and the tab washer, do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801.

(m) Remove the 0.0 - 0.5 Inch feeler gauge, STD-1107 (2 locations) between the sensor shaft and the aileron drum shaft.

NOTE: Install the bolt [4], nut [1], washers [5], spacer [8], clamp [7] and plug [6] if you remove them earlier.

(n) Make sure that each clearance is between 0.057 in. (1.448 mm) and 0.060 in. (1.524 mm)

(o) Do the following, to check the adjustments:

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER. THE CABLES, CONTROL WHEEL AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

1) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 55.18).

a) Do the instructions that show on the CDU display to complete the ROLL CWS test.

b) Make sure that the values for the A and B sides are between the limits that show on the CDU display.

NOTE: For detailed data about the ROLL CWS rigging test, refer to "Roll Control Wheel Steering Rigging Test" in (TASK 22-11-00-820-807).

c) To continue the test, you must install the control wheel torque wrench adapter, SPL-1674.

d) When the CDU display shows "Torque wheel clockwise (or counter-clockwise) to x LBS on scale", use the control wheel torque wrench (100 Lb-In), STD-1293 to measure the force that you put on the control wheel.

NOTE: Where x is a number.

2) Remove the control wheel torque wrench adapter, SPL-1674 when you complete the ROLL CWS test.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-11-860-008

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-11-860-030

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-010

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-11-860-011

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-11-860-012

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-11-860-013

(6) Remove the DO-NOT-OPERATE tags on the control columns.

SUBTASK 22-11-11-410-001

(7) Close this access panel:

Number	Name/Location
112A	Forward Access Door

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Roll Force Transducer Adjustment
Figure 501/22-11-11-990-803 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ROLL FORCE TRANSDUCER

B

F80579 S0006563912_V2

Roll Force Transducer Adjustment
Figure 501/22-11-11-990-803 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Roll Force Transducer Adjustment
Figure 501/22-11-11-990-803 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-11-740-801

3. Roll Force Transducer Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-11-860-014

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

SUBTASK 22-11-11-860-033

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-015

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-11-860-016

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-11-860-017

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-11-860-018

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-11-740-002

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) CHANNEL A AND B
6) ROLL SENS
7) Do the instructions that show on the CDU display to complete the test.
8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-11-860-019

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-11-860-031

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-021

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-11-860-022

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-11-860-023

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A/P ACTUATOR SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) A/P Actuator Solenoid and Electrohydraulic Servo Valves Deactivation.

(2) A/P Actuator Solenoid and Electrohydraulic Servo Valves Activation.

TASK 22-11-12-040-801

2. A/P Actuator Solenoid and Electrohydraulic Servo Valves - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to A/P Actuator Solenoid and Electrohydraulic Servo Valves.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
113	Area Above and Outboard of Nose Landing Gear Wheel Well - Left
211	Flight Compartment - Left
212	Flight Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Procedure

SUBTASK 22-11-12-860-018

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-010-004

(2) For the A/P aileron actuators, do these steps:

(a) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

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

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

SUBTASK 22-11-12-010-005

(3) For the A/P elevator actuators, do this step:

(a) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-12-860-019

(4) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. A/P Actuator Solenoid and Electrohydraulic Servo Valves - Tryout

NOTE: This tryout is to make sure the A/P Actuator Solenoid and Electrohydraulic Servo Valves is in a zero energy state.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-12-860-020

WARNING	MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-12-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LEFT MAIN LANDING GEAR WHEEL WELL

A

Solenoid and Electrohydraulic Valve
Figure 202/22-11-12-990-803 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Solenoid and Electrohydraulic Valve
Figure 202/22-11-12-990-803 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-12-440-801

3. A/P Actuator Solenoid and Electrohydraulic Servo Valves - Activation
(Figure 202)

A. General

(1) This procedure adds electrical power and hydraulic pressure to A/P Actuator Solenoid and Electrohydraulic Servo Valves.

B. References

Reference	Title
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)

C. Location Zones

Zone	Area
113	Area Above and Outboard of Nose Landing Gear Wheel Well - Left
211	Flight Compartment - Left
212	Flight Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. A/P Actuator Solenoid and Electrohydraulic Servo Valves Activation

SUBTASK 22-11-12-860-021

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-860-024

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-12-410-002

(3) For the A/P aileron actuators, do these steps:

(a) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

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

SUBTASK 22-11-12-410-003

(4) For the A/P elevator actuators, do this step:

(a) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A/P ACTUATOR SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the A/P solenoid and electrohydraulic servo valves

(2) An installation of the A/P solenoid and electrohydraulic servo valves.

B. There are two solenoid valves and one electrohydraulic servo valve on each autopilot (A/P) actuator. The removal and installation procedures of the solenoid valves and the electrohydraulic servo valve are the same on all of the A/P actuators (A/P Aileron Actuators and A/P Elevator Actuators).

C. Two A/P aileron actuators (M943 and M1024) are located in the left main landing gear wheel well.

D. Two A/P elevator actuators (M1020 and M1022) are located on the aft bulkhead at Body station 1156.

TASK 22-11-12-000-801

2. A/P Solenoid and Electrohydraulic Servo Valves Removal

(Figure 401)

A. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 22-11-12-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-010-001

(2) For the A/P aileron actuators, do these steps:

(a) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

WARNING YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 22-11-12-010-002

(3) For the A/P elevator actuators, do these steps:

(a) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

(b) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

E. A/P Solenoid and Electrohydraulic Servo Valves Removal

SUBTASK 22-11-12-020-001

(1) Do these steps to remove the solenoid valve [1]:

(a) Remove lockwires from the screws [2].

1) Remove the screws [2] and washers [3] that attach the solenoid valve [1].

(b) Remove the solenoid valve [1].

(c) Remove the O-ring [5].

1) Discard the O-ring [5].

(d) Remove the gasket plate [4].

1) Discard the gasket plate [4].

SUBTASK 22-11-12-020-002

(2) Do these steps to remove the electrohydraulic servo valve [7]:

(a) Remove lockwires from the screws [8].

1) Remove the screws [8] and washers [9] that attach the electrohydraulic servo valve [7].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Remove the electrohydraulic servo valve [7].

(c) Remove the O-ring [5].

1) Discard the O-ring [5].

(d) Remove the gasket plate [6].

1) Discard the gasket plate [6].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Solenoid and Electrohydraulic Valves Installation
Figure 401/22-11-12-990-802 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F69897 S0006563920_V2

Solenoid and Electrohydraulic Valves Installation
Figure 401/22-11-12-990-802 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ACTUATOR (EXAMPLE)

C

F69924 S0006563921_V4

Solenoid and Electrohydraulic Valves Installation
Figure 401/22-11-12-990-802 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-12-400-801

3. A/P Solenoid and Electrohydraulic Servo Valves Installation

(Figure 401)

A. 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)
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)
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)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00226	Compound - Tamper-Proof Putty	BMS8-45
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Solenoid valve	27-11-54-50-007	LOM ALL
		27-11-54-50-250	LOM ALL
		27-11-54-50-380	LOM ALL
4	Gasket plate	27-11-54-50-025	LOM ALL
5	O-ring	27-11-54-50-030	LOM ALL
		27-11-54-50-150	LOM ALL
6	Gasket plate	27-11-54-50-145	LOM ALL
7	Electrohydraulic servo valve	27-11-54-50-075	LOM ALL

D. Location Zones

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

F. Prepare for the Installation

SUBTASK 22-11-12-860-002

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-860-003

(2) For the A/P (Autopilot) aileron actuators, do these steps:

(a) Make sure that pressure from the Aileron Hydraulic Systems A and B is deactivated (TASK 27-11-00-860-801).

WARNING

YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURIES AND DAMAGE TO EQUIPMENT.

(b) Make sure that the landing gear downlock pin is installed (TASK 32-00-01-480-801).

SUBTASK 22-11-12-010-003

(3) For the A/P elevator actuators, do these steps:

(a) Make sure that the pressure from the Elevator Hydraulic Systems A and B is removed (TASK 27-31-00-800-802).

(b) For the A/P elevator actuators, make sure that this access door is open:

Number	Name/Location
318BR	Tailcone Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. A/P Solenoid and Electrohydraulic Servo Valves Installation

SUBTASK 22-11-12-420-001

(1) Do these steps to install the solenoid valve [1]:

(a) Install the new O-ring [5] on the solenoid valve [1].

1) Make sure that the larger diameter on the taper of the O-ring [5] facing towards the valve.

(b) Apply a layer of the hydraulic fluid, D00153, or MCS 352B fluid, D00054, to the two sides of the gasket plate [4].

(c) Put the new gasket plate [4] in the correct position.

(d) Put the solenoid valve [1] in its position for installation.

(e) Install the screws [2] and washers [3] that attach the solenoid valve [1].

(f) Tighten the screws [2] to 50 in-lb (5.6 N·m) to 70 in-lb (7.9 N·m).

1) Install MS20995C20 lockwire, G50225, on the screws [2] with double twist method.

2) Apply compound, A00226, to the end of the MS20995C20 lockwire, G50225.

SUBTASK 22-11-12-420-002

(2) Do these steps to install the electrohydraulic servo valve [7]:

(a) Install the new O-ring [5] on the electrohydraulic servo valve [7].

1) Make sure that the larger diameter on the taper of the O-ring [5] facing towards the valve.

(b) Apply a layer of the hydraulic fluid, D00153, or MCS 352B fluid, D00054, to the two sides of the gasket plate [6].

(c) Put the new gasket plate [6] in the correct position.

(d) Put the electrohydraulic servo valve [7] in its position for installation.

(e) Install the screws [8] and washers [9] that attach the electrohydraulic servo valve [7].

(f) Tighten the screws [8] to 50 in-lb (5.6 N·m) to 70 in-lb (7.9 N·m).

1) Install MS20995C20 lockwire, G50225, on the screws [8] with double twist method.

2) Apply compound, A00226, to the end of the MS20995C20 lockwire, G50225.

SUBTASK 22-11-12-860-004

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-12-860-025

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

H. Prepare for the Test

SUBTASK 22-11-12-860-017

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-12-860-006

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-12-860-007

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-12-860-023

(4) 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 22-11-12-620-001

(5) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

SUBTASK 22-11-12-860-008

(6) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-12-860-009

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

I. Post Installation Test

SUBTASK 22-11-12-740-001

(1) Do this Built-In-Test Equipment (BITE) test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, do the instructions that show on the CDU display before the LSK is pushed that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) BITE LIBRARY TEST

6) Make a selection for the applicable channel:

NOTE: A/P aileron actuator A and A/P elevator actuator A have interfaces with the Flight Control Computer (FCC) A (Channel A). A/P aileron actuator B and A/P elevator actuator B have interfaces with the FCC B (Channel B).

a) CHANNEL A

b) CHANNEL B

c) CHANNEL A AND B.

7) RUN SELECT LIBRARY TESTS

8) 3O ELEV CONTROL or 31 AIL CONTROL

NOTE: 30 ELEV CONTROL is for the A/P elevator actuators and 31 AIL CONTROL is for the A/P aileron actuators.

9) EXECUTE.

(c) Do the instructions that show on the CDU to complete the test.

(d) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

SUBTASK 22-11-12-210-001

(2) Visually examine the solenoid valve [1] and electrohydraulic servo valve [7].

(a) Make sure that there is no hydraulic leak.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

J. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-12-410-001

(1) Install this access panel:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-12-860-010

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

SUBTASK 22-11-12-860-011

(3) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-12-860-016

(4) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-12-860-013

(5) Set the STAB TRIM AUTOPILOT switch, on the control stand, to the NORMAL position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-12-860-026

(6) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the Digital Flight Control System (DFCS) BITE test.

LOM ALL

SUBTASK 22-11-12-860-014

(7) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR NEUTRAL SHIFT SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Elevator Neutral Shift Sensor Deactivation.

(2) Elevator Neutral Shift Sensor Activation.

B. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Elevator Neutral Shift Sensor.

TASK 22-11-14-040-801

2. Elevator Neutral Shift Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Elevator Neutral Shift Sensor.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Procedure

SUBTASK 22-11-14-860-029

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-14-010-005

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-14-860-030

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Elevator Neutral Shift Sensor - Tryout

NOTE: This tryout is to make sure the Elevator Neutral Shift Sensor is in a zero energy state.

SUBTASK 22-11-14-860-031

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-14-700-002

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-14-990-806

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Elevator Neutral Shift Sensor
Figure 202/22-11-14-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-14-440-801

3. **Elevator Neutral Shift Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to Elevator Neutral Shift Sensor.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. **Elevator Neutral Shift Sensor Activation**

SUBTASK 22-11-14-860-032

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-860-034

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-14-410-003

(3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR NEUTRAL SHIFT SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the elevator neutral shift sensor.

(2) An installation of the elevator neutral shift sensor.

B. The elevator neutral shift sensor (M958) is located on the forward right side of the feel and centering unit. The elevator neutral shift sensor is installed on the aft bulkhead at Body Station 1156.

C. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Elevator Neutral Shift Sensor.

TASK 22-11-14-000-801

2. Elevator Neutral Shift Sensor Removal

(Figure 401)

A. Location Zones

Zone	Area
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

B. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

C. Prepare for the Removal

SUBTASK 22-11-14-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-010-003

(2) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

D. Procedure

SUBTASK 22-11-14-020-001

(1) Disconnect the electrical connectors [4].

SUBTASK 22-11-14-020-002

(2) Do these steps to remove the elevator neutral shift sensor [5].

(a) Remove the bolt [7], washer [8], and nut [9] in the crank [10].

(b) Loosen the bolt [1] in the bracket [6].

NOTE: You do not have to remove the bolt [1], washer [2], and nut [3].

(c) Remove the elevator neutral shift sensor [5].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Elevator Neutral Shift Sensor Installation
Figure 401/22-11-14-990-804 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G18297 S0006563928_V3

Elevator Neutral Shift Sensor Installation
Figure 401/22-11-14-990-804 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-14-400-801

3. **Elevator Neutral Shift Sensor Installation**

(Figure 401)

A. **References**

Reference	Title
22-11-14-710-801	Elevator Neutral Shift Sensor Test (P/B 501)
22-11-14-820-801	Elevator Neutral Shift Sensor Adjustment and Test (P/B 501)

B. **Location Zones**

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

D. **Prepare for the Installation**

SUBTASK 22-11-14-860-022

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-14-010-004

(2) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-14-980-003

(3) Do these steps to set the stabilizer (this is the position where the Neutral Shift Sensor voltage is null):

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Turn the stab trim wheel handle on the control stand to set the stab to 11.6 units.

E. Elevator Neutral Shift Sensor Installation

SUBTASK 22-11-14-820-002

(1) Align the reference mark on the sensor case with the reference mark on the end of the sensor shaft.

SUBTASK 22-11-14-420-001

(2) Do these steps to install the elevator neutral shift sensor [5]:

(a) Make sure that the thumbwheel on the rod is not positioned near either end of its travel.

(b) Put the elevator neutral shift sensor [5] in the bracket and the crank [10] with the zero reference alignment mark aligned with the slot in the crank [10].

(c) Install the bolt [7], washer [8], and nut [9] in the crank [10] and tighten to 35 in-lb (3.95 N·m).

(d) Tighten the bolt [1] in the bracket [6] to 34 in-lb (3.84 N·m) - 36 in-lb (4.07 N·m).

SUBTASK 22-11-14-420-002

(3) Connect the electrical connectors [4].

SUBTASK 22-11-14-860-023

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-14-860-035

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-820-003

(6) Do this task: Elevator Neutral Shift Sensor Adjustment and Test, TASK 22-11-14-820-801.

SUBTASK 22-11-14-710-001

(7) Do this task: Elevator Neutral Shift Sensor Test, TASK 22-11-14-710-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR NEUTRAL SHIFT SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Elevator Neutral Shift Sensor Adjustment and Test.

(2) Elevator Neutral Shift Sensor Test.

B. The elevator neutral shift sensor (M958) is located on the forward right side of the feel and centering unit. The elevator neutral shift sensor is installed on the aft bulkhead at Body Station 1156.

C. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Elevator Neutral Shift Sensor.

TASK 22-11-14-820-801

2. Elevator Neutral Shift Sensor Adjustment and Test

(Figure 501, Figure 502)

A. References

Reference	Title
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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

E. Prepare for the Adjustment

SUBTASK 22-11-14-860-028

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-860-002

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-14-860-036

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-14-010-001

(4) Open this access panel:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-14-010-002

(5) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-14-980-001

(6) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Make sure that the main stabilizer trim cutout switch, on the control stand, is in the NORMAL position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **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.

(b) Set the B dimension to 39.89 ±0.01 in. (1013.21 ±0.26 mm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim.

(c) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-14-860-003

(7) Set the autopilot stabilizer trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-14-860-004

(8) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-14-860-005

(9) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-14-860-006

> **WARNING** MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU REMOVE OR INSTALL HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU REMOVE HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) Supply hydraulic power to hydraulic systems A and B (TASK 29-11-00-860-801).

F. Elevator Neutral Shift Sensor Adjustment and Test

SUBTASK 22-11-14-740-002

(1) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

SUBTASK 22-11-14-740-003

(2) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. If it is necessary, use the NEXT PAGE or PREV PAGE key to change pages.

(a) INDEX

(b) MAINT

(c) DFCS

(d) EXTENDED MAINTENANCE

(e) RIGGING

(f) ELEVATOR

(g) CONTINUE

(h) CONTINUE

(i) ELEV RIG.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-740-007

(3) Select CONTINUE to advance to test 51.01.

SUBTASK 22-11-14-820-007

(4) Make sure that the jackscrew B dimension equals 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-14-820-009

(5) Select CONTINUE to access display screen 51.02.

SUBTASK 22-11-14-820-010

(6) Select CONTINUE to access display screen 51.03.

SUBTASK 22-11-14-820-011

(7) Make sure that the A is within limits shown on screen 51.03.

SUBTASK 22-11-14-820-012

(8) Select CONTINUE on screen 51.03.

SUBTASK 22-11-14-820-013

(9) Jiggle the Column and wheel per instructions on the CDU.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1

SUBTASK 22-11-14-820-014

(10) Select CONTINUE after following the instruction on the CDU to access display screen 51.04.

SUBTASK 22-11-14-820-016

(11) Make sure that the right elevator trailing edge aligns with tailcone index mark within ±0.06 in. (1.5 mm).

SUBTASK 22-11-14-820-034

(12) Select CONTINUE to advance to screen 51.05.

SUBTASK 22-11-14-820-035

(13) For coarse adjustment, loosen the bolt [1] used to clamp the sensor to the support bracket only enough to allow neutral shift sensor to be rotated in the bracket.

(a) Rotate the neutral shift sensor housing slowly in both direction seeking a reading of -1.72 volts (-1.22V max, -2.22V min) on FMC-CDU display.

(b) Tighten the bolt [1] to 34 in-lb (3.84 N·m) - 36 in-lb (4.07 N·m).

SUBTASK 22-11-14-820-036

(14) For fine adjustment, remove the lockwire on thumbnut on the micro adjustment rod.

(a) Turn the knurled thumb nut on micro-adjustment rod 69-73371 to obtain -1.72 ±0.03 volts on FMC-CDU display.

(b) Install the lockwire on the thumbnut on micro-adjustment rod.

SUBTASK 22-11-14-820-037

(15) Make sure that the neutral shift sensor reads -1.72 ±0.03 volts.

SUBTASK 22-11-14-820-038

(16) Set the stabilizer to 11.6 units of trim.

(a) Make sure that the jackscrew “B” dimension equals 29.00 ±0.01 in. (736.60 ±0.25 mm).

SUBTASK 22-11-14-820-039

(17) Jiggle the control column to center the system.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1 (Continued)

SUBTASK 22-11-14-820-040

(18) Make sure that the voltage for the A and B value on the FMC-CDU screen 51.05 read 0.00 ±0.10 volts.

NOTE: Ignore the limits on FMC-CDU screen for this step.

NOTE: If the voltage does not fall within tolerance limits, check to make sure that the adjustment rod length is 5.33 ±0.01 in. (135.38 ±0.25 mm) and installed correctly. Adjust the micro-adjustment rod 69-73371 with the knurled thumb nut to obtain a reading of 0.00 ±0.05 volts.

SUBTASK 22-11-14-820-041

(19) Continue to adjust as necessary to make sure that the voltage readings in step 15 and 18 meet the tolerance requirements after micro-adjustment rod thumbnut has been lockwired.

SUBTASK 22-11-14-820-042

(20) Set the horizontal stabilizer to 0° (4 units of trim).

(a) Make sure that the jackscrew B dimension equals 39.89 ±0.01 in. (1013.21 ±0.26 mm).

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1

SUBTASK 22-11-14-820-046

(21) Select CONTINUE after following the instruction on the CDU to access display screen 51.04.

SUBTASK 22-11-14-820-047

(22) For coarse adjustment, loosen the bolt [1] used to clamp the sensor to the support bracket only enough to allow neutral shift sensor to be rotated in the bracket.

(a) Rotate the neutral shift sensor housing slowly in both direction seeking a reading of -1.72 volts (-1.22V max, -2.22V min) on FMC-CDU display.

(b) Tighten the bolt [1] to 34 in-lb (3.84 N·m) - 36 in-lb (4.07 N·m).

SUBTASK 22-11-14-820-048

(23) For fine adjustment, remove the lockwire on thumbnut on the micro adjustment rod.

(a) Turn the knurled thumb nut on micro-adjustment rod 69-73371 to obtain -1.72 ±0.03 volts on FMC-CDU display.

(b) Install the lockwire on the thumbnut on micro-adjustment rod.

SUBTASK 22-11-14-820-049

(24) Make sure that the neutral shift sensor reads -1.72 ±0.03 volts.

SUBTASK 22-11-14-820-050

(25) Set the stabilizer to 11.6 units of trim.

(a) Make sure that the jackscrew “B” dimension equals 29.00 ±0.01 in. (736.60 ±0.25 mm).

SUBTASK 22-11-14-820-051

(26) Jiggle the control column to center the system.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1 (Continued)

SUBTASK 22-11-14-820-052

(27) Make sure that the voltage for the A and B value on the FMC-CDU screen 51.04 read 0.00 ±0.10 volts.

NOTE: Ignore the limits on FMC-CDU screen for this step.

NOTE: If the voltage does not fall within tolerance limits, check to make sure that the adjustment rod length is 5.33 ±0.01 in. (135.38 ±0.25 mm) and installed correctly. Adjust the micro-adjustment rod 69-73371 with the knurled thumb nut to obtain a reading of 0.00 ±0.05 volts.

SUBTASK 22-11-14-820-053

(28) Continue to adjust as necessary to make sure that the voltage readings in step 24 and 27 meet the tolerance requirements after micro-adjustment rod thumbnut has been lockwired.

SUBTASK 22-11-14-820-054

(29) Set the horizontal stabilizer to 0° (4 units of trim).

(a) Make sure that the jackscrew B dimension equals 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-14-820-055

(30) Select CONTINUE to advance to screen 51.05.

SUBTASK 22-11-14-820-056

(31) Make sure that the right elevator trailing edge aligns with tailcone index mark within ±0.06 in. (1.5 mm).

LOM ALL

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-14-410-001

(1) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-14-410-002

(2) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-14-860-007

(3) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-14-860-024

(4) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-14-860-009

(5) Set the autopilot stabilizer trim cutout switch, on the control stand, to the NORMAL position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-14-860-010

(6) Remove hydraulic power from hydraulic systems A and B (TASK 29-11-00-860-805).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Elevator Neutral Shift Sensor Installation
Figure 501/22-11-14-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Elevator Neutral Shift Sensor Installation
Figure 501/22-11-14-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G19456 S0006563935_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-14-990-802 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G19457 S0006563936_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-14-990-802 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-14-710-801

3. Elevator Neutral Shift Sensor Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-14-860-012

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

SUBTASK 22-11-14-860-027

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-14-860-013

(3) Set the autopilot stabilizer trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-14-860-014

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-14-860-015

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

D. Procedure

SUBTASK 22-11-14-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: Use the NEXT PAGE or PREV PAGE key to change page if it is necessary. During the BITE test, if the "CONTINUE" shows, then push the LSK that is adjacent to "CONTINUE" after you do the instructions that show on the CDU display.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) CHANNEL A AND B
6) PITCH SENS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

7) Do the instructions that show on the CDU display to complete the test.

8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

SUBTASK 22-11-14-860-016

(2) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-14-860-025

(3) Close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-14-860-018

(4) Set the autopilot stabilizer trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-14-860-019

(5) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-14-860-020

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RUDDER ROLLOUT GUIDANCE ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Rudder Rollout Guidance Actuator Deactivation.

(2) Rudder Rollout Guidance Actuator Activation.

TASK 22-11-22-040-801

2. Rudder Rollout Guidance Actuator - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Rudder Rollout Guidance Actuator.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

E. Procedure

SUBTASK 22-11-22-860-015

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-010-005

(2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-22-860-018

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Rudder Rollout Guidance Actuator - Tryout

NOTE: This tryout is to make sure the Rudder Rollout Guidance Actuator is in a zero energy state.

SUBTASK 22-11-22-860-016

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-22-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Rudder Rollout Guidance Actuator
Figure 202/22-11-22-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-22-440-801

3. Rudder Rollout Guidance Actuator - Activation

(Figure 202)

A. General

(1) This procedure adds electrical power and hydraulic pressure to Rudder Rollout Guidance Actuator.

B. References

Reference	Title
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

D. Rudder Rollout Guidance Actuator Activation

SUBTASK 22-11-22-860-017

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-860-020

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-22-410-002

(3) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RUDDER ROLLOUT GUIDANCE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the rudder rollout guidance actuator.

(2) The installation of the rudder rollout guidance actuator.

(3) The rudder rollout guidance actuator test.

B. The rudder rollout guidance actuator (M2446) is located on a bracket on the rudder trailing edge hinge rib at rudder station 74.8.

TASK 22-11-22-000-801

2. Rudder Rollout Guidance Actuator - Removal

(Figure 401)

A. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

C. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

D. Prepare for the Removal

SUBTASK 22-11-22-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-010-001

(2) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-11-22-010-002

(3) Remove this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

E. Procedure

SUBTASK 22-11-22-020-001

(1) Disconnect the two electrical connectors [11].

SUBTASK 22-11-22-020-002

(2) Do these steps to remove the rudder rollout guidance actuator [1]:

(a) Remove the bolt [6] and washers [2] on the jumpers [9].

(b) Remove the bolt [3], washers [4], and nut [7] that hold the pushrod assembly [8] onto the output crank.

(c) Remove the four mounting bolts [13] and washers [12] that hold the rudder rollout guidance actuator [1] onto the actuator support bracket [10].

(d) Remove the rudder rollout guidance actuator [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Rudder Rollout Guidance Actuator Installation
Figure 401/22-11-22-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-22-400-801

3. Rudder Rollout Guidance Actuator - Installation

(Figure 401)

A. References

Reference	Title
20-10-34-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
27-21-00-840-802	Pressure to the Rudder Systems A, B, and Standby - Activation (P/B 201)

B. Tools/Equipment

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

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

C. Consumable Materials

Reference	Description	Specification
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50359	Sealant - Low Density, Non-Chromate Type	BMS5-142 Type II Class B

D. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

F. Prepare for the Installation

SUBTASK 22-11-22-100-001

(1) For the bonding surface of the actuator support bracket [10], rudder rollout guidance actuator [1], or jumper [9], do this task: Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-34-110-802.

G. Rudder Rollout Guidance Actuator Installation

SUBTASK 22-11-22-420-001

(1) Install the rudder rollout guidance actuator [1]:

(a) Hold the rudder rollout guidance actuator [1] in position for mounting.

(b) Install the bolts [13] and washers [12] that hold the rudder rollout guidance actuator [1] to the actuator support bracket [10].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Align the pushrod assembly [8] with the actuator output crank [5].

(d) Install the bolt [3], washers [4], and nut [7] to connect the actuator output crank [5] to the pushrod assembly [8].

(e) Install the bolt [6] and washer [2] to connect the jumpers [9].

1) Apply a fillet seal with sealant, A50359, or sealant, A50231, to fully cover the bolt [6], washer [2], and jumper [9].

SUBTASK 22-11-22-420-002

(2) Connect the electrical connectors [11].

SUBTASK 22-11-22-420-003

(3) Measure the resistance between the actuator and the support bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure that the resistance is less than 0.008 ohms.

SUBTASK 22-11-22-860-003

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-22-820-001

(6) Do this task: Pressure to the Rudder Systems A, B, and Standby - Activation, TASK 27-21-00-840-802.

SUBTASK 22-11-22-710-001

(7) Do this task: Rudder Rollout Guidance Actuator Test, TASK 22-11-22-710-801.

SUBTASK 22-11-22-410-001

(8) Install this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

——— END OF TASK ———

TASK 22-11-22-710-801

4. Rudder Rollout Guidance Actuator Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-22-860-004

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

SUBTASK 22-11-22-860-014

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-22-860-005

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-22-860-006

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-22-860-007

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-22-860-008

> **WARNING**
> KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-22-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) CHANNEL A AND B
6) YAW SENS
7) Do the instructions that show on the CDU to complete the test.
8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-22-860-009

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel to make sure that the autopilot is disengaged.

SUBTASK 22-11-22-860-010

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-22-860-011

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-22-860-012

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-22-860-013

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT RUDDER POSITION SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autopilot Rudder Position Sensor Deactivation.

(2) Autopilot Rudder Position Sensor Activation.

TASK 22-11-23-040-801

2. Autopilot Rudder Position Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic press to Autopilot Rudder Position Sensor.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

E. Procedure

SUBTASK 22-11-23-860-025

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-23-010-007

(2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801

SUBTASK 22-11-23-860-028

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Rudder Position Sensor - Tryout

NOTE: This tryout is to make sure the Autopilot Rudder Position Sensor is in a zero energy state.

SUBTASK 22-11-23-860-026

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-23-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-23-990-806

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2375200 S0000542874_V1

Autopilot Rudder Position Sensor
Figure 202/22-11-23-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-23-440-801

3. **Autopilot Rudder Position Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to Autopilot Rudder Position Sensor.

B. **References**

Reference	Title
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

D. **Autopilot Rudder Position Sensor - Activation**

SUBTASK 22-11-23-860-027

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-23-860-030

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-23-440-001

(3) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT RUDDER POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the autopilot rudder position sensor.

(2) The installation of the autopilot rudder position sensor.

B. The autopilot rudder position sensor (M2445) is on a bracket on the rudder trailing edge hinge rib at station 74.8.

TASK 22-11-23-000-801

2. Autopilot Rudder Position Sensor Removal

(Figure 401)

A. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

C. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

D. Prepare for the Removal

SUBTASK 22-11-23-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-23-710-001

(2) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-11-23-010-001

(3) Remove this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

E. Procedure

SUBTASK 22-11-23-020-001

(1) Disconnect the two electrical connectors [4].

SUBTASK 22-11-23-020-002

(2) Do these steps to remove the autopilot rudder position sensor [1]:

(a) Remove the bolt [6], washers [5], and nut [3] in the clamp [2].

(b) Remove the clamp [2].

(c) Remove the bolt [9], washer [11], and nut [12] in the lever [10].

(d) Remove the bolt [7], washer [14], and nut [13] in the sensor mounting bracket [8].

(e) Remove the autopilot rudder position sensor [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

W05452 S0006563948_V3

Autopilot Rudder Position Sensor Installation
Figure 401/22-11-23-990-803 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MOUNTING BRACKET

B

LEVER
(EZ INDEX MARK ALIGNMENT)

C

W05501 S0006563949_V2

Autopilot Rudder Position Sensor Installation
Figure 401/22-11-23-990-803 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-23-400-801

3. Autopilot Rudder Position Sensor Installation

(Figure 401)

A. References

Reference	Title
22-11-23-710-801	Autopilot Rudder Position Sensor Test (P/B 501)
22-11-23-820-801	Rudder Position Sensor Adjustment and Test (P/B 501)
27-21-00-800-801	Rudder Hydraulic System A, B, or Standby Pressurization (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Autopilot rudder position sensor	31-31-60-04-055	LOM 427-431, 450, 465-999

C. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
324	Vertical Fin - Rear Spar To Trailing Edge

D. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

E. Autopilot Rudder Position Sensor Installation

SUBTASK 22-11-23-020-003

(1) Do these steps to install the autopilot rudder position sensor [1]:

(a) Align the reference mark on the sensor shaft with the reference mark on the sensor case.

(b) Align the EZ (Electrical Zero) mark on the sensor case with the slot in the bracket.

(c) Align the lever with the EZ mark on the sensor shaft.

(d) Put the autopilot rudder position sensor [1] into the mounting bracket [8], and through the hole in the lever [10].

(e) Install the bolt [7], washer [14], and nut [13] to clamp the bracket onto the sensor.

(f) Tighten the clamp bolt [7].

(g) Install the bolt [9], washer [11], and nut [12] to clamp the lever [10] to the sensor shaft.

(h) Tighten the clamp bolt [9].

(i) Install the cable clamp [2] with the bolt [6], washers [5], and nut [3].

SUBTASK 22-11-23-820-001

(2) To connect the two electrical connectors [4], do these steps.

(a) Connect the label “A” RVDT connector to D11613 (channel A).

(b) Connect the label “B: RVDT connector to D11615 (channel B).

SUBTASK 22-11-23-820-002

(3) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-23-010-006

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-23-860-031

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-23-820-003

(6) Do this task: Rudder Position Sensor Adjustment and Test, TASK 22-11-23-820-801.

SUBTASK 22-11-23-820-004

(7) Do this task: Autopilot Rudder Position Sensor Test, TASK 22-11-23-710-801.

SUBTASK 22-11-23-410-001

(8) Install this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RUDDER POSITION SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Rudder Position Sensor Adjustment.

(2) Rudder Position Sensor Test.

TASK 22-11-23-820-801

2. Rudder Position Sensor Adjustment and Test

(Figure 501)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
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)

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-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

D. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

E. Prepare for the Adjustment

SUBTASK 22-11-23-860-003

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	15	C01239	FMCS MCDU 2
D	16	C01262	FMCS CMPTR 2

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
E	1	C00721	AUTOTHROTTLE DC 1
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1
A	7	C01238	FMCS MCDU 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-23-860-032

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-23-860-004

> **WARNING** YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

SUBTASK 22-11-23-860-005

(4) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-23-860-006

(5) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-23-860-007

(6) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-23-860-008

(7) Remove this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

SUBTASK 22-11-23-860-009

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

F. Rudder Position Sensor Adjustment and Test

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-23-820-005

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) RUDDER
7) RUDDER POSITION

ECCN 9E991 BOEING PROPRIETARY - See title page for details

8) Jiggle the Rudder Feel Centering Unit input arm to make sure it is centered in the cam. Adjust the rudder trim using the Rudder Trim Knob until the rudder is at the neutral position.

NOTE: Both sides of the rudder must be within the marks on the index plate.

9) Make sure that rig pin #6 can be freely inserted. rigging pin kit, SPL-1585

10) Loosen the clamp blot for the sensor case, and rotate the case until the reading on the BITE screen is as close to zero as possible.

11) Tighten the sensor case clamp bolt.

12) Remove Rig Pin #6.

13) Remove the lockwire on the thumb nut on the micro-adjustment rod (TASK 20-10-44-000-801).

14) Turn the thumb nut on the micro-adjustment rod until you get the smallest value less than 0.02 VAC.

NOTE: Do not turn the thumbnut more than one complete turn in either direction.

15) Install the lockwire on the thumbnut on the micro-adjustment rod (TASK 20-10-44-400-801).

16) Press the LSK next to "PREV MENU" on the CDU to go back to the "RUDDER RIGGING" screen.

17) Press the LSK next to "PREV MENU" on the CDU to go back to the "RIGGING INDEX" screen.

18) Press the LSK next to "EXIT" on the CDU to go back to the "RIGGING INDEX" screen.

19) Press the LSK next to "CONTINUE" after having complied with the instructions on "END OF BITE RIGGING" screen

20) Press the LSK next to "EXIT" on the "TEST COMPLETE" screen.

21) Press the LSK next to "EXIT" after having complied with the instructions on the "END OF DFCS BITE" screen.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-23-860-010

(1) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-23-860-011

(2) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Rudder Position Sensor Adjustment/Test
Figure 501/22-11-23-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-23-710-801

3. Autopilot Rudder Position Sensor Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

D. Prepare for the Test

SUBTASK 22-11-23-860-013

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

SUBTASK 22-11-23-860-024

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-23-860-014

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-23-860-015

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-23-860-016

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-23-860-017

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Procedure

SUBTASK 22-11-23-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) LRU REPLACEMENT TESTS

5) CHANNEL A AND B

NOTE: The autopilot rudder position sensor has interfaces with the FCC-A (channel A) and FCC-B (channel B).

6) YAW SENS

7) Do the instructions that show on the CDU to complete the test.

8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-23-860-018

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel to make sure that the autopilot is disengaged.

SUBTASK 22-11-23-860-019

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-23-860-020

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-23-860-021

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-23-860-022

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-23-860-023

(6) Install this access panel:

Number	Name/Location
324JL	Vertical Fin, Access

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MACH TRIM ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Mach Trim Actuator Deactivation

(2) Mach Trim Actuator Activation

TASK 22-11-24-040-801

2. Mach Trim Actuator - Deactivation

(Figure 201, Figure 202, and Figure 203)

A. General

(1) This procedure removes electrical power and hydraulic pressure to the mach trim servo.

B. References

Reference	Title
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Mach Trim Actuator Deactivation

SUBTASK 22-11-24-860-018

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-24-860-011

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-24-860-020

(3) Attach DO NOT OPERATE tag, STD-858, to the captain's and first officer's control columns.

F. Mach Trim Actuator - Tryout

NOTE: This tryout is to make sure that the mach trim actuator is in a zero energy state.

SUBTASK 22-11-24-860-017

(1) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306			
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
LOM ALL			
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306			
D	3	C01630	AFCS SYS B RUDDER DC
LOM ALL			

These circuit breakers are inoperative and should remain open:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426, 432; LOM 427 POST SB 737-22-1306			
E	4	C01629	AFCS SYS A RUDDER DC (INOP)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	3	C01630	AFCS SYS B RUDDER DC (INOP)

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-24-700-001

(2) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, is turned on (Figure 202).

SUBTASK 22-11-24-700-002

(3) Use the Flight Management Computer (FMC) - Control Display Unit (CDU) to do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) Digital Flight Control System (DFCS) will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS.

(e) SELECT, "CONTINUE" (LSK 6R).

NOTE: Ignore this message, “CALIBRATION ERROR ---MSG22-11235”.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE" (LSK 4L).

(h) SELECT, "SENSOR VALUES" (LSK 4L).

(i) SELECT, "DISCRETE INPUTS" (LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK" (LSK 5R).

1) Make sure that 0.00 +/-5.00 VAC appears on both FCC-A and FCC-B on “MACH TRIM AC (J1C-A05/B05)”.

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-24-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Control Panel P5-3
Figure 202/22-11-24-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(VIEW WHEN YOU ARE LOOKING THROUGH THE TAILCONE ACCESS DOOR)

A

2356686 S0000538466_V2

Mach Trim Actuator
Figure 203/22-11-24-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-24-440-801

3. Mach Trim Actuator - Activation

(Figure 202 and Figure 203)

A. General

(1) This procedure adds electrical power and hydraulic pressure to the mach trim servo.

B. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)

C. Location Zones

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

D. Mach Trim Actuator Activation

SUBTASK 22-11-24-860-014

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-24-860-019

(2) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 22-11-24-700-003

(3) Make sure that the MACH TRIM FAIL light, on the P5 forward overhead panel, is turned off (Figure 202).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MACH TRIM ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the mach trim actuator.

(2) An installation of the mach trim actuator.

B. The mach trim actuator (M414) is in the APU Compartment.

C. The mach trim actuator must be calibrated if the elevator rigging is changed.

(1) To check for the correct calibration of the mach trim actuator, do this task: Mach Trim Actuator Installation Test, TASK 22-11-24-740-801.

(2) To adjust the rigging, do this task: Sensor Null - Test, TASK 27-31-00-700-814.

TASK 22-11-24-000-801

2. Mach Trim Actuator Removal

(Figure 401)

A. References

Reference	Title
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (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-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Location Zones

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

D. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

E. Prepare for the Removal

SUBTASK 22-11-24-860-001

(1) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-24-860-002

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-24-010-001

(3) To get access to the mach trim actuator [1], do this step:

Open this access panel:

Number	Name/Location
318BR	Tailcone Access Door

F. Mach Trim Actuator Removal

SUBTASK 22-11-24-820-001

(1) Put rigging pin E-5 from the kit of rigging pin kit, SPL-1585, into its hole in the aft control quadrant.

SUBTASK 22-11-24-020-001

(2) Disconnect the electrical connector [4] from the mach trim actuator [1].

SUBTASK 22-11-24-020-002

(3) Remove the nut [8], washer [7], nut [6], washer [5], washer [11], and bolt assembly [3], to disconnect the mach trim actuator [1] from the neutral shift mechanism.

NOTE: Pull up on the aft end of the elevator feel and centering unit to release the load on the bolt.

SUBTASK 22-11-24-020-005

(4) Remove lockwire from the bolts [2].

SUBTASK 22-11-24-020-003

(5) Remove the bolts [2] that attach the mach trim actuator [1] to the elevator feel and centering unit.

SUBTASK 22-11-24-020-004

(6) Remove the mach trim actuator [1], washers [9], and bearings [10].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Mach Trim Actuator Installation
Figure 401/22-11-24-990-801 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MACH TRIM ACTUATOR

B

F95651 S0006563961_V3

Mach Trim Actuator Installation
Figure 401/22-11-24-990-801 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

J85569 S0000180514_V2

Mach Trim Actuator Installation
Figure 401/22-11-24-990-801 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-24-400-801

3. Mach Trim Actuator Installation

(Figure 401)

A. References

Reference	Title
22-11-24-740-801	Mach Trim Actuator Installation Test (P/B 501)
SOPM 20-50-03	Bearing and Bushing Replacement

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-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Mach trim actuator	22-11-24-01-065	LOM ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

G. Mach Trim Actuator Installation

SUBTASK 22-11-24-820-002

(1) Put rigging pin E-5 from the kit of rigging pin kit, SPL-1585, into its hole in the aft control quadrant.

SUBTASK 22-11-24-420-001

(2) Make sure the bearings and washer are in the correct position at the mounting points on the feel and centering unit.

NOTE: Move the feel and centering unit up or down to put the actuator arm in position. If it is necessary, remove the rigging pin and push the elevator control surface up, or pull aft on the control column.

SUBTASK 22-11-24-420-002

(3) Set the mach trim actuator [1] on top of the feel and centering unit and put in the bolts [2], washers [9], and bearings [10] on the sides.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Install the bearings [10] with sealant, A00247 (SOPM 20-50-03).

SUBTASK 22-11-24-420-003

(4) Make sure that the crank arm of the neutral shift mechanism can move freely in the clevis of the mach trim actuator [1] arm.

SUBTASK 22-11-24-420-004

> **WARNING** MAKE SURE THAT YOU TURN THE NEUTRAL SHIFT CRANK IN THE UP DIRECTION. IF YOU INSTALL THE NEUTRAL SHIFT CRANK INCORRECTLY, THE STABILIZER CAN MOVE QUICKLY WHEN YOU ENGAGE THE AUTOPILOT. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Install the bolt assembly [3].

(a) Install the bolt assembly [3] and washer [11] from the left to the right side.

(b) Install the washer [5] and nut [6].

NOTE: This is the larger nut.

(c) Tighten the nut [6] to 85 in-lb (9.6 N·m) - 100 in-lb (11.3 N·m).

> **CAUTION** DO NOT CHANGE THE TORQUE ON THE LARGE NUT [6] AFTER YOU TIGHTEN THE SMALL NUT [8]. IF CHANGED, THE TORQUE VALUE WILL BE INCORRECT.

(d) Install the washer [7] and nut [8].

(e) Tighten the nut [8] to 30 in-lb (3.4 N·m) - 35 in-lb (4.0 N·m).

SUBTASK 22-11-24-420-005

(6) Tighten the bolts [2] on the sides of the mach trim actuator [1] to 20 in-lb (2.3 N·m) - 25 in-lb (2.8 N·m).

SUBTASK 22-11-24-420-007

(7) Install MS20995NC32 lockwire, G01912, on the bolts [2].

SUBTASK 22-11-24-420-006

(8) Connect the electrical connector [4] to the mach trim actuator [1].

SUBTASK 22-11-24-940-001

(9) Remove the rigging pin E-5 from the aft control quadrant.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-24-410-001

(1) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-24-860-005

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

I. Mach Trim Actuator Installation Test

SUBTASK 22-11-24-710-002

(1) Do this task: Mach Trim Actuator Installation Test, TASK 22-11-24-740-801.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MACH TRIM ACTUATOR - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

(1) An installation test of the mach trim actuator.

B. The mach trim actuator is located in the APU Compartment.

C. The DFCS built-in test equipment (BITE) is used to do the LRU Replacement test after the installation of the mach trim actuator. The test uses no external equipment. The airplane electrical and hydraulic systems are the only power sources necessary for this task.

TASK 22-11-24-740-801

2. Mach Trim Actuator Installation Test

A. General

(1) The installation test makes sure that the mach trim actuator is installed correctly.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
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)

C. Location Zones

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

D. Installation Test

SUBTASK 22-11-24-860-006

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

SUBTASK 22-11-24-860-007

(2) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 22-11-24-860-008

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	4	C00457	AFCS SYS A MACH TRIM DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-24-740-001

(4) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If CONTINUE shows on the CDU display during the BITE test, first do the instructions on the CDU display. Then push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change the page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) Make the selection for the applicable channel:

NOTE: Channel A is for FCC-A and channel B is for FCC-B.

a) CHANNEL A
b) CHANNEL B
c) CHANNEL A AND B

6) MACH TRIM
7) Do the instructions that show on the CDU display to complete the test.
8) Make sure that the test is completed with no failure.

NOTE: If a failure occurs, the TEST FAILED indication will show on the CDU display.

SUBTASK 22-11-24-860-009

(5) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-24-740-002

(6) Continue the instructions on the CDU display:

(a) Push the LSK next to INDEX.
(b) Do the instructions on the CDU display.
(c) Push the LSK next to INDEX.

SUBTASK 22-11-24-860-010

(7) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autopilot Aileron Actuator Deactivation.

(2) Autopilot Aileron Actuator Activation.

TASK 22-11-25-040-801

2. Autopilot Aileron Actuator - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Autopilot Aileron Actuator.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Procedure

SUBTASK 22-11-25-860-043

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-25-010-001

(2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-25-860-044

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

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

SUBTASK 22-11-25-860-047

(4) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Aileron Actuator - Tryout

SUBTASK 22-11-25-860-045

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

NOTE: This tryout is to make sure the Autopilot Aileron Actuator is in a zero energy state.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-25-700-002

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-25-990-808

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Aileron Actuator
Figure 202/22-11-25-990-807

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-25-440-801

3. **Autopilot Aileron Actuator - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to Autopilot Aileron Actuator.

B. **References**

Reference	Title
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. **Location Zones**

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

D. **Autopilot Aileron Actuator Activation**

SUBTASK 22-11-25-860-046

WARNING
MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-25-860-051

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-25-410-001

(3) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of an autopilot aileron actuator.

(2) The installation of an autopilot aileron actuator.

B. There are two autopilot aileron actuators. You can find the autopilot aileron actuator A (M943) and autopilot aileron actuator B (M1024) in the left main landing gear wheel well, outboard of the power control units for the ailerons.

C. The removal/installation procedure is the same for each of the autopilot aileron actuators.

TASK 22-11-25-000-801

2. Autopilot Aileron Actuator Removal

(Figure 401)

A. References

Reference	Title
22-11-40-000-801	Hydraulic Pressure Switch Removal (P/B 401)
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (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
SPL-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

D. Prepare for the Removal

SUBTASK 22-11-25-860-026

(1) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-25-860-027

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-25-860-054

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.

(3) 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 22-11-25-860-040

(4) Insert rig pin A/S 15 from rigging pin kit, SPL-1585.

E. Autopilot Aileron Actuator Removal

SUBTASK 22-11-25-020-004

(1) Disconnect the hydraulic lines from the hydraulic ports on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

(a) Seal the hydraulic lines and hydraulic ports with plugs.

SUBTASK 22-11-25-020-005

(2) Remove the electrical connector [19] from the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-020-007

CAUTION HOLD THE ACTUATOR ASSEMBLY UP TO KEEP ITS WEIGHT OFF THE SHAFT. ITS WEIGHT CAN CAUSE DAMAGE TO THE SHAFT.

(3) Do these steps to remove the autopilot aileron actuator A [1] or autopilot aileron actuator B [1]:

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464

(a) Remove the bolt [16], washer [13], and nut [12] that attach the lever assembly [17] to the autopilot aileron actuator B [1] or lever assembly [23] to the autopilot aileron actuator A [1].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999

(b) Remove the bolt [16], washer [24], washer [13], and nut [12] that attach the lever assembly [17] to the autopilot aileron actuator B [1] or lever assembly [23] to the autopilot aileron actuator A [1].

LOM ALL

(c) Remove the nut [14] and washer [15] that attach the output shaft of the autopilot aileron actuator A [1] to the lever assembly [23] or autopilot aileron actuator B [1] to the lever assembly [17].

(d) Move the lever assembly [17] away from the autopilot aileron actuator B [1] or lever assembly [23] away from the autopilot aileron actuator A [1].

(e) Remove the mounting bolt [18], mounting bolts [20], mounting bolts [22], and washers [21].

(f) Remove the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-020-010

(4) Remove the hydraulic pressure switch [4] (TASK 22-11-40-000-801).

SUBTASK 22-11-25-020-008

(5) Remove the fitting [2], retainer [6], swivel nut [7], union [8], and O-ring [3].

NOTE: These items are only on the actuator assy B.

(a) Discard the O-ring [3].

SUBTASK 22-11-25-020-009

(6) Remove the reducer [10], union [9], and O-rings [11] from the ports on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

(a) Seal the ports with plugs.

(b) Keep the reducer [10] and union [9].

(c) Discard the O-rings [11].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 1 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR B

B

F54345 S0006563970_V7

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 2 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1 THIS WASHER MUST BE INSTALLED IF BOLT P/N BACB30NT3K23 IS USED

3044259 S0000811365_V3

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 3 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR A

C

G19029 S0006563971_V7

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 4 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR A

C

1 THIS WASHER MUST BE INSTALLED IF BOLT P/N BACB30NT3K23 IS USED

3044260 S0000811366_V3

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 5 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RIG PIN 15

D

H08513 S0006563972_V2

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 6 of 6)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-25-400-801

3. Autopilot Aileron Actuator Installation

(Figure 401)

A. References

Reference	Title
22-11-25-710-801	Autopilot Aileron Actuator Test (P/B 501)
22-11-25-820-801	Autopilot Aileron Actuator Adjustment (P/B 501)
22-11-29-820-801	Aileron Position Sensor Adjustment (P/B 501)
22-11-40-400-801	Hydraulic Pressure Switch - Installation (P/B 401)
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)
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)
OHM 27-09-05	Aileron/Elevator Autopilot Actuator Lever Assembly

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-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Autopilot aileron actuator B	22-11-25-01-180	LOM ALL
1	Autopilot aileron actuator A	22-11-25-01-260	LOM ALL
3	O-ring	22-11-25-01-235	LOM ALL
11	O-ring	22-11-25-01-250	LOM ALL

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

F. Prepare for the Installation

SUBTASK 22-11-25-860-029

(1) Make sure that you do these steps:

(a) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **WARNING** MAKE CERTAIN THAT LANDING GEAR DOWNLOCK PINS ARE INSTALLED. PINS NOT INSTALLED MAY CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

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

(c) Install rig pin A/S 15 from rigging pin kit, SPL-1585.

SUBTASK 22-11-25-860-030

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

G. Autopilot Aileron Actuator Installation

SUBTASK 22-11-25-420-002

(1) Do these steps to install the reducer [10] and union [9]:

(a) Lightly lubricate the new O-rings [11] on the reducer [10] and union [9] with the hydraulic fluid, D00153.

(b) Install the reducer [10] and O-ring [11] in the pressure port on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

1) Tighten the reducer [10] to 165 in-lb (18.6 N·m) - 175 in-lb (19.8 N·m).

(c) Install the union [9] and O-ring [11] in the port on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

1) Tighten the union [9] to 165 in-lb (18.6 N·m) - 175 in-lb (19.8 N·m).

SUBTASK 22-11-25-420-003

(2) Do these steps to install the fitting [2], swivel nut [7], and union [8]:

NOTE: These items are only on the actuator assy B.

(a) Lightly lubricate the new O-ring [3] on the union [8] with the hydraulic fluid, D00153.

(b) Install the union [8] and O-ring [3] in the pressure port on the autopilot aileron actuator B [1].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Tighten the union [8] to 105 in-lb (11.9 N·m) - 115 in-lb (13 N·m).

(c) Install the fitting [2], retainer [6], and swivel nut [7].

1) Tighten the swivel nut [7] to 105 in-lb (11.9 N·m) - 115 in-lb (13 N·m).

SUBTASK 22-11-25-800-001

(3) Fill the autopilot aileron actuator A [1] or autopilot aileron actuator B [1] with the hydraulic fluid, D00153.

(a) Seal the reducer [10] and union [9] with plugs.

SUBTASK 22-11-25-420-005

CAUTION

HOLD THE ACTUATOR ASSEMBLY UP TO KEEP ITS WEIGHT OFF THE SHAFT. ITS WEIGHT CAN CAUSE DAMAGE TO THE SHAFT.

(4) Hold the autopilot aileron actuator A [1] or autopilot aileron actuator B [1] in its position for installation.

(a) Install the mounting bolt [18], mounting bolts [20], mounting bolts [22], and washers [21].

1) Make sure that the countersunk side of the washer [21] is against the head of the bolt.

SUBTASK 22-11-25-200-004

(5) Do these steps to examine the shear rivets on the lever assemblies:

(a) Make sure that there is no unwanted materials in the shear rivet holes.

(b) Do this step to check for deformation of the rivet:

1) Insert a 0.0375 in. (0.952 mm) - 0.0395 in. (1.003 mm) diameter pin in the inspection hole in each rivet.

(c) Make sure that the pin moves freely while applying force in both directions to the lever assembly.

(d) If the pin does not move freely, replace the shear rivets (OHM 27-09-05).

SUBTASK 22-11-25-420-006

(6) Install the lever assembly [17] or lever assembly [23]:

(a) Place the lever assembly [17] on the autopilot aileron actuator B [1] or lever assembly [23] on the autopilot aileron actuator A [1].

(b) Carefully align the splines.

NOTE: The position of a tooth not on the spline provides the access.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464

(c) Install the bolt [16], washer [13], and nut [12] to attach the lever assembly [17] to the autopilot aileron actuator B [1] or lever assembly [23] to the autopilot aileron actuator A [1].

LOM 465-999

(d) Install the bolt [16], washer [24], washer [13], and nut [12] to attach the lever assembly [17] to the autopilot aileron actuator B [1] or lever assembly [23] to the autopilot aileron actuator A [1].

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) Install the washer [15] and nut [14] on the output shaft of the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

(f) Tighten the nut [14] on the output shaft.

(g) Tighten the bolt [16].

SUBTASK 22-11-25-420-007

(7) Connect the hydraulic lines:

(a) Remove the plugs from the hydraulic lines and the plugs on the reducer [10] and union [9].

(b) Connect the hydraulic lines to the hydraulic ports on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-420-011

(8) Install the hydraulic pressure switch [4] (TASK 22-11-40-400-801).

SUBTASK 22-11-25-420-008

(9) Connect the electrical connector [19] for the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-860-031

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-25-860-052

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-25-790-001

(12) Do a hydraulic leak check:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

(b) Visually examine the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

1) Make sure that there is no hydraulic leak.

(c) Remove Hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-25-860-041

(13) Remove rig pin A/S 15 from rigging pin kit, SPL-1585.

SUBTASK 22-11-25-820-004

(14) Do this task: Autopilot Aileron Actuator Adjustment, TASK 22-11-25-820-801.

SUBTASK 22-11-25-820-005

(15) Do this task: Aileron Position Sensor Adjustment, TASK 22-11-29-820-801.

SUBTASK 22-11-25-740-003

(16) Do this task: Autopilot Aileron Actuator Test, TASK 22-11-25-710-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) An adjustment of the autopilot aileron actuator

(2) A test of the autopilot aileron actuator.

B. If you must adjust the aileron and aileron trim control system and the autopilot aileron actuators, then you must adjust the aileron and aileron trim control system first before you adjust the autopilot aileron actuators.

TASK 22-11-25-820-801

2. Autopilot Aileron Actuator Adjustment

(Figure 501)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-803	Aileron Rigging Test (P/B 501)
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)
OHM 27-09-05	Aileron/Elevator Autopilot Actuator Lever Assembly

B. Location Zones

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

C. Prepare for the Adjustment

SUBTASK 22-11-25-860-002

(1) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-25-860-003

(2) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-25-860-004

(3) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-25-860-005

(4) Set the aileron trim to 0 unit.

SUBTASK 22-11-25-860-006

(5) Set the flaps to 1 degree.

SUBTASK 22-11-25-860-007

(6) Set the speed brake handle to the down position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-25-420-010

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

(7) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

D. Autopilot Aileron Actuator Adjustment

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-25-020-001

(1) Disconnect the end of the rod assembly [5] that connects to the autopilot aileron actuator B lever assembly [8]:

(a) Remove the bolt [1], washer [2], washer [3], and nut [4].

SUBTASK 22-11-25-020-002

(2) Disconnect the end of the rod assembly [7] that connects to the autopilot aileron actuator A lever assembly [6]:

(a) Remove the bolt [1], washer [2], washer [3], and nut [4].

SUBTASK 22-11-25-200-005

(3) Do these steps to examine the shear rivets on the lever assemblies:

(a) Make sure that there is no unwanted materials in the shear rivet holes.

(b) Do this step to check for deformation of the rivet:

1) Insert a 0.0375 in. (0.952 mm) - 0.0395 in. (1.003 mm) diameter pin in the inspection hole in each rivet.

(c) Make sure that the pin moves freely while applying force in both directions to the lever assembly.

(d) If the pin does not move freely, replace the shear rivets (OHM 27-09-05).

SUBTASK 22-11-25-860-009

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-25-820-001

(5) Do this BITE test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) AILERON
7) AIL RIG.

(c) Do the instructions that show on the CDU display until test 52.04.

NOTE: For detailed data about the AIL RIG test, refer to "Do the Aileron Rigging Check" in (TASK 22-11-00-820-803).

WARNING KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

1) Do not press the LSK adjacent to “CONTINUE” or exit BITE until the rod adjustments are complete.

NOTE: If the “CONTINUE” LSK is pushed or BITE is exited the rod assemblies may move.

2) Test 52.04, AIL LVDT (VAC), Limits: -0.08 to +0.08.

NOTE: Use this CDU display to do the adjustment for the rod assemblies.

3) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

NOTE: Ignore the values check for the AIL POS (VAC) limits on tests 52.01, 52.02, and 52.03 in this test.

SUBTASK 22-11-25-820-002

(6) Adjust the rod assembly [5].

(a) Adjust the length of the rod assembly [5] until the bolt [1] can go smoothly through the rod end and the autopilot aileron actuator B lever assembly [8].

(b) Make sure that you can see the bearing thread of the rod end through the inspection hole at the end of the rod assembly [5].

1) Adjust the rod assembly [5] if it is necessary.

NOTE: The nominal length of the rod assembly is 8.08 in. (205.2 mm).

(c) Tighten the locknut on the rod end.

1) Install lockwire (TASK 20-10-44-400-801).

(d) Install the bolt [1], washer [2], washer [3], and nut [4].

1) Make sure that the bolt [1] goes smoothly through the rod end and the lever assembly.

(e) Make sure that the values for the A side and B side are at 0 ±0.08 VAC that show on the CDU display (Test 52.04).

SUBTASK 22-11-25-820-003

(7) Adjust the rod assembly [7].

(a) Jiggle the captain's control wheel at the neutral position to make sure that the system is at center.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Adjust the length of the rod assembly [7] until the bolt [1] can go smoothly through the rod and the autopilot aileron actuator A lever assembly [6].

(c) Make sure that you can see the bearing threads of the rod end through the inspection hole at the end of the rod assembly [7].

1) Adjust the rod assembly if it is necessary.

NOTE: The nominal length of the rod assembly is 10.35 in. (262.9 mm).

(d) Tighten the locknut on the rod end.

1) Install lockwire (TASK 20-10-44-400-801).

(e) Install the bolt [1], washer [2], washer [3], and nut [4].

1) Make sure that the bolt [1] goes smoothly through the rod end and the lever assembly.

2) Make sure that the installation of the bolt [1] does not cause the ailerons to move from their rigged position.

NOTE: You can see the movement at the inboard end of the right aileron.

(f) Make sure that the values for the A side and B side are at 0 ±0.08 VAC that show on the CDU display (Test 52.04).

SUBTASK 22-11-25-740-001

WARNING	KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 52.04).

(a) Do the instructions that show on the CDU display to complete the AIL RIG test.

(b) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-25-860-010

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel.

(a) Make sure that the autopilot is disengaged.

SUBTASK 22-11-25-860-038

(2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-25-860-012

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-25-860-050

(4) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the Digital Flight Control System (DFCS) Built-In-Test Equipment (BITE) test.

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-25-860-013

(5) Remove hydraulic power from hydraulic systems A and B (TASK 29-11-00-860-805).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Autopilot Aileron Actuator Adjustment
Figure 501/22-11-25-990-804 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATORS A AND B

B

F54348 S0006563979_V3

Autopilot Aileron Actuator Adjustment
Figure 501/22-11-25-990-804 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-25-710-801

3. Autopilot Aileron Actuator Test

A. References

Reference	Title
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-25-860-042

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-25-860-017

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-25-860-018

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-25-860-019

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-25-860-020

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply the hydraulic power to the hydraulic systems A and B (TASK 29-11-00-860-801).

D. Autopilot Aileron Actuator Test

SUBTASK 22-11-25-740-002

(1) Do this Built-In-Test Equipment (BITE) test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) DFCS

4) EXTENDED MAINTENANCE

5) BITE LIBRARY TEST

6) Make a selection for the applicable channel:

NOTE: A/P (Autopilot) aileron actuator A has interface with the Flight Control Computer (FCC) A (Channel A). A/P aileron actuator B has interface with the FCC B (Channel B).

a) CHANNEL A

b) CHANNEL B

c) CHANNEL A AND B.

7) RUN SELECT LIBRARY TESTS

8) 31 AIL CONTROL

9) EXECUTE

10) Do the instructions that show on the CDU to complete the test.

11) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-25-860-021

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel.

(a) Make sure that the autopilot is disengaged.

SUBTASK 22-11-25-860-039

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-25-860-023

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-25-860-049

(4) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the Digital Flight Control System (DFCS) BITE test.

LOM ALL

SUBTASK 22-11-25-860-024

(5) Remove the hydraulic power from the hydraulic systems A and B (TASK 29-11-00-860-805).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-25-200-801

1. Autopilot Aileron Actuator Linkage Inspection

(Figure 601)

A. General

(1) This procedure is for an inspection of the worn areas of the autopilot aileron actuator linkage. To do this check, you must remove the autopilot aileron actuator linkage. Usually you use this procedure when you do the overhaul of the autopilot aileron actuator linkage. To get access to the components or to replace the components during the inspection, refer to (Autopilot Aileron Actuator Removal, TASK 22-11-25-000-801)

B. References

Reference	Title
22-11-25-000-801	Autopilot Aileron Actuator Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1096	Micrometer - Depth, 0-1 inch, Readable to 1/1000 inch
STD-1097	Caliper - Vernier, 0-6 inch, Readable to 1/1000 inch

D. Procedure

SUBTASK 22-11-25-020-003

(1) Remove the parts that are necessary for inspection.

SUBTASK 22-11-25-200-003

(2) Examine the parts:

(a) Use a micrometer (0-1 inch, readable to 1/1000 inch), STD-1096 or a vernier caliper (0 - 6 inch, readable to 1/1000 inch), STD-1097 to measure the parts.

(b) Compare the dimensions you measured with the permitted dimensions shown in (Figure 601).

(c) Repair or replace the parts that are out of the tolerance.

SUBTASK 22-11-25-420-001

(3) Install the parts.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 1 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT AILERON ACTUATORS A AND B

B

A-A

F54350 S0006563985_V2

Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 2 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MINIMUM INCHES (mm)	DESIGN LIMITS DIAMETER MAXIMUM INCHES (mm)	WEAR LIMITS PERMITTED WEAR DIMENSION INCHES (mm)	WEAR LIMITS MAXIMUM DIAMETER CLEARANCE INCHES (mm)	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
[1]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[2]	Lever	ID	0.250 (6.35)	0.251 (6.38)	0.255 (6.48)	3 0.005 (0.13)		X	1
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[3]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[4]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	2
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[5]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[6]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	2
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[7]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		

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Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 3 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PERMITTED WEAR DIMENSION INCHES (mm)	MAXIMUM DIAMETER CLEARANCE INCHES (mm)			
			MINIMUM INCHES (mm)	MAXIMUM INCHES (mm)					
[8]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	2
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		

1 GET THE BUSHING. BORE A HOLE [0.3756 INCH (9.54 mm) DIAMETER MAXIMUM] TO GET 0.0002 +0.0009 OR -0.0002 INCH (0.005 +0.023 OR -0.005 mm) INTERFERENCE FIT. REAM BUSHING TO 0.250/0.251 INCH (6.35/6.38 mm) DIAMETER.

2 GET THE BUSHING. BORE A HOLE [0.3756 INCH (9.54 mm) DIAMETER MAXIMUM] TO GET 0.0002 +0.0009 OR -0.0002 INCH (0.005 +0.023 OR -0.005 mm) INTERFERENCE FIT. REAM BUSHING TO 0.2495/0.2505 INCH (6.34/6.363 mm) DIAMETER.

3 THE TOTAL DIAMETRICAL CLEARANCE OF LOCATIONS (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8) MUST NOT BE MORE THAN 0.0225 INCH (0.572 mm).

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Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ELEVATOR ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autopilot Elevator Actuator Deactivation.

(2) Autopilot Elevator Actuator Activation.

TASK 22-11-26-040-801

2. Autopilot Elevator Actuator - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Autopilot Elevator Actuator.

B. References

Reference	Title
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

E. Procedure

SUBTASK 22-11-26-860-033

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-26-010-005

(2) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802

SUBTASK 22-11-26-860-034

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Elevator Actuator - Tryout

NOTE: This tryout is to make sure the Autopilot Elevator Actuator is in a zero energy state.

SUBTASK 22-11-26-860-035

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-26-700-002

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-26-990-810

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Elevator Actuator
Figure 202/22-11-26-990-809

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-26-440-801

3. **Autopilot Elevator Actuator - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic power to Autopilot Elevator Actuator.

B. **References**

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

D. **Autopilot Elevator Actuator Activation**

SUBTASK 22-11-26-860-036

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-26-860-038

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-26-410-005

(3) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ELEVATOR ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of an autopilot elevator actuator.

(2) The installation of an autopilot elevator actuator.

B. There are two autopilot elevator actuators. The autopilot elevator actuator A (M1020) and autopilot elevator actuator B (M1022) are located adjacent to the elevator power control units on the aft bulkhead at Body Station 1156.

C. The removal/installation procedure is the same for each of the autopilot elevator actuator.

TASK 22-11-26-000-801

2. Autopilot Elevator Actuator - Removal

(Figure 401)

A. References

Reference	Title
22-11-40-000-801	Hydraulic Pressure Switch Removal (P/B 401)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)

B. Location Zones

Zone	Area
318	Tail Cone Compartment - Right
318	Tail Cone Compartment - Right

C. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 22-11-26-860-001

(1) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-26-860-002

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-26-010-001

(3) Open this access panel:

Number	Name/Location
318BR	Tailcone Access Door

E. Autopilot Elevator Actuator Removal

SUBTASK 22-11-26-020-001

(1) Disconnect the hydraulic lines from the hydraulic ports on the autopilot elevator actuator [1].

SUBTASK 22-11-26-480-001

(2) Install protective covers and plugs on the hydraulic lines and the hydraulic ports.

SUBTASK 22-11-26-020-002

(3) Remove the electrical connector from the autopilot elevator actuator [1].

SUBTASK 22-11-26-020-004

(4) Remove the hydraulic pressure switch [11] (TASK 22-11-40-000-801).

SUBTASK 22-11-26-020-005

(5) Do these steps to remove the autopilot elevator actuator [1]:

(a) Remove the clamp bolt [6], washer [7], and nut [8] that attach the lever assembly [13] or lever assembly [12] to the autopilot elevator actuator [1].

(b) Remove the nut [4] and washer [5] that attach the output shaft of the autopilot elevator actuator [1] to the lever assembly [13] or lever assembly [12].

(c) Move the lever assembly [13] or lever assembly [12] away from the autopilot elevator actuator [1].

(d) Remove the mounting bolts [2] and washer [3] that hold the autopilot elevator actuator [1].

(e) Remove the autopilot elevator actuator [1].

(f) Remove the reducer [9] and reducer [10] from the hydraulic ports on the autopilot elevator actuator [1].

1) Remove and discard the packings [14].

SUBTASK 22-11-26-480-002

(6) Install protective plugs on the hydraulic ports.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F96115 S0006563992_V2

Autopilot Elevator Actuator Installation
Figure 401/22-11-26-990-805 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ELEVATOR ACTUATORS A AND B

B

F96330 S0006563993_V3

Autopilot Elevator Actuator Installation
Figure 401/22-11-26-990-805 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-26-400-801

3. **Autopilot Elevator Actuator - Installation**

(Figure 401)

A. **References**

Reference	Title
22-11-26-710-801	Autopilot Elevator Actuator Test (P/B 501)
22-11-26-820-801	Autopilot Elevator Actuator Adjustment and Test (P/B 501)
22-11-40-400-801	Hydraulic Pressure Switch - Installation (P/B 401)
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)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

B. **Consumable Materials**

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Autopilot elevator actuator	22-11-26-01-280	LOM ALL
14	Packing	22-11-26-01-270	LOM ALL

D. **Location Zones**

Zone	Area
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

F. **Prepare for the Installation**

SUBTASK 22-11-26-860-003

(1) Make sure that you do these steps:

(a) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

(b) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-26-860-004

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

G. Autopilot Elevator Actuator Installation

SUBTASK 22-11-26-420-001

(1) Lightly lubricate the new packings [14] with hydraulic fluid, D00153.

SUBTASK 22-11-26-420-013

(2) Install the new packings [14] on the reducer [9] and reducer [10].

SUBTASK 22-11-26-080-001

(3) Remove the protective plugs from the hydraulic ports.

SUBTASK 22-11-26-420-011

(4) Install the reducer [9] and reducer [10] in the hydraulic ports on the autopilot elevator actuator [1].

SUBTASK 22-11-26-800-001

(5) Fill the autopilot elevator actuator [1] with hydraulic fluid, D00153.

SUBTASK 22-11-26-480-003

(6) Install protective plugs on the reducer [9] and reducer [10].

SUBTASK 22-11-26-420-002

(7) Hold the autopilot elevator actuator [1] in its position for installation.

SUBTASK 22-11-26-420-012

(8) Install the mounting bolts [2] and washers [3].

(a) Make sure that the countersunk side of the washer [3] is against the head of the mounting bolt [2].

SUBTASK 22-11-26-200-007

(9) Do these steps to examine the shear rivets on the lever assembly [12] or lever assembly [13]:

(a) Make sure that there is no unwanted materials in the shear rivet holes.

(b) Do this step to check for deformation of the rivet:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Insert a 0.0375 in. (0.95 mm) – 0.0395 in. (1 mm) diameter pin in the inspection hole in each rivet.
2) Make sure that the pin moves freely while applying force in both directions to the lever assembly.
3) If the pin does not move freely, replace the shear rivets.

SUBTASK 22-11-26-420-003

(10) Install the lever assembly [13] or lever assembly [12]:
(a) Place the lever assembly [13] or lever assembly [12] on the autopilot elevator actuator [1].
(b) Carefully align the splines.
NOTE: The position of a tooth not on the spline provides the access.
(c) Install the clamp bolt [6], washer [7], and nut [8] to attach the lever assembly [13] or lever assembly [12] to the autopilot elevator actuator [1].
1) Torque the nut [8] to 33 in-lb (3.7 N·m) - 35 in-lb (4.0 N·m).
(d) Install the washer [5] and nut [4] on the output shaft of the autopilot elevator actuator [1].
(e) Tighten the nut [4] on the output shaft.
(f) Tighten the clamp bolt [6].

SUBTASK 22-11-26-420-004

(11) Connect the hydraulic lines:
(a) Remove the plugs from the hydraulic lines and the plugs on the reducer [9] and reducer [10].
(b) Connect the hydraulic lines to the hydraulic ports on the autopilot elevator actuator [1].

SUBTASK 22-11-26-420-005

(12) Install the hydraulic pressure switch [11] (TASK 22-11-40-400-801).

SUBTASK 22-11-26-420-006

(13) Connect the electrical connector for the autopilot elevator actuator [1].

SUBTASK 22-11-26-420-007

(14) Connect the electrical connector for the hydraulic pressure switch [11].

SUBTASK 22-11-26-860-005

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-26-860-039

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-26-790-001

(17) Do a hydraulic leak check:

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Supply hydraulic pressure to the elevator hydraulic systems A and B (TASK 27-31-00-800-801).

(b) Visually examine the autopilot elevator actuator [1].

1) Make sure that there is no hydraulic leak.

(c) Remove Hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-26-820-001

(18) Do this task: Autopilot Elevator Actuator Adjustment and Test, TASK 22-11-26-820-801.

SUBTASK 22-11-26-710-001

(19) Do this task: Autopilot Elevator Actuator Test, TASK 22-11-26-710-801.

SUBTASK 22-11-26-410-001

(20) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ELEVATOR ACTUATOR - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) Autopilot Elevator Actuator Adjustment and Test.

(2) Autopilot Elevator Actuator Test.

C. If you do the adjustments for the elevator and elevator tab control system and the autopilot elevator actuators, then you must do the adjustment for the elevator and elevator tab control system first before you do the adjustment for the autopilot elevator actuators.

TASK 22-11-26-820-801

2. Autopilot Elevator Actuator Adjustment and Test

(Figure 501)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-802	Elevator Rigging Test (P/B 501)
22-11-31-990-808	Figure: Stabilizer Trim Jackscrew Setting (P/B 501)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (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)
OHM 27-09-05	Aileron/Elevator Autopilot Actuator Lever Assembly

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Prepare for the Adjustment

SUBTASK 22-11-26-860-009

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

SUBTASK 22-11-26-860-032

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-010-003

(3) To get access to the elevator autopilot actuators, open this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-26-010-004

(4) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-26-980-001

(5) Do these steps to set the B dimension (Figure 22-11-31-990-808):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim (zero degree).

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.25 mm).

SUBTASK 22-11-26-860-010

(6) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-26-860-011

(7) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-26-860-012

(8) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

F. Procedure

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-26-020-006

(1) Disconnect the end of the rod assembly [8] which connects to the autopilot elevator actuator B lever assembly [1]:

(a) Remove the bolt [2], washers [3], [4] and nut [5].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-26-020-007

(2) Disconnect the end of the rod assembly [6] which connects to the autopilot elevator actuator A lever assembly [7]:

(a) Remove the bolt [2], washers [3], [4] and nut [5].

SUBTASK 22-11-26-200-005

(3) Do these steps to examine the shear rivets on the lever assemblies:

(a) Make sure that there is no unwanted materials in the shear rivet holes.

(b) Do this step to check for deformation of the rivet:

1) Insert a 0.0375 in. (0.952 mm) - 0.0395 in. (1.003 mm) diameter pin in the inspection hole in each rivet.

(c) Make sure that the pin moves freely while applying force in both directions to the lever assembly.

(d) If the pin does not move freely, replace the shear rivets (OHM 27-09-05).

SUBTASK 22-11-26-860-013

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-26-820-002

(5) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) ELEVATOR

7) ELEV RIG

8) Do the instructions that show on the CDU display until test 51.06.

NOTE: Use the trammel trammel bar, SPL-1677, for measurement of the "B" dimension that shows on the CDU display (Test 51.01).

NOTE: For detailed data about the ELEV RIG test, refer to "Do the Elevator Rigging Check" in (TASK 22-11-00-820-802).

9) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **CAUTION**
> DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE UNTIL YOU COMPLETE THE ROD ADJUSTMENTS. PUSH <CONTINUE BEFORE YOU COMPLETE THE ROD ADJUSTMENTS CAN CAUSE DAMAGE TO THE ROD ASSEMBLIES.

a) Test 51.06, ELEV LVDT (VAC), Limits: -2.05 to -1.95

NOTE: Use this CDU display to do the adjustment for the rod assemblies.

SUBTASK 22-11-26-420-008

> **WARNING**
> DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE ON TEST 51.06 WHEN YOU ADJUST THE ROD ASSEMBLIES. THE A/P ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(6) Adjust the rod assembly [8]:

(a) Adjust the length of the rod assembly [8] until the bolt [2] can go smoothly through the rod end and the autopilot elevator actuator B lever assembly [1].

NOTE: Use the CDU display (Test 51.06) to do the adjustment for the rod assembly.

1) Make sure that the elevator A/P actuator LVDT voltage is -2.00 (±0.05) VAC.

2) Make sure that you can see the threads of the rod end through the inspection hole at the end of the rod assembly [8].

3) Adjust the rod assembly [8] if it is necessary.

NOTE: The nominal length of the rod assembly is 9.43 in. (239.52 mm).

(b) Tighten the locknut on the rod end.

1) Do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801.

(c) Install the bolt [2], washers [3], [4] and nut [5].

NOTE: The bolt must go smoothly through the rod end and the lever assembly.

SUBTASK 22-11-26-420-009

> **WARNING**
> DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE ON TEST 51.06 WHEN YOU ADJUST THE ROD ASSEMBLIES. THE A/P ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Adjust the rod assembly [6]:

(a) Jiggle the aft quadrant.

1) Make sure that the trailing edge of the right elevator aligns with the index mark on the tail cone within ±0.06 inch.

(b) Adjust the length of the rod assembly [6] until the bolt [2] can go smoothly through the rod and the autopilot elevator actuator A lever assembly [7].

NOTE: Use the CDU display (Test 51.06) to do the adjustment for the rod assembly.

1) Make sure that the elevator A/P actuator LVDT voltage is -2.00 (±0.05) VAC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Make sure that you can see the threads of the rod end through the inspection hole at the end of the rod assembly [6].

3) Adjust the rod assembly if it is necessary.

NOTE: The nominal length of the rod assembly is 17.52 in. (445.01 mm).

(c) Tighten the locknut on the rod end.

(d) Install the bolt [2], washers [3], [4] and nut [5].

NOTE: The bolt must go smoothly through the rod end and the lever assembly.

SUBTASK 22-11-26-740-001

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE A/P ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES. THE A/P ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 51.06).

(a) Do the instructions that show on the CDU display to complete the ELEV RIG test.

(b) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-26-860-014

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-26-860-029

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-860-016

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-26-860-017

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-26-860-018

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-26-410-003

(6) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-26-410-004

(7) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Elevator Actuator Adjustment
Figure 501/22-11-26-990-807 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A/P ELEVATOR ACTUATORS A AND B

B

F96392 S0006564000_V2

Autopilot Elevator Actuator Adjustment
Figure 501/22-11-26-990-807 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G05685 S0006564001_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-26-990-808 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G05686 S0006564002_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-26-990-808 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-26-710-801

3. Autopilot Elevator Actuator Test

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-26-860-031

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-860-020

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-26-860-021

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-26-860-022

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-26-860-023

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

D. Autopilot Elevator Actuator Test

SUBTASK 22-11-26-740-002

(1) Do this Built-In-Test Equipment (BITE) test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) BITE LIBRARY TEST
6) Make a selection for the applicable channel:

NOTE: If you do the test as a scheduled maintenance task, you must do the CHANNEL A test, the CHANNEL B test, and the CHANNEL A AND B test.

NOTE: A/P (Autopilot) elevator actuator A has interface with the Flight Control Computer (FCC) A (Channel A). A/P elevator actuator B has interface with the FCC B (Channel B).

a) CHANNEL A
b) CHANNEL B
c) CHANNEL A AND B

7) RUN SELECT LIBRARY TESTS
8) 30 ELEV
9) EXECUTE
10) Do the instructions that show on the CDU display to complete the test.
11) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-26-860-024

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-26-860-030

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-860-026

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-26-860-041

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the OFF position.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-26-860-040

(5) Set the Flight Management Computer (FMC) transfer switch, on the P5 forward overhead panel, to the initial position before you did the Digital Flight Control System (DFCS) BITE test.

LOM ALL

SUBTASK 22-11-26-860-027

(6) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT ELEVATOR ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure has this task:

(1) An inspection of the autopilot elevator actuator linkage.

B. This inspection is for looseness or worn areas of the autopilot elevator actuator linkages.

TASK 22-11-26-200-802

2. Autopilot Elevator Actuator Linkage Inspection

(Figure 601 and Figure 602)

A. General

(1) To do the inspection, it is necessary to remove the autopilot elevator actuator linkages. Usually this task is used to do the overhaul of the autopilot elevator actuator linkages. To get access to the components or replace the components during the inspection, do this task: Autopilot Elevator Actuator - Removal, TASK 22-11-26-000-801.

B. References

Reference	Title
22-11-26-000-801	Autopilot Elevator Actuator - Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1096	Micrometer - Depth, 0-1 inch, Readable to 1/1000 inch
STD-1097	Caliper - Vernier, 0-6 inch, Readable to 1/1000 inch

D. Autopilot Elevator Actuator Linkage Inspection

SUBTASK 22-11-26-200-008

(1) Do a visual check of the both lever assemblies while connected to the autopilot elevator actuators output shafts (Views D and E, Figure 601).

(a) Manually move each lever assembly.

1) Make sure that the lever assemblies do not have looseness/freeplay while connected to the autopilot elevator actuator.

NOTE: If looseness/freeplay is present, the lever arm will move sideways, along the direction of the autopilot elevator output shaft.

(b) If lever assemblies have looseness/freeplay, do the following steps:

1) Tighten the lever assembly nut [9] to 34 ±1 in-lb (3.8 ±0.1 N·m).

a) Make sure that the looseness/freeplay is no longer present.

2) If the looseness/freeplay is still present, replace the lever assembly.

a) Make sure that the looseness is no longer present.

SUBTASK 22-11-26-020-008

(2) Remove the parts that are necessary for inspection (Figure 601).

SUBTASK 22-11-26-200-003

(3) Examine the removed parts as follows:

(a) Use a micrometer (0-1 inch, readable to 1/1000 inch), STD-1096, or a vernier caliper (0 - 6 inch, readable to 1/1000 inch), STD-1097, to measure the parts.

(b) Compare the dimensions you measured with the permitted dimensions (Figure 602).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Repair or replace the parts that are out of the tolerance.

SUBTASK 22-11-26-420-010

(4) Install the parts (Figure 601).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autopilot Elevator Actuator Linkage Inspection
Figure 601/22-11-26-990-811 (Sheet 1 of 5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F96041 S0006564008_V3

Autopilot Elevator Actuator Linkage Inspection
Figure 601/22-11-26-990-811 (Sheet 2 of 5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F96081 S0006564009_V5

Autopilot Elevator Actuator Linkage Inspection
Figure 601/22-11-26-990-811 (Sheet 3 of 5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(EXAMPLE)

D

3066579 S0000828088_V1

Autopilot Elevator Actuator Linkage Inspection
Figure 601/22-11-26-990-811 (Sheet 4 of 5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOTE:

THE LEVER CANNOT MOVE FREELY IN THE DIRECTION OF THE ARROW.

2966380 S0000745176_V2

Autopilot Elevator Actuator Linkage Inspection
Figure 601/22-11-26-990-811 (Sheet 5 of 5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS DIAMETER MINIMUM INCHES (mm)	DESIGN LIMITS DIAMETER MAXIMUM INCHES (mm)	WEAR LIMITS PERMITTED WEAR DIMENSION INCHES (mm)	WEAR LIMITS MAXIMUM DIAMETER CLEARANCE INCHES (mm)	REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
[1]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[2]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	1
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[3]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[4]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	1
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[5]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[6]	Lever	ID	0.2495 (6.34)	0.2505 (6.36)	0.2535 (6.44)	3 0.0040 (0.10)		X	1
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		
[7]	Bearing	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	3 0.0035 (0.09)	X		
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		

F97242 S0006564010_V1

Autopilot Elevator Actuator Linkage Wear Limits
Figure 602/22-11-26-990-806 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PERMITTED WEAR DIMENSION INCHES (mm)	MAXIMUM DIAMETER CLEARANCE INCHES (mm)			
			MINIMUM INCHES (mm)	MAXIMUM INCHES (mm)					
[8]	Lever	ID	0.250 (6.35)	0.251 (6.38)	0.255 (6.48)	3 0.005 (0.13)		X	2
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		

1 GET THE BUSHING. BORE A HOLE [0.3756 INCH (9.54 mm) DIAMETER MAXIMUM] TO GET 0.0002 +0.0009 OR -0.0002 INCH (0.005 +0.023 OR -0.005 mm) INTERFERENCE FIT. REAM BUSHING TO 0.2495/0.2500 INCH (6.38/6.35 mm) DIAMETER.

2 GET THE BUSHING. BORE A HOLE [0.3756 INCH (9.54 mm) DIAMETER MAXIMUM] TO GET 0.0002 +0.0009 OR -0.0002 INCH (0.005 +0.023 OR -0.005 mm) INTERFERENCE FIT. REAM BUSHING TO 0.250/0.251 INCH (6.35/6.38 mm) DIAMETER.

3 THE TOTAL DIAMETRICAL CLEARANCE OF LOCATIONS ([1] + [2] + [3] + [4] + [5] + [6] + [7] + [8]) MUST NOT BE MORE THAN 0.0225 INCH (0.572 mm).

L40397 S0006564011_V1

Autopilot Elevator Actuator Linkage Wear Limits
Figure 602/22-11-26-990-806 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SPOILER POSITION SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Spoiler Position Sensor Deactivation.

(2) Spoiler Position Sensor Activation.

TASK 22-11-27-040-801

2. Spoiler Position Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Spoiler Position Sensor.

B. References

Reference	Title
27-61-00-800-802	Remove Pressure from the Spoiler Hydraulic Systems A and B (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
563	Left Wing - Spoiler No. 4
663	Right Wing - Spoiler No. 9

E. Procedure

SUBTASK 22-11-27-860-043

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-27-010-001

(2) Do this task: Remove Pressure from the Spoiler Hydraulic Systems A and B, TASK 27-61-00-800-802.

SUBTASK 22-11-27-860-044

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Spoiler Position Sensor - Tryout

SUBTASK 22-11-27-860-045

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

NOTE: This tryout is to make sure the Spoiler Position Sensor is in a zero energy state.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-27-700-002

(2) Use the FMC - CDU and do the following test (Figure 201):

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-27-990-806

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Spoiler Position Sensor
Figure 202/22-11-27-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-27-440-801

3. **Spoiler Position Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to Spoiler Position Sensor.

B. **References**

Reference	Title
27-61-00-800-801	Spoiler Hydraulic Systems A and B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
563	Left Wing - Spoiler No. 4
663	Right Wing - Spoiler No. 9

D. **Spoiler Position Sensor Activation**

SUBTASK 22-11-27-860-046

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-27-860-051

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-27-410-001

(3) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SPOILER POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a spoiler position sensor.

(2) The installation of a spoiler position sensor.

B. There are four spoiler position sensors. The spoiler No. 3 position sensor and spoiler No. 10 position sensor are for the flight control system. The spoiler No. 4 position sensor and spoiler No. 9 position sensor are for the autopilot system.

C. This procedure only contains the tasks for the spoiler No. 4 position sensor and spoiler No. 9 position sensor.

D. The spoiler position sensor No. 4 (M931) is installed on the left wing spoiler No. 4. The spoiler position sensor (M930) No. 9 is installed on the right wing spoiler No. 9. To get access to the spoiler position sensors, you must extend the spoilers.

E. For the removal of the spoiler No. 3 positions sensor and spoiler No. 10 position sensor, refer to (Spoiler Position Transmitter Removal, TASK 27-61-04-000-801).

F. For the installation of the spoiler No. 3 positions sensor and spoiler No. 10 position sensor, refer to (Spoiler Position transmitter Installation, TASK 27-61-04-400-801).

TASK 22-11-27-000-801

2. Spoiler Position Sensor Removal

(Figure 401)

A. References

Reference	Title
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-61-00-800-801	Spoiler Hydraulic Systems A and B Pressurization (P/B 201)
27-61-00-800-802	Remove Pressure from the Spoiler Hydraulic Systems A and B (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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
563	Left Wing - Spoiler No. 4
663	Right Wing - Spoiler No. 9

D. Prepare for the Removal

SUBTASK 22-11-27-860-002

> **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.

(1) Do this task: Spoiler Hydraulic Systems A and B Pressurization, TASK 27-61-00-800-801.

SUBTASK 22-11-27-860-003

(2) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 22-11-27-860-004

(3) To extend the spoiler, set the speedbrake control lever to the UP position.

SUBTASK 22-11-27-860-005

(4) Do this task: Remove Pressure from the Spoiler Hydraulic Systems A and B, TASK 27-61-00-800-802.

SUBTASK 22-11-27-860-006

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406

SUBTASK 22-11-27-860-007

(6) Install the spoiler ground lock set, SPL-1745, on the spoiler actuator No. 4 or No. 9.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 22-11-27-860-042

(7) Install the spoiler ground lock set, SPL-5586, on the spoiler actuator No. 4 or No. 9.

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 22-11-27-860-048

(8) Install the spoiler ground lock set, SPL-14240, on the spoiler actuator No. 4 or No. 9.

LOM ALL

E. Spoiler Position Sensor Removal

SUBTASK 22-11-27-020-001

(1) Disconnect the electrical connectors of the spoiler position sensor [1].

(a) Remove the lockwire from the electrical connectors.

SUBTASK 22-11-27-020-002

(2) Do these steps to remove the spoiler position sensor [1]:

(a) Remove the bolt [7], washer [8], and nut [5] in the crank [9].

(b) Remove the bolt [2], washer [3], and nut [5] in the mounting bracket [6].

(c) Remove the spoiler position sensor [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Spoiler Position Sensor Installation
Figure 401/22-11-27-990-804 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SPOILER POSITION SENSOR

B

F59384 S0006564017_V2

Spoiler Position Sensor Installation
Figure 401/22-11-27-990-804 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-27-400-801

3. Spoiler Position Sensor Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-27-710-801	Spoiler Position Sensor Test (P/B 501)
22-11-27-820-801	Spoiler Position Sensor Adjustment (P/B 501)
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)
27-61-00-800-802	Remove Pressure from the Spoiler Hydraulic Systems A and B (P/B 201)
27-61-00-840-802	Put the Spoiler Systems A and B Back to the Condition Before the Pressure Removal (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

C. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
563	Left Wing - Spoiler No. 4
663	Right Wing - Spoiler No. 9

E. Prepare for the Installation

SUBTASK 22-11-27-860-008

(1) Make sure that you do these steps:

(a) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

(b) Set the speedbrake control lever to the UP position.

(c) Do this task: Remove Pressure from the Spoiler Hydraulic Systems A and B, TASK 27-61-00-800-802.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406

(d) Install the spoiler ground lock set, SPL-1745, on the spoiler actuator No. 4 or No. 9.

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

(e) Install the spoiler ground lock set, SPL-5586, on the spoiler actuator No. 4 or No. 9.

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

(f) Install the spoiler ground lock set, SPL-14240, on the spoiler actuator No. 4 or No. 9.

LOM ALL

SUBTASK 22-11-27-860-009

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

F. Spoiler Position Sensor Installation

SUBTASK 22-11-27-820-001

(1) Align the reference mark on the sensor case with the reference mark on the sensor shaft.

SUBTASK 22-11-27-420-001

(2) Install the spoiler position sensor [1]:

(a) Put the spoiler position sensor [1] into the mounting bracket [6], and crank [9] with the zero reference alignment mark aligned with the slot in the crank [9].

(b) Tighten the bolt [7] in the crank [9] to 35 in-lb (3.95 N·m).

(c) Tighten the bolt [2] in the mounting bracket [6] to 35 in-lb (3.95 N·m).

SUBTASK 22-11-27-420-002

(3) Install the electrical connectors.

(a) Install the MS20995NC20 lockwire, G02166, on the electrical connectors with the double twist method (TASK 20-10-44-400-801).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406

SUBTASK 22-11-27-800-001

(4) Remove the spoiler ground lock set, SPL-1745, from the spoiler actuator.

LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999

SUBTASK 22-11-27-800-002

(5) Remove the spoiler ground lock set, SPL-5586, from the spoiler actuator.

LOM 407, 412, 415, 416, 420, 423, 424, 426, 432, 437-439, 441, 443-447, 455, 456, 458-463

SUBTASK 22-11-27-800-003

(6) Remove the spoiler ground lock set, SPL-14240, from the spoiler actuator.

LOM ALL

SUBTASK 22-11-27-860-010

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-27-860-052

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-27-860-053

(9) Do this task: Put the Spoiler Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-61-00-840-802.

SUBTASK 22-11-27-820-002

(10) Do this task: Spoiler Position Sensor Adjustment, TASK 22-11-27-820-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-27-740-001

(11) Do this task: Spoiler Position Sensor Test, TASK 22-11-27-710-801.

SUBTASK 22-11-27-860-011

(12) Set the speedbrake control lever to the DOWN position.

SUBTASK 22-11-27-860-012

(13) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SPOILER POSITION SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Spoiler Position Sensor Adjustment

(2) Spoiler Position Sensor Test.

B. There are four spoiler position sensors. The spoiler No. 3 position sensor and spoiler No. 10 position sensor are for the flight spoiler system. The spoiler No. 4 position sensor and spoiler No. 9 position sensor are for the autopilot system.

C. This procedure only contains the tasks for the spoiler No. 4 position sensor and spoiler No. 9 positions sensor. For the adjustment test of the spoiler No. 3 position sensor and spoiler No. 10 position sensor, refer to (TASK 27-61-00-820-813).

TASK 22-11-27-820-801

2. Spoiler Position Sensor Adjustment

(Figure 501)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-803	Aileron Rigging Test (P/B 501)
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)
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)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
563	Left Wing - Spoiler No. 4
663	Right Wing - Spoiler No. 9

C. Prepare for the Adjustment

SUBTASK 22-11-27-860-041

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-27-860-014

> **WARNING**
> KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Supply hydraulic power to hydraulic systems A and B (TASK 29-11-00-860-801).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-27-860-015

(3) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.

SUBTASK 22-11-27-860-016

(4) Set the speedbrake control lever to the DOWN position.

SUBTASK 22-11-27-860-017

(5) Set the aileron trim to zero.

SUBTASK 22-11-27-860-018

(6) Put the pilot's control wheel in the center position.

(a) Jiggle the pilot's control wheel.

(b) Make sure that the pilot's control wheel is in the center position.

SUBTASK 22-11-27-860-019

(7) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-27-860-020

(8) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-27-860-021

(9) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

D. Procedure

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-27-820-003

(1) Do this BITE test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) AILERON

7) SPOILER.

(c) Do the instructions that show on the CDU display until test 52.23.

NOTE: For detailed data about the SPOILER test, refer to "Do the Spoiler Check" in (TASK 22-11-00-820-803).

(d) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

1) Test 52.23, SPOILER 4 (VAC), Limits: -0.20 to +0.20

NOTE: Use this CDU display to do the adjustment for the spoiler position sensor (No. 4).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

WARNING DO NOT PUSH THE LSK WHEN YOU ADJUST THE SPOILER POSITION SENSOR. THE AILERONS, SPOILERS AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(e) Adjust the spoiler position sensor (No. 4):

1) Loosen the bolt [1] on the mounting bracket until you can turn the spoiler position sensor.

NOTE: You do not have to remove the bolt, washers, and nut.

2) Turn the spoiler position sensor until you get a value less than 0.10 VAC.

3) Tighten the bolt [1] on the mounting bracket to 35 in-lb (4 N·m).

4) Do this check:

a) Slowly move the speedbrake lever aft and look at the CDU display while the spoilers start to move up.

b) If the value on the CDU decreases toward zero before it increases when the speed brake starts to move up, then do these steps:

c) Put the speedbrake lever to the DOWN position.

d) Do the above adjustment for the spoiler position sensor (No. 4) again.

e) If the value on the CDU does not decrease toward zero before it increases when the speedbrake starts to move up, then continue.

f) Remove the lockwire from the thumbnut on the micro-adjustment rod (TASK 20-10-44-000-801).

g) Turn the thumbnut on the micro-adjustment rod until you get a smallest possible value less than 0.06 VAC.

h) Install lockwire on the thumbnut (TASK 20-10-44-400-801).

WARNING DO NOT PUSH THE LSK WHEN YOU ADJUST THE SPOILER POSITION SENSOR. THE AILERONS, SPOILERS AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

i) Push the LSK that is adjacent to <CONTINUE.

j) Test 52.24, SPOILER 9 (VAC), Limits: -0.20 to +0.20

NOTE: Use this CDU display to do the adjustment for the spoiler position sensor (No. 9).

WARNING DO NOT PUSH THE LSK WHEN YOU ADJUST THE SPOILER POSITION SENSOR. THE AILERONS, SPOILERS AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(f) Adjust the spoiler position sensor (No. 9):

1) Loosen the bolt [1] on the mounting bracket until you can turn the spoiler position sensor.

NOTE: You do not have to remove the bolt, washers, and nut.

2) Turn the spoiler position sensor until you get a value less than 0.10 VAC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Tighten the bolt [1] on the mounting bracket to 35 in-lb (4 N·m).

4) Do this check:

a) Slowly move the speedbrake lever aft and look at the CDU display while the spoilers start to move up.

b) If the value on the CDU decreases toward zero before it increases when the speed brake starts to move up, then do these steps:

c) Put the speedbrake lever to the DOWN position.

d) Do the above adjustment for the spoiler position sensor (No. 9) again.

e) If the value on the CDU does not decrease toward zero before it increases when the speed brake starts to move up, then continue.

f) Remove the lockwire from the thumbnut on the micro-adjustment rod (TASK 20-10-44-000-801).

g) Turn the thumbnut on the micro-adjustment rod until you get a smallest possible value less than 0.06 VAC.

h) Install lockwire on the thumbnut (TASK 20-10-44-400-801).

WARNING DO NOT PUSH THE LSK WHEN YOU ADJUST THE SPOILER POSITION SENSOR. THE AILERONS, SPOILERS AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

5) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 52.24).

a) Do the instructions that show on the CDU display to complete the SPOILER test.

b) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-27-860-022

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-27-860-038

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-27-860-024

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-27-860-025

(4) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 22-11-27-860-026

(5) Remove hydraulic power from hydraulic systems A and B (TASK 29-11-00-860-805).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Spoiler Position Sensor Adjustment
Figure 501/22-11-27-990-803 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SPOILER POSITION SENSOR

B

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Spoiler Position Sensor Adjustment
Figure 501/22-11-27-990-803 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-27-710-801

3. Spoiler Position Sensor Test

A. References

Reference	Title
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-27-860-040

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-27-860-029

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-27-860-030

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-27-860-031

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-27-860-032

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-27-740-002

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) MAINT

3) DFCS

4) LRU REPLACEMENT TESTS

5) CHANNEL A AND B

NOTE: The spoiler position sensor (No. 4 or No. 9) has interfaces with the FCC-A (channel A) and FCC-B (channel B).

6) ROLL SENS

7) Do the instructions that show on the CDU display to complete the test.

8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-27-860-033

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-27-860-039

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-27-860-035

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-27-860-036

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AILERON POSITION SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Aileron Position Sensor Deactivation.

(2) Aileron Position Sensor Activation.

TASK 22-11-29-040-801

2. Aileron Position Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Aileron Position Sensor.

B. References

Reference	Title
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

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Procedure

SUBTASK 22-11-29-860-037

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-29-010-001

(2) Do this task:Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-29-860-038

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

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

SUBTASK 22-11-29-860-039

(4) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Aileron Position Sensor - Tryout

NOTE: This tryout is to make sure the Aileron Position Sensor is in a zero energy state.

SUBTASK 22-11-29-860-040

> **WARNING**
> MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-29-700-002

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-29-990-806

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Aileron Position Sensor
Figure 202/22-11-29-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-29-440-801

3. **Aileron Position Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to Aileron Position Sensor.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

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

D. **Aileron Position Sensor Activation**

SUBTASK 22-11-29-860-041

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-29-860-044

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-29-410-001

(3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AILERON POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the aileron position sensor.

(2) The installation of the aileron position sensor.

B. The aileron position sensor (M937) is installed on the left aileron torque tube. You can find it on the forward wall of the main landing gear wheel well adjacent to the autopilot aileron actuators.

TASK 22-11-29-000-801

2. Aileron Position Sensor Removal

(Figure 401)

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

C. Prepare for the Removal

SUBTASK 22-11-29-860-025

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-29-860-026

> **WARNING** YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

D. Procedure

SUBTASK 22-11-29-020-001

(1) Disconnect the electrical connector [1].

SUBTASK 22-11-29-020-002

(2) Remove the clamp [2], bolt [3], washers [4] and nut [5].

SUBTASK 22-11-29-020-003

(3) Do these steps to remove the aileron position sensor [11]:

(a) Remove the bolt [8], washer [7] and nut [5] in the crank [9].

(b) Remove the bolt [6], washer [7], and nut [5] in the clamp [10].

(c) Remove the aileron position sensor [11].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F53968 S0006564029_V2

Aileron Position Sensor Installation
Figure 401/22-11-29-990-803 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F53969 S0006564030_V3

Aileron Position Sensor Installation
Figure 401/22-11-29-990-803 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-29-400-801

3. Aileron Position Sensor Installation

(Figure 401)

A. References

Reference	Title
22-11-29-710-801	Aileron Position Sensor Test (P/B 501)
22-11-29-820-801	Aileron Position Sensor Adjustment (P/B 501)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
11	Sensor	22-11-29-01-155	LOM ALL

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

D. Prepare for the Installation

SUBTASK 22-11-29-860-027

(1) Set the aileron trim to 0 unit.

SUBTASK 22-11-29-860-028

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-29-860-029

WARNING MAKE SURE THAT 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.

(3) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Aileron Position Sensor Installation

SUBTASK 22-11-29-820-002

(1) Align the reference mark on the sensor case with the reference mark on the sensor shaft.

SUBTASK 22-11-29-420-001

(2) Do these steps to install the aileron position sensor [11]:

(a) Put the aileron position sensor [11] into the clamp [10] and crank [9] with the zero reference alignment mark aligned with the slot in the crank [9] Figure 401.

1) Make sure that the zero reference alignment mark is oriented in the closed end direction.

NOTE: If the sensor shaft and crank are not oriented correctly, it will cause the DFCS BITE aileron rigging and surface tests to fail.

2) Tighten the bolt [8] in the crank [9] to 35 in-lb (4 N·m).

3) Tighten the bolt [6] in the clamp [10] to 35 in-lb (4 N·m).

SUBTASK 22-11-29-420-002

(3) Install the clamp [2] with the bolt [3], washers [4], and nut [5].

SUBTASK 22-11-29-420-003

(4) Connect the electrical connector [1].

SUBTASK 22-11-29-860-030

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-29-860-043

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-29-820-003

(7) Do this task: Aileron Position Sensor Adjustment, TASK 22-11-29-820-801.

SUBTASK 22-11-29-740-002

(8) Do this task: Aileron Position Sensor Test, TASK 22-11-29-710-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AILERON POSITION SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Aileron Position Sensor Adjustment.

(2) Aileron Position Sensor Test.

TASK 22-11-29-820-801

2. Aileron Position Sensor Adjustment

(Figure 501)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-803	Aileron Rigging Test (P/B 501)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (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)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

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

C. Prepare for the Adjustment

SUBTASK 22-11-29-860-001

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

SUBTASK 22-11-29-860-035

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-002

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-29-860-003

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-29-860-004

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-29-860-005

> **WARNING**
> KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-29-860-006

(7) Make sure that the ailerons and the aileron trim are set to zero.

SUBTASK 22-11-29-860-007

(8) Set the speed brake handle to the down position.

SUBTASK 22-11-29-860-008

> **WARNING**
> YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

D. Procedure

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-29-820-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE
5) RIGGING
6) AILERON
7) AIL RIG
8) Do the instructions that show on the CDU display until test 52.01.

NOTE: For detailed data about the AIL RIG test, refer to "Do the Aileron Rigging Check" in (TASK 22-11-00-820-803).

9) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

a) Test 52.01, AIL POS (VAC), Limits: -0.06 to +0.06

NOTE: Use this CDU display to do the adjustment for the aileron position sensor.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **WARNING** DO NOT SELECT <CONTINUE ON TEST 52.01 OR TEST 51.01 WHEN YOU ADJUST THE SENSOR. THE FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK NEXT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

10) Adjust the aileron position sensor:
    a) Loosen the bolt [1] on the clamp until you can turn the aileron position sensor.

       NOTE: You do not have to remove the bolt [1], washer [2] and nut [3].
    b) Turn the aileron position sensor slowly in the clockwise and counter-clockwise directions until you get a value less than 0.06 VAC.
    c) Tighten the bolt [1] on the clamp to 35 in-lb (4 N·m).
    d) Remove the lockwire on the thumb nut on the micro-adjustment rod (TASK 20-10-44-000-801).
    e) Turn the thumb nut on the micro-adjustment rod until you get a smallest value less than 0.03 VAC.
    f) Install the lockwire on the thumb nut on the micro-adjustment rod (TASK 20-10-44-400-801).

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE AILERON POSITION SENSOR AND FLIGHT CONTROL SURFACES. THESE PARTS CAN MOVE WHEN YOU PUSH THE LSK NEXT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

11) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 52.01).
12) Do the instructions that show on the CDU display to complete the AIL RIG test.
13) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-29-860-009

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel to make sure that the autopilot is disengaged.

SUBTASK 22-11-29-860-032

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-011

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-29-860-012

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-29-860-013

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G15406 S0006564035_V2

Aileron Position Sensor Adjustment
Figure 501/22-11-29-990-804 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G15411 S0006564036_V2

Aileron Position Sensor Adjustment
Figure 501/22-11-29-990-804 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-29-710-801

3. Aileron Position Sensor Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-29-860-015

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

SUBTASK 22-11-29-860-034

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-016

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-29-860-017

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-29-860-018

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-29-860-019

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-29-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) CHANNEL A AND B
6) ROLL SENS
7) Do the instructions that show on the CDU to complete the test.
8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-29-860-020

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel to make sure that the autopilot is disengaged.

SUBTASK 22-11-29-860-033

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-022

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-29-860-023

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-29-860-024

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR POSITION SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Elevator Position Sensor Deactivation.

(2) Elevator Position Sensor Activation.

TASK 22-11-30-040-801

2. Elevator Position Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to Elevator Position Sensor.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

E. Procedure

SUBTASK 22-11-30-860-031

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-30-010-006

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-30-860-034

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Elevator Position Sensor - Tryout

NOTE: This tryout is to make sure the Elevator Position Sensor is in a zero energy state.

SUBTASK 22-11-30-860-032

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-30-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-30-990-810

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Elevator Position Sensor
Figure 202/22-11-30-990-809

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-30-440-801

3. **Elevator Position Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to the elevator position sensor.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

D. **Elevator Position Sensor Activation**

SUBTASK 22-11-30-860-033

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-30-860-036

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-30-410-005

(3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the elevator position sensor.

(2) The installation of the elevator position sensor.

B. The elevator position sensor (M929) is on the input torque tube adjacent to the lower right hand control quadrant located at Body Station 1156.

TASK 22-11-30-000-801

2. Elevator Position Sensor Removal

(Figure 401)

A. Location Zones

Zone	Area
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

B. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

C. Prepare for the Removal

SUBTASK 22-11-30-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-30-010-003

(2) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

D. Procedure

SUBTASK 22-11-30-020-003

(1) Remove the lockwire from the electrical connector [1].

SUBTASK 22-11-30-020-001

(2) Disconnect the electrical connector [1].

SUBTASK 22-11-30-020-002

(3) Do these steps to remove the elevator position sensor [6]:

(a) Remove the bolt [7], washer [3], and nut [4] in the crank [5].

(b) Remove the bolt [2], washer [3] and nut [4] in the bracket.

(c) Remove the elevator position sensor [6].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Elevator Position Sensor Installation
Figure 401/22-11-30-990-805 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F88126 S0006564043_V2

Elevator Position Sensor Installation
Figure 401/22-11-30-990-805 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G06494 S0006564044_V2

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-30-990-806 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G06495 S0006564045_V2

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-30-990-806 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-30-400-801

3. Elevator Position Sensor Installation

(Figure 401, Figure 402)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-808	Mach Trim Rigging Test (P/B 501)
22-11-30-710-801	Elevator Position Sensor Test (P/B 501)
22-11-30-820-801	Elevator Position Sensor Adjustment and Test (P/B 501)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Sensor	31-31-51-02-105	LOM ALL

E. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

F. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

G. Prepare for the Installation

SUBTASK 22-11-30-010-004

(1) Make sure you remove this access panel:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-30-010-005

(2) To get access to the stabilizer trim jackscrew, do this step:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-30-980-002

(3) Do these steps to set the B dimension (Figure 402):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim (zero degrees).

(b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-30-860-038

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-30-800-001

(5) Do these steps to make sure that the mach trim actuator is at the null position:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS
4) EXTENDED MAINTENANCE

ECCN 9E991 BOEING PROPRIETARY - See title page for details

5) RIGGING

6) ELEVATOR

NOTE: After you make this selection, CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) CONTINUE

8) COMPLETE ELEV RIG

9) During this test, do the instructions that show on the CDU display.

10) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

(c) Do this elevator rigging check:

NOTE: These steps make sure the mach trim actuator is at the null position.

1) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 401/22-11-30-993-801

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS
51.01	STAB POS (VAC)	-0.07 to 0.07

2) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

3) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

Table 402/22-11-30-993-802

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS
51.02	MT ACT POS (VAC)	-6.35 to -8.70
	Note: No value for B side; N/A	

Table 403/22-11-30-993-803

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS
51.03	MT ACT POS (VAC)	0.20 to -0.20
	Note: No value for B side; N/A	

(d) If the value of A is greater than the limits, do this task: Mach Trim Rigging Test, TASK 22-11-00-820-808.

SUBTASK 22-11-30-860-026

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

H. Elevator Position Sensor Installation

SUBTASK 22-11-30-820-002

(1) Align the reference mark on the sensor case with the reference mark on the sensor shaft.

SUBTASK 22-11-30-420-001

(2) Install the elevator position sensor [6].

(a) Put the elevator position sensor [6] into the bracket and the crank [5] with the zero reference alignment mark aligned with the slot in the crank [5].

(b) Install the bolt [7], washer [3], and nut [4] in the crank [5].

1) Tighten the bolt [7] to 35 in-lb (4 N·m).

(c) Install the bolt [2], washer [3], and nut [4] in the bracket.

1) Tighten the bolt [2] to 35 in-lb (4 N·m).

SUBTASK 22-11-30-420-002

(3) Connect the electrical connector [1].

(a) Install the MS20995NC20 lockwire, G02166, on the electrical connectors with the double twist method (TASK 20-10-44-400-801).

SUBTASK 22-11-30-860-023

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-30-860-037

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-30-820-003

(6) Do this task: Elevator Position Sensor Adjustment and Test, TASK 22-11-30-820-801.

SUBTASK 22-11-30-710-001

(7) Do this task: Elevator Position Sensor Test, TASK 22-11-30-710-801.

SUBTASK 22-11-30-410-003

(8) Close this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-30-410-004

(9) Install this access panel:

Number	Name/Location
318BR	Tailcone Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR POSITION SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Elevator Position Sensor Adjustment and Test.

(2) Elevator Position Sensor Test.

B. The elevator position sensor is on the input torque tube adjacent to the lower right hand control quadrant located a aft bulkhead station 1156.

TASK 22-11-30-820-801

2. Elevator Position Sensor Adjustment and Test

(Figure 501, Figure 502)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

E. Prepare for the Adjustment

SUBTASK 22-11-30-010-001

(1) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-30-010-002

(2) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-30-860-001

(3) Make sure that electrical power is on (TASK 24-22-00-860-811).

SUBTASK 22-11-30-860-030

(4) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-980-001

(5) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Make sure that the main stabilizer trim cutout switch on the control stand is in the NORMAL position.

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.

(b) Set the B dimension to 39.89 ±0.01 in. (1013.21 ±0.26 mm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim.

I (c) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-30-860-003

(6) Set the autopilot stabilizer trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-30-860-004

(7) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-30-860-005

(8) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-30-860-027

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Elevator Position Sensor Adjustment and Test

SUBTASK 22-11-30-820-001

(1) Push the INIT REF key on the CDU keyboard.

SUBTASK 22-11-30-820-004

(2) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the Control Display Unit (CDU) display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

(a) INDEX

(b) MAINT

(c) DFCS

(d) EXTENDED MAINTENANCE

(e) RIGGING

(f) ELEVATOR

(g) CONTINUE

(h) CONTINUE

(i) ELEV RIG.

SUBTASK 22-11-30-820-009

(3) The CDU will display screen 51.01.

SUBTASK 22-11-30-820-016

(4) Make sure that the jackscrew B dimension equals 39.89 ±0.01 in. (1013.21 ±0.26 mm), that is equal to the horizontal stabilizer set at 0 degrees (4 units of trim).

(a) Make sure that the A and B values are within the limits shown on the CDU.

SUBTASK 22-11-30-740-002

(5) Select CONTINUE to advance to test 51.02.

SUBTASK 22-11-30-820-010

(6) Select CONTINUE to advance to test 51.03.

SUBTASK 22-11-30-740-003

(7) Make sure that the A value is within the limits shown on the CDU.

NOTE: For tests 51.03, there is no value for the B side.

SUBTASK 22-11-30-820-011

(8) Select CONTINUE on screen 51.03.

SUBTASK 22-11-30-860-028

(9) Lightly jiggle the control column to center the system.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1

SUBTASK 22-11-30-740-004

(10) Select CONTINUE to advance to test 51.04.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1

SUBTASK 22-11-30-740-006

(11) Select CONTINUE twice to advance to test 51.05.

LOM ALL

SUBTASK 22-11-30-820-012

(12) Make sure that the right elevator trailing edge is aligned with the tailcone index within plus or minus 0.06 in. (1.52 mm).

SUBTASK 22-11-30-820-005

(13) Do these steps to adjust the elevator position sensor:

(a) Loosen the bolt [1] on the bracket until you can turn the elevator position sensor.

NOTE: You do not have to remove the bolt [1], washer [2], and nut [3].

(b) Turn the elevator position sensor slowly in the clockwise and counterclockwise directions until you get a value of -0.50 (0 max, -1 min) VAC.

(c) Tighten the bolt [1] on the bracket to 30 in-lb (3.4 N·m) to 35 in-lb (4 N·m).

(d) Do this step again and again until no more adjustment is necessary.

SUBTASK 22-11-30-820-013

(14) Do these steps to fine adjust the elevator position sensor:

(a) Do these steps to adjust the elevator position sensor (Figure 501):

1) Remove the lockwire on the micro-adjustment nut (TASK 20-10-44-000-801).

2) Turn the micro-adjustment nut until you get a value of -0.50 ±0.03 VAC.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1

(b) Install the lockwire on the micro-adjustment nut (TASK 20-10-44-400-801) monitoring the voltage for test 51.04 to make sure that the value remains within -0.50 ±0.03 VAC.

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1

(c) Install the lockwire on the micro-adjustment nut (TASK 20-10-44-400-801) monitoring the voltage for test 51.05 to make sure that the value remains within -0.50 ±0.03 VAC.

LOM ALL

SUBTASK 22-11-30-860-039

(15) Set the stabilizer to 11.6 units of trim.

(a) Make sure that the B dimension equals 29.00 ±0.01 in. (736.60 ±0.25 mm).

SUBTASK 22-11-30-820-014

(16) Lightly jiggle the control column to center the system.

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITHOUT COLLINS E-FCC SOFTWARE P11.1

(a) Make sure that the voltage for the A and B value of screen 51.04 read 0.00 ± 0.07 VAC.

NOTE: Ignore the limits on FMC-CDU screen for this step.

NOTE: If the voltage does not fall within tolerance limits then check to make sure that the adjustment rod length is 6.70 ±0.02 in. (170.18 ±0.51 mm) and installed correctly. Adjust the micro-adjustment rod 69-43490 with the knurled thumbnut to obtain a reading of 0.00 ± .07 VAC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999; LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-464 WITH COLLINS E-FCC SOFTWARE P11.1

(b) Make sure that the voltage for the A and B value of screen 51.05 read 0.00 ± 0.07 VAC.

NOTE: Ignore the limits on FMC-CDU screen for this step.

NOTE: If the voltage does not fall within tolerance limits then check to make sure that the adjustment rod length is 6.70 ±0.02 in. (170.18 ±0.51 mm) and installed correctly. Adjust the micro-adjustment rod 69-43490 with the knurled thumbnut to obtain a reading of 0.00 ± .07 VAC.

LOM ALL

SUBTASK 22-11-30-820-015

(17) Continue to adjust as necessary to make sure that the voltage readings in steps (14)(a)2) and (16) meet the tolerance requirements after the micro-adjustment rod thumbnut has been lockwired.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-30-860-006

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-30-860-024

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-860-008

(3) Set the autopilot stabilizer trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-30-860-009

(4) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-30-410-001

(5) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-30-410-002

(6) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F88128 S0006564053_V2

Elevator Position Sensor Adjustment
Figure 501/22-11-30-990-807 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F88127 S0006564054_V2

Elevator Position Sensor Adjustment
Figure 501/22-11-30-990-807 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G06496 S0006564055_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-30-990-808 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G06497 S0006564056_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-30-990-808 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-30-710-801

3. Elevator Position Sensor Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-30-860-011

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

SUBTASK 22-11-30-860-029

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-860-012

(3) Set the autopilot stabilizer trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-30-860-013

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-30-860-014

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-30-860-015

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-30-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) CHANNEL A AND B
6) PITCH SENS
7) Do the instructions that show on the CDU display to complete the test.
8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-30-860-016

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-30-860-025

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-860-018

(3) Set the autopilot stabilizer trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-30-860-019

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-30-860-020

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER POSITION SENSOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Stabilizer Position Sensor Deactivation.

(2) Stabilizer Position Sensor Activation.

B. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Stabilizer Position Sensor.

TASK 22-11-31-040-801

2. Stabilizer Position Sensor - Deactivation

(Figure 202)

A. General

(1) This procedure removes electrical power and hydraulic pressure to the Stabilizer Position Sensor.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

E. Procedure

SUBTASK 22-11-31-860-029

> **WARNING** MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-010-006

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-31-860-032

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Stabilizer Position Sensor - Tryout

NOTE: This tryout is to make sure the Stabilizer Position Sensor is in a zero energy state.

SUBTASK 22-11-31-860-030

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-31-990-810

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TAILCONE ACCESS DOOR

A

2375471 S0000542974_V1

Stabilizer Position Sensor
Figure 202/22-11-31-990-809

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-31-440-801

3. **Stabilizer Position Sensor - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to the Stabilizer Position Sensor.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
318	Tail Cone Compartment - Right

D. **Stabilizer Position Sensor Activation**

SUBTASK 22-11-31-860-031

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-31-860-034

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-31-410-005

(3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a stabilizer position sensor.

(2) The installation of a stabilizer position sensor.

B. There are two stabilizer position sensors. They are on the aft bulkhead station 1156.

(1) The stabilizer position sensor A (M1192) is a dual synchro position sensor and it has two connectors.

(2) The stabilizer position sensor B (M1193) is a single synchro position sensor and it only has one connector.

C. The removal and installation procedures are the same for the stabilizer position sensor A and stabilizer position sensor B.

(1) The stabilizer position sensor A is on the left side of the elevator feel and centering unit.

(2) The stabilizer position sensor B is on the right side of the elevator feel and centering unit.

D. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Stabilizer Position Sensor.

TASK 22-11-31-000-801

2. Stabilizer Position Sensor Removal

(Figure 401, Figure 402)

A. Location Zones

Zone	Area
315	APU Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

B. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

C. Prepare for the Removal

SUBTASK 22-11-31-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-010-003

(2) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

D. Stabilizer Position Sensor Removal

SUBTASK 22-11-31-020-001

(1) Disconnect the electrical connector(s).

SUBTASK 22-11-31-020-002

(2) Do these steps to remove the stabilizer position sensor [4] or stabilizer position sensor [6]:

(a) Remove the bolt [1], washer [2], and nut [3] from the crank.

(b) Remove the bolt [5], washer [2], and nut [3] from the bracket.

(c) Remove the stabilizer position sensor [4] or stabilizer position sensor [6].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F89270 S0006564062_V2

Stabilizer Position Sensors Installation
Figure 401/22-11-31-990-805 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER POSITION SENSOR A

B

STABILIZER POSITION SENSOR B

C

(EXAMPLE)

D

E

NOTE:

FOR STABILIZER POSITION SENSOR B, THERE ARE ALSO TWO REFERENCE MARKS, ONE MARK IS ON THE BRACKET AND THE OTHER MARK IS ON THE SIDE OF THE SENSOR CASE.

F93167 S0006564063_V3

Stabilizer Position Sensors Installation
Figure 401/22-11-31-990-805 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

G06488 S0006564064_V2

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-31-990-811 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G06489 S0006564065_V2

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-31-990-811 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-31-400-801

3. Stabilizer Position Sensor Installation

(Figure 401, Figure 402)

A. References

Reference	Title
22-11-00-820-808	Mach Trim Rigging Test (P/B 501)
22-11-31-710-801	Stabilizer Position Sensor Test (P/B 501)
22-11-31-820-801	Stabilizer Position Sensor Adjustment and Test (P/B 501)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Sensor	22-11-31-01-065	LOM ALL
		22-11-31-01-070	LOM ALL
6	Sensor	22-11-31-01-065	LOM ALL
		22-11-31-01-070	LOM ALL

D. Location Zones

Zone	Area
118	Electrical and Electronics Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

F. Prepare for the Installation

SUBTASK 22-11-31-860-022

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-010-004

(2) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-31-010-005

(3) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-31-980-002

(4) Do these steps to set the B dimension (Figure 402):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment.

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim (zero degree).

I (b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-31-860-036

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-800-003

(6) Do these steps to make sure that the mach trim actuator is at the null position:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) ELEVATOR

NOTE: After you make this selection, CONTINUE shows. Do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE.

7) CONTINUE

8) COMPLETE ELEV RIG

9) During this test, do the instructions that show on the CDU display.

10) After you do the instructions that show on the CDU display, push the LSK that is adjacent to CONTINUE.

(c) Do this elevator rigging check:

NOTE: These steps make sure the mach trim actuator is at the null position.

1) Make sure that the values for the A and B sides are between the limits that show on the CDU display or in this task.

Table 401/22-11-31-993-801

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 401/22-11-31-993-801 (Continued)

51.01	STAB POS (VAC)	-0.07 to 0.07

I 2) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

3) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

Table 402/22-11-31-993-802

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS
51.02	MT ACT POS (VAC)	-6.35 to -8.70
	Note: No value for B side; N/A	

Table 403/22-11-31-993-803

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS
51.03	MT ACT POS (VAC)	0.20 to -0.20
	Note: No value for B side; N/A	

(d) If the value of A is greater than the limits, do this task: Mach Trim Rigging Test, TASK 22-11-00-820-808.

SUBTASK 22-11-31-860-037

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

G. Stabilizer Position Sensor Installation

SUBTASK 22-11-31-820-002

(1) Align the reference mark on the sensor case with the reference mark on the bracket.

SUBTASK 22-11-31-420-001

(2) Install the stabilizer position sensor [4] or stabilizer position sensor [6]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Put the stabilizer position sensor [4] or stabilizer position sensor [6] into the bracket and the crank with the zero reference alignment mark on the sensor shaft aligned with the slot in the crank.

(b) Tighten the bolt [1] in the crank to 35 in-lb (4 N·m).

(c) Tighten the bolt [5] in the bracket to 35 in-lb (4 N·m).

SUBTASK 22-11-31-420-002

(3) Connect the electrical connector(s).

SUBTASK 22-11-31-860-023

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-31-820-003

(5) Do this task: Stabilizer Position Sensor Adjustment and Test, TASK 22-11-31-820-801.

SUBTASK 22-11-31-710-001

(6) Do this task: Stabilizer Position Sensor Test, TASK 22-11-31-710-801.

SUBTASK 22-11-31-410-003

(7) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-31-410-004

(8) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER POSITION SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

(1) Stabilizer Position Sensor Adjustment.

(2) Stabilizer Position Sensor Test.

B. There are two stabilizer position sensors. They are located on the aft bulkhead station 1156.

(1) The stabilizer position sensor A (M1192) is on the left side of the elevator feel and centering unit.

(2) The stabilizer position sensor B (M1193) is on the right side of the elevator feel and centering unit.

C. The tail cone contains two of the same position sensors within close proximity. Make sure that you work on the Stabilizer Position Sensor.

TASK 22-11-31-820-801

2. Stabilizer Position Sensor Adjustment and Test

(Figure 501)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-00-820-805	Stabilizer Rigging Test (P/B 501)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (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)

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-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Number	Name/Location
318BR	Tailcone Access Door

E. Prepare for the Adjustment

SUBTASK 22-11-31-860-001

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

SUBTASK 22-11-31-860-026

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-31-010-001

(3) To get access to the stabilizer position sensors, remove this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-31-010-002

(4) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-31-980-001

(5) Do these steps to set the B dimension (Figure 502):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment

(a) Turn the stab trim wheel handle on the control stand to set the B dimension.

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim (zero degree).

I (b) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.26 mm).

SUBTASK 22-11-31-860-002

(6) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-31-860-003

(7) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-31-860-004

(8) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-31-860-005

> **WARNING** KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

F. Procedure

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-31-820-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) RIGGING

6) STABILIZER

7) Do the instructions that show on the CDU display until test 54.01.

NOTE: Use the trammel trammel bar, SPL-1677 for measurement of the "B" dimension that shows on the CDU display (Test 54.01).

NOTE: For detailed data about the STAB RIG test, refer to Stabilizer Rigging Test, TASK 22-11-00-820-805.

a) Test 54.01, STAB POS (VAC), Limits: -0.07 to +0.07

NOTE: Use this CDU display to do the adjustment for the stabilizer position sensors.

b) Jiggle the aft quadrant.

c) Make sure that the right elevator trailing edge aligns with the elevator index on the tail cone at 0 ±0.06 inch.

> **WARNING** DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE ON TEST 54.01 WHEN YOU ADJUST THE STABILIZER POSITION SENSOR. THE ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

8) Adjust the stabilizer position sensor A [4]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

a) Loosen the bolt [1] on the bracket until you can turn the stabilizer position sensor.

NOTE: You do not have to remove the bolt [1], washer [2] and nut [3].

b) Turn the stabilizer position sensor slowly in the clockwise and counter-clockwise directions until the voltage is less than 0.0 ±0.5 VAC.

c) Tighten the bolt [1] on the bracket to 35 in-lb (4 N·m) .

d) Remove the lockwire on the micro-adjustment nut (TASK 20-10-44-000-801).

e) Turn the micro-adjustment nut until you get a smallest possible voltage that is between -0.07 and +0.07 VAC.

f) Install the lockwire on the micro-adjustment nut (TASK 20-10-44-400-801).

WARNING

DO NOT PUSH THE LSK THAT IS ADJACENT TO <CONTINUE ON TEST 51.01 WHEN YOU ADJUST THE STABILIZER POSITION SENSOR. THE ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

9) Adjust the stabilizer position sensor B [5]:

a) Loosen the bolt [1] on the bracket until you can turn the stabilizer position sensor.

NOTE: You do not have to remove the bolt [1], washer [2] and nut [3].

b) Turn the stabilizer position sensor slowly in the clockwise and counter-clockwise directions until the voltage is less than 0.0 ±0.5 VAC.

c) Tighten the bolt [1] on the bracket to 35 in-lb (4 N·m).

d) Remove the lockwire on the micro-adjustment nut (TASK 20-10-44-000-801).

e) Turn the micro-adjustment nut until you get a smallest possible voltage that is between -0.07 and +0.07 VAC.

f) Install the lockwire on the micro-adjustment nut (TASK 20-10-44-400-801).

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE STABILIZER POSITION SENSOR. THE ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO <CONTINUE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(c) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 54.01).

1) Do the instructions that show on the CDU display to complete the STAB RIG test.

2) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-31-860-006

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-31-860-024

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-31-860-008

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-31-860-009

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-31-860-010

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 22-11-31-410-001

(6) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-31-410-002

(7) Close this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F95310 S0006564070_V2

Stabilizer Position Sensors Adjustment
Figure 501/22-11-31-990-807 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER POSITION SENSOR A

B

STABILIZER POSITION SENSOR B

C

F95311 S0006564071_V4

Stabilizer Position Sensors Adjustment
Figure 501/22-11-31-990-807 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER TRIM ACCESS DOOR

A

F95330 S0006564072_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-31-990-808 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

F95331 S0006564073_V2

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-31-990-808 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-31-710-801

3. Stabilizer Position Sensor Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-31-860-011

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

SUBTASK 22-11-31-860-027

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-31-860-012

(3) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-31-860-013

(4) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-31-860-014

(5) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-31-860-015

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Hydraulic power is necessary for surface test.

D. Procedure

SUBTASK 22-11-31-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

(c) INDEX

(d) MAINT

(e) DFCS

(f) LRU REPLACEMENT TESTS

(g) Make a selection for the applicable channel:

NOTE: Stabilizer position sensor A has interface with the Flight Control Computer A (Channel A). Stabilizer position sensor B has interface with the Flight Control Computer B (Channel B).

1) CHANNEL A

2) CHANNEL B

3) CHANNEL A AND B

(h) STAB SENS

1) Do the instructions that show on the CDU display to complete the test.

2) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-31-860-016

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-31-860-025

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-31-860-018

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-31-860-019

(4) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-31-860-020

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOFLIGHT STATUS ANNUNCIATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autoflight Status Annunciator Deactivation.

(2) Autoflight Status Annunciator Activation.

TASK 22-11-32-040-801

2. Autoflight Status Annunciator - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical power to the Autoflight Status Annunciator.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-32-860-006

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

D. Autoflight Status Annunciator - Tryout

NOTE: This tryout is to make sure the Autoflight Status Annunciator is in a zero energy state.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-32-860-007

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-32-700-001

(2) Do the following steps to make sure electrical power has been removed:

(a) Hold the TEST switch in the position 1:

1) Make sure none of the warning lights come on.

(b) Hold the TEST switch in the position 2:

1) Make sure none of the warning lights come on.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

2375474 S0000542985_V1

Autoflight Status Annunciator
Figure 201/22-11-32-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-32-440-801

3. **Autoflight Status Annunciator - Activation**
(Figure 201)

A. **General**

(1) This procedure adds electrical power to Autoflight the Status Annunciator.

B. **Location Zones**

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

C. **Autoflight Status Annunciator Activation**

SUBTASK 22-11-32-860-008

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-32-860-010

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-32-700-002

(3) Do the following steps to make sure power has been restored:

(a) Hold the TEST switch in the position 1:

1) Make sure that all three warning lights come on (in amber).

NOTE: The A/P and A/T warning lights come on before the FMC warning light comes on.

(b) Release the TEST switch:

1) Make sure that all the warning lights go off.

(c) Hold the TEST switch in the position 2:

1) Make sure that the A/P and A/T warning lights come on (in red), then the FMC warning light comes on (in amber).

(d) Release the TEST switch:

1) Make sure that all the warning lights go off.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOFLIGHT STATUS ANNUNCIATOR - SERVICING

1. General

A. This procedure contains two tasks. The first task is for the replacement of the lamps in the autoflight status annunciator. The second task is the annunciator test. It makes sure that the annunciator operates correctly after the replacement of the lamps.

B. There are two autoflight status annunciators installed in the airplane, one on each pilot's instrument panel. When you replace the lamps, you do not have to remove the annunciator.

C. Each annunciator has three warning light indicators and a test switch. Each warning light indicator has four filament lamps (each at 28v and 0.4A) . In each warning light indicator, you will find two lamps behind an amber filter and two behind a red filter. The red lamps in the FMC warning light indicator are not connected.

TASK 22-11-32-960-801

2. Lamp Replacement

(Figure 301)

A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lamps	33-11-01-10-055	LOM ALL
		33-11-01-10-065	LOM ALL
		33-11-01-10-075	LOM ALL

B. Location Zones

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

C. Procedure

SUBTASK 22-11-32-020-001

(1) Pull the front cap out and hold it down to get access to the lamps.

SUBTASK 22-11-32-960-001

(2) Do these steps to replace a lamps [1]:

(a) Remove all the lamps [1] in the cap.

NOTE: In the FMC warning light indicator, you only replace the two lamps installed behind the amber filter.

(b) Examine all the lamps [1].

(c) Replace the bad lamps [1].

SUBTASK 22-11-32-420-001

(3) Lift the cap assembly and move it into the autoflight status annunciator until the cap assembly goes into its position.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G44261 S0006564079_V2

Autoflight Status Annunciator - Lamp Replacement
Figure 301/22-11-32-990-801

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-32-710-801

3. Annunciator Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 22-11-32-860-001

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

SUBTASK 22-11-32-710-001

(2) Hold the TEST switch in the 1 position:

(a) Make sure that all three amber warning lights come on.

NOTE: The A/P and A/T warning lights come on before the FMC warning light comes on.

SUBTASK 22-11-32-710-002

(3) Release the TEST switch:

(a) Make sure that all the warning lights go off.

SUBTASK 22-11-32-710-003

(4) Hold the TEST switch in the 2 position:

(a) Make sure that the red A/P and A/T warning lights come on, and then the amber FMC warning light comes on.

SUBTASK 22-11-32-710-004

(5) Release the TEST switch:

(a) Make sure that all the warning lights go off.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOFLIGHT STATUS ANNUNCIATOR - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task is for the removal of the autoflight status annunciator. The second task is for the installation of the autoflight status annunciator.

B. The autoflight status annunciator is also known as the FMS warning annunciator. There are two autoflight status annunciators installed in the airplane, one on each pilot's instrument panel.

C. Each annunciator is attached to the rear of the pilot's instrument panel with a clamp. Two electrical connectors are at the rear of each annunciator.

TASK 22-11-32-000-801

2. Annunciator - Removal

(Figure 401)

A. Location Zones

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

B. Procedure

SUBTASK 22-11-32-860-002

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-32-020-002

(2) Do these steps to remove the annunciator assembly [1]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Loosen the two fasteners [3] that attach the clamp to the annunciator assembly [1].

NOTE: The two fasteners used to remove the ASA are the top left and bottom right corners. Do not loosen the top right and the lower left adjustment screws [2]. These two screws hold the annunciator in its position behind the instrument panel.

(b) Carefully pull the annunciator assembly [1] out of the instrument panel.

(c) Disconnect the two electrical connectors [4].

(d) Install the dust caps on the electrical connectors [4].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

G44359 S0006564083_V3

Autoflight Status Annunciator Installation
Figure 401/22-11-32-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-32-400-801

3. **Annunciator - Installation**

(Figure 401)

A. **Location Zones**

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

B. **Annunciator Installation**

SUBTASK 22-11-32-420-002

(1) Do these steps to install the annunciator assembly [1]:

(a) Remove the dust caps from the electrical connectors [4].

(b) Connect the two electrical connectors [4].

(c) Put the annunciator assembly [1] in its position.

(d) Tighten the two fasteners [3].

C. **Annunciator Test**

SUBTASK 22-11-32-860-004

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-32-860-011

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-32-710-005

(3) Hold the TEST switch in the position 1:

(a) Make sure that all three warning lights come on (in amber).

NOTE: The A/P and A/T warning lights come on before the FMC warning light comes on.

SUBTASK 22-11-32-710-006

(4) Release the TEST switch:

(a) Make sure that all the warning lights go off.

SUBTASK 22-11-32-710-007

(5) Hold the TEST switch in the position 2:

(a) Make sure that the A/P and A/T warning lights come on (in red), then the FMC warning light comes on (in amber).

SUBTASK 22-11-32-710-008

(6) Release the TEST switch:

(a) Make sure that all the warning lights go off.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT CONTROL COMPUTER - MAINTENANCE PRACTICES

1. **General**

A. This procedure contains these tasks:

(1) Flight Control Computer Deactivation.

(2) Flight Control Computer Activation.

LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438

(3) An installation of the FCC Operational Program Software (OPS) with an Airborne Data Loader (ADL).

(4) An download of the FCC flight faults memory with an ADL.

(5) An download of the FCC BITE test data with an ADL.

LOM 429-431, 440, 442-447, 450-460, 464-999

(6) An installation of the FCC OPS with an Enhanced Airborne Data Loader (eADL).

(7) An download of the FCC flight faults memory with an eADL.

(8) An download of the FCC BITE test data with an eADL.

LOM ALL

(9) An installation of the FCC OPS with a Portable Data Loader (PDL) from the flight compartment.

(10) An download of the FCC flight faults memory with a PDL from the flight compartment.

(11) An download of the FCC BITE test data with a PDL from the flight compartment.

(12) An installation of the FCC OPS with a PDL from the electrical and electronics compartment.

(13) An installation of the FCC OPS from one FCC to the other FCC, using the FCC cross-load function. A data loader is not needed in this task.

B. The data loader control panel (DLCP) is installed on the P61 panel in the flight compartment. The DLCP can have one or two switches.

(1) If the DLCP has two switches, then you can install the FCC software from the flight compartment. If an ADL is installed on the P61 panel, then use the software installation procedure with the ADL. If a DATA TRANSFER UNIT RECEPTACLE is installed on the P61 panel, then use the procedure with the PDL from the flight compartment.

(2) If the DLCP has one switch, then you cannot install FCC software from the flight compartment because there is no FCC switch position. Use the alternate procedure to install the FCC software from the electrical and electronics compartment with a PDL.

C. For general information for software installation times and data loaders, do this task: On-Airplane Software - Installation, TASK 20-15-11-400-801.

TASK 22-11-33-040-802

2. **Flight Control Computer - Deactivation**

(Figure 201)

A. General

(1) This procedure removes electrical power to the Flight Control Computer.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Zone	Area
212	Flight Compartment - Right

C. Flight Control Computer Deactivation

SUBTASK 22-11-33-860-208

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

D. Flight Control Computer - Tryout

NOTE: This tryout is to make sure the Flight Control Computer is in a zero energy state.

SUBTASK 22-11-33-860-209

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-33-860-210

(2) At the FMC - CDU make sure that the keyboard and display panel are not functioning (Figure 201).

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-33-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-33-440-802

3. **Flight Control Computer - Activation**

Figure 201

A. **General**

(1) This procedure adds electrical power to the Flight Control Computer.

B. **Location Zones**

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

C. **Flight Control Computer Activation**

SUBTASK 22-11-33-860-211

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-33-860-286

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-33-470-814

4. FCC Software Installation with an Airborne Data Loader

A. General

(1) This task tells you how to install Operational Program Software (OPS) in the Flight Control Computer (FCC).

(2) An Airborne Data Loader (ADL) and a data loader control panel are necessary for this task. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the ADL on the P61 panel.

(3) The airplane must be on the ground with the engines shutdown before you can install software.

(4) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software - Installation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC OPS	22-11-33-03A-020	LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438
		22-11-33-03A-021	LOM 404, 411, 416, 420, 437

D. Location Zones

Zone	Area
212	Flight Compartment - Right

E. Prepare for the Software Installation

SUBTASK 22-11-33-860-026

(1) Make sure that the DFCS is not engaged.

SUBTASK 22-11-33-860-027

(2) Use an ADL to install software in the FCC.

NOTE: For the FCC to be an approved installation, the correct FCC OPS must be installed. Refer to the Expendables/Parts table for FCC OPS [1].

NOTE: Modern software loaders that meet the security requirements defined in ARINC 645-1 or newer are recommended to use. The procedures for modern software loaders will be marked as preferred for now and will be the only procedures available after removing floppy disk loaders procedures in the future. Please check with your Software Loader Supplier for current capabilities since this is still maturing across current and future software loaders.

SUBTASK 22-11-33-860-028

(3) Make sure that the lower system select switch on the data loader control panel, P61, is set to NORMAL position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-850-001

(4) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

F. Software Installation for FCC A

SUBTASK 22-11-33-860-171

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-031

(2) Set the upper system select switch on the data loader control panel, P61, to L position.

SUBTASK 22-11-33-860-032

(3) Set the lower system select switch on the data loader control panel to FCC position.

SUBTASK 22-11-33-860-033

(4) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-037

(5) Do this step to install the software into Flight Control Computer A (FCC-A) - (Preferred):

(a) Follow the generic Airborne Data Loader (ADL) procedure to load software part to FCC channel (TASK 20-15-11-400-801).

SUBTASK 22-11-33-420-005

(6) Do these steps to install the software into FCC-A - (Non-Preferred):

(a) Put the correct disk in the disk drive.

(b) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE, and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

(c) Remove the disk from the disk drive when the software installation is completed.

G. Software Installation for FCC B

SUBTASK 22-11-33-860-034

(1) Set the upper system select switch on the data loader control panel, P61, to R position.

SUBTASK 22-11-33-860-035

(2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-172

(3) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-038

(4) Do this step to install the software into Flight Control Computer B (FCC-B) - (Preferred):

(a) Follow the generic ADL procedure to load software part to FCC channel (TASK 20-15-11-400-801).

SUBTASK 22-11-33-420-006

(5) Do these steps to install the software into FCC-B - (Non-Preferred):

(a) Put the correct disk in the disk drive.

(b) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE, and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

NOTE: The software for the Collins FCC's is supplied on two diskettes. Put the second disk in less than ten minutes after the first disk has completed. If the second disk is not installed in less than ten minutes, the software installation procedure must start over.

(c) When the software installation is completed, set the lower system select switch on the data loader control panel, P61, to NORMAL position.

(d) Set the upper system select switch on the data loader control panel to SINGLE SYS position.

(e) Remove the disk from the disk drive.

SUBTASK 22-11-33-860-173

(6) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-860-056

(7) After two minutes, do the Software Installation Test below.

H. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-420-007

(1) Do these steps to test the software installation:

(a) Do not continue the procedure until the flight director flags are gone from the EADI's.

NOTE: The software installation is not complete when the flight director flags show.

(b) If you are not at one of the DFCS BITE TEST displays, do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Push the line select key adjacent to the MAINT prompt.

(c) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(d) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(e) Push the line select key adjacent to the CHANNEL A prompt.

1) Make sure that the software part number for FCC A is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(f) Push the line select key adjacent to the PREV MENU prompt.

(g) Push the line select key adjacent to the CHANNEL B prompt.

1) Make sure that the software part number for FCC B is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(h) Push the line select key adjacent to the PREV MENU prompt.

(i) Push the line select key adjacent to the PREV MENU prompt.

(j) Push the line select key adjacent to the FAULT REVIEW prompt.

(k) Push the line select key adjacent to the ERASE FAULT HISTORY prompt.

(l) Push the line select key adjacent to the CHANNEL A AND B prompt.

(m) Push the line select key adjacent to the YES prompt.

(n) Push and release the line select key adjacent to the EXIT prompt until you are out of DFCS BITE.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-33-860-284

(1) If it is necessary, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

END OF TASK

TASK 22-11-33-470-815

5. FCC Inflight Faults Memory Download with an Airborne Data Loader

A. General

(1) This procedure tells you how to download Flight Faults Memory in the FCC.

(2) An airborne data loader (ADL) and a data loader control panel are necessary for this procedure. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the airborne data loader on the (P61) panel.

(3) The airplane must be on the ground with the engines shutdown before you download the flight faults.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(4) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

B. Location Zones

Zone	Area
212	Flight Compartment - Right

C. Prepare for FCC Faults Memory Download

SUBTASK 22-11-33-860-068

(1) Make sure the DFCS is not engaged.

SUBTASK 22-11-33-860-069

(2) Use an ADL to download the flight faults in the FCC.

SUBTASK 22-11-33-860-070

(3) Make sure that the lower system select switch on the data loader control panel (P61) is set to NORMAL.

SUBTASK 22-11-33-860-071

(4) Make sure that the FCC is power up and not in BITE.

D. FCC Flight Faults Memory Download Procedure for FCC A

SUBTASK 22-11-33-860-072

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-073

(2) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-074

(3) Set the upper system select switch on the data loader control panel (P61) to L.

SUBTASK 22-11-33-860-075

(4) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-860-076

(5) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-970-001

(6) Do these steps to download the Flight Faults Memory of FCC A.

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Select FAULT REVIEW.

(f) Select DOWNLOAD FAULT HISTORY.

(g) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(h) Install a floppy disk into the disk drive.

NOTE: The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

(i) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-231

(7) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-860-232

(8) Remove the Data Loader connection before exit BITE.

E. FCC Flight Faults Memory Download Procedure for FCC B.

SUBTASK 22-11-33-860-077

(1) Set the upper system select switch on the data loader control panel (P61) to R.

SUBTASK 22-11-33-860-229

(2) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-860-078

(3) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

SUBTASK 22-11-33-970-002

(4) Do these steps to download the Flight Faults Memory of FCC B.

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Select FAULT REVIEW.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(f) Select DOWNLOAD FAULT HISTORY.

(g) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(h) Install a floppy disk into the disk drive.

NOTE: The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

(i) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-233

(5) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-860-234

(6) Set the lower system select switch on the data loader control panel to NORMAL.

SUBTASK 22-11-33-860-235

(7) Remove the Data Loader connection before exit BITE.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-33-860-241

(1) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

END OF TASK

TASK 22-11-33-470-816

6. FCC BITE Test Data Download with an Airborne Data Loader

A. General

(1) This task gives the instructions how to download Built-In-Test Equipment (BITE) test data in the Flight Control Computer (FCC).

(2) An Airborne Data Loader (ADL) and data loader control panel are necessary for this task. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the airborne data loader on the P61 panel.

(3) The airplane must be on the ground with the engines shutdown before you download the BITE test data.

(4) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

B. Location Zones

Zone	Area
212	Flight Compartment - Right

C. Prepare for BITE Test Data Download

SUBTASK 22-11-33-860-291

(1) Make sure that this DFCS is not engaged and turn both flight directors off.

SUBTASK 22-11-33-860-292

(2) Use an ADL to download the BITE test data from the FCC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-293

(3) Make sure that the lower system select switch, on the P61 data loader control panel, is set to NORMAL position.

SUBTASK 22-11-33-860-294

(4) Make sure that the FCC is power up and not in BITE.

D. BITE Test Data Download for FCC A

SUBTASK 22-11-33-860-295

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-296

(2) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-297

(3) Set the upper system select switch, on the P61 data loader control panel, to L position.

SUBTASK 22-11-33-860-298

(4) Set the lower system select switch, on the P61 data loader control panel, to FCC position.

SUBTASK 22-11-33-860-299

(5) Close this circuit breaker and wait 60 second:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

SUBTASK 22-11-33-860-300

(6) Do these steps to download the BITE Test Data of the FCC A:

(a) Make sure that the Dataloader is powered on.

(b) Use the Flight Management Computer (FMC)-Control Display Unit (CDU) to enter DFCS BITE.

(c) Select INDEX.

(d) Select MAINT.

(e) Select DFCS.

(f) Install a floppy disk into the disk drive.

(g) Do these steps for the applicable download:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) For the CURRENT STATUS tests, do these steps:
   a) Select FAULT REVIEW.
   b) Select CURRENT STATUS.
   c) Enter 100 into the scratchpad.
   d) Select Line Select Key (LSK) 6R.

      NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.
   e) Select CHANNEL A.

      NOTE: “CHANNEL B NOT AVAILABLE” message may show on the CDU and can be ignored. This message can show if FCC-B is not powered up during this procedure.
   f) Perform the requested CURRENT STATUS test.
      <1> If the test fails, do these steps:
         <a> Select the Failed Library Test, or select the TEST RESULTS.
         <b> Select DOWNLOAD TEST DATA.
         <c> Insert the floppy disk into the disk drive.

            NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).
2) For the Line Replaceable Unit (LRU) REPLACEMENT test, do these steps:
   a) Select LRU REPLACEMENT TESTS.
   b) Enter 100 into the scratchpad.
   c) Select LSK 6R.

      NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.
   d) Select CHANNEL A.
   e) Perform the requested LRU REPLACEMENT test.
      <1> If the test fails, do these steps:
         <a> Select the Failed Library Test, or select the TEST RESULTS.
         <b> Select DOWNLOAD TEST DATA.
         <c> Insert the floppy disk into the disk drive.

            NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).
3) For the LAND VERIFY test, do these steps:
   a) Select LAND VERIFY.
   b) Enter 100 into the scratchpad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

c) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.

NOTE: The LAND VERIFY test requires both FCC-A and FCC-B to be powered on.

d) Perform the LAND VERIFY test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).

4) For the EXTENDED MAINTENANCE tests, do these steps.

a) Select EXTENDED MAINTENANCE.

b) Select the applicable BITE LIBRARY TEST or Mode Control Panel (MCP) TESTS.

c) Enter 100 into the scratchpad.

d) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test.

e) Select CHANNEL A.

NOTE: CHANNEL B NOT AVAILABLE” message may show on the CDU and can be ignored. This message can show if FCC-B is not powered up during this procedure.

f) Perform the requested EXTENDED MAINTENANCE test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select the TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).

(h) Exit out of DFCS BITE mode completely.

(i) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-301

(7) Set the upper system select switch, on the P61 data loader control panel, to C position.

SUBTASK 22-11-33-860-302

(8) Set the lower system select switch, on the P61 data loader control panel, to NORMAL position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-303

(9) Remove the Data Loader connection before exit BITE.

E. BITE Test Data Download for FCC B

SUBTASK 22-11-33-860-304

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-305

(2) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-306

(3) Set the upper system select switch, on the P61 data loader control panel, to R position.

SUBTASK 22-11-33-860-307

(4) Set the lower system select switch, on the P61 data loader control panel, to FCC position

SUBTASK 22-11-33-860-308

(5) Close this circuit breaker and wait 60 second:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

SUBTASK 22-11-33-970-047

(6) Do these steps to download the BITE test data of the FCC B:

(a) Make sure that the Dataloader is powered on.

(b) Use the FMC-CDU to enter DFCS BITE.

(c) Select INDEX.

(d) Select MAINT.

(e) Select DFCS.

(f) Do these steps for the applicable download:

1) For the CURRENT STATUS tests do the following:

a) Select FAULT REVIEW.

b) Select CURRENT STATUS.

c) Enter 100 into the scratchpad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

d) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.

e) Select CHANNEL B.

NOTE: CHANNEL A NOT AVAILABLE" message may show on the CDU and can be ignored. This message can show if FCC-A is not powered up during this procedure.

f) Perform the requested CURRENT STATUS test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select the TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show "DOWNLOAD IN PROGRESS". The file name will show on the CDU when the download is complete (TESTnn.DAT, where 'nn' is a number).

2) For the LRU REPLACEMENT TEST, do these steps:

a) Select LRU REPLACEMENT TESTS.

b) Enter 100 into the scratchpad.

c) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.

d) Select CHANNEL B.

e) Perform the requested LRU REPLACEMENT test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select the TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show "DOWNLOAD IN PROGRESS". The file name will show on the CDU when the download is complete (TESTnn.DAT, where 'nn' is a number).

3) For the LAND VERIFY test, do these steps:

a) Select LAND VERIFY.

b) Enter 100 into the scratchpad.

c) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test. The CDU page will not change after entering 100 into the scratchpad and LSK 6R is pushed.

NOTE: The LAND VERIFY test requires both FCC-A and FCC-B to be powered on.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

d) Perform the LAND VERIFY test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).

4) For the EXTENDED MAINTENANCE tests, do these steps:

a) Select EXTENDED MAINTENANCE.

b) Select the applicable BITE LIBRARY TEST or MCP TESTS.

c) Enter 100 into the scratchpad.

d) Select LSK 6R.

NOTE: The engineer code 100 must be entered after the initialization screen is shown and before continue the test.

e) Select CHANNEL B.

NOTE: CHANNEL A NOT AVAILABLE” message may show on the CDU and can be ignored. This message can show if FCC-A is not powered up during this procedure.

f) Perform the requested EXTENDED MAINTENANCE test.

<1> If the test fails, do these steps:

<a> Select the Failed Library Test, or select the TEST RESULTS.

<b> Select DOWNLOAD TEST DATA.

<c> Insert the floppy disk into the disk drive.

NOTE: The CDU will show “DOWNLOAD IN PROGRESS”. The file name will show on the CDU when the download is complete (TESTnn.DAT, where ‘nn’ is a number).

(g) Exit out of DFCS BITE mode completely.

(h) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-309

(7) Set the upper system select switch, on the P61 data loader control panel, to C position.

SUBTASK 22-11-33-970-049

(8) Set the lower system select switch, on the P61 data loader control panel, to NORMAL position.

SUBTASK 22-11-33-000-001

(9) Remove the Data Loader connection before exit BITE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 402, 404, 406, 407, 411, 416, 420, 422, 425, 426, 432-434, 437, 438 (Continued)

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-33-860-310

(1) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

END OF TASK

LOM 429-431, 440, 442-447, 450-460, 464-999

TASK 22-11-33-470-817

7. FCC Software Installation with an Enhanced Airborne Data Loader (eADL)

A. General

(1) This task provides instructions on how to install Operational Program Software (OPS) in the Flight Control Computer (FCC) with an eADL.

(2) An eADL and a Control Display Unit (CDU) are necessary for this procedure. A data loader control panel is also necessary. The data loader control panel is installed above the enhanced airborne data loader on the P61 panel.

(3) The eADL software installation:

LOM 429-431, 440, 442-447, 450-460, 464, 465

(a) Floppy Disk Software Installation

LOM 429-431, 440, 442-447, 450-460, 464-999

(b) Universal Serial Bus (USB) Flash Drive Software Installation

1) This procedure uses the USB port on the front panel of the eADL to install software from a valid USB flash drive to the Mass Storage Device (MSD). Once the software is installed on the MSD, the software is loaded to the FCC LRU.

2) The USB flash drive must be configured correctly using the USB tool defined in the eADL Operations Guide.

(4) The airplane must be on the ground with the engines shutdown before you can install software.

(5) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

(6) The word "media" defines a data storage device. Examples of media are CDs, mass storage devices, diskettes, USB flash drives or floppy disks.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software - Installation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC OPS	22-11-33-03A-020	LOM 429-431, 440, 442-447, 450-460, 464-999
		22-11-33-03A-021	LOM 450-452, 457

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Prepare for the Software Installation

SUBTASK 22-11-33-470-010

(1) Make sure the DFCS is not engaged.

SUBTASK 22-11-33-470-043

(2) Make sure you know the correct software part number for the FCC.

NOTE: For the FCC to be an approved installation, the correct FCC OPS must be installed. Refer to the Expendables/Parts table for FCC OPS [1].

SUBTASK 22-11-33-470-044

(3) Make sure that the lower system select switch on the data loader control panel (P61) is set to NORMAL.

SUBTASK 22-11-33-470-045

(4) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-470-011

(5) To install software in FCC A follow these step:

(a) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

Make sure that this circuit breaker is open and has safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

(b) Set the upper system select switch on the data loader control panel (P61) to L.

(c) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-470-012

(6) To install software in FCC B follow these step:

(a) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

Make sure that this circuit breaker is open and has safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

(b) Set the upper system select switch on the data loader control panel (P61) to R.

(c) Set the lower system select switch on the data loader control panel to FCC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

E. Software Installation Procedure - (Preferred)

SUBTASK 22-11-33-470-036

(1) Do this step to install the software:

(a) Follow the generic Airborne Data Loader (ADL) procedure to load software part (TASK 20-15-11-400-801).

F. Software Installation Procedure - (Non-Preferred)

LOM 429-431, 440, 442-447, 450-460, 464, 465

SUBTASK 22-11-33-470-013

(1) Do these steps to install software from a floppy disk:

(a) Wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

1) If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select “Floppy Drive.”

1) The eADL will show a Load Confirmation screen.

(d) Carefully push the first disk (label up) into the disk drive.

(e) Select “CONFIRM.”

1) The eADL will show “LOADING” on the Transfer In Progress screen.

NOTE: It may take one to two minutes for the installation to start.

NOTE: If the disk set has more than one disk and the data of the current disk is completely transferred, the eADL will prompt you to insert the next diskette. Eject the current diskette, insert the next diskette and select “CONTINUE.”

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the installation procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the installation procedure is completed.

(f) Select “MAIN” or “GO BACK” to go back to the main menu.

(g) Eject the disk from the disk drive when the software installation is completed.

LOM 429-431, 440, 442-447, 450-460, 464-999

SUBTASK 22-11-33-470-014

(2) Do these steps to install software from a USB flash drive to the eADL MSD:

(a) Put the USB flash drive into the eADL USB port.

NOTE: The USB flash drive must be configured correctly as specified in the eADL Operations Guide.

(b) Make sure that the “eADL Main Menu” is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(c) Select “Maintenance Page.”

1) This will show the “Maintenance Menu” screen.

(d) Select “Transfer Parts From USB.”

1) If the error message “USB Is Not Mounted Or Is Not A Valid USB” is shown, select “GO BACK” and do the steps again.

2) Make sure that the USB flash drive is configured correctly by the USB tool as specified in the eADL Operations Guide.

3) The eADL screen will show “CONFIRM TO BEGIN TRANSFERRING.”

4) Select “CONFIRM.”

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

NOTE: If the software is already on the eADL MSD, this message will show: “This part name already exists.”

(e) Make sure that USB and MSB annunciators turn green and the message shows "Part Transfer Complete".

NOTE: This means that software transfer is complete.

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

(f) Select “MAIN” or “GO BACK” to go back to the main menu.

(g) Remove the USB flash drive from the eADL USB port.

(h) Following the successful load of the software perform these steps to remove previous versions from the MSD:

NOTE: This procedure allows the operator to remove an LSP from the MSD. This will also delete any downloaded files associated with the LSP that may have been added to the LSP. This action cannot be undone.

NOTE: It is recommended to remove the older LSP on the MSD, but it is not required.

1) On the eADL use the Up and Down keys and select the following:

a) Select the Maintenance page.

b) Select delete Software part option.

NOTE: The listed LSP may or may not appear as a part number. It will appear as it was originally saved using eADL Part Builder.

c) Select the desired LSP.

d) The eADL screen will display, Part Selected for Deletion is <Desired LSP>.

e) Press the CONFIRM softkey to initiate the deletion process.

NOTE: If you want to cancel the operation, use the Go Back key.

2) The MSD annunciator will turn yellow while the delete operation is taking place.

3) The MSD annunciator will turn back to green and scree will display:

a) Part Deleted.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) Press the GO BACK key to return to the Main Menu.

SUBTASK 22-11-33-470-015

(3) Do these steps to install the software from the eADL MSD to the LRU:

(a) Make sure that the “eADL Main Menu” is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

1) If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

NOTE: This will show the “Select Target System” screen.

(c) Select the software received by the LRU.

NOTE: This will show the “Select Software Part” screen.

(d) Push the “SELECT” button for the desired software.

NOTE: The listed software will appear as it was originally configured in the USB tool. See the supplier eADL Operations Guide.

(e) Make sure that the “Load Confirmation” screen shows.

(f) Select “CONFIRM”.

NOTE: This will show the “Transfer In Progress” screen.

NOTE: The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the installation procedure.

NOTE: The “LOADING” annunciator will change to “COMPLETE” and turn green when the installation procedure is completed.

(g) Select “MAIN” or “GO BACK” to go back to the main menu.

G. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-470-009

(1) Do these steps to test the software installation:

NOTE: Do not continue the procedure until the flight director flags are gone from the EADI's. The software installation is not complete when the flight director flags show.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

(b) If you are not at one of the DFCS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key adjacent to the MAINT prompt.

(c) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(d) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(e) Push the line select key adjacent to the CHANNEL A prompt.

1) Make sure that the software part number for FCC A is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(f) Push the line select key adjacent to the PREV MENU prompt.

(g) Push the line select key adjacent to the CHANNEL B prompt.

1) Make sure that the software part number for FCC B is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(h) Push the line select key adjacent to the PREV MENU prompt.

(i) Push the line select key adjacent to the PREV MENU prompt.

(j) Push the line select key adjacent to the FAULT REVIEW prompt.

(k) Push the line select key adjacent to the ERASE FAULT HISTORY prompt.

(l) Push the line select key adjacent to the CHANNEL A AND B prompt.

(m) Push the line select key adjacent to the YES prompt.

(n) Push and release the line select key adjacent to the EXIT prompt until you are out of DFCS BITE.

——— END OF TASK ———

TASK 22-11-33-470-818

8. FCC Inflight Faults Memory Download with an Enhanced Airborne Data Loader (eADL)

A. General

(1) This procedure tells you how to download Flight Faults Memory in the FCC.

(2) An eADL and a data loader control panel are necessary for this procedure. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the airborne data loader on the (P61) panel.

LOM 429-431, 440, 442-447, 450-460, 464, 465

(3) The downloaded data goes on to an empty high density disk (HD 1.44 MB) or on to a USB flash drive.

NOTE: The USB flash drive must be configured correctly as defined in the supplier eADL Operations Guide.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 465-999

(4) The downloaded data goes on to a formatted USB flash drive.

NOTE: The USB flash drive must be configured correctly as defined in the supplier eADL Operations Guide.

LOM 429-431, 440, 442-447, 450-460, 464-999

(5) The airplane must be on the ground with the engines shutdown before you download the flight faults.

(6) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

B. Location Zones

Zone	Area
212	Flight Compartment - Right

C. Prepare for FCC Faults Memory Download

SUBTASK 22-11-33-470-018

(1) Make sure the DFCS is not engaged

SUBTASK 22-11-33-470-019

(2) Use an eADL to download the flight faults in the FCC.

SUBTASK 22-11-33-470-020

(3) Make sure that the lower system select switch on the data loader control panel (P61) is set to NORMAL.

SUBTASK 22-11-33-470-046

(4) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-470-021

(5) Make sure that the FCC is power up and not in BITE.

SUBTASK 22-11-33-470-034

(6) Do these steps to prepare the USB flash drive and the eADL MSD to receive FCC Inflight Faults data:

(a) Create a FCC A and a FCC B download LSAPs (Loadable Software Airplane Part)s which will receive the FCC Inflight Faults data and place them on the USB flash drive.

NOTE: Use the eADL Connect software defined in the eADL Operations Guide.

NOTE: The USB flash drive must be configured correctly, it must be marked as “Downloadable”, using the eADL Connect software defined in the eADL Operations Guide.

(b) To install FCC A download LSAP follow these step:

1) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Make sure that this circuit breaker is open and has safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

2) Set the upper system select switch on the data loader control panel (P61) to L.

3) Set the lower system select switch on the data loader control panel to FCC.

(c) To install FCC B download LSAP follow these step:

1) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

Make sure that this circuit breaker is open and has safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

2) Set the upper system select switch on the data loader control panel (P61) to R.

3) Set the lower system select switch on the data loader control panel to FCC.

(d) Do these steps to install the FCC A and FCC B download LSAPs from the USB flash drive to the eADL Mass Storage Device (MSD):

1) Put the USB flash drive into the eADL USB port.

2) Make sure that the ‘‘eADL Main Menu’’ is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select ‘‘Maintenance Page.’’

a) This will show the ‘‘Maintenance Menu’’ screen.

4) Select ‘‘Transfer Parts From USB.’’

NOTE: If the error message ‘‘USB Is Not Mounted Or Is Not A Valid USB’’ is shown, select ‘‘GO BACK’’ and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show ‘‘CONFIRM TO BEGIN TRANSFERRING.’’

b) Select ‘‘CONFIRM.’’

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

NOTE: If the software is already on the eADL MSD, this message will show: ‘‘Skipping, the software part number already exists.’’

5) When the software transfer is complete, the USB and MSD annunciators will turn green and this message will show:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

"Part Transfer Complete"

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

6) Select "MAIN" to go back to the main menu.

7) Remove the USB flash drive.

D. FCC Flight Faults Memory Download Procedure for FCC A

SUBTASK 22-11-33-470-022

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-470-023

(2) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-470-024

(3) Set the upper system select switch on the data loader control panel (P61) to L.

SUBTASK 22-11-33-470-025

(4) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-470-026

(5) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

LOM 429-431, 440, 442-447, 450-460, 464, 465

SUBTASK 22-11-33-470-027

(6) Do these steps to download the Flight Faults Memory of FCC A to floppy disk (earlier eADL's only):

(a) Wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select "Target Page."

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464, 465 (Continued)

1) The eADL will show the Select Target System screen.

(c) Select “Floppy Drive.”

1) The eADL will show a Load Confirmation screen.

(d) Carefully push the first disk (label up) into the disk drive.

(e) Use the FMC-CDU to enter DFCS BITE.

(f) Select INDEX.

(g) Select MAINT.

(h) Select DFCS.

(i) Select FAULT REVIEW.

(j) Select DOWNLOAD FAULT HISTORY.

(k) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(l) Select “CONFIRM” on the EADL

1) The eADL will show “LOADING” on the Transfer In Progress screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(m) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-470-047

(7) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-470-048

(8) Remove the Data Loader connection before exit BITE.

LOM 429-431, 440, 442-447, 450-460, 464-999

SUBTASK 22-11-33-470-032

(9) Do these steps to download the Flight Faults Memory of FCC A to a USB flash drive:

NOTE: For more information on how to use the data loader, refer to the supplier's eADL Operations Guide. The necessary LSAPs should be stored on eADL MSD.

NOTE: The USB flash drive must be configured correctly, it must be marked as “Downloadable”, using the eADL Connect software defined in the eADL Operations Guide.

(a) Wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Select target LRU."

1) This will show the "Select Software Part" screen.

(d) Push the "SELECT" button for the desired software (FCC A download LSAP).

NOTE: The listed software will appear as it was originally configured in the eADL Connect software.

(e) Make sure that the "Confirm Transfer" screen shows.

(f) Use the FMC-CDU to enter DFCS BITE.

(g) Select INDEX.

(h) Select MAINT.

(i) Select DFCS.

(j) Select FAULT REVIEW.

(k) Select DOWNLOAD FAULT HISTORY.

(l) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(m) Select "CONFIRM" on the eADL

1) This will show the "Transfer In Progress" screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

It takes around 15 minutes to complete the download.

2) The "TRANSFER" annunciator will change to "LOADING" and turn yellow during the download procedure.

3) The "LOADING" annunciator will change to "COMPLETE" and turn green when the download procedure is completed.

(n) Do these steps to download the FCC A Inflight Faults data from the eADL MSD to a USB flash drive:

1) Put the USB flash drive into the eADL USB port.

NOTE: The USB flash drive must be configured correctly, it must be marked "Downloadable", by the eADL Connect software as specified in the eADL Operations Guide.

2) Make sure that the "eADL Main Menu" is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select "Maintenance Page."

a) This will show the "Maintenance Menu" screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) Select “Transfer Downloaded Data to USB.”

NOTE: If the error message “USB Is Not Mounted Or Is Not A Valid USB” is shown, select “GO BACK” and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly, it must be marked “Downloadable” by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show “CONFIRM TO BEGIN TRANSFERRING.”

b) Select “CONFIRM.”

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

5) When the download is complete, the USB and MSD annunciators will turn green and this message will show:

“Part Transfer Complete”

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

6) Select “MAIN” to go back to the main menu.

(o) Remove the USB flash drive when the download is completed.

SUBTASK 22-11-33-470-049

(10) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-470-050

(11) Remove the Data Loader connection before exit BITE.

E. FCC Flight Faults Memory Download Procedure for FCC B.

SUBTASK 22-11-33-470-028

(1) Set the upper system select switch on the data loader control panel (P61) to R.

SUBTASK 22-11-33-470-029

(2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

LOM 429-431, 440, 442-447, 450-460, 464, 465

SUBTASK 22-11-33-470-030

(3) Do these steps to download the Flight Faults Memory of FCC B to floppy disk (earlier eADL's only):

(a) Wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) The eADL will show the Select Target System screen.

(c) Select “Floppy Drive.”

1) The eADL will show a Load Confirmation screen.

(d) Carefully push the first disk (label up) into the disk drive.

(e) Use the FMC-CDU to enter DFCS BITE.

(f) Select INDEX.

(g) Select MAINT.

(h) Select DFCS.

(i) Select FAULT REVIEW.

(j) Select DOWNLOAD FAULT HISTORY.

(k) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(l) Select “CONFIRM” on the EADL

1) The eADL will show “LOADING” on the Transfer In Progress screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(m) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-470-051

(4) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-470-052

(5) Set the lower system select switch on the data loader control panel to NORMAL.

SUBTASK 22-11-33-470-053

(6) Remove the Data Loader connection before exit BITE.

LOM 429-431, 440, 442-447, 450-460, 464-999

SUBTASK 22-11-33-470-033

(7) Do these steps to download the Flight Faults Memory of FCC B to a USB flash drive:

(a) Wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select target LRU.”

1) This will show the “Select Software Part” screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(d) Push the “SELECT” button for the desired software (FCC B download LSAP).

NOTE: The listed software will appear as it was originally configured in the eADL Connect software.

(e) Make sure that the “Confirm Transfer” screen shows.

(f) Use the FMC-CDU to enter DFCS BITE.

(g) Select INDEX.

(h) Select MAINT.

(i) Select DFCS.

(j) Select FAULT REVIEW.

(k) Select DOWNLOAD FAULT HISTORY.

(l) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

(m) Select “CONFIRM” on the eADL

1) This will show the “Transfer In Progress” screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

It takes around 15 minutes to complete the download.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(n) Do these steps to download the FCC B Inflight Faults data from the eADL MSD to a USB flash drive:

1) Put the USB flash drive into the eADL USB port.

NOTE: The USB flash drive must be configured correctly, it must be marked “Downloadable”, by the eADL Connect software as specified in the eADL Operations Guide.

2) Make sure that the “eADL Main Menu” is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select “Maintenance Page.”

a) This will show the “Maintenance Menu” screen.

4) Select “Transfer Downloaded Data to USB.”

NOTE: If the error message “USB Is Not Mounted Or Is Not A Valid USB” is shown, select “GO BACK” and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly, it must be marked “Downloadable” by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show “CONFIRM TO BEGIN TRANSFERRING.”

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

b) Select “CONFIRM.”

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

5) When the download is complete, the USB and MSD annunciators will turn green and this message will show:

“Part Transfer Complete”

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

6) Select “MAIN” to go back to the main menu.

(o) Remove the USB flash drive when the download is completed.

(8) Set the upper system select switch on the data loader control panel (P61) to C.

(9) Set the lower system select switch on the data loader control panel to NORMAL.

(10) Remove the Data Loader connection before exit BITE.

END OF TASK

TASK 22-11-33-470-819

9. FCC BITE Test Data Download with an Enhanced Airborne Data Loader (eADL)

A. General

(1) This procedure tells you how to download BITE test data in the FCC.

(2) An eADL and a data loader control panel are necessary for this procedure. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the eADL on the P61 panel.

LOM 429-431, 440, 442-447, 450-460, 464, 465

(3) The downloaded data goes on to a formatted high density disk (HD 1.44 MB) or on to a USB flash drive.

NOTE: The USB flash drive must be configured correctly as defined in the eADL Operations Guide.

LOM 465-999

(4) The downloaded data goes on to a formatted USB flash drive.

NOTE: The USB flash drive must be configured correctly as defined in the eADL Operations Guide.

LOM 429-431, 440, 442-447, 450-460, 464-999

(5) The airplane must be on the ground with the engines shutdown before you download the BITE test data.

(6) Some airlines keep the circuit breaker for the data loader open when the data loader is not necessary. This increases the length of time that the data loader is serviceable.

B. Location Zones

Zone	Area
212	Flight Compartment - Right

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

C. Prepare for BITE Test Data Download

SUBTASK 22-11-33-860-215

(1) Make sure this DFCS is not engaged.

SUBTASK 22-11-33-860-216

(2) Use an eADL to download the BITE test data in the FCC.

SUBTASK 22-11-33-860-217

(3) Make sure that the lower system select switch on the data loader control panel (P61) is set to NORMAL.

SUBTASK 22-11-33-860-218

(4) Make sure that the FCC is power up and not in BITE.

SUBTASK 22-11-33-470-035

(5) Do these steps to prepare the USB flash drive and the eADL MSD to receive FCC BITE Test data:

(a) Create a FCC A BITE and a FCC B BITE download LSAPs (Loadable Software Airplane Part)s which will receive the FCC BITE Test data and place them on the USB flash drive.

NOTE: Use the eADL Connect software defined in the eADL Operations Guide.

NOTE: The USB flash drive must be configured correctly, as defined in the eADL Operations Guide.

(b) To install FCC A BITE download LSAP follow these step:

1) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

Make sure that this circuit breaker is open and has safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

2) Set the upper system select switch on the data loader control panel (P61) to L.

3) Set the lower system select switch on the data loader control panel to FCC.

(c) To install FCC B BITE download LSAP follow these step:

1) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

Make sure that this circuit breaker is open and has safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

2) Set the upper system select switch on the data loader control panel (P61) to R.

3) Set the lower system select switch on the data loader control panel to FCC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(d) Do these steps to install the FCC A BITE and FCC B BITE download LSAPs from the USB flash drive to the eADL Mass Storage Device (MSD):

1) Put the USB flash drive into the eADL USB port.

2) Make sure that the ‘‘eADL Main Menu’’ is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select ‘‘Maintenance Page.’’

a) This will show the ‘‘Maintenance Menu’’ screen.

4) Select ‘‘Transfer Parts From USB.’’

NOTE: If the error message ‘‘USB Is Not Mounted Or Is Not A Valid USB’’ is shown, select ‘‘GO BACK’’ and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show ‘‘CONFIRM TO BEGIN TRANSFERRING.’’

b) Select ‘‘CONFIRM.’’

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

NOTE: If the software is already on the eADL MSD, this message will show: ‘‘Skipping, the software part number already exists.’’

5) When the software transfer is complete, the USB and MSD annunciators will turn green and this message will show:

‘‘Part Transfer Complete’’

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

6) Select ‘MAIN’’ to go back to the main menu.

7) Remove the USB flash drive.

D. BITE Test Data Download Procedure for FCC A

SUBTASK 22-11-33-860-219

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

SUBTASK 22-11-33-860-220

(2) Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-221

(3) Set the upper system select switch on the data loader control panel (P61) to L.

SUBTASK 22-11-33-860-222

(4) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-860-223

(5) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

LOM 429-431, 440, 442-447, 450-460, 464, 465

SUBTASK 22-11-33-970-032

(6) Do these steps to download the BITE Test Data from FCC A to floppy:

(a) Open the front cover and wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select “Floppy Drive.”

1) The eADL will show a Load Confirmation screen.

(d) Carefully push the disk (label up) into the disk drive.

(e) Use the FMC-CDU to enter DFCS BITE.

(f) Select INDEX.

(g) Select MAINT.

(h) Select DFCS.

(i) Turn on the data loader.

(j) Install a floppy disk into the disk drive.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464, 465 (Continued)

(k) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.
   a) Select CURRENT STATUS.
   b) Select CHANNEL A.
2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.
   a) Select CHANNEL A.
   b) Select an applicable LRU.
3) For the LAND VERIFY, select LAND VERIFY.
4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.
   a) Select BITE LIBRARY TEST.
   b) Select CHANNEL A.
   c) Select applicable libraries.
   d) If it is necessary, select EXECUTE.

(l) Enter 100.

(m) Select LSK 6R.

NOTE: The screen will not change.

(n) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

(o) If it is applicable, select TEST RESULT.

(p) If it is applicable, select a library test

(q) Select DOWNLOAD TEST DATA.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE.

The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(r) Select “CONFIRM” on the EADL

1) The eADL will show “LOADING” on the Transfer In Progress screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.
3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(s) Remove the disk from the disk drive when the download is completed.

LOM 429-431, 440, 442-447, 450-460, 464-999

SUBTASK 22-11-33-970-033

(7) Do these steps to download the BITE Test Data from FCC A to a USB flash drive

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Open the front cover and wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select target LRU.”

1) This will show the “Select Software Part” screen.

(d) Push the “SELECT” button for the desired software (FCC A BITE download LSAP).

NOTE: The listed software will appear as it was originally configured in the eADL Connect software.

(e) Make sure that the “Confirm Transfer” screen shows.

(f) Use the FMC-CDU to enter DFCS BITE.

(g) Select INDEX.

(h) Select MAINT.

(i) Select DFCS.

(j) Turn on the data loader.

(k) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.
   a) Select CURRENT STATUS.
   b) Select CHANNEL A.
2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.
   a) Select CHANNEL A.
   b) Select an applicable LRU.
3) For the LAND VERIFY, select LAND VERIFY.
4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.
   a) Select BITE LIBRARY TEST.
   b) Select CHANNEL A.
   c) Select applicable libraries.
   d) If it is necessary, select EXECUTE.

(l) Enter 100.

(m) Select LSK 6R.

NOTE: The screen will not change.

(n) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

(o) If it is applicable, select TEST RESULT.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

(p) If it is applicable, select a library test

(q) Select DOWNLOAD TEST DATA.

NOTE: The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(r) Select “CONFIRM” on the eADL

1) This will show the “Transfer In Progress” screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(s) Do these steps to download the FCC A BITE data from the eADL MSD to a USB flash drive:

1) Put the USB flash drive into the eADL USB port.

NOTE: The USB flash drive must be configured correctly, it must be marked “Downloadable”, by the eADL Connect software as specified in the eADL Operations Guide.

2) Make sure that the “eADL Main Menu” is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select “Maintenance Page.”

a) This will show the “Maintenance Menu” screen.

4) Select “Transfer Downloaded Data to USB.”

NOTE: If the error message “USB Is Not Mounted Or Is Not A Valid USB” is shown, select “GO BACK” and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly, it must be marked “Downloadable” by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show “CONFIRM TO BEGIN TRANSFERRING.”

b) Select “CONFIRM.”

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

5) When the download is complete, the USB and MSD annunciators will turn green and this message will show:

“Part Transfer Complete”

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

6) Select “MAIN” to go back to the main menu.

(t) Remove the USB flash drive when the download is completed.

SUBTASK 22-11-33-860-224

(8) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-860-225

(9) Remove the Data Loader connection before exit BITE.

E. BITE Test Data Download Procedure for FCC B.

SUBTASK 22-11-33-860-226

(1) Set the upper system select switch on the data loader control panel (P61) to R.

SUBTASK 22-11-33-860-227

(2) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

NOTE: WAIT until the FCC powers-up and the F/D flag is out of view before proceeding to the next step (this could take approximately 60 seconds).

LOM 429-431, 440, 442-447, 450-460, 464, 465

SUBTASK 22-11-33-970-038

(3) Do these steps to download the BITE test Data from FCC B to floppy disk:

(a) Open the front cover and wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select “Floppy Drive.”

1) The eADL will show a Load Confirmation screen.

(d) Carefully push the disk (label up) into the disk drive.

(e) Use the FMC-CDU to enter DFCS BITE.

(f) Select INDEX.

(g) Select MAINT.

(h) Select DFCS.

(i) Turn on the data loader.

(j) Install a floppy disk into the disk drive.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.
   a) Select CURRENT STATUS.
   b) Select CHANNEL B.
2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.
   a) Select CHANNEL B.
   b) Select an applicable LRU.
3) For the LAND VERIFY, select LAND VERIFY.
4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.
   a) Select BITE LIBRARY TEST.
   b) Select CHANNEL B.
   c) Select applicable libraries.
   d) If it is necessary, select EXECUTE.

(l) Enter 100.

(m) Select LSK 6R.

NOTE: The screen will not change.

(n) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

(o) If it is applicable, select TEST RESULT.

(p) If it is applicable, select a library test

(q) Select DOWNLOAD TEST DATA.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE.

The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(r) Select “CONFIRM” on the EADL

1) The eADL will show “LOADING” on the Transfer In Progress screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.
3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(s) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-970-056

(4) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-970-057

(5) Remove the Data Loader connection before exit BITE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999

SUBTASK 22-11-33-970-039

(6) Do these steps to download the BITE test Data from FCC B to a USB flash drive:

(a) Open the front cover and wait until the display shows the eADL Main Menu.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

(b) Select “Target Page.”

1) The eADL will show the Select Target System screen.

(c) Select target LRU.”

1) This will show the “Select Software Part” screen.

(d) Push the “SELECT” button for the desired software (FCC B BITE download LSAP).

NOTE: The listed software will appear as it was originally configured in the eADL Connect software.

(e) Make sure that the “Confirm Transfer” screen shows.

(f) Use the FMC-CDU to enter DFCS BITE.

(g) Select INDEX.

(h) Select MAINT.

(i) Select DFCS.

(j) Turn on the data loader.

(k) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.

a) Select CURRENT STATUS.

b) Select CHANNEL B.

2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.

a) Select CHANNEL B.

b) Select an applicable LRU.

3) For the LAND VERIFY, select LAND VERIFY.

4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.

a) Select BITE LIBRARY TEST.

b) Select CHANNEL B.

c) Select applicable libraries.

d) If it is necessary, select EXECUTE.

(l) Enter 100.

(m) Select LSK 6R.

NOTE: The screen will not change.

(n) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

(o) If it is applicable, select TEST RESULT.

(p) If it is applicable, select a library test

(q) Select DOWNLOAD TEST DATA.

NOTE: The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(r) Select “CONFIRM” on the eADL

1) This will show the “Transfer In Progress” screen.

NOTE: It may take one to two minutes for the transfer to start.

NOTE: The file name will show on the CDU when the download is completed.

2) The “TRANSFER” annunciator will change to “LOADING” and turn yellow during the download procedure.

3) The “LOADING” annunciator will change to “COMPLETE” and turn green when the download procedure is completed.

(s) Do these steps to download the FCC B BITE data from the eADL MSD to a USB flash drive:

1) Put the USB flash drive into the eADL USB port.

NOTE: The USB flash drive must be configured correctly, it must be marked “Downloadable”, by the eADL Connect software as specified in the eADL Operations Guide.

2) Make sure that the “eADL Main Menu” is shown.

NOTE: To navigate UP or DOWN and make a selection on the eADL screen, use the appropriate buttons on the eADL front panel.

NOTE: If the eADL Main Menu does not show, select MAIN or GO BACK until the eADL shows the Main Menu.

3) Select “Maintenance Page.”

a) This will show the “Maintenance Menu” screen.

4) Select “Transfer Downloaded Data to USB.”

NOTE: If the error message “USB Is Not Mounted Or Is Not A Valid USB” is shown, select “GO BACK” and do the steps again.

NOTE: Make sure the USB flash drive is configured correctly, it must be marked “Downloadable” by the eADL Connect software as specified in the eADL Operations Guide.

a) The eADL screen will show “CONFIRM TO BEGIN TRANSFERRING.”

b) Select “CONFIRM.”

NOTE: The USB and MSD annunciators will turn yellow during the transfer procedure.

5) When the download is complete, the USB and MSD annunciators will turn green and this message will show:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 429-431, 440, 442-447, 450-460, 464-999 (Continued)

"Part Transfer Complete"

NOTE: The annunciators will turn red if the transfer procedure is aborted or if there is a failure.

6) Select "MAIN" to go back to the main menu.

(t) Remove the USB flash drive when the download is completed.

SUBTASK 22-11-33-970-058

(7) Set the upper system select switch on the data loader control panel (P61) to C.

SUBTASK 22-11-33-970-059

(8) Remove the Data Loader connection before exit BITE.

——— END OF TASK ———

LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999

TASK 22-11-33-470-820

10. FCC Software Installation from the Flight Compartment with a Portable Data Loader

A. General

(1) This procedure tells you how to install Operational Program Software (OPS) in the Flight Control Computer (FCC).

(2) A portable data loader (PDL) is necessary for this procedure. A data loader control panel and a PDL interface connector are also necessary. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the DATA TRANSFER UNIT RECEPTACLE connector on the P61 panel.

(3) A PDL is not a Boeing supplied part. Refer to the PDL supplier for instructions for operation. PDLs have a disk drive for software installation from disks. Some PDLs have an internal mass storage device. If the software is stored in the PDL, then disks are not necessary.

(4) The airplane must be on the ground with the engines shutdown before you can install software.

(5) Modern software loaders that meet the security requirements defined in ARINC 645-1 or newer are recommended to use. The procedures for modern software loaders will be marked as preferred for now and will be the only procedures available after removing floppy disk loaders procedures in the future. Please check with your Software Loader Supplier for current capabilities since this is still maturing across current and future software loaders.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software - 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.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999 (Continued)

Reference	Description
COM-1915	Data Loader - ARINC 615 (without ARINC 645-1 Compliant) Part #: 11615-50 Supplier: 0D4J3 Part #: 2231560-1-B Supplier: 98571 Part #: 465130-01-01 Supplier: 30782 Part #: 800-0631 Supplier: 1JSZ6 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: PXS-LDS-10 Supplier: 98571 Part #: YV68A110 Supplier: FAQ15 Opt Part #: 11615-02 Supplier: 0D4J3 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 18000-02 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-03-01010203 Supplier: 0BAW0 Opt Part #: 80000-04-01020301 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-024 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-044 Supplier: 97896 Opt Part #: 964-0400-045 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: P2K-615A-06 Supplier: 0BAW0
COM-21223	Data Loader - ARINC 615 (with ARINC 645-1 Compliant) Part #: 403474 Supplier: CG603 Part #: 403562 Supplier: CG603 Part #: AE-615-MPDL Supplier: CD624 Part #: PDL-615-XT Supplier: 89Q20

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC OPS	22-11-33-03A-020	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
		22-11-33-03A-021	LOM 437, 450-452, 457

E. Location Zones

Zone	Area
212	Flight Compartment - Right

F. Prepare for Software Installation

SUBTASK 22-11-33-860-038

(1) Make sure that the DFCS is not engaged.

SUBTASK 22-11-33-860-039

(2) Use a Portable Data Loader (PDL) to install software in the FCC.

NOTE: For the FCC to be an approved installation, the correct FCC OPS must be installed. Refer to the Expendables/Parts table for FCC OPS [1].

SUBTASK 22-11-33-860-040

(3) Make sure that the lower system select switch on the data loader control panel (P61) is set to NORMAL.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G. Software Installation Procedure for FCC A

SUBTASK 22-11-33-860-041

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-043

CAUTION SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(2) Set the power switch on the portable data loader to the off position.

SUBTASK 22-11-33-860-044

(3) Connect the interface cable of the portable data ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

NOTE: This loader is going obsolete due use of floppy disks and ARINC 645 security requirements.

SUBTASK 22-11-33-860-045

(4) Set the upper system select switch on the data loader control panel (P61) to L.

SUBTASK 22-11-33-860-046

(5) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-860-047

(6) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-039

(7) SOFTWARE INSTALLATION WITH A PDL - (Preferred)

(a) Do this step to install the software into Flight Control Computer A (FCC-A):

1) Follow the generic PDL procedure to load software part (TASK 20-15-11-400-801).

SUBTASK 22-11-33-470-001

(8) SOFTWARE INSTALLATION WITH A PDL DISK DRIVE - (Non-Preferred)

Do these steps to install the software into FCC-A:

NOTE: For more information on how to use the data loader, refer to the supplier's instructions for the data loader.

(a) Set the power switch on the portable data loader to the on position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Put the correct disk in the disk drive.

(c) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

(d) Remove the disk from the disk drive when the software installation is completed.

SUBTASK 22-11-33-470-002

(9) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER WITH A MASS STORAGE DEVICE - (Non-Preferred)

Follow the PDL supplier instructions to install the software.

SUBTASK 22-11-33-940-001

CAUTION	SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(10) Set the power switch on the data loader to the off position.

H. Software Installation Procedure for FCC B

SUBTASK 22-11-33-860-048

(1) Set the upper system select switch on the data loader control panel (P61) to R.

SUBTASK 22-11-33-860-049

(2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-169

(3) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-040

(4) SOFTWARE INSTALLATION WITH A PDL - (Preferred)

(a) Do this step to install the software into Flight Control Computer B (FCC-B):

1) Follow the generic PDL procedure to load software part (TASK 20-15-11-400-801).

SUBTASK 22-11-33-470-003

(5) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER WITH A DISK DRIVE - (Non-Preferred)

Do these steps to install the software into FCC-B:

NOTE: For more information on how to use the data loader, refer to the supplier's instructions for the data loader.

(a) Set the power switch on the portable data loader to the on position.

(b) Put the correct disk in the disk drive.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

(d) Remove the disk from the disk drive.

SUBTASK 22-11-33-470-004

(6) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER WITH A MASS STORAGE DEVICE - (Non-Preferred)

Follow the PDL supplier instructions to install the software.

SUBTASK 22-11-33-860-055

(7) Set the system select switch on the data loader control panel (P61) to NORMAL.

SUBTASK 22-11-33-940-002

CAUTION	SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(8) Set the power switch on the data loader to the off position.

SUBTASK 22-11-33-860-170

(9) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-860-051

(10) Remove the interface cable from the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

SUBTASK 22-11-33-860-057

(11) After two minutes, do the Software Installation Test below.

I. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-420-010

(1) Do these steps to test the software installation:

(a) If you are not at one of the DFCS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key adjacent to the MAINT prompt.

(b) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(c) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(d) Push the line select key adjacent to the CHANNEL A prompt.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Make sure that the software part number for FCC A is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(e) Push the line select key adjacent to the PREV MENU prompt.

(f) Push the line select key adjacent to the CHANNEL B prompt.

1) Make sure that the software part number for FCC B is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(g) Push the line select key adjacent to the PREV MENU prompt.

(h) Push the line select key adjacent to the PREV MENU prompt.

(i) Push the line select key adjacent to the FAULT REVIEW prompt.

(j) Push the line select key adjacent to the ERASE FAULT HISTORY prompt.

(k) Push the line select key adjacent to the CHANNEL A AND B prompt.

(l) Push the line select key adjacent to the YES prompt.

(m) Push and release the line select key adjacent to the EXIT prompt until you are out of DFCS BITE.

END OF TASK

TASK 22-11-33-470-821

11. FCC Inflight Faults Memory Download with a Portable Data Loader

A. General

(1) This procedure tells you how to download Flights Faults Memory in the FCC.

(2) A portable data loader (PDL) is necessary for this procedure. A data loader panel and a PDL interface connector cable are also necessary. There must be an FCC switch position on the data loader selector panel. The data loader selector switch is installed above the DATA TRANSFER UNIT RECEPTACLE connector on the (P61) panel. The PDL interface connector cable is hooked up to the data transfer unit receptacle connector for this procedure.

(3) The airplane must be on the ground with the engines shutdown before you can download the FCC flight faults memory.

(4) Modern software loaders that meet the security requirements defined in ARINC 645-1 or newer are recommended to use. The procedures for modern software loaders will be marked as preferred for now and will be the only procedures available after removing floppy disk loaders procedures in the future. Please check with your Software Loader Supplier for current capabilities since this is still maturing across current and future software loaders.

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.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999 (Continued)

Reference	Description
COM-1915	Data Loader - ARINC 615 (without ARINC 645-1 Compliant) Part #: 11615-50 Supplier: 0D4J3 Part #: 2231560-1-B Supplier: 98571 Part #: 465130-01-01 Supplier: 30782 Part #: 800-0631 Supplier: 1JSZ6 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: PXS-LDS-10 Supplier: 98571 Part #: YV68A110 Supplier: FAQ15 Opt Part #: 11615-02 Supplier: 0D4J3 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 18000-02 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-03-01010203 Supplier: 0BAW0 Opt Part #: 80000-04-01020301 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-024 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-044 Supplier: 97896 Opt Part #: 964-0400-045 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: P2K-615A-06 Supplier: 0BAW0
COM-21223	Data Loader - ARINC 615 (with ARINC 645-1 Compliant) Part #: 403474 Supplier: CG603 Part #: 403562 Supplier: CG603 Part #: AE-615-MPDL Supplier: CD624 Part #: PDL-615-XT Supplier: 89Q20

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

D. Prepare for FCC Faults Memory Download

SUBTASK 22-11-33-860-100

(1) Make sure the FMC-CDU is not in Maintenance. If DFCS BITE is displayed, exit out completely to the INDEX page.

SUBTASK 22-11-33-860-243

(2) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-244

> **CAUTION** SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(3) Make sure the PDL power switch is set to OFF.

SUBTASK 22-11-33-860-245

> **CAUTION** MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

E. FCC Flight Faults Memory Download Procedure for FCC A

SUBTASK 22-11-33-860-246

(1) At the DATA LOAD SELECTOR, P61 panel, do this step:

(a) Set the switch to the L / CAPT / UPR position.

SUBTASK 22-11-33-860-311

(2) At the DATA TRANSFER UNIT, P61 receptacle panel, do these steps.

(a) Remove the connector cap.

(b) Connect the interface cable of the portable data ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

SUBTASK 22-11-33-860-312

(3) At the DATA LOAD, P61 panel, do this step:

(a) Turn the SYSTEM SELECT switch to the FCC position.

SUBTASK 22-11-33-860-247

(4) Make sure these circuit breakers are open before proceeding:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-248

(5)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999 (Continued)

Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-860-273

(6) Wait 60 seconds before proceeding to the next step.

SUBTASK 22-11-33-860-249

(7) Close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-250

(8) At the PDL, do these steps:

(a) Turn the PDL power switch and interface cable to the ON position.

(b) Make sure the diskette is not inserted.

(c) Wait 60 seconds before proceeding to the next step.

SUBTASK 22-11-33-860-251

(9) Do these steps to download the Flight Faults Memory of FCC A:

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Select FAULT REVIEW.

(f) Select DOWNLOAD FAULT HISTORY.

(g) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE. Insert the diskette into the PDL drive. The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

NOTE: If the download fail occurs, exit DFCS BITE completely, remove the diskette from the PDL drive, turn off the PDL power switch for about 10 seconds, then turn the PDL back ON and repeat the steps above until successful.

(h) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-252

(10) Use the FMC-CDU to exit out of DFCS BITE completely.

SUBTASK 22-11-33-860-253

(11) Set the power switch on the PDL to the OFF position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-254

> **CAUTION** MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(12) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-255

(13) Remove the interface cable from the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

(a) Replace the connector cap.

SUBTASK 22-11-33-860-256

(14) At the DATA LOAD control panel, P61, turn the SYSTEM SELECT switch to the NORMAL position.

SUBTASK 22-11-33-860-257

(15) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F. FCC Flight Faults Memory Download Procedure for FCC B

SUBTASK 22-11-33-860-274

(1) At the DATA LOAD SELECTOR, P61 panel, do this step:

(a) Set the switch to the R / F/O / LWR position.

SUBTASK 22-11-33-860-275

(2) At the DATA TRANSFER UNIT RECEPTACLE connector on the (P61) panel, do these steps.

(a) Remove the connector cap.

(b) Connect the PDL and interface cable to the P61 receptacle.

SUBTASK 22-11-33-860-276

(3) At the DATA LOAD (P61) panel, do this step:

(a) Turn the SYSTEM SELECT switch to the FCC position.

SUBTASK 22-11-33-860-277

(4) Make sure that these circuit breakers are open:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-278

(5) Close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-279

(6) Wait 60 seconds before proceeding to the next step.

SUBTASK 22-11-33-860-280

(7) Close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-281

(8) At the PDL, do these steps:

(a) Turn the PDL power switch and interface cable to the ON position.

(b) Make sure the diskette is not inserted.

(c) Wait 60 seconds before proceeding to the next step.

SUBTASK 22-11-33-970-008

(9) Do these steps to download the Flight Faults Memory of FCC B

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Select FAULT REVIEW.

(f) Select DOWNLOAD FAULT HISTORY.

(g) Select AUTOPILOT FAULT HISTORY or AUTOTHROTTLE FAULT HISTORY.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE. Insert the diskette into the PDL drive to continue. The file name will show on the CDU when the download is completed. It takes around 15 minutes to complete the download.

NOTE: If the download fail occurs, exit DFCS BITE completely, remove the diskette from the PDL drive, turn off the PDL power switch for about 10 seconds, then turn the PDL back ON and repeat the steps above until successful.

(h) Remove the disk from the disk drive when the download is completed.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-118

> **CAUTION** MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(10) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-282

(11) Remove the interface cable from the DATA TRANSFER UNIT RECEPTACLE on the P61 panel before exit BITE.

(a) Replace the connector cap.

SUBTASK 22-11-33-860-283

(12) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

G. Put the Airplane Back to its Usual Condition

SUBTASK 22-11-33-860-267

(1) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

TASK 22-11-33-470-822

12. FCC BITE Test Data Download from the Flight Compartment with a Portable Data Loader

A. General

(1) This procedure tells you how to download Flights Faults Memory in the FCC.

(2) A portable data loader (PDL) is necessary for this procedure. A data loader control panel and a PDL interface connector are also necessary. There must be an FCC switch position on the data loader control panel. The data loader control panel is installed above the DATA TRANSFER UNIT RECEPTACLE connector on the (P61) panel.

(3) The airplane must be on the ground with the engines shutdown before you can install software.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(4) Modern software loaders that meet the security requirements defined in ARINC 645-1 or newer are recommended to use. The procedures for modern software loaders will be marked as preferred for now and will be the only procedures available after removing floppy disk loaders procedures in the future. Please check with your Software Loader Supplier for current capabilities since this is still maturing across current and future software loaders.

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-1915	Data Loader - ARINC 615 (without ARINC 645-1 Compliant) Part #: 11615-50 Supplier: 0D4J3 Part #: 2231560-1-B Supplier: 98571 Part #: 465130-01-01 Supplier: 30782 Part #: 800-0631 Supplier: 1JSZ6 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: PXS-LDS-10 Supplier: 98571 Part #: YV68A110 Supplier: FAQ15 Opt Part #: 11615-02 Supplier: 0D4J3 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 18000-02 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-03-01010203 Supplier: 0BAW0 Opt Part #: 80000-04-01020301 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-024 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-044 Supplier: 97896 Opt Part #: 964-0400-045 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: P2K-615A-06 Supplier: 0BAW0
COM-21223	Data Loader - ARINC 615 (with ARINC 645-1 Compliant) Part #: 403474 Supplier: CG603 Part #: 403562 Supplier: CG603 Part #: AE-615-MPDL Supplier: CD624 Part #: PDL-615-XT Supplier: 89Q20

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

D. Prepare for BITE Test Data Download

SUBTASK 22-11-33-860-123

(1) Make sure the DFCS is not engaged.

SUBTASK 22-11-33-860-124

(2) Use an PDL to download the BITE test data in the FCC.

SUBTASK 22-11-33-860-182

(3) If using the J2 connector on the front of the FCC, do this step.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Remove the J2 connector cap.

SUBTASK 22-11-33-860-183

(4) If using the DATA TRANSFER UNIT RECEPTACLE connector on the (P61) panel, do this step.

(a) Remove the connector cap.

SUBTASK 22-11-33-860-126

(5) Make sure that the FCC is power up and not in BITE.

E. BITE Test Data Download Procedure for FCC A

SUBTASK 22-11-33-860-127

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-128

CAUTION MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-129

CAUTION SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(3) Set the power switch on the portable data loader to the off position.

SUBTASK 22-11-33-860-185

(4) If using the J2 connector on the front of the FCC A (E1-1 shelf), do this step.

(a) Connect the interface cable from the portable data loaderARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the J2 connector on the front of the FCC A (E1-1 shelf).

SUBTASK 22-11-33-860-186

(5) If using the DATA TRANSFER UNIT RECEPTACLE on the P61 panel, do these steps.

(a) Connect the interface cable from the portable data loaderARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Set the upper system select switch on the data loader control panel (P61) to L.

(c) Set the lower system select switch on the data loader control panel to FCC.

SUBTASK 22-11-33-860-131

(6) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-970-015

(7) Do these steps to download the BITE Test Data.

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Turn on the data loader.

(f) Install a floppy disk into the disk drive.

(g) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.

a) Select CURRENT STATUS.

b) Select CHANNEL A.

2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.

a) Select CHANNEL A.

b) Select an applicable LRU.

3) For the LAND VERIFY, select LAND VERIFY.

4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.

a) Select BITE LIBRARY TEST.

b) Select CHANNEL A.

c) Select applicable libraries.

d) If it is necessary, select EXECUTE.

(h) Enter 100.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(i) Select LSK 6R.

NOTE: The screen will not change.

(j) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

(k) If it is applicable, select TEST RESULT.

(l) If it is applicable, select a library test

(m) Select DOWNLOAD TEST DATA.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE.
The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(n) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-132

(8) Set the power off switch on the data loader to the off position.

SUBTASK 22-11-33-860-133

CAUTION	MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-187

(10) If using the J2 connector on the front of the FCC A (E1–1 shelf), do these steps.

(a) Remove the interface cable from the portable data loader ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the J2 connector on the front of the FCC A (E1–1 shelf) before exit BITE.

(b) Reinstall the J2 connector cap.

SUBTASK 22-11-33-860-188

(11) If using the DATA TRANSFER UNIT RECEPTACLE on the P61 panel, do this step.

(a) Remove the interface cable from the portable data loader ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel before exit BITE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999 (Continued)

F. BITE Test Data Download Procedure for FCC B

SUBTASK 22-11-33-860-137

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-138

CAUTION MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-139

CAUTION SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(3) Set the power switch on the portable data loader to the off position.

SUBTASK 22-11-33-860-189

(4) If using the J2 connector on the front of the FCC B (E1-4 shelf), do these steps.

(a) Remove the J2 connector cap.

(b) Connect the interface cable from the portable data loader ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the J2 connector on the front of the FCC B (E1-4 shelf).

SUBTASK 22-11-33-860-190

(5) If using the DATA TRANSFER UNIT RECEPTACLE on the P61 panel, do these steps.

(a) Connect the interface cable from the portable data loaderARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel.

(b) Set the upper system select switch on the data loader control panel (P61) to R.

(c) Set the lower system select switch on the data loader control panel to FCC.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-141

(6) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-970-026

(7) Do these steps to download the BITE Test Data.

(a) Use the FMC-CDU to enter DFCS BITE.

(b) Select INDEX.

(c) Select MAINT.

(d) Select DFCS.

(e) Turn on the data loader.

(f) Install a floppy disk into the disk drive.

(g) Do these steps below for the applicable download:

NOTE: Only one download can be selected at a time.

1) For the CURRENT STATUS, select FAULT REVIEW.

a) Select CURRENT STATUS.

b) Select CHANNEL B.

2) For the LRU INTERFACE TEST, select LRU REPLACEMENT TEST.

a) Select CHANNEL B.

b) Select an applicable LRU.

3) For the LAND VERIFY, select LAND VERIFY.

4) For the EXTENDED MAINTENANCE, select EXTENDED MAINTENANCE.

a) Select BITE LIBRARY TEST.

b) Select CHANNEL B.

c) Select applicable libraries.

d) If it is necessary, select EXECUTE.

(h) Enter 100.

(i) Select LSK 6R.

NOTE: The screen will not change.

(j) Select CONTINUE.

1) Wait for TEST IN PROGRESS to go out of view of the screen.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) If it is applicable, select TEST RESULT.

(l) If it is applicable, select a library test

(m) Select DOWNLOAD TEST DATA.

NOTE: If no disk is in the data loader, CDU will show INSERT DISKETTE.

The file name will show on the CDU when the download is completed.

NOTE: If the download fail occurs, disconnect the power on the data loader for 10 second. Then reconnect the power.

(n) Remove the disk from the disk drive when the download is completed.

SUBTASK 22-11-33-860-142

(8) Set the power off switch on the data loader to the off position.

SUBTASK 22-11-33-860-143

CAUTION MAKE SURE THAT THE CIRCUIT BREAKER FOR THE DATA LOADER IS OPEN BEFORE YOU CONNECT OR REMOVE THE INTERFACE CABLE. IF THE CIRCUIT BREAKER IS NOT OPEN, DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Open this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

SUBTASK 22-11-33-860-191

(10) If you use the J2 connector on the front of the FCC B (E1–4 shelf), do these steps.

(a) Remove the interface cable from the portable data loader ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the J2 connector on the front of the FCC B (E1–4 shelf) before you exit BITE.

(b) Reinstall the J2 connector cap.

SUBTASK 22-11-33-860-192

(11) If you use the DATA TRANSFER UNIT RECEPTACLE on the P61 panel, do this step.

(a) Remove the interface cable from the portable data loader ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the DATA TRANSFER UNIT RECEPTACLE on the P61 panel before you exit BITE.

(b) Reinstall the connector cap.

SUBTASK 22-11-33-860-285

(12) Close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	9	C00923	DATA LOADER

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-33-470-823

13. FCC Software Installation from the Electrical and Electronics Compartment with a Portable Data Loader

A. General

(1) This procedure tells you how to install Operational Program Software (OPS) in the Flight Control Computer (FCC).

(2) A portable data loader (PDL) is necessary for this procedure.

(3) The airplane must be on the ground with the engines shutdown before you can install software.

(4) Modern software loaders that meet the security requirements defined in ARINC 645-1 or newer are recommended to use. The procedures for modern software loaders will be marked as preferred for now and will be the only procedures available after removing floppy disk loaders procedures in the future. Please check with your Software Loader Supplier for current capabilities since this is still maturing across current and future software loaders.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
20-15-11-400-801	On-Airplane Software - 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-1915	Data Loader - ARINC 615 (without ARINC 645-1 Compliant) Part #: 11615-50 Supplier: 0D4J3 Part #: 2231560-1-B Supplier: 98571 Part #: 465130-01-01 Supplier: 30782 Part #: 800-0631 Supplier: 1JSZ6 Part #: CEI-715-DL-2 Supplier: 0BPH5 Part #: PXS-LDS-10 Supplier: 98571 Part #: YV68A110 Supplier: FAQ15 Opt Part #: 11615-02 Supplier: 0D4J3 Opt Part #: 11615-20 Supplier: 0D4J3 Opt Part #: 18000-02 Supplier: 0D4J3 Opt Part #: 30100 Supplier: 0BAW0 Opt Part #: 80000-03-01010203 Supplier: 0BAW0 Opt Part #: 80000-04-01020301 Supplier: 0BAW0 Opt Part #: 80000-05 Supplier: 0BAW0 Opt Part #: 964-0400-020 Supplier: 97896 Opt Part #: 964-0400-024 Supplier: 97896 Opt Part #: 964-0400-025 Supplier: 97896 Opt Part #: 964-0400-030 Supplier: 97896 Opt Part #: 964-0400-044 Supplier: 97896 Opt Part #: 964-0400-045 Supplier: 97896 Opt Part #: 964-0400-055 Supplier: 97896 Opt Part #: P2K-615A-06 Supplier: 0BAW0

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

Reference	Description
COM-21223	Data Loader - ARINC 615 (with ARINC 645-1 Compliant) Part #: 403474 Supplier: CG603 Part #: 403562 Supplier: CG603 Part #: AE-615-MPDL Supplier: CD624 Part #: PDL-615-XT Supplier: 89Q20

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC OPS	22-11-33-03A-020	LOM 412, 415, 423, 424, 427, 428, 437-447, 450-999
		22-11-33-03A-021	LOM 437, 450-452, 457

E. Location Zones

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

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Prepare for Software Installation

SUBTASK 22-11-33-860-053

(1) Make sure the DFCS is not engaged.

SUBTASK 22-11-33-860-014

(2) Use a Portable Data Loader (PDL) to install software in the FCC.

NOTE: For the FCC to be an approved installation, the correct FCC OPS must be installed. Refer to the Expendables/Parts table for FCC OPS [1].

H. Software Installation Procedure for FCC A

SUBTASK 22-11-33-860-015

(1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-33-010-002

(2) To get access to the electrical and electronic compartment, do this task: (Finding an Access Door or Panel on the Lower Half of the Fuselage, TASK 06-41-00-800-801).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-33-860-016

(3) Take the portable data ARINC 615 data loader, COM-1915, or ARINC 645-1 compliant portable data loader, COM-21223, to the electrical and electronics compartment and do these steps:

NOTE: This loader is going obsolete due use of floppy disks and ARINC 645 security requirements.

CAUTION SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(a) Set the power switch on the portable data loader to the off position.

(b) Connect the interface cable between the portable data loader and the P2 connector of FCC A.

NOTE: There are three connectors of the front of the FCC. The P2 connector is on the top.

SUBTASK 22-11-33-860-017

(4) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-041

(5) SOFTWARE INSTALLATION WITH A PDL - (Preferred)

(a) Do this step to install the software into Flight Control Computer A (FCC-A):

1) Follow the generic PDL procedure to load software part (TASK 20-15-11-400-801).

SUBTASK 22-11-33-470-005

(6) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER DISK DRIVE - (Non-Preferred)

Do these steps to install the software into FCC A:

NOTE: For more information on how to use the portable data loader, refer to the supplier's instructions for the data loader.

(a) Set the power switch on the portable data loader to the on position.

(b) Put the correct disk in the disk drive.

(c) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

(d) Remove the disk from the disk drive when the software installation is completed.

(e) Remove the interface cable between the portable data loader and the P2 connector of FCC A

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-470-006

(7) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER WITH A MASS STORAGE DEVICE - (Non-Preferred)

Follow the portable data loader supplier instructions to install the software.

SUBTASK 22-11-33-940-003

CAUTION	SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(8) Set the power switch on the data loader to the off position.

I. Software Installation Procedure for Flight Control Computer B

SUBTASK 22-11-33-860-019

(1) Connect the interface cable between the portable data loader and the P2 connector of Flight Control Computer B.

NOTE: There are three connectors of the front of the FCC. The P2 connector is on the top.

SUBTASK 22-11-33-860-020

(2) Close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
C	1	C01037	AFCS SYS B MACH TRIM AC

SUBTASK 22-11-33-860-167

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-470-042

(4) SOFTWARE INSTALLATION WITH A PDL - (Preferred)

(a) Do this step to install the software into Flight Control Computer B (FCC-B):

1) Follow the generic PDL procedure to load software part (TASK 20-15-11-400-801).

SUBTASK 22-11-33-470-007

(5) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER DISK DRIVE - (Non-Preferred)

Do these steps to install the software into FCC B:

NOTE: For more information on how to use the data loader, refer to the supplier's instructions for the data loader.

(a) Set the power switch on the portable data loader to the on position.

(b) Put the correct disk in the disk drive.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Follow the prompts on the data loader to complete the installation.

NOTE: COMP, LOAD COMPLETE and TRANSF COMPLETE are examples of data loader prompts for a completed installation.

(d) Remove the disk from the disk drive when the software installation is completed.

SUBTASK 22-11-33-470-008

(6) SOFTWARE INSTALLATION WITH A PORTABLE DATA LOADER WITH A MASS STORAGE DEVICE - (Non-Preferred)

Follow the PDL supplier instructions to install the software.

SUBTASK 22-11-33-940-004

CAUTION	SET THE POWER SWITCH FOR THE PORTABLE DATA LOADER TO OFF BEFORE YOU CONNECT, OR REMOVE THE INTERFACE CABLE. IF THE POWER SWITCH IS NOT OFF, DAMAGE TO THE PORTABLE DATA LOADER CAN OCCUR.

(7) Set the power switch on the data loader to the off position.

SUBTASK 22-11-33-860-168

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	2	C01045	AFCS SYS A FCC DC

SUBTASK 22-11-33-860-022

(9) Remove the interface cable from the P2 connector on Flight Control Computer B.

SUBTASK 22-11-33-410-002

(10) Do this task (Finding an Access Door or Panel on the Lower Half of the Fuselage, TASK 06-41-00-800-801).

Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-33-860-058

(11) After two minutes, do the Software Installation Test below.

J. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-420-004

(1) Do these steps to test the software installation:

(a) If you are not at one of the DFCS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key adjacent to the MAINT prompt.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(c) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(d) Push the line select key adjacent to the CHANNEL A prompt.

1) Make sure that the software part number for FCC A is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(e) Push the line select key adjacent to the PREV MENU prompt.

(f) Push the line select key adjacent to the CHANNEL B prompt.

1) Make sure that the software part number for FCC B is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(g) Push and release the line select key adjacent to the EXIT prompt until you are out of DFCS BITE.

END OF TASK

LOM ALL

TASK 22-11-33-470-824

14. FCC Software Installation using the Cross-load Function

A. General

(1) This procedure tells you how to install Operational Program Software (OPS) from one Flight Control Computer (FCC) to the other FCC.

(2) The airplane must be on the ground with the engines shutdown before you can cross-load software.

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC OPS	22-11-33-03A-020	LOM ALL
		22-11-33-03A-021	LOM 404, 411, 416, 420, 437, 450-452, 457

C. Location Zones

Zone	Area
212	Flight Compartment - Right

D. FCC Cross-load Software Installation Procedure

SUBTASK 22-11-33-860-060

(1) Make sure the DFCS is not engaged.

SUBTASK 22-11-33-860-061

(2) Use the cross-load function to install software in the FCC.

NOTE: For the FCC to be an approved installation, the correct FCC OPS must be installed. Refer to the Expendables/Parts table for FCC OPS [1].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-062

(3) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-063

(4) Do these steps to install the software into an FCC:

(a) On the FMCS CDU, if you are not at one of the DFCS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key adjacent to the MAINT prompt.

(b) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(c) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(d) Push the line select key adjacent to the CROSSLOAD prompt.

NOTE: The CROSSLOAD prompt only appears if the FCCs have different OPS part numbers installed. The OPS and OPC software part numbers will be displayed for both FCC-A and FCC-B.

(e) To load software from FCC-A to FCC-B, push the line select key adjacent to the A TO B prompt.

(f) To load software from FCC-B to FCC-A, push the line select key adjacent to the B TO A prompt.

(g) To start the software cross-load, push the line select key adjacent to the YES prompt.

(h) If the software cross-load is successful, the following BITE screen will be displayed:

DFCS BITE TEST

CROSSLOAD FROM FCC-A (or B)

CROSSLOAD COMPLETE.

INITIALIZATION OF FCC

IN PROGRESS. THIS MAY

REQUIRE 30 SECONDS.

NOTE: The software cross-load may take between 6 and 8 minutes. During this time the message IN PROGRESS will be displayed.

SUBTASK 22-11-33-860-064

(5) After two minutes, do the Software Installation Test below. If cross-loading is successful, the CDU should display the DFCS BITE TEST MAIN MENU.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-420-011

(1) Do these steps to test the software installation:

(a) If you are not at one of the DFCS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key adjacent to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key adjacent to the MAINT prompt.

(b) From the MAINT BITE INDEX, push the line select key adjacent to the DFCS prompt.

NOTE: The DFCS will do a self-test.

(c) When the self-test is complete, push the line select key adjacent to the IDENTIFICATION AND CONFIGURATION prompt.

(d) Push the line select key adjacent to the CHANNEL A prompt.

1) Make sure that the software part number for FCC A is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(e) Push the line select key adjacent to the PREV MENU prompt.

(f) Push the line select key adjacent to the CHANNEL B prompt.

1) Make sure that the software part number for FCC B is correct.

NOTE: The software part number shows below FCC OPS.

NOTE: Refer to the Expendables/Parts table for FCC OPS [1].

(g) Push the line select key adjacent to the PREV MENU prompt.

(h) Push the line select key adjacent to the PREV MENU prompt.

(i) Push the line select key adjacent to the FAULT REVIEW prompt.

(j) Push the line select key adjacent to the ERASE FAULT HISTORY prompt.

(k) Push the line select key adjacent to the CHANNEL A AND B prompt.

(l) Push the line select key adjacent to the YES prompt.

(m) Push and release the line select key adjacent to the EXIT prompt until you are out of DFCS BITE.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT CONTROL COMPUTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a flight control computer.

(2) The installation of a flight control computer.

B. The are two flight control computers (FCCs) in the main equipment center. The FCC-A (M1875), is on the E1 electronics equipment rack, shelf No. 1 (E1-1). The FCC-B (M1876), is on the E1 electronics equipment rack, shelf No. 4 (E1-4).

C. The removal and installation tasks are the same for the FCC-A and FCC-B.

TASK 22-11-33-000-801

2. Flight Control Computer Removal

(Figure 401)

A. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 201)

B. Location Zones

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

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Removal Procedure

SUBTASK 22-11-33-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-33-010-001

(2) To get access to the electrical and electronic compartment, open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-33-020-001

CAUTION

DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FCC. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FCC.

(3) To remove the FCC [1], do this task: E/E Box Removal, TASK 20-10-07-000-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Control Computer Installation
Figure 401/22-11-33-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-33-400-801

3. **Flight Control Computer Installation**
(Figure 401)

A. **References**

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 201)
22-11-00-700-801	Land Verify Test (P/B 201)
22-11-00-700-802	Reset Latches Procedure (P/B 201)
22-11-33-470-814	FCC Software Installation with an Airborne Data Loader (P/B 201)
22-11-33-470-817	FCC Software Installation with an Enhanced Airborne Data Loader (eADL) (P/B 201)
22-11-33-470-820	FCC Software Installation from the Flight Compartment with a Portable Data Loader (P/B 201)
22-11-33-470-823	FCC Software Installation from the Electrical and Electronics Compartment with a Portable Data Loader (P/B 201)
22-11-33-470-824	FCC Software Installation using the Cross-load Function (P/B 201)

B. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC	22-11-33-03-010	LOM ALL
2	FCC OPS	22-11-33-03A-020	LOM ALL
		22-11-33-03A-021	LOM 404, 411, 416, 420, 437, 450-452, 457

C. **Location Zones**

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

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Flight Control Computer Installation**

SUBTASK 22-11-33-860-002

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-33-420-001

CAUTION DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE FLIGHT CONTROL COMPUTER (FCC). IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FCC.

(2) To install the FCC [1], do this task: E/E Box Installation, TASK 20-10-07-400-801.

SUBTASK 22-11-33-410-001

(3) Close this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-33-860-003

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-207

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

F. Prepare for the Test

SUBTASK 22-11-33-860-066

(1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-33-860-005

(2) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-33-860-006

(3) Make sure that the Very High Frequency (VHF) NAV and Inertial Reference System (IRS) switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-33-860-007

(4) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

LOM ALL; AIRPLANES WITH HEAD UP DISPLAY (HUD)

NOTE: If the Head-Up Display (HUD) combiner is down and deployed, the HUD is in PRI mode and one or more NAV receivers are tuned to a recognized ILS frequency, the Digital Flight Control System (DFCS) Built-In-Test Equipment (BITE) test may fail. If this occurs, it is necessary to turn off the HUD, move the HUD combiner to the UP and STOWED position, and to repeat the DFCS BITE test.

LOM ALL

G. Erase Fault History from the Installed Flight Control Computer

SUBTASK 22-11-33-740-003

(1) Do this BITE procedure to erase the fault history data from the installed Flight Control Computer (FCC):

NOTE: The fault history should ONLY be erased if this is an installation of a new FCC, or the FCC is a permanent installation.

NOTE: The fault history should NOT be erased if the FCC installation is temporary or is interchanged for troubleshooting.

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

1) INDEX
2) MAINT
3) DFCS

ECCN 9E991 BOEING PROPRIETARY - See title page for details

4) FAULT REVIEW
5) ERASE FAULTS
6) ERASE FAULT HISTORY
7) CHANNEL A or CHANNEL B

NOTE: If Flight Control Computer A (FCC-A) was replaced, select CHANNEL A.

NOTE: If Flight Control Computer B (FCC-B) was replaced, select CHANNEL B.

8) YES

(c) Make sure that the FAULT HISTORY ERASED is shown on the CDU before you continue.

(d) Push the LSK adjacent to the EXIT selection until you get back to the INIT/REF INDEX CDU page.

H. Installation Test

SUBTASK 22-11-33-740-001

(1) Do this DFCS BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the LSK that is adjacent to each selection:

NOTE: If the CONTINUE shows during the DFCS BITE test, do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

NOTE: Close all FCC power related circuit breakers if the DFCS BITE test CDU screen shows "CLOSE ALL C/B" before the next step.

1) INDEX
2) MAINT
3) DFCS
4) LRU REPLACEMENT TESTS
5) Make a selection for the applicable channel:

NOTE: Channel A is for FCC-A and channel B is for FCC-B.

a) CHANNEL A
b) CHANNEL B
c) CHANNEL A AND B.

6) DFCS/AT or FCC

NOTE: If you push the LSK adjacent to CHANNEL A or CHANNEL A AND B, DFCS/AT will show on the BITE display.

If you push the LSK adjacent to CHANNEL B, FCC will show on the BITE display.

7) Do the instructions that show on the CDU display to complete the test.
8) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

SUBTASK 22-11-33-700-001

(2) If you replaced the FCC because of a NO AUTOLAND FAULT, do these steps:

(a) Do this task: Land Verify Test, TASK 22-11-00-700-801.

(b) Do this task: Reset Latches Procedure, TASK 22-11-00-700-802.

LOM ALL

SUBTASK 22-11-33-740-002

(3) Do these steps to make sure that the hardware and software are correct:

NOTE: For the FCC to be an approved installation, the correct FCC and FCC Operational Program Software (OPS) must be installed. Refer to the Expendables/Parts table for FCC [1] and FCC OPS [2].

(a) Push and release the PREV MENU key until you get back to the DFCS BITE TEST MAIN MENU.

(b) Push the line select key next to the IDENTIFICATION AND CONFIGURATION prompt.

(c) Push the line select key next to the CHANNEL A prompt.

1) Make sure that the HARDWARE PART NUMBER and FCC OPS for channel A are correct.

a) If the FCC OPS part number is not correct, load the correct software (TASK 22-11-33-470-823 or TASK 22-11-33-470-820 or TASK 22-11-33-470-814 or TASK 22-11-33-470-824 or TASK 22-11-33-470-817).

NOTE: AIRPLANES WITH COLLINS FCCs;

If the correct software part number is installed on FCC-A, it may be cross-loaded to FCC-B.

b) If the HARDWARE PART NUMBER is not correct, replace the FCC (PAGEBLOCK 22-11-33/401).

(d) Push the LSK next to the PREV MENU prompt.

(e) Push the LSK next to the CHANNEL B prompt.

1) Make sure that the HARDWARE PART NUMBER and FCC OPS for channel B are correct.

a) If the FCC OPS part number is not correct, load the correct software (TASK 22-11-33-470-823 or TASK 22-11-33-470-820 or TASK 22-11-33-470-814 or TASK 22-11-33-470-824 or TASK 22-11-33-470-817).

NOTE: AIRPLANES WITH COLLINS FCCs;

If the correct software part number is installed on FCC-A, it may be cross-loaded to FCC-B.

b) If the HARDWARE PART NUMBER is not correct, replace the FCC (PAGEBLOCK 22-11-33/401).

(f) Push and release the LSK next to the EXIT prompt until you are out of DFCS BITE.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-33-860-008

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-33-860-012

(2) Close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-33-860-010

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DFCS MODE CONTROL PANEL - CLEANING/PAINTING

1. General

A. This procedure has this task:

(1) Clean the MCP.

B. The MCP is in the center of the glareshield, P7, in the control compartment.

TASK 22-11-34-100-801

2. DFCS Mode Control Panel Cleaning

A. General

(1) The mode control panel must not be cleaned with the incorrect liquid. The procedure cautions must be obeyed to make sure that there is no damage to the mode control panel.

B. Consumable Materials

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

C. Location Zones

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

D. Procedure

SUBTASK 22-11-34-420-001

(1) Clean the surface of the MCP:

> **CAUTION** MAKE SURE THAT THE OUTLET HOSE OF COMPRESSED AIR HAS AN AIR IONIZING GUN ATTACHMENT OR AIR IONIZING NOZZLE. YOU CAN DAMAGE THE MCP IF THE AIR IS NOT IONIZED.

(a) Use the compressed air or a brush (soft and natural bristle) to remove light dirt and dust from the surface of the MCP.

> **CAUTION** DO NOT APPLY THE ISOPROPYL ALCOHOL IN LARGE QUANTITIES. THE LIQUID MAY GET INSIDE A COMPONENT OF THE MCP AND CAUSE DAMAGE.

(b) Use the cotton swab with a small quantity of alcohol, B00130 to remove heavy oil and grease from the surface of the MCP.

> **CAUTION** DO NOT USE LIQUID CLEANING AGENTS TO CLEAN THE LIQUID CRYSTAL DISPLAY (LCD). THE LIQUID CLEANING AGENTS CAN CAUSE MOISTURE CONTAMINATION IN THE LCD MODULES.

(c) Use the lens tissue to remove dust, dirt, oil, and grease from the LCD displays and edgelight panel.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DFCS MODE CONTROL PANEL - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the mode control panel (MCP).

(2) An installation of the MCP.

B. The MCP (M198) is in the center of the glare shield, P7, in the control compartment.

TASK 22-11-34-000-801

2. DFCS Mode Control Panel Removal

(Figure 401)

A. References

Reference	Title
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

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

C. MCP Removal

SUBTASK 22-11-34-860-007

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-34-860-008

(2) Turn the PANEL BRIGHT knob on captain's light control module (P1) to OFF.

LOM ALL; AIRPLANES WITH HONEYWELL MCP

NOTE: The MCP light is controlled by the main panel brightness knob (P1-5 panel). To view the light you will have to latch the A/T arm switch in the ARM position and adjust the main panel brightness knob. If the MCP light illuminates, the panel is not defective. Incidentally, leaving the light illuminated for daytime viewing only reduces the bulb life, and therefore is not recommended.

LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-34-020-001

(3) Before you touch the Mode Control Panel (MCP) [3], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 22-11-34-020-007

CAUTION

DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE MCP. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MCP.

(4) Remove the Mode Control Panel (MCP) [3]:

(a) Remove the four mounting screws [2] on the front of the Mode Control Panel (MCP) [3].

(b) Remove the two mounting screws [4] on the bottom of the Mode Control Panel (MCP) [3].

CAUTION

CAREFULLY MOVE THE MODE CONTROL PANEL (MCP) OUT FROM ITS SUPPORTS IN THE GLARE SHIELD TO PREVENT FORCE ON THE ELECTRICAL CABLES. DAMAGE TO THE ELECTRICAL CABLES COULD OCCUR IF YOU PUT TOO MUCH FORCE ON THEM.

(c) Move the Mode Control Panel (MCP) [3] out from its supports in the glare shield until you can get access to the electrical connector [1] at the rear of the MCP unit.

(d) Disconnect the electrical connectors [1].

(e) Remove the Mode Control Panel (MCP) [3] from its supports in the glare shield.

(f) Put protective covers on the electrical connectors [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Mode Control Panel Installation
Figure 401/22-11-34-990-801

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-34-400-801

3. DFCS Mode Control Panel Installation

(Figure 401)

A. General

(1) The installation test makes sure that the mode control panel is installed correctly.

B. References

Reference	Title
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
22-11-34-740-801	Mode Control Panel Installation Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Mode Control Panel (MCP)	22-11-34-02-005	LOM ALL
		31-11-41-02-215	LOM ALL

D. Location Zones

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

E. MCP Installation

SUBTASK 22-11-34-860-009

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-34-420-002

(2) Before you touch the Mode Control Panel (MCP) [3], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 22-11-34-020-008

CAUTION

DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE MCP. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MCP.

(3) Install the Mode Control Panel (MCP) [3]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Remove the protective covers from the electrical connectors [1].

(b) Examine the electrical connectors [1] for bent or broken pins, dirt, and damage.

(c) Move the Mode Control Panel (MCP) [3] onto its supports in the glare shield until the electrical connectors [1] can connect to the rear of the MCP.

(d) Connect the electrical connectors [1].

(e) Move the Mode Control Panel (MCP) [3] into its installed position.

(f) Install the four mounting screws [2] on the front of the Mode Control Panel (MCP) [3].

(g) Install the two mounting screws [4] on the bottom of the Mode Control Panel (MCP) [3].

SUBTASK 22-11-34-860-010

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-34-860-012

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-34-710-001

(6) Do this task: Mode Control Panel Installation Test, TASK 22-11-34-740-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DFCS MODE CONTROL PANEL - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has this task:

(1) An installation test of the DFCS mode control panel (MCP).

C. The MCP is in the center of the glare shield, P7, in the control compartment.

D. The DFCS built-in test equipment (BITE) is used to do the operational test after the installation of the DFCS mode control panel (MCP). The test uses no external equipment. The airplane electrical and hydraulic systems are the only power sources necessary for this task.

TASK 22-11-34-740-801

2. Mode Control Panel Installation Test

A. General

(1) The installation test makes sure that the mode control panel is installed correctly.

B. References

Reference	Title
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)

C. Location Zones

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

D. Installation Test

SUBTASK 22-11-34-860-004

(1) On the captain's main instrument panel (P1), turn the control knob of the AFDS FLOOD lights approximately to the middle position.

SUBTASK 22-11-34-740-001

(2) Do the Line Replaceable Unit (LRU) replacement test for the Digital Flight Control System (DFCS) Mode Control Panel (MCP):

(a) Prepare for the LRU replacement test:

1) Make sure that the BAT switch on the Pilots' Forward Overhead Panel (P5) is in the ON position.

2) Set the STANDBY POWER switch on the Pilots' Forward Overhead Panel (P5) to the AUTO position.

3) Align the Air Data Inertial Reference System (ADIRS). Do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801.

4) Make sure that all the instrument switches, on the P5 Forward Overhead Panel, are in the NORMAL position.

5) Make sure that the airplane is in the ground mode.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

6) Make sure that the autopilot is disengaged.

7) Make sure that the Inertial Reference System (IRS) ground speed is less than 20 knots or the Flight Management Computer (FMC) ground speed is less than 20 knots.

(b) Push the INIT REF key on the Flight Management Computer System (FMCS) Control Display Unit (CDU).

(c) Push the Line Select Key (LSK) adjacent to <INDEX.

(d) Push the LSK adjacent to MAINT>.

(e) Push the LSK adjacent to <DFCS.

NOTE: The DFCS self-test will start and will run for a few seconds.

(f) Push the LSK adjacent to <LRU REPLACEMENT TESTS.

(g) Push the LSK adjacent to <CHANNEL A AND B.

(h) Push the LSK adjacent to <MCP.

(i) Do the preparation steps as shown on the CDU display.

(j) Push the LSK adjacent to <CONTINUE.

NOTE: The A/P (Autopilot) disengage aural warning may sound during the test. This warning does not affect performance and test result. Push the captain or first officer autopilot disengage switch to clear the A/P disengage aural warning after the test is completed.

(k) Make sure that the test is completed with no failure.

NOTE: If a failure occurs, the TEST FAILED indication will show on the CDU display.

(l) If a failure occurs, do these steps:

1) Look at the CDU display and make a note of the channel and the LRU that caused the failure.

NOTE: Before you replace a defective component, do the Built-In-Test Equipment (BITE) on the system (if it is applicable) and on the FMS interface subsystems that have the defective component.

2) Replace the LRU that had the failure.

3) Do the LRU REPLACEMENT TEST for DFCS MCP again.

(m) Make sure that the CDU display shows TEST PASSED.

1) Make sure that the INTERACTIVE TEST PASSED shows on the CDU display at the end of each interactive test.

NOTE: Some tests are too fast to see. The tests passed unless TEST FAILED shows on the CDU display.

SUBTASK 22-11-34-740-002

(3) Continue the instructions on the CDU display:

(a) Push the LSK adjacent to <EXIT when the TEST COMPLETE shows on the CDU display.

(b) Do the instructions on the CDU display.

NOTE: The EXIT CONFIGURATION steps are at the end of the DFCS BITE test. Make sure to not push the INIT REF key to exit out of the steps.

(c) Push the LSK adjacent to <EXIT.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-34-860-020

(4) Make sure that the autopilot stab trim cutout switch, on the control stand, is set at the NORMAL position after the completion of the DFCS BITE test.

LOM 402, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450-999

SUBTASK 22-11-34-860-021

(5) Set the FMC transfer switch, on the P5 forward overhead panel, to the initial position before you did the DFCS BITE test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

DFCS MODE CONTROL PANEL - MAINTENANCE PRACTICES

1. **General**

A. This procedure has these tasks:

(1) DFCS Mode Control Panel Deactivation.

(2) DFCS Mode Control Panel Activation.

(3) DFCS Mode Control Panel Knobs Replacement.

TASK 22-11-34-040-801

2. **DFCS Mode Control Panel - Deactivation**

(Figure 201, Figure 202)

A. General

(1) This procedure removes electrical power from the DFCS Mode Control Panel.

B. Location Zones

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

C. DFCS Mode Control Panel Deactivation

SUBTASK 22-11-34-860-014

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

D. DFCS Mode Control Panel - Tryout

NOTE: This tryout is to make sure the DFCS Mode Control Panel is in a zero energy state.

SUBTASK 22-11-34-860-015

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-34-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) The CDU display shows DFCS BITE INOP CHECK FCC OR INTERFACE.

(e) SELECT, INIT/REF on the keyboard, to exit of BITE.

(f) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-34-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

2375476 S0000543204_V1

DFCS Mode Control Panel
Figure 202/22-11-34-990-804

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-34-440-801

3. DFCS Mode Control Panel - Activation

(Figure 202)

A. General

(1) This procedure adds electrical power to the DFCS Mode Control Panel.

B. Location Zones

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

C. DFCS Mode Control Panel Activation

SUBTASK 22-11-34-860-013

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-34-860-022

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

TASK 22-11-34-900-801

4. DFCS Mode Control Panel Knobs - Replacement

(Figure 203)

A. General

(1) This task includes the steps to replace the left course indicator control knob, right course indicator control knob, speed indicator control knob, heading indicator control knob, or indicator control altitude knob.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

B. Location Zones

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

C. Prepare for the Replacement

SUBTASK 22-11-34-040-001

(1) Do this task: DFCS Mode Control Panel - Deactivation, TASK 22-11-34-040-801.

D. DFCS Mode Control Panel Knobs Replacement

SUBTASK 22-11-34-960-001

(1) Replace the left course indicator control knob [1].
   (a) Loosen the setscrews [2] on the left course indicator control knob [1].
   (b) Remove the left course indicator control knob [1] by pulling on it.
   (c) Install the new left course indicator control knob [1] onto the indicator shaft.
   (d) Make sure that there is clearance of 0.03 ±0.01 in. (0.76 ±0.25 mm) between the bottom face of the knob and the top face of the control panel.
   (e) Install the setscrews [2] in the left course indicator control knob [1].
      1) Tighten the screws to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-002

(2) Replace the speed indicator control knob [3].
   (a) Loosen the setscrews [4] on the speed indicator control knob [3].
   (b) Remove the speed indicator control knob [3] by pulling on it.
   (c) Install the new speed indicator control knob [3] onto the indicator shaft.
   (d) Make sure that there is clearance of 0.03 ±0.01 in. (0.76 ±0.25 mm) between the bottom face of the knob and the top face of the control panel.
   (e) Install the setscrews [4] in the speed indicator control knob [3].
      1) Tighten the screws to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-003

(3) Replace the heading indicator control knob [5].
   (a) Loosen the setscrews [6] on the heading indicator control knob [5].
   (b) Remove the heading indicator control knob [5] by pulling on it.
   (c) Install the new heading indicator control knob [5] onto the indicator shaft.
   (d) Make sure that there is clearance of 0.03 ±0.01 in. (0.76 ±0.25 mm) between the bottom face of the knob and the top face of the bank limit knob.
   (e) Install the setscrews [6] in the heading indicator control knob [5].
      1) Tighten the screws to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-004

(4) Replace the altitude indicator control knob [7].
   (a) Loosen the setscrews [8] on the altitude indicator control knob [7].
   (b) Remove the altitude indicator control knob [7] by pulling on it.
   (c) Install the new altitude indicator control knob [7] onto the indicator shaft.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(d) Make sure that there is clearance of 0.03 ±0.01 in. (0.76 ±0.25 mm) between the bottom face of the knob and the top face of the control panel.

(e) Install the setscrews [8] in the altitude indicator control knob [7].

1) Tighten the screws to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-005

(5) Replace the right course indicator control knob [9].

(a) Loosen the setscrews [10] on the right course indicator control knob [9].

(b) Remove the right course indicator control knob [9] by pulling on it.

(c) Install the new right course indicator control knob [9] onto the indicator shaft.

(d) Make sure that there is clearence of 0.03 ±0.01 in. (0.76 ±0.25 mm) between the bottom face of the knob and the top face of the control panel.

(e) Install the setscrew [10] in the right course indicator control knob [9].

1) Tighten the screws to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-34-440-001

(1) Do this task: DFCS Mode Control Panel - Activation, TASK 22-11-34-440-801.

SUBTASK 22-11-34-710-004

(2) Make sure that the indicator control knob works correctly.

(a) Rotate the knob back and forth.

(b) Make sure that the indicator window changes.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

MODE CONTROL PANEL

2883000 S0000682670_V1

DFCS Mode Control Panel Knobs Installation
Figure 203/22-11-34-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Integrated Flight System Accessory Unit (IFSAU) Deactivation

(2) Integrated Flight System Accessory Unit (IFSAU) Activation

TASK 22-11-37-040-801

2. Integrated Flight System Accessory Unit - Deactivation

(Figure 201, Figure 202)

A. General

(1) This procedure removes electrical power to the IFSAU.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

C. Location Zones

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

D. Integrated Flight System Accessory Unit Deactivation

SUBTASK 22-11-37-860-013

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

E. IFSAU - Tryout

NOTE: This tryout is to make sure the IFSAU system is in a zero energy state.

SUBTASK 22-11-37-860-015

> **WARNING** MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-37-860-016

(2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306			
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
LOM ALL			
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	3	C01047	AFCS MCP DC 2
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306			
D	3	C01630	AFCS SYS B RUDDER DC
LOM ALL			

These circuit breakers are inoperative and should remain open:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426, 432; LOM 427 POST SB 737-22-1306			
E	4	C01629	AFCS SYS A RUDDER DC (INOP)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	3	C01630	AFCS SYS B RUDDER DC (INOP)

LOM ALL

SUBTASK 22-11-37-700-001

(3) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore this message, “400 HZ PWR INV---MSG22-11333”.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

1) Make sure that 0.00 +/-5.00 VAC appears on both FCC-A and FCC-B opposite “SNSR EXC AC (J1C-G05)”

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer
Figure 201/22-11-37-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Integrated Flight System Accessory Unit
Figure 202/22-11-37-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-37-440-801

3. **Integrated Flight System Accessory Unit - Activation**
(Figure 202)

A. **General**

(1) This procedure adds electrical power to the IFSAU.

B. **Location Zones**

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

C. **Integrated Flight System Accessory Unit Activation**

SUBTASK 22-11-37-860-018

> **WARNING** MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-37-860-019

(2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	1	C00721	AUTOTHROTTLE DC 1
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306			
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
LOM ALL			
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	3	C01047	AFCS MCP DC 2

LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306

D	3	C01630	AFCS SYS B RUDDER DC

LOM ALL

These circuit breakers are inoperative and should remain open:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name

LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-426, 432; LOM 427 POST SB 737-22-1306

E	4	C01629	AFCS SYS A RUDDER DC (INOP)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	3	C01630	AFCS SYS B RUDDER DC (INOP)

LOM ALL

SUBTASK 22-11-37-860-020

(3) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the Integrated Flight System Accessory Unit (IFSAU).

(2) An installation of the IFSAU.

B. The IFSAU is on the E1 electronic equipment rack, shelf number 1, in the main equipment center.

TASK 22-11-37-000-801

2. Integrated Flight System Accessory Unit (IFSAU) Removal

(Figure 401)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
20-10-07-000-801	E/E Box Removal (P/B 201)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

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

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Removal Procedure

SUBTASK 22-11-37-860-001

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

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
A	10	C01377	RADIO NAVIGATION NAV SNSR DC-2
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-37-730-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
B	1	C01376	RADIO NAVIGATION NAV SNSR DC-1
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
E	2	C00412	INSTR XFR
E	8	C00425	ADIRU LEFT EXC

SUBTASK 22-11-37-010-001

(3) To get access to the electrical and electronics compartment, open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

Do this task: Finding an Access Door or Panel on the Lower Half of the Fuselage, TASK 06-41-00-800-801.

SUBTASK 22-11-37-020-001

CAUTION DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE IFSAU. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE IFSAU.

(4) Before you touch the Integrated Flight System Accessory Unit (IFSAU), do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 22-11-37-020-003

(5) To remove the IFSAU, do this task: E/E Box Removal, TASK 20-10-07-000-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Integrated Flight System Accessory Unit (IFSAU) Installtion
Figure 401/22-11-37-990-804 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

INTEGRATED FLIGHT SYSTEM ACCESSORY UNIT (IFSAU)

B

HANDLE

C

NOTE:

ADJUST FRONT HOLD DOWNS AS FOLLOWS:
WITH PLUG ON THE REAR OF UNIT FULLY ENGAGED AND THE HANDLE LEVER ON THE FRONT OF THE UNIT AT THE DIMENSION SHOWN, ADJUST FORKS BY ROTATING TO A POSITION WHERE THEY START TO EXERT PRESSURE ON THE LOCKING LEVER.

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Integrated Flight System Accessory Unit (IFSAU) Installtion
Figure 401/22-11-37-990-804 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-37-400-801

3. **Integrated Flight System Accessory Unit Installation**
(Figure 401)

A. **General**

(1) The installation test at the end of this procedure makes sure that the Integrated Flight System Accessory Unit (IFSAU) is installed correctly.

B. **References**

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Lower Half of the Fuselage (P/B 201)
20-10-07-400-801	E/E Box Installation (P/B 201)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
22-11-00-700-801	Land Verify Test (P/B 201)
22-11-00-740-801	Digital Flight Control System (DFCS) - Operational Test (P/B 501)

C. **Tools/Equipment**

Reference	Description
STD-600	Mirror - Inspection

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

F. **Integrated Flight System Accessory Unit Installation**

SUBTASK 22-11-37-860-002

(1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
A	10	C01377	RADIO NAVIGATION NAV SNSR DC-2
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-37-730-002

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
B	1	C01376	RADIO NAVIGATION NAV SNSR DC-1
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
E	2	C00412	INSTR XFR
E	8	C00425	ADIRU LEFT EXC

SUBTASK 22-11-37-020-002

CAUTION DO NOT TOUCH THE CONNECTOR PINS OR OTHER CONDUCTORS ON THE INTEGRATED FLIGHT-SYSTEM ACCESSORY-UNIT (IFSAU). IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE IFSAU.

(3) Before you touch the IFSAU, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 22-11-37-420-001

(4) To install the IFSAU, do this task: E/E Box Installation, TASK 20-10-07-400-801.

(a) Make sure that the IFSAU lever is in the open position before moving the IFSAU into the tray.

(b) Make sure that the lever engages the shelf-mounted fork.

(c) Make sure that the lever latched into the locked position.

(d) Make sure that electrical connectors are properly engaged behind the unit.

NOTE: If necessary, use an inspection mirror, STD-600 to visually check the engagement of the electrical connectors.

(e) Pull on the handle of the IFSAU to make sure that the electrical connectors and the lever latch are fully engaged.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-37-860-003

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

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
A	10	C01377	RADIO NAVIGATION NAV SNSR DC-2
C	14	C01008	ADIRU RIGHT AC
C	15	C00426	ADIRU RIGHT EXC
C	17	C01010	ADIRU RIGHT DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	3	C01631	AFCS INTLK 2
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-37-730-003

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
B	1	C01376	RADIO NAVIGATION NAV SNSR DC-1
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1
E	5	C01009	ADIRU LEFT DC
E	7	C01007	ADIRU LEFT AC

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
E	2	C00412	INSTR XFR
E	8	C00425	ADIRU LEFT EXC

SUBTASK 22-11-37-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-37-410-001

(8) Do this task: Finding an Access Door or Panel on the Lower Half of the Fuselage, TASK 06-41-00-800-801.

Close this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

G. Prepare for the Test

SUBTASK 22-11-37-860-005

(1) Set the autopilot stab trim cutout switch on the control stand to CUTOUT.

SUBTASK 22-11-37-860-006

(2) Make sure that the VHF NAV and IRS switches on the P5 forward overhead panel are in NORMAL.

SUBTASK 22-11-37-860-007

(3) Set the left and right IRS select switches on the P5 aft overhead panel to ALIGN or NAV.

H. Installation Test

SUBTASK 22-11-37-740-001

(1) Do the following Digital Flight Control System (DFCS) BITE tests to verify the IFSAU interfaces for correct operation:

(a) Do the DFCS BITE CURRENT STATUS AUTOTEST (TASK 22-11-00-740-801).

1) Make sure that the CURRENT STATUS test passes with no failures.

(b) Do this task: Land Verify Test, TASK 22-11-00-700-801.

1) Make sure that the LAND VERIFY test passes with no failures.

SUBTASK 22-11-37-800-001

(2) Follow the instructions on the CDU display to fully exit the DFCS BITE mode:

(a) Push the LSK adjacent to EXIT.

(b) Follow the instructions on the CDU display.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-37-860-008

(1) Push the captain's or first officer's autopilot disengage switch on the control wheel to make sure that the autopilot is disengaged.

SUBTASK 22-11-37-860-009

(2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

SUBTASK 22-11-37-860-010

(3) Set the autopilot stab trim cutout switch on the control stand to NORMAL.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TAKEOFF/GO-AROUND SWITCH - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Takeoff/Go-Around Switch Deactivation.

(2) Takeoff/Go-Around Switch Activation.

TASK 22-11-39-040-801

2. Takeoff/Go-Around Switch - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical power to the Takeoff/Go-Around Switch.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-39-860-009

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC

D. Takeoff/Go-Around Switch - Tryout

NOTE: This tryout is to make sure the Takeoff/Go-Around Switch is in a zero energy state.

SUBTASK 22-11-39-860-010

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-39-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-39-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-39-440-801

3. Takeoff/Go-Around Switch - Activation

(Figure 201)

A. General

(1) This procedure adds electrical power to the Takeoff/Go-Around Switch.

B. Location Zones

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

C. Takeoff/Go-Around Switch Activation

SUBTASK 22-11-39-860-011

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

SUBTASK 22-11-39-860-013

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TAKEOFF/GO-AROUND SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a Takeoff Go-Around (TOGA) switch.

(2) The installation of a TOGA switch.

B. There are two TOGA switches (S786 and S787). You can find the TOGA switch on the top of the aft edge of each thrust lever.

TASK 22-11-39-000-801

2. Takeoff/Go-Around Switch Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-3905	Gun - Soldering

B. Consumable Materials

Reference	Description	Specification
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	
G51210	Tubing - Highly Flame-Retardant, Low-Shrink Temperature, Polyolefin	AMS-DTL-23053/5 Class 1

C. Location Zones

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

D. Removal Procedure

SUBTASK 22-11-39-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-39-860-002

(2) Make sure that the engines are not in operation.

SUBTASK 22-11-39-860-003

(3) Put the thrust lever in a position so that you can get access to the switch [6].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-39-010-001

(4) Remove the applicable cover [4] or [5] from the left or right thrust lever.

(a) Remove the screws [7] from the applicable cover.

SUBTASK 22-11-39-020-001

(5) Do these steps to remove the switch [6]:

(a) Remove the lacing tape that attaches the TOGA switch wire bundle.

(b) Remove the screws [8] which attach the switch holder [3] and the switch [6] to the thrust lever.

(c) Remove the hex nut [1], and the lockwasher [2] from the switch [6].

(d) Remove the switch [6] from the switch holder [3].

(e) Remove the heat shrinkable RT-876 sleeve, G01148 or Versafit heat shrink tubing, G51210 from the switch terminals.

(f) Use the soldering gun, STD-3905 to melt the solder on the switch terminals to release the wires from the switch [6].

1) Make a record of the wire positions and the locations of the switch terminals.

(g) Remove the switch [6].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LEFT THRUST LEVER
(EXAMPLE)
(RIGHT THRUST LEVER IS EQUIVALENT)

A

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Takeoff/Go-Around Switch Installation
Figure 401/22-11-39-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-39-400-801

3. TOGA Switch Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Tools/Equipment

Reference	Description
STD-442	Gun - Heat, 180 deg. F (82 deg. C) Maximum Output Temperature
STD-3905	Gun - Soldering

C. Consumable Materials

Reference	Description	Specification
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	
G51210	Tubing - Highly Flame-Retardant, Low-Shrink Temperature, Polyolefin	AMS-DTL-23053/5 Class 1

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Switch	22-11-39-01-020	LOM ALL
		22-11-39-01A-025	LOM ALL

E. Location Zones

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

F. TOGA Switch Installation

SUBTASK 22-11-39-860-004

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	3	C01046	AFCS SYS B FCC DC
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-39-420-001

(2) Do these steps to install the switch [6]:

(a) Put the wire for each terminal of the switch [6] through a heat shrinkable RT-876 sleeve, G01148, or Versafit heat shrink tubing, G51210.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(b) Use the soldering gun, STD-3905, to solder the wires to the new TOGA switch terminals.

(c) Push the heat shrinkable RT-876 sleeve, G01148, or Versafit heat shrink tubing, G51210, on all of the switch terminals.

(d) Use the heat 180 deg. F (82 deg. C) maximum output temperature heat gun, STD-442, to blow the hot air on the heat shrinkable RT-876 sleeve, G01148, or Versafit heat shrink tubing, G51210, to make it smaller and tighter.

(e) Put the switch [6] in the switch holder [3].

1) Install the lockwasher [2] and hex nut [1].

(f) Install the switch [6] and switch holder [3] in the thrust lever with the screws [8].

(g) Use the lacing tape to attach the TOGA switch wire bundle.

(h) Install the applicable cover [4] or cover [5] with the screws [7].

SUBTASK 22-11-39-860-005

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-39-860-014

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

G. Installation Test

SUBTASK 22-11-39-860-006

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

SUBTASK 22-11-39-740-001

(2) Do this BITE test:

(a) Push the INIT REF key on the CDU keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

(c) INDEX

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(d) MAINT

(e) A/T

(f) INTERACTIVE

(g) INPUT DISCRETES

(h) Find the CDU display that shows the input discrete for the TOGA.

1) Push the LSK adjacent to INPUT DISCRETES.

2) Follow the instructions on the CDU.

NOTE: This test checks numerous inputs of the A/T system. If a fault does occur during the tests troubleshooting tips will be displayed at test completion.

3) Make sure that the TEST PASSED shows on the CDU.

4) Push the LSK adjacent to INDEX to return to the INTERACTIVE INDEX page.

SUBTASK 22-11-39-860-007

(3) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

HYDRAULIC PRESSURE SWITCH - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Hydraulic Pressure Switch Deactivation.

(2) Hydraulic Pressure Switch Activation.

TASK 22-11-40-040-801

2. Hydraulic Pressure Switch - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical and hydraulic pressure from the Hydraulic Pressure Switch.

B. References

Reference	Title
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Hydraulic Pressure Switch Deactivation

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

SUBTASK 22-11-40-860-019

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-010-003

(2) For the A/P aileron actuators, do these steps:

(a) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

WARNING

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

(b) Make sure that you install the landing gear downlock pins (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 22-11-40-010-004

(3) For the A/P elevator actuators, do this step:

(a) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

SUBTASK 22-11-40-860-020

(4) Attach the DO NOT OPERATE tag, STD-858, to the captain's and first officer's control columns.

F. Hydraulic Pressure Switch Tryout

NOTE: This tryout is to make sure that the Hydraulic Pressure Switch is in a zero energy state.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-40-860-022

WARNING	MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-40-990-803

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-40-440-801

3. **Hydraulic Pressure Switch - Activation**
(Figure 201)

A. **General**

(1) This procedure adds electrical power and hydraulic pressure to the Hydraulic Pressure Switch.

B. **References**

Reference	Title
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)

C. **Location Zones**

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

D. **Hydraulic Pressure Switch Activation**

SUBTASK 22-11-40-860-023

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-860-026

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-40-410-002

(3) For the A/P aileron actuators, do this step:

(a) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

SUBTASK 22-11-40-410-003

(4) For the A/P elevator actuators, do this step: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

HYDRAULIC PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of a hydraulic pressure switch.

(2) The installation of a hydraulic pressure switch.

B. There is one hydraulic pressure switch on each A/P actuator. The removal and installation procedures of the hydraulic pressure switch are the same on all of the A/P actuators (A/P Aileron Actuators and A/P Elevator Actuators).

C. You can find the A/P aileron actuator A (M943) and the A/P aileron actuator B (M1024) in the left main landing gear wheel well.

D. You can find the A/P elevator actuator A (M1020) and the A/P elevator actuator B (M1022) on the aft bulkhead at Body station 1156.

TASK 22-11-40-000-801

2. Hydraulic Pressure Switch Removal

(Figure 401)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-31-00-800-802	Remove Pressure from the Elevator Hydraulic Systems A and B (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

D. Prepare for the Removal

SUBTASK 22-11-40-860-001

(1) For the A/P (Autopilot) aileron actuators, do these steps:

(a) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

(b) Release pressure from the reservoir for the applicable hydraulic system (TASK 29-09-00-860-802).

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **WARNING** YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(c) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

SUBTASK 22-11-40-010-001

(2) For the A/P elevator actuators, do these steps:

(a) Do this task: Remove Pressure from the Elevator Hydraulic Systems A and B, TASK 27-31-00-800-802.

(b) Release pressure from the reservoir for the applicable hydraulic system (TASK 29-09-00-860-802).

(c) Open this access door, to get access to the A/P elevator actuators:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-40-860-002

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

E. Hydraulic Pressure Switch Removal

SUBTASK 22-11-40-020-001

(1) Do these steps to remove the hydraulic pressure switch [1]:

(a) Disconnect the electrical connector from the hydraulic pressure switch [1].

(b) Remove the lockwire from the hydraulic pressure switch [1] (TASK 20-10-44-000-801).

(c) Remove the hydraulic pressure switch [1].

(d) Remove the packing [2] and discard it.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) Install a cover on the open hydraulic port.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

A/P ACTUATORS (EXAMPLE)

C

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Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-40-400-801

3. **Hydraulic Pressure Switch - Installation**

(Figure 401)

A. **References**

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
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)
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)
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)

B. **Consumable Materials**

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Switch	22-11-40-01-010	LOM ALL
		22-11-40-02-010	LOM ALL
2	Packing	22-11-40-01-015	LOM ALL
		22-11-40-02-005	LOM ALL

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F. Prepare for the Installation

SUBTASK 22-11-40-860-003

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-860-004

(2) For the A/P aileron actuators, make sure that the pressure from the aileron hydraulic systems A and B are removed (TASK 27-11-00-860-801).

SUBTASK 22-11-40-860-028

WARNING YOU MUST CAREFULLY INSTALL THE GROUND LOCKS IN ALL LANDING GEAR. AN ACCIDENTAL RETRACTION OF THE LANDING GEAR CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Make sure that the landing gear downlock pins are installed (TASK 32-00-01-480-801).

SUBTASK 22-11-40-860-029

(4) For the A/P elevator actuators, make sure that the pressure from the elevator hydraulic systems A and B are removed (TASK 27-31-00-800-802).

SUBTASK 22-11-40-010-005

(5) Make sure that this access panel is removed:

Number	Name/Location
318BR	Tailcone Access Door

G. Hydraulic Pressure Switch Installation

SUBTASK 22-11-40-020-002

(1) Remove the cover from the hydraulic port.

SUBTASK 22-11-40-420-001

(2) Do these steps to install the hydraulic pressure switch [1]:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Apply a layer of the MCS 352B fluid, D00054, or hydraulic fluid, D00153, to the new packing [2].

(b) Apply a layer of the hydraulic MCS 352B fluid, D00054, or hydraulic fluid, D00153, to the threads of the hydraulic pressure switch [1].

(c) Install the packing [2] on the hydraulic pressure switch [1].

(d) Install the hydraulic pressure switch [1].

(e) Tighten the aileron hydraulic pressure switch [1] to 70 in-lb (7.9 N·m) - 115 in-lb (13.0 N·m).

(f) Tighten the elevator hydraulic pressure switch [1] to 70 in-lb (7.9 N·m) - 120 in-lb (13.6 N·m).

(g) Install MS20995NC32 lockwire, G01912, on the hydraulic pressure switch [1] per double twist method (TASK 20-10-44-400-801).

(h) Connect the electrical connector to the hydraulic pressure switch [1].

SUBTASK 22-11-40-860-005

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-860-027

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H. Prepare for the Test

SUBTASK 22-11-40-860-007

(1) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-40-860-008

(2) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-40-860-009

(3) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-40-860-024

(4) 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 22-11-40-860-025

(5) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

SUBTASK 22-11-40-860-010

WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

I. Installation Test

SUBTASK 22-11-40-740-001

(1) Do this BITE test:

(a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

(b) Push the Line Select Key (LSK) that is adjacent to each selection:

NOTE: If the CONTINUE shows during the BITE test, then do the instructions that show on the CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change page if it is necessary.

1) INDEX

2) MAINT

3) DFCS

4) EXTENDED MAINTENANCE

5) BITE LIBRARY TEST

6) Make a selection for the applicable channel:

NOTE: The A/P aileron actuator A and A/P elevator actuator A have interfaces with the Flight Control Computer A (FCC-A) (Channel A). The A/P aileron actuator B and A/P elevator actuator B have interfaces with the Flight Control Computer B (FCC-B) (Channel B).

7) CHANNEL A

8) CHANNEL B

ECCN 9E991 BOEING PROPRIETARY - See title page for details

9) CHANNEL A AND B

10) RUN SELECT LIBRARY TESTS

11) 3O ELEV CONTROL or 31 AIL CONTROL

NOTE: The 30 ELEV CONTROL is for the A/P elevator actuators and 31 AIL CONTROL is for the A/P aileron actuators.

12) EXECUTE

13) Do the instructions that show on the CDU to complete the test.

14) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

SUBTASK 22-11-40-210-001

(2) Visually examine the hydraulic pressure switch.

(a) Make sure that there is no hydraulic leak.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-40-860-011

(1) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

SUBTASK 22-11-40-860-017

(2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-40-860-013

(3) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-40-860-014

(4) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-40-410-001

(5) Close this access door:

Number	Name/Location
318BR	Tailcone Access Door

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT DISENGAGE SWITCH - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autopilot Disengage Switch Deactivation.

(2) Autopilot Disengage Switch Activation.

TASK 22-11-41-040-801

2. Autopilot Disengage Switch - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical power from the Autopilot Disengage Switch.

B. Location Zones

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

C. Procedure

SUBTASK 22-11-41-860-012

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

D. Autopilot Disengage Switch - Tryout

NOTE: This tryout is to make sure the Autopilot Disengage Switch is in a zero energy state.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-41-860-013

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-41-700-001

(2) Do these steps:

(a) Push the CMD A or CMD B autopilot engage switch on the mode control panel to engage the autopilot.

1) Make sure that the CMD A or CMD B autopilot engage switch light does not come on.

(b) Push the captain or first officer autopilot disengage switch on the control wheel to disengage the autopilot.

1) Make sure that the A/P warning lights do not flash.

2) Make sure that the A/P disengage warning sound does not come on.

3) Push the captain or first officer autopilot disengage switch again.

a) Make sure that the A/P warning lights do not come on.

b) Make sure that there is no A/P disengage warning sound.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

CONTROL WHEEL

A

2375499 S0000543277_V1

Autopilot Disengage Switch
Figure 201/22-11-41-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-41-440-801

3. **Autopilot Disengage Switch - Activation**
(Figure 201)

A. **General**

(1) This procedure adds electrical power to the Autopilot Disengage Switch.

B. **Location Zones**

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

C. **Autopilot Disengage Switch Activation**

SUBTASK 22-11-41-860-014

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-41-860-016

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOPILOT DISENGAGE SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of an autopilot disengage switch.

(2) The installation of an autopilot disengage switch.

B. You can find the two autopilot disengage switches (S231 and S232) on each outboard horn of the pilot's control wheel. The switch is a single action, multipole, pushbutton type. A switch plate holds the switch in its position.

C. The removal and installation tasks are the same for the two autopilot disengage switches.

TASK 22-11-41-000-801

2. Autopilot Disengage Switch Removal

(Figure 401)

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-3934	Tool - Electrical Contact Insertion/Extraction, 20 Gauge Part #: M15570-20 Supplier: 00779 Part #: M81969/1-02 Supplier: 11851 Part #: M81969/14-11 Supplier: 11851 Opt Part #: MS3447-20 Supplier: 58960

B. Location Zones

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

C. Removal Procedure

SUBTASK 22-11-41-860-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-41-020-001

(2) Do these steps to remove the switch [1]:

(a) At the center of the control wheel, remove the screws [4] on the medallion and approach plate [5].

NOTE: The medallion is part of the approach plate.

1) Remove the medallion and approach plate [5].

(b) Use the extraction insertion/extraction tool, COM-3934 to disconnect the eight wires on the autopilot disengage switch side of the wire connectors in the center of the control wheel.

(c) Attach one end of the threading wire around the eight wires that connect to the switch [1].

NOTE: For the threading wire, you can use a 30-inch (76.2 centimeters) length of standard wire (No. 18 to 20 gage, without insulation).

(d) Remove the screw [3] on the outboard horn of the control wheel.

(e) Remove the switch plate [2].

(f) Pull the switch [1] and its eight wires through the control wheel horn slowly until the threading wire shows.

NOTE: Pull until approximately 3 inches (76.2 millimeters) of the threading wire comes out of the control wheel horn. Do not remove the threading wire. It is necessary to use this threading wire for the installation.

(g) Remove the eight wires from the threading wire.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

Autopilot Disengage switch Installation
Figure 401/22-11-41-990-801

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-41-400-801

3. Autopilot Disengage Switch Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)

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-3934	Tool - Electrical Contact Insertion/Extraction, 20 Gauge Part #: M15570-20 Supplier: 00779 Part #: M81969/1-02 Supplier: 11851 Part #: M81969/14-11 Supplier: 11851 Opt Part #: MS3447-20 Supplier: 58960

C. Consumable Materials

Reference	Description	Specification
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Switch	22-11-41-01-025	LOM ALL

E. Location Zones

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

F. Autopilot Disengage Switch Installation

SUBTASK 22-11-41-860-002

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-41-420-001

(2) Do these steps to install the switch [1]:

(a) Install the switch plate [2] on the autopilot disengage switch [1] with the primer, C00259.

NOTE: Apply the primer, C00259, on the threads only.

(b) Make sure that the threading wire is in the control wheel horn and the two ends of the threading wire show.

(c) Attach the end of the threading wire that comes out of the control wheel horn around the eight wires of the switch [1].

(d) Pull the eight wires down through the control wheel horn with the opposite end of the threading wire.

(e) Put the switch [1] in its position for installation.

1) Install the switch plate [2] to the control wheel horn with the screw [3].

(f) Remove the threading wire from the eight wires.

(g) Use the insertion insertion/extraction tool, COM-3934, to connect the eight wires to the wire connectors in the center of the control wheel.

NOTE: There are two equivalent switches you can use for the autopilot disconnect function. The switches have different part numbers and some different wire colors.

NOTE: The wires on the 721101-A1 switch are white. The switch wire labels are stamped onto the wires. The wires on the SW43896 switch each have a different color.

NOTE: In the AIRPLANE WIRE COLOR column of the table, the second color is for the stripe on the wire.

(h) Use Table 401 for the switch part number 721101-A1 or Table 402 for the switch part number SW43896.

Table 401/22-11-41-993-802 Wire Colors for Switch 721101-A1

SWITCH WIRE LABEL	AIRPLANE WIRE COLOR
BKB	BLACK/BLUE
BRN	BROWN
GRN	GREEN
YEL	YELLOW
BKG (Not Used)	(Not Used)
BKY (Not Used)	(Not Used)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Table 401/22-11-41-993-802 Wire Colors for Switch 721101-A1 (Continued)

SWITCH WIRE LABEL	AIRPLANE WIRE COLOR
BKA	BLACK/GRAY
BLU	BLUE

Table 402/22-11-41-993-803 Wire Colors for Switch SW43896

SWITCH WIRE COLOR	AIRPLANE WIRE COLOR
BLACK	BLACK/BLUE
BROWN	BROWN
GREEN	GREEN
YELLOW	YELLOW
GRAY (Not Used)	(Not Used)
ORANGE (Not Used)	(Not Used)
WHITE	BLACK/GRAY
BLUE	BLUE

(i) Put the wire connectors on top of the terminal block [6].

(j) Install the medallion and approach plate [5] with the screws [4].

SUBTASK 22-11-41-860-003

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-41-860-017

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-41-860-004

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

SUBTASK 22-11-41-860-005

(6) Make sure that the autopilot stab trim cutout switch, on the control stand, is in the NORMAL position.

SUBTASK 22-11-41-860-006

(7) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-41-860-007

(8) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-41-860-008

WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Supply hydraulic power to hydraulic systems A and B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

G. Installation Test

SUBTASK 22-11-41-740-001

(1) Do this manual test:

(a) Push the CMD A or CMD B autopilot engage switch on the mode control panel to engage the autopilot.

1) Make sure that the CMD A or CMD B autopilot engage switch light comes on.

(b) Push the captain or first officer autopilot disengage switch on the control wheel to disengage the autopilot.

1) Make sure that the A/P warning lights flash.

2) Make sure that the A/P disengage warning sound comes on.

3) Push the captain or first officer autopilot disengage switch again.

a) Make sure that the A/P warning lights go off.

b) Make sure that there is no A/P disengage warning sound.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-41-860-009

(1) Remove hydraulic power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-41-860-010

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM MOTOR (AUTOPILOT TEST) - ADJUSTMENT/TEST

1. General

A. This procedure has one task. This task makes sure that the stabilizer trim motor operates correctly.

TASK 22-11-81-710-801

2. Stabilizer Trim Motor Autopilot Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
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)
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 22-11-81-860-001

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

SUBTASK 22-11-81-860-006

(2) Set the autopilot stab trim cutout switch, on the control stand, to the NORMAL position.

SUBTASK 22-11-81-860-007

(3) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-81-860-008

(4) Do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801.

SUBTASK 22-11-81-860-002

> **WARNING**
> KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-81-980-001

(6) Set the stabilizer to 5 units of trim.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-81-860-003

(7) Make sure that the trailing edge flaps are in the UP position.

SUBTASK 22-11-81-980-002

(8) Engage the autopilot A in the CWS mode.

SUBTASK 22-11-81-980-003

(9) Pull the control column to the aft position approximately 2 inches (51 mm). Release the control column. To prevent a camout of the control column, keep the force on the control column below 15 pounds.

NOTE: These conditions can cause the STAB OUT OF TRIM light to come on during the test:

1. Camout of the control column.
2. STAB NOSE UP or STAB NOSE DOWN limit switches are engaged.
3. The Stab Trim Motor is bad and did not operate at the correct rate.

SUBTASK 22-11-81-210-001

(10) Make sure that these occur:

(a) The stabilizer starts to move.

(b) The stabilizer leading edge moves down at a rate of 3 units in 30 to 40 seconds.

SUBTASK 22-11-81-980-004

(11) Disengage the autopilot A.

SUBTASK 22-11-81-980-005

(12) Set the stabilizer to 5 units of trim.

SUBTASK 22-11-81-980-006

(13) Extend the flaps to 5 degrees.

SUBTASK 22-11-81-980-007

(14) Engage the autopilot B in the CWS mode.

SUBTASK 22-11-81-980-008

(15) Push the control column to the fwd position approximately 2 inches (51 mm). Release the control column. To prevent a camout of the control column, keep the force on the control column below 15 pounds.

NOTE: These conditions can cause the STAB OUT OF TRIM light to come on during the test:

1. Camout of the control column.
2. STAB NOSE UP or STAB NOSE DOWN limit switches are engaged.
3. The Stab Trim Motor is bad and did not operate at the correct rate.

SUBTASK 22-11-81-210-002

(16) Make sure that these occur:

(a) The stabilizer starts to move.

(b) The stabilizer leading edge moves up at a rate of 1 unit in 4 to 7 seconds.

SUBTASK 22-11-81-980-009

(17) Disengage the autopilot B.

SUBTASK 22-11-81-860-010

(18) Set the mode select switches on the inertial reference system (IRS) and mode select unit (MSU) to the OFF position.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-81-980-010

(19) Set the flaps in the UP position.

SUBTASK 22-11-81-860-004

(20) Remove hydraulic power from hydraulic systems A and B. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-81-860-005

(21) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Pitch Control Wheel Steering Force Transducer Deactivation.

(2) Pitch Control Wheel Steering Force Transducer Activation.

TASK 22-11-92-040-801

2. Pitch Control Wheel Steering Force Transducer - Deactivation

(Figure 201)

A. General

(1) This procedure removes electrical power and hydraulic pressure from the Pitch Control Wheel Steering Force Transducer.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Procedure

SUBTASK 22-11-92-860-015

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-92-010-006

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 22-11-92-860-016

(3) Attach DO NOT OPERATE tag, STD-858 on the captain's and first officer's control columns.

F. Pitch Control Wheel Steering Force Transducer - Tryout

NOTE: This tryout is to make sure the Pitch Control Wheel Steering Force Transducer is in a zero energy state.

SUBTASK 22-11-92-860-018

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-92-700-001

(2) Use the FMC - CDU and do the following test (Figure 201):

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) SELECT, INIT/REF on the keyboard.

(b) SELECT, "INDEX" (LSK 6L).

(c) SELECT, "MAINT" (LSK 6R).

(d) SELECT, "DFCS" (LSK 2L).

1) DFCS will run the self test and display as following:

- FCC-A SELF TEST FAIL
- FCC-B SELF TEST FAIL
- CROSS CHANNEL TEST PASS

(e) SELECT, "CONTINUE" (LSK 6R)

NOTE: Ignore the message that appears.

(f) SELECT, "CONTINUE" (LSK 6R).

(g) SELECT, "EXTENDED MAINTENANCE"(LSK 4L).

(h) SELECT, "SENSOR VALUES"(LSK 4L).

(i) SELECT, "DISCRETE INPUTS"(LSK 5L).

(j) SELECT, "CIRCUIT BREAKER CHECK"(LSK 5R).

(k) SELECT, INIT/REF on the keyboard, to exit of BITE.

(l) End of test.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Flight Management Computer Control Display Unit
Figure 201/22-11-92-990-805

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-92-440-801

3. **Pitch Control Wheel Steering Force Transducer - Activation**
(Figure 201)

A. **Pitch Control Wheel Steering Force Transducer Activation**

(1) This procedure adds electrical power and hydraulic pressure to the Pitch Control Wheel Steering Force Transducer.

B. **References**

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

C. **Location Zones**

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Procedure**

SUBTASK 22-11-92-860-019

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-92-860-021

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-92-410-004

(3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of the pitch control wheel steering force transducer

(2) An installation of the pitch control wheel steering force transducer.

B. The pitch control wheel steering force transducer is referred to as the pitch force transducer [1] in this procedure.

C. Each control column has one pitch force transducer installed on the assembly of the elevator control quadrant. The two pitch force transducers are installed opposite to each other.

TASK 22-11-92-000-801

2. Pitch Force Transducer Removal

(Figure 401)

A. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

B. Access Panels

Number	Name/Location
112A	Forward Access Door

C. Prepare for the Removal

SUBTASK 22-11-92-860-012

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-92-940-001

(2) Do these steps to prepare for the removal:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) To get access to the pitch force transducer [1], open this access door:

Number	Name/Location
112A	Forward Access Door

(b) Remove the lockwire from the mass balance weight [4].

(c) Remove the bolts [2] and washers [3] that attach the mass balance weight [4] to the forward quadrant assembly.

D. Pitch Force Transducer Removal

SUBTASK 22-11-92-020-003

(1) Do these steps to remove the pitch force transducer [1]:

(a) Disconnect the pitch force transducer connectors.

(b) Remove electrical cables from the clamps [5].

(c) Loosen the bolts [16] on the quadrant assembly.

1) Do not remove bolts [16] fully.

NOTE: This avoids possible damage to rod-end assembly.

(d) Remove the bolt [6], washer [10], and nut [11] from the pitch adjustable rod end [7] of the pitch force transducer [1].

(e) Remove the bolt [15], washer [10], and nut [11] from the pitch force transducer [1] and quadrant assembly.

(f) Remove the pitch force transducer [1].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FORWARD ACCESS DOOR

A

G22789 S0006564138_V2

Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-804 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR FORWARD CONTROL QUADRANT ASSEMBLY
(LEFT SIDE SHOWN, RIGHT SIDE IS EQUIVALENT)

B

1 LEFT SIDE OF FORWARD QUADRANT ASSEMBLY ONLY

G22790 S0006564139_V3

Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-804 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER
(LEFT SIDE SHOWN, RIGHT SIDE IS EQUIVALENT)

Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-804 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-92-400-801

3. Pitch Force Transducer Installation

(Figure 401)

A. References

Reference	Title
22-11-92-730-801	Pitch Force Transducer Test (P/B 501)
22-11-92-820-801	Pitch Force Transducer Adjustment (DFCS BITE Test) (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Transducer	22-11-92-01-025	LOM ALL

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

D. Access Panels

Number	Name/Location
112A	Forward Access Door

E. Pitch Force Transducer Installation

SUBTASK 22-11-92-860-013

(1) Loosen the adjustable rod end [7] and locknut [8] until the adjusting nut [12] and adjustable rod end [7] can be turned.

(a) If installed, remove lockwire from the locknut [8], locknut [18], locktab [17], and adjusting nut [12].

SUBTASK 22-11-92-420-002

(2) Put the pitch force transducer [1] into position on the quadrant assembly.

NOTE: The adjustable rod end must point forward on the right quadrant. The adjustable rod end must point aft on the left quadrant.

SUBTASK 22-11-92-020-006

(3) Make sure that the bolts [16] are loose.

SUBTASK 22-11-92-420-003

(4) Attach electrical cables to the electrical clamps [5].

NOTE: Do not pull the electrical cables tightly.

SUBTASK 22-11-92-420-005

(5) Install pitch force transducer [1] to the quadrant assembly with the bolt [15], washer [10], and nut [11].

SUBTASK 22-11-92-420-004

(6) Connect the pitch force transducer [1] connectors.

(a) For the captain's side pitch force transducer [1] (M219), do these steps:

1) Connect the A side pitch force transducer [1] cable to connector D383.

2) Connect the B side pitch force transducer [1] cable to connector D1673.

(b) For the first officer's side pitch force transducer [1] (M220), do these steps:

1) Connect the A side pitch force transducer [1] cable to connector D385.

2) Connect the B side pitch force transducer [1] cable to connector D1675.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-92-820-001

(7) Do this task: Pitch Force Transducer Adjustment (DFCS BITE Test), TASK 22-11-92-820-801.

NOTE: The installation will be completed in the Adjustment/Test.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-92-410-005

(1) Close this access door:

Number	Name/Location
112A	Forward Access Door

SUBTASK 22-11-92-860-020

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
B	2	C01064	AFCS SYS B MACH TRIM DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
C	1	C01037	AFCS SYS B MACH TRIM AC
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-92-860-022

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	3	C01046	AFCS SYS B FCC DC

G. Pitch Force Transducer Installation Test

SUBTASK 22-11-92-710-002

(1) Do this task: Pitch Force Transducer Test, TASK 22-11-92-730-801.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST

1. General

A. This procedure contains these tasks:

(1) The first task uses the DFCS BITE test for the adjustment of the transducers

(2) The second task is the pitch force transducer test.

B. Each control column has a pitch force transducer installed on the quadrant assembly. You can find the transducers installed opposite to each other, and they are electrically 180 degrees out of phase. This will decrease the null error voltage to the autopilot system.

C. The adjustment/test procedures for the captain's and first officer's pitch force transducers are the same, except as shown.

D. The adjustment procedure adjusts the length of the transducer adjustable rod end such that no force is applied while the control columns are at the neutral position.

E. The pitch control wheel steering force transducer is referred to as the pitch force transducer [1] in this procedure.

TASK 22-11-92-820-801

2. Pitch Force Transducer Adjustment (DFCS BITE Test)

(Figure 501, Figure 502, Figure 503)

A. References

Reference	Title
20-10-44-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-31-00-700-801	Null Procedure - Mach Trim Actuator (P/B 201)
27-31-00-820-801	Elevator Control Cables EA and EB and Pitch Force Transducers - Adjustment (P/B 501)

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-1585	Kit - Rigging Pin Part #: F70207-109 Supplier: 81205
SPL-1677	Trammel Bar Assembly - Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

F. Prepare for the Pitch Force Transducers Adjustment

SUBTASK 22-11-92-800-001

(1) Make sure that the cable tension of the elevator control cables are adjusted correctly (TASK 27-31-00-820-801).

NOTE: If the cables are not rigged properly then there may be a pitch control wheel steering fault BITE message.

SUBTASK 22-11-92-730-003

(2) Do this task: Null Procedure - Mach Trim Actuator, TASK 27-31-00-700-801.

SUBTASK 22-11-92-860-001

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

SUBTASK 22-11-92-010-002

(4) Open these access doors:

Number	Name/Location
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

G. Pitch Force Transducer Adjustment

SUBTASK 22-11-92-860-003

(1) Insert rig pin E-5, from the rigging pin kit, SPL-1585, in the aft quadrant.

NOTE: Rig pin E-5 must go through easily and freely.

SUBTASK 22-11-92-740-001

(2) Make these selections on the Control Display Unit (CDU):

(a) Push the INIT REF key on the CDU keyboard.

(b) <INDEX

(c) MAINT>

(d) <DFCS

(e) <EXTENDED MAINTENANCE

(f) <RIGGING

(g) <CWS

(h) <CONTINUE

(i) Do the instructions shown on the CDU.

(j) Push the Line Select Key (LSK) adjacent to <PITCH CWS.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(k) Do the instructions shown on the CDU.

NOTE: Do not apply force to the control column for tests 55.01, 55.02, and 55.03. The control column must be at neutral for these tests.

SUBTASK 22-11-92-980-001

(3) Do these steps to set the B dimension (Figure 501):

NOTE: The B dimension is measured between the center of the upper and lower Gimbal pins on the stabilizer trim jackscrew. To do this, one person must be in the tail of the airplane with a headset and the other person in the flight compartment

(a) Make sure that the MAIN STABILIZER TRIM CUTOUT switch, on the control stand, is in the NORMAL position.

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.

(b) Set the B dimension to 39.89 ±0.01 in. (1013.21 ±0.25 mm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim (zero degrees).

CAUTION MAKE SURE TO GIVE PROTECTION TO THE WIRE BUNDLES WHEN YOU USE THE TRAMMEL BAR, SPL-1677. THE TRAMMEL BAR HAS SHARP EDGES THAT CAN CAUSE DAMAGE TO THE WIRE BUNDLE INSULATION.

(c) Use the trammel trammel bar, SPL-1677, to measure the B dimension.

1) Make sure that the B dimension is 39.89 ±0.01 in. (1013.21 ±0.25 mm).

SUBTASK 22-11-92-740-002

(4) Push the LSK adjacent to <CONTINUE to show test 55.02 PITCH CWS SENSOR RIGGING.

NOTE: You can use the procedure that follows to adjust the captain's or first officer's pitch force transducer. Test 55.02 is for the captain's pitch force transducer, if it is necessary. After you complete the adjustment procedure for the captain's pitch force transducer, push the LSK adjacent to <CONTINUE on the CDU. The CDU display will show test 55.03. Test 55.03 is for the adjustment of the first officer's pitch force transducer, if it is necessary.

SUBTASK 22-11-92-480-002

(5) Install rig pin E-1, from the rigging pin kit, SPL-1585, in the left forward quadrant.

NOTE: The rig pin E-1 must go through easily and freely.

SUBTASK 22-11-92-020-001

(6) If the mass balance weight [4] is installed, do these steps:

(a) Remove the lockwire from the mass balance weight [4] (TASK 20-10-44-000-801).

(b) Remove the bolts [2], washers [3], and mass balance weight [4] from the elevator forward quadrant assembly.

SUBTASK 22-11-92-020-004

(7) Make sure that the bolt [16] near the side of the adjustable rod end [7] is loose.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-92-020-005

(8) Remove the bolt [6], washer [10], and nut [11] from the adjustable rod end [7] of the applicable pitch force transducer [1].

SUBTASK 22-11-92-020-002

(9) Move the adjustable rod end [7] of the pitch force transducer [1] out of the quadrant assembly attachment point.

SUBTASK 22-11-92-970-001

(10) Record the null voltage shown on the CDU.

SUBTASK 22-11-92-220-001

(11) Make sure that the null voltage shown on the CDU is less than 0.080 VAC.

NOTE: If the null voltage is more than 0.080 VAC, make sure that no external force is applied to the transducer.

SUBTASK 22-11-92-020-007

(12) Remove the lockwire from the locknut [8], locknut [18], locktab [17], and adjusting nut [12] on the captain's (or first officer's) pitch force transducer [1].

SUBTASK 22-11-92-020-008

(13) Loosen the locknut [8] so that the adjusting nut [12] can be turned with fingers.

SUBTASK 22-11-92-820-002

(14) Adjust the pitch force transducer [1] so the adjustable rod end [7] can be installed.

NOTE: For coarse adjustment, turn the rod end. For a fine adjustment, turn the adjusting nut.

SUBTASK 22-11-92-211-001

(15) Make sure that the null voltage shown on the CDU is within 0.040 VAC of the value you recorded earlier.

SUBTASK 22-11-92-020-009

(16) Remove the bolt [16], washer [14], and nut [13].

NOTE: This bolt is removed as part of the rigging procedure then reinstalled in subsequent operations.

SUBTASK 22-11-92-480-003

(17) Install the rig pin E-2 (captain's) or the rig pin E-3 (first officer's) through the hole where the bolt [16] was removed.

SUBTASK 22-11-92-210-001

(18) Make sure that the rig pin E-2 (captain's) or the rig pin E-3 (first officer's), from the rigging pin kit, SPL-1585, can be freely inserted.

SUBTASK 22-11-92-420-001

(19) Do these steps to install the adjustable rod end [7] of the pitch force transducer [1]:

(a) Install the bolt [6], washer [10], and nut [11].

(b) Tighten the nut [11] on the adjustable rod end [7].

(c) Tighten the locknut [8] on the adjusting nut [12] for the pitch force transducer [1].

(d) Install MS20995NC20 lockwire, G02166, for the locknut [8], locknut [18], locktab [17], adjusting nut [12] on the pitch force transducer [1] (TASK 20-10-44-400-801).

SUBTASK 22-11-92-080-002

(20) Remove the rig pins E-2 or E-3, from the rigging pin kit, SPL-1585, from the quadrant assemblies.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-92-420-006

(21) Install the bolt [16], washer [14], and nut [13].

SUBTASK 22-11-92-420-007

(22) Tighten the nut [13] to 200 ±40 in-lb (22.60 ±4.52 N·m).

SUBTASK 22-11-92-420-008

(23) Install the mass balance weight [4] with the bolts [2] and washers [3].

(a) Tighten the bolts [2].

(b) Install the MS20995NC32 lockwire, G50347, on the bolts [2] (TASK 20-10-44-400-801).

SUBTASK 22-11-92-080-003

(24) Remove the rig pins E-1 and E-5, from the rigging pin kit, SPL-1585, from the quadrant assemblies.

SUBTASK 22-11-92-710-001

(25) Do this check on the pitch force transducer [1]:

(a) Move the control columns lightly until the system is in the center.

(b) Make sure that the A and B voltages on the CDU display are less than 0.20 VAC.

(c) Make sure that the difference between the A and B voltages is less than 0.20 VAC.

1) If the voltage is larger than 0.20 VAC, do a check on the control quadrant and bearings of the structure.

2) If they are satisfactory, do a check of the cable tension for elevator control cables EA and EB (TASK 27-31-00-820-801).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-92-410-006

(1) Close these access doors:

Number	Name/Location
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G22883 S0006564144_V2

Stabilizer Trim Jackscrew Setting
Figure 501/22-11-92-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STABILIZER TRIM JACKSCREW

B

NOTE:

THE STABILIZER TRIM JACKSCREW IS SHOWN WITH THE STABILIZER LEADING EDGE AT ZERO DEGREE.

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

G22884 S0006564145_V2

Stabilizer Trim Jackscrew Setting
Figure 501/22-11-92-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G24227 S0006564146_V2

Elevator Rig Pin Installation
Figure 502/22-11-92-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

G22900 S0006564147_V2

Elevator Forward Control Quadrant Assembly Installation
Figure 503/22-11-92-990-803 (Sheet 1 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

ELEVATOR FORWARD CONTROL QUADRANT ASSEMBLY
(LEFT SIDE SHOWN, RIGHT SIDE IS EQUIVALENT)

B

1 THE HOLE FOR RIG PIN E-1 IS IN THE LEFT SIDE OF THE ELEVATOR CONTROL QUADRANT ASSEMBLY. THE HOLE IN THE RIGHT SIDE IS NOT A RIG PIN HOLE

G23221 S0006564148_V3

Elevator Forward Control Quadrant Assembly Installation
Figure 503/22-11-92-990-803 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

1 USE RIG PIN E-2 FOR LEFT SIDE
USE RIG PIN E-3 FOR RIGHT SIDE

G22953 S0006564149_V5

Elevator Forward Control Quadrant Assembly Installation
Figure 503/22-11-92-990-803 (Sheet 3 of 3)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-11-92-730-801

3. Pitch Force Transducer Test

A. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (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)

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-1557	Gauge - Force Part #: DG-200 Supplier: 92456 Part #: FDIX 100 Supplier: 0BFD9 Part #: FDIX 50 Supplier: 0BFD9 Part #: LG-050 Supplier: 92456 Part #: LG-100 Supplier: 92456 Opt Part #: DPP-500G Supplier: 92456 Opt Part #: DPPH-150 Supplier: 92456 Opt Part #: DPPH-200 Supplier: 92456 Opt Part #: DPPH-50 Supplier: 92456 Opt Part #: FDI 100 Supplier: 0BFD9 Opt Part #: FDI 50 Supplier: 0BFD9 Opt Part #: FDV 100 Supplier: 0BFD9 Opt Part #: FDV 50 Supplier: 0BFD9
SPL-1674	Assembly - Adapter, Control Wheel, Torque and Force Test Part #: C27060-22 Supplier: 81205 Opt Part #: C27060-1 Supplier: 81205 Opt Part #: F72867-1 Supplier: 81205

C. Pitch Force Transducer Test - DFCS BITE

SUBTASK 22-11-92-860-004

WARNING KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, THE ELEVATORS, THE RUDDER, THE FLAPS, THE SLATS, THE SPOILERS, THE STABILIZER AND THE NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Supply hydraulic power to hydraulic systems A and B. To supply hydraulic power, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 22-11-92-980-002

(2) Do these steps to put the control wheel to the center:

NOTE: The power control units must be serviceable for the correct adjustment of the cables in relation to the roll force transducer.

(a) Turn the control wheel clockwise 30 degrees.

(b) Turn the control wheel counter-clockwise 30 degrees.

(c) Slowly turn the control wheel to the center.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-11-92-860-005

(3) Attach the DO-NOT-OPERATE tags to the control columns.

SUBTASK 22-11-92-860-006

(4) Set the aileron trim to 0.0 unit.

SUBTASK 22-11-92-860-007

(5) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-92-860-008

(6) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.

SUBTASK 22-11-92-860-009

(7) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

SUBTASK 22-11-92-740-003

(8) Make these selections to access the PITCH CWS test:

(a) Push the INIT REF key on the CDU keyboard.

(b) <INDEX

(c) MAINT>

(d) <DFCS

(e) <EXTENDED MAINTENANCE

(f) <RIGGING

(g) <CWS

(h) <PITCH CWS

(i) Do the preparation steps as shown on the CDU display.

(j) <CONTINUE

D. Pitch Force Transducer - Manual Test

SUBTASK 22-11-92-480-001

(1) Connect the force gauge, COM-1557, to the center hub of the captain's control column.

NOTE: You can use the torque wrench adapter, SPL-1674, and lock wire to attach the force gauge, COM-1557, to the control wheel on the control column.

SUBTASK 22-11-92-730-002

(2) Do the steps shown on the CDU to complete the test:

(a) Make sure that the values for the A side and B side are between the limits that show on the CDU display.

SUBTASK 22-11-92-080-001

(3) Remove the force gauge, COM-1557, from the control wheels.

(a) Remove torque wrench adapter, SPL-1674, and lock wire, if installed.

E. Pitch Force Transducer Interface Test - DFCS BITE

SUBTASK 22-11-92-740-004

(1) Make these selections on the CDU to do a transducer interface test:

(a) Push the INIT REF key on the CDU keyboard.

(b) <INDEX

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) MAINT>

(d) <DFCS

(e) <LRU REPLACEMENT TESTS

(f) <CHANNEL A AND B

(g) Push the NEXT PAGE key on the CDU keyboard.

(h) <PITCH SENS

(i) Do the preparation steps as shown on the CDU.

(j) <CONTINUE

(k) Make sure that the test is completed with no failure.

(l) Push the INIT REF key on the CDU keyboard to get out of the BITE.

F. Put the Airplanes Back to Its Initial Condition

SUBTASK 22-11-92-860-010

(1) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-92-860-011

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

YAW DAMPER INDICATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Yaw Damper Indicator Deactivation.

(2) Yaw Damper Indicator Activation

TASK 22-23-00-040-801

2. Yaw Damper Indicator - Deactivation

(Figure 201)

A. General

(1) This procedure removes the electrical power to the Yaw Damper Indicator.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 22-23-00-860-016

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812

SUBTASK 22-23-00-860-017

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

E. Yaw Damper Indicator - Tryout

NOTE: This procedure is to make the Yaw Damper Indicator is in a zero energy state.

SUBTASK 22-23-00-860-018

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

ECCN 9E991 BOEING PROPRIETARY - See title page for details

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

SUBTASK 22-23-00-860-020

(2) Set the yaw damper engage switch on the P5 overhead panel to ON.

(a) Make sure the Yaw indicator light does not come on.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

YAW DAMPER INDICATOR

B

J95026 S0000186505_V2

Yaw Damper
Figure 201/22-23-00-990-802

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-23-00-440-801

3. Yaw Damper Indicator - Activation

(Figure 201)

A. General

(1) This procedure adds electrical power to the Yaw Damper Indicator.

B. Location Zones

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

C. Procedure

SUBTASK 22-23-00-860-019

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Yaw Damper Indicator-Removal/Installation

1. General

A. This procedure has these tasks:

(1) A removal of the Yaw Damper indicator

(2) An installation of the Yaw Damper indicator.

TASK 22-23-00-000-801

2. Yaw Damper Indicator Removal

A. Location Zones

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

B. Procedure

SUBTASK 22-23-00-860-012

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

SUBTASK 22-23-00-020-001

(2) Remove the Yaw Damper Indicator [1] from the P2 Center Instrument Panel.

(a) Turn the adjustment screw [4] to loosen the clamp.

(b) Remove the Yaw Damper Indicator [1] from the panel.

(c) Disconnect the electrical connector [2] from the Yaw Damper Indicator [1].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

YAW DAMPER INDICATOR

B

J95026 S0000186505_V2

Yaw Damper Indicator Installation
Figure 401/22-23-00-990-801

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-23-00-400-801

3. Yaw Damper Indicator Installation

A. References

Reference	Title
22-23-00-710-802	Yaw Damper System - System Test (P/B 501)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Yaw Damper Indicator	22-23-00-03-020	LOM 402, 404, 406, 407, 412, 415, 416, 420
		22-23-00-03-500	LOM 402, 404, 406, 407
		22-23-00-03-501	LOM 402, 404, 406, 407, 412, 415, 416, 420

C. Location Zones

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

D. Procedure

SUBTASK 22-23-00-860-009

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

SUBTASK 22-23-00-420-001

(2) Install the Yaw Damper Indicator [1].

(a) Connect the electrical connector [2] D319 to the Yaw Damper Indicator [1].

(b) Make sure the index on the top of the indicator is in the correct position.

(c) Tighten the adjustment screw [4] on the clamp to hold the Yaw Damper Indicator [1].

SUBTASK 22-23-00-860-011

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	6	C01429	YAW DAMPER IND
C	7	C00285	YAW DAMPER AC

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	9	C00331	PANEL & INSTR 28V PRI CAPT & CTR

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-00-710-002

(4) Do this task: Yaw Damper System - System Test, TASK 22-23-00-710-802.

E. Put the airplane back to its initial condition.

SUBTASK 22-23-00-860-010

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

YAW DAMPER SYSTEM - ADJUSTMENT/TEST

1. General

A. The yaw damper function is inside the same unit as the stall management function. The two functions are together in the stall management yaw damper (SMYD) computers. There are two SMYD computers (M1747 and M1748) on the E3 electronic equipment rack, shelf number 2, in the main equipment center.

B. This procedure has these tasks:

(1) Yaw Damper System - Operational Test

(2) Yaw Damper System - System Test

TASK 22-23-00-710-801

2. Yaw Damper System - Operational Test

A. General

(1) This procedure does a self-test of SMYD 1 and SMYD 2.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
34-61-00-400-801	Setting Zero Fuel Weight (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Procedure

SUBTASK 22-23-00-860-001

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

SUBTASK 22-23-00-010-001

(2) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-00-860-013

(3) Do this task to enter the zero fuel weight: Setting Zero Fuel Weight, TASK 34-61-00-400-801

SUBTASK 22-23-00-860-002

(4) Push the ON/OFF key on the Stall Management Yaw Damper (SMYD) Computers (E3-2).

NOTE: SMYD BITE will operate only when the engines are off or when the flaps are up and the airspeed is less than 60 knots.

SUBTASK 22-23-00-740-003

(5) Do the Stall Management Yaw Damper Computer 1 self-test:

(a) Make sure that the display shows EXISTING FAULTS?

(b) Push and release the down arrow key until the display shows GROUND TESTS?

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Push the YES key on the keypad.

1) Make sure that the display shows SELF TEST?

(d) Push the YES key on the keypad.

1) Make sure that the display shows TEST IN PROGRESS.

(e) When the self-test is completed, make sure that the display shows SMYD LRU OK.

SUBTASK 22-23-00-740-004

(6) Do the Stall Management Yaw Damper Computer 2 self-test:

(a) Make sure that the display shows EXISTING FAULTS?

(b) Push and release the down arrow key until the display shows GROUND TESTS?

(c) Push the YES key on the keypad.

1) Make sure that the display shows SELF TEST?

(d) Push the YES key on the keypad.

1) Make sure that the display shows TEST IN PROGRESS.

(e) When the self-test is completed, make sure that the display shows SMYD LRU OK.

SUBTASK 22-23-00-010-002

(7) Close this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-00-860-003

(8) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

TASK 22-23-00-710-802

3. Yaw Damper System - System Test

A. General

(1) This procedure does a test of the interface between SMYD 1 and the main rudder power control unit and SMYD 2 and the standby rudder power control unit. It also does an interlock and light test.

B. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
27-21-00-800-801	Rudder Hydraulic System A, B, or Standby Pressurization (P/B 201)
27-21-00-840-801	Put the Rudder Hydraulic systems A, B, and Standby Back to the Condition Before the Pressurization (P/B 201)
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)
34-61-00-400-801	Setting Zero Fuel Weight (P/B 201)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

C. Location Zones

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

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Test

SUBTASK 22-23-00-860-004

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-23-00-860-005

> **WARNING** KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-00-010-003

(3) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-00-860-008

(4) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	6	C01354	YAW DAMPER 2 DC

SUBTASK 22-23-00-820-001

(5) Align ADIRS. To align it, do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801.

SUBTASK 22-23-00-860-014

(6) Do this task to enter the zero fuel weight:Setting Zero Fuel Weight, TASK 34-61-00-400-801

F. Stall Management Yaw Damper Computer Servo Test

SUBTASK 22-23-00-730-002

(1) Do the Stall Management Yaw Damper Computer 1 servo test:

(a) Push the ON/OFF key on Stall Management Yaw Damper (SMYD) Computer 1 (E3-2).

NOTE: SMYD BITE will operate only when the engines are off or when the flaps are up and the airspeed is less than 60 knots.

(b) Make sure that the display shows EXISTING FAULTS?

(c) Push and release the down arrow key until the display shows GROUND TESTS?

(d) Push the YES key on the keypad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(e) Push and release the down arrow key until the display shows SERVO TEST?

NOTE: The display will show some warnings.

(f) Push the YES key on the keypad.

(g) Make sure that the display shows these indications:

NOTE: These indications are displayed for a short period of time. It is not necessary to read each word of the indications.

1) WARNING! WARNING!
2) RUDDER MOVEMENT
3) RUDDER CLEARED?

(h) Make sure that all personnel are clear of the rudder.

(i) Push the YES key on the keypad.

1) Make sure that the display shows SYS B HYD ON?
2) Make sure that HYD PUMPS B switch on the P5 panel is ON.

(j) Push the YES key on the keypad.

1) Make sure that the display shows FLT CTRL B ON?
2) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to ON.

(k) Push the YES key on the keypad.

1) Make sure that the display shows YAW DMPR ENGAGED?

WARNING

THE STEPS THAT FOLLOW WILL CAUSE THE RUDDER TO MOVE. MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER BEFORE YOU DO THESE STEPS. RUDDER MOVEMENT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(l) Set the yaw damper engage switch on the P5 overhead panel to ON.

(m) Push the YES key on the keypad.

1) Make sure that the display shows ZERO COMMAND?

(n) Push the YES key on the keypad.

(o) Make sure that the display shows this indication:

1) RUDDER MOVING

(p) After approximately ten seconds, make sure that the display shows these indications:

1) YD cmd 0.0 ±0.2
2) LVDT 0.0 ±0.2
3) END ZERO COMMAND?

(q) Push the YES key on the keypad.

(r) Make sure that the display shows these indications:

NOTE: These indications are displayed for a short period of time. It is not necessary to read each word of the indications.

1) RUDDER MOVING
2) TEST EXITING
3) ZERO COMMAND?

(s) Push the down arrow key on the keypad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Make sure that the display shows SWEEP TEST?

(t) Push the YES key on the keypad.

LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213

(u) Make sure that the yaw damper indicator on the P2 center instrument panel moves in the same direction as the rudder.

LOM ALL

(v) After approximately two seconds, make sure that the display shows this indication:

1) RUD CMD LEFT

(w) After approximately ten seconds, make sure that the display shows this indication:

1) YD LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

(x) After approximately two seconds, make sure that the display shows this indication:

1) RUD CMD RIGHT

(y) After approximately ten seconds, make sure that the display shows this indication:

1) YD LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

(z) After approximately two seconds, make sure that the display shows this indication:

1) RUD CMD ZERO

(aa) After approximately ten seconds, make sure that the display shows these indications in sequence:

1) YD LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

2) TEST PASSED

(ab) Set the FLT CONTROL B switch on the P5 overhead panel to OFF.

1) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

2) Make sure that the YAW DAMPER light on the P5 overhead panel comes on.

(ac) Set the FLT CONTROL B switch on the P5 overhead panel to ON.

(ad) Set the yaw damper engage switch on the P5 overhead panel to ON.

(ae) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	7	C00286	YAW DAMPER 1 DC

1) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

(af) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 1.

1) Make sure that the display shows TURN OFF DISPLAY?

(ag) Push the YES key on the keypad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(ah) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	6	C01354	YAW DAMPER 2 DC

SUBTASK 22-23-00-730-003

(2) Do the Stall Management Yaw Damper Computer 2 servo test:

(a) Push the ON/OFF key on Stall Management Yaw Damper (SMYD) Computer 2 (E3-2).

NOTE: SMYD BITE will operate only when the engines are off or when the flaps are up and the airspeed is less than 60 knots.

(b) Make sure that the display shows EXISTING FAULTS?

(c) Push and release the down arrow key until the display shows GROUND TESTS?

(d) Push the YES key on the keypad.

(e) Push and release the down arrow key until the display shows SERVO TEST?

NOTE: The display will show some warnings.

(f) Push the YES key on the keypad.

(g) Make sure that the display shows these indications:

NOTE: These indications are displayed for a short period of time. It is not necessary to read each word of the indications.

1) WARNING! WARNING!

2) RUDDER MOVEMENT

3) RUDDER CLEARED?

(h) Make sure that all personnel are clear of the rudder.

(i) Push the YES key on the keypad.

1) Make sure that the display shows FLT CTRL A STBY?

2) Make sure that the FLT CONTROL A switch on the P5 overhead panel is set to STBY RUD.

(j) Push the YES key on the keypad.

1) Make sure that the display shows FLT CTRL B STBY?

2) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to STBY RUD.

(k) Push the YES key on the keypad.

1) Make sure that the display shows YAW DMPR ENGAGED?

WARNING

THE STEPS THAT FOLLOW WILL CAUSE THE RUDDER TO MOVE. MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER BEFORE YOU DO THESE STEPS. RUDDER MOVEMENT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(l) Set the yaw damper engage switch on the P5 overhead panel to ON.

(m) Push the YES key on the keypad.

1) Make sure that the display shows ZERO COMMAND?

(n) Push the YES key on the keypad.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(o) Make sure that the display shows this indication:
  1) RUDDER MOVING

(p) After approximately ten seconds, make sure that the display shows these indications:
  1) YD cmd 0.0 ±0.2
  2) YD LVDT 0.0 ±0.2
  3) END ZERO COMMAND?

(q) Push the YES key on the keypad.

(r) Make sure that the display shows these indications:

NOTE: These indications are displayed for a short period of time. It is not necessary to read each word of the indications.

  1) RUDDER MOVING
  2) TEST EXITING
  3) ZERO COMMAND?

(s) Push the down arrow key on the keypad.
  1) Make sure that the display shows SWEEP TEST?

(t) Push the YES key on the keypad.

(u) After approximately two seconds, make sure that the display shows this indication:
  1) RUD CMD LEFT

(v) After approximately ten seconds, make sure that the display shows this indication:
  1) YD LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

(w) After approximately two seconds, make sure that the display shows this indication:
  1) RUD CMD RIGHT

(x) After approximately ten seconds, make sure that the display shows this indication:
  1) YD LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

(y) After approximately two seconds, make sure that the display shows this indication:
  1) RUD CMD ZERO

(z) After approximately ten seconds, make sure that the display shows these indications in sequence:
  1) YD LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

  2) TEST PASSED

(aa) Set the FLT CONTROL A switch on the P5 overhead panel to ON.
  1) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.
  2) Make sure that the YAW DAMPER light on the P5 overhead panel comes on.

(ab) Set the FLT CONTROL A switch on the P5 overhead panel to STBY RUD.

(ac) Set the yaw damper engage switch on the P5 overhead panel to ON.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(ad) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	6	C01354	YAW DAMPER 2 DC

1) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

(ae) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 2.

1) Make sure that the display shows TURN OFF DISPLAY?

(af) Push the YES key on the keypad.

(ag) Set the FLT CONTROL A and the FLT CONTROL B switches on the P5 overhead panel to ON.

G. Interlock and Light Test

SUBTASK 22-23-00-730-001

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

(a) Set the yaw damper engage switch on the P5 overhead panel to ON.

(b) Make sure that the YAW DAMPER disengage light on the P5 overhead panel is off.

(c) Push and hold the YAW DAMPER disengage light.

1) Make sure that the YAW DAMPER disengage light comes on.

(d) Release the YAW DAMPER disengage light.

1) Make sure that the YAW DAMPER disengage light goes out.

(e) Set the LIGHTS switch on the P1 main instrument panel to TEST and make sure that these lights come on:

1) The left and right MASTER CAUTION lights on the ends of the P7 glareshield panel.

2) The FLT CONT light on the left end of the P7 glareshield panel.

3) The YAW DAMPER disengage light on the P5 overhead panel.

NOTE: Ignore other indications.

(f) Set the yaw damper engage switch on the P5 overhead panel to OFF.

(g) Set the LIGHTS switch on the P1 main instrument panel to BRT.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-00-010-004

(1) Close this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-00-860-006

(2) Do this task: Put the Rudder Hydraulic systems A, B, and Standby Back to the Condition Before the Pressurization, TASK 27-21-00-840-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-00-730-004

(3) Set the two mode select switches on the IRS MSU to the OFF position.

SUBTASK 22-23-00-860-007

(4) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STANDBY RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the standby rudder power control unit (PCU) solenoid and electrohydraulic servo valves.

(2) The installation of the standby rudder PCU solenoid and electrohydraulic servo valves.

B. The standby rudder PCU solenoid and electrohydraulic servo valves are located on the standby rudder PCU in the vertical fin. The standby rudder PCU is above the main rudder PCU.

TASK 22-23-11-000-801

2. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves - Removal

(Figure 401)

A. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

C. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

D. Prepare for the Removal

SUBTASK 22-23-11-860-007

(1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-11-860-008

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-11-010-003

(3) Find this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

(a) Remove the screws [1] and the skin panel [2] on the right side of the vertical fin to get access to the standby rudder Power Control Unit (PCU):

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Procedure

SUBTASK 22-23-11-020-001

(1) Do these steps to remove the solenoid valve [3]:

(a) Remove the bolts [4] that attach the solenoid valve [3] to the standby rudder PCU.

(b) Remove the solenoid valve [3].

(c) Remove the gasket plate [9].

1) If the seals on the gasket plate [9] are in bad condition, discard the gasket plate [9].

(d) Remove and discard the o-ring [7].

(e) Put plugs on the standby rudder PCU ports.

SUBTASK 22-23-11-020-002

(2) Do these steps to remove the electrohydraulic servo valve [5]:

(a) Remove the bolts [6] that attach the electrohydraulic servo valve [5] to the standby rudder PCU.

(b) Remove the electrohydraulic servo valve [5].

(c) Remove the gasket plate [8].

1) If the seals on the gasket plate [8] are in bad condition, discard the gasket plate [8].

(d) Remove and discard the o-ring [7].

(e) Put plugs on the standby rudder PCU ports.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

RIGHT SIDE TRAILING EDGE OF THE VERTICAL FIN

A

G34272 S0006564160_V4

Standby Rudder PCU Solenoid and Electrohydraulic Valves Installation
Figure 401/22-23-11-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STANDBY RUDDER POWER CONTROL UNIT (PCU)

B

G35451 S0006564161_V3

Standby Rudder PCU Solenoid and Electrohydraulic Valves Installation
Figure 401/22-23-11-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-23-11-400-801

3. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves - Installation

(Figure 401)

A. References

Reference	Title
22-23-11-740-801	Rudder Solenoid and Electrohydraulic Servo Valves - Installation Test (P/B 501)
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50387	Sealant - PR-1440 Class B Fuel Tank Sealant, B-1/2	MIL-S-8802
A50419	Sealant - Pressure And Environmental-Chromate, Type I, Class B-2	BMS5-95 Type I Class B-2
A50527	Sealant - PR-1440 Class B Fuel Tank Sealant, B-2	
B50046	Solvent - Methyl Ethyl Ketone, Technical Grade	ASTM D740 (Supersedes TT-M-261)
B50281	Solvent - Degreasing, High Flash Point	MIL-PRF-680 Type II
C00012	Coating - Akzo Nobel Clear Polyurethane Topcoat, 683-3-2 Base with X-310A Catalyst (Akzo Nobel Aerospace Coatings)	
C50238	Coating - Akzo Nobel Clear Polyurethane Topcoat, 683-3-20 Base with X-310A Catalyst (Akzo Nobel Aerospace Coatings)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D00571	Grease - BATCO X8401-2	
D50105	Grease - BATCO X8401-1	
D50106	Grease - (BATCO X8401)	
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Solenoid valve	27-21-24-01-266	LOM ALL
		27-21-24-01-267	LOM ALL
5	Electrohydraulic servo valve	27-21-24-01-130	LOM ALL
		27-21-24-01-200	LOM ALL
		27-21-24-01-250	LOM ALL
7	O-ring	27-21-24-01-260	LOM ALL
		27-21-24-01-280	LOM ALL
8	Gasket plate	27-21-24-01-255	LOM ALL

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Gasket plate	27-21-24-01-275	LOM ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

F. Prepare for the Installation

SUBTASK 22-23-11-860-009

(1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-11-860-010

(2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-11-010-004

(3) Find this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

(a) Remove the screws [1] and skin panel [2] on the right side of the vertical fin to get access to the standby rudder Power Control Unit (PCU).

G. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation

SUBTASK 22-23-11-020-003

(1) Do these steps to install the solenoid valve [3]:

(a) Remove the plugs on the standby rudder PCU ports.

(b) Lubricate the o-ring [7] with hydraulic fluid, D00153.

(c) Install the new o-ring [7].

(d) Install the gasket plate [9].

(e) Install the solenoid valve [3].

(f) Lightly coat the threads of the bolts [4] with grease, D50106, BATCO X8401-1 grease, D50105, or BATCO X8401-2 grease, D00571.

(g) Install the bolts [4] that attach the solenoid valve [3] to the standby rudder PCU.

1) Tighten the bolts [4] to 50 in-lb (5.6 N·m) - 70 in-lb (7.9 N·m).

(h) Apply a fillet seal to the interface between the bolts [4] and solenoid valve [3], do the following steps:

1) Use solvent, B50281, to clean the area and let the area dry.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Apply a bead of PR-1440 B-2 sealant, A50527, or PR-1440 B-1/2 sealant, A50387, around the head of each of the bolts [4] and let a sealant cure.

3) Use Akzo Nobel 683-3-2 coating, C00012, or Akzo Nobel 683-3-20 coating, C50238, to apply a top coating on the sealant.

(i) Install a MS20995C32 lockwire, G01048, on the bolts [4].

(j) Apply a fillet seal to the interface between the solenoid valve [3] and standby rudder PCU, do the following steps:

1) Use technical grade methyl ethyl ketone, B50046, to clean the area and let the area dry.

2) Apply a bead of sealant, A50419, or sealant, A50110, around the interface between the solenoid valve [3] and gasket plate [9] and between the gasket plate [9] and standby rudder PCU.

SUBTASK 22-23-11-020-004

(2) Do these steps to install the electrohydraulic servo valve [5]:

(a) Remove the plugs on the standby rudder PCU ports.

(b) Lubricate the o-ring [7] with hydraulic fluid, D00153.

(c) Install the new o-ring [7].

(d) Install the gasket plate [8].

(e) Install the electrohydraulic servo valve [5].

(f) Lightly coat the threads of the bolts [6] with grease, D50106, BATCO X8401-1 grease, D50105, or BATCO X8401-2 grease, D00571.

(g) Install the bolts [6] that attach the electrohydraulic servo valve [5] to the standby rudder PCU.

1) Tighten the bolts [6] to 50 in-lb (5.6 N·m) - 70 in-lb (7.9 N·m).

(h) Apply a fillet seal to the interface between the bolts [6] and electrohydraulic servo valve [5], do the following steps:

1) Use solvent, B50281, to clean the area and let the area dry.

2) Apply a bead of PR-1440 B-2 sealant, A50527, or PR-1440 B-1/2 sealant, A50387, around the head of each of the bolts [6] and let a sealant cure.

3) Use Akzo Nobel 683-3-2 coating, C00012, or Akzo Nobel 683-3-20 coating, C50238, to apply a top coating on the sealant.

(i) Install a MS20995C32 lockwire, G01048, on the bolts [6].

(j) Apply a fillet seal to the interface between the electrohydraulic servo valve [5] and standby rudder PCU, do the following steps:

1) Use technical grade methyl ethyl ketone, B50046, to clean the area and let the area dry.

2) Apply a bead of sealant, A50419, or sealant, A50110, around the interface between the electrohydraulic servo valve [5] and gasket plate [8] and between the gasket plate [8] and standby rudder PCU.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation Test

SUBTASK 22-23-11-860-013

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-11-710-001

(2) Do this task: Rudder Solenoid and Electrohydraulic Servo Valves - Installation Test, TASK 22-23-11-740-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-11-010-005

(1) Install the screws [1] and skin panel [2] in this location to close access to the standby rudder PCU:

(a) Install the skin panel [2] to the correct access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

NOTE: The skin panel that contains the access panels is on the left side of the vertical fin. Do not remove this skin panel. Remove the skin panel on the right side of the vertical fin at the same level.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

STANDBY RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

(1) An installation test of the standby rudder power control unit (PCU) solenoid and electrohydraulic servo valves.

B. The rudder solenoid and electrohydraulic servo valves are located on the standby rudder PCU in the vertical fin.

TASK 22-23-11-740-801

2. Rudder Solenoid and Electrohydraulic Servo Valves - Installation Test

A. General

(1) The installation test makes sure that the solenoid and electrohydraulic servo valves are installed correctly.

B. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
27-21-00-800-801	Rudder Hydraulic System A, B, or Standby Pressurization (P/B 201)
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

C. Location Zones

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

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Installation Test

SUBTASK 22-23-11-860-001

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-23-11-860-002

> **WARNING**
> KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-11-010-001

(3) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-11-860-004

(4) Do the Stall Management Yaw Damper Computer 2 servo test:

(a) Push the ON/OFF key on Stall Management Yaw Damper (SMYD) Computer 2 (E3-2).

NOTE: SMYD BITE will operate only when the engines are off or when the flaps are up and the airspeed is less than 60 knots.

(b) Make sure that the display shows EXISTING FAULTS?

(c) Push and release the down arrow key until the display shows GROUND TESTS?

(d) Push the YES key on the keypad.

(e) Push and release the down arrow key until the display shows SERVO TEST?

NOTE: The display will show some warnings.

(f) Push the YES key on the keypad.

(g) Make sure that the display shows these indications:

1) WARNING! WARNING!

2) RUDDER MOVEMENT

3) RUDDER CLEAR?

(h) Make sure that all personnel are clear of the rudder.

(i) Push the YES key on the keypad.

1) Make sure that the display shows FLT CTRL A STBY?

2) Make sure that the FLT CONTROL A switch on the P5 overhead panel is set to STBY RUD.

(j) Push the YES key on the keypad.

1) Make sure that the display shows FLT CTRL B STBY?

2) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to STBY RUD.

(k) Push the YES key on the keypad.

1) Make sure that the display shows YAW DMPR ENGAGED?

WARNING THE STEPS THAT FOLLOW WILL CAUSE THE RUDDER TO MOVE. MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER BEFORE YOU DO THESE STEPS. RUDDER MOVEMENT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(l) Set the yaw damper engage switch on the P5 overhead panel to ON.

(m) Push the YES key on the keypad.

1) Make sure that the display shows ZERO COMMAND?

(n) Push the YES key on the keypad.

(o) Make sure that the display shows this indication:

1) RUDDER MOVING

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(p) After approximately ten seconds, make sure that the display shows these indications:
  1) YD 0.0 ±0.2
  2) LVDT 0.0 ±0.2
  3) END ZERO COMMAND?

(q) Push the YES key on the keypad.

(r) Make sure that the display shows these indications:
  1) RUDDER MOVING
  2) TEST EXITING
  3) ZERO COMMAND?

(s) Push and release the down arrow key until the display shows SWEEP TEST?

(t) Push the YES key on the keypad.

(u) After approximately two seconds, make sure that the display shows this indication:
  1) RUDDER CMD LEFT

(v) After approximately ten seconds, make sure that the display shows this indication:
  1) LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

(w) After approximately two seconds, make sure that the display shows this indication:
  1) RUDDER CMD RIGHT

(x) After approximately ten seconds, make sure that the display shows this indication:
  1) LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

(y) After approximately two seconds, make sure that the display shows this indication:
  1) RUDDER CMD ZERO

(z) After approximately ten seconds, make sure that the display shows these indications in sequence:
  1) LVDT XXXXX

  NOTE: The Xs are a number. You can ignore the value of the number.

  2) TEST PASSED
  3) TEST EXITING
  4) ZERO COMMAND?

(aa) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 2.
  1) Make sure that the display shows TURN OFF DISPLAY?

(ab) Push the YES key on the keypad.

(ac) Set the FLT CONTROL A and the FLT CONTROL B switches on the P5 overhead panel to ON.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-11-860-005

WARNING	KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-11-010-002

(6) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-11-860-006

(7) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MAIN RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) The removal of the main rudder power control unit (PCU) solenoid and electrohydraulic servo valves.

(2) The installation of the main rudder PCU solenoid and electrohydraulic servo valves.

B. The main rudder PCU solenoid and electrohydraulic servo valves are located on the main rudder PCU in the vertical fin. The main rudder PCU is below the standby rudder PCU.

TASK 22-23-21-000-801

2. Main Rudder PCU Solenoid and Electrohydraulic Servo Valves - Removal

(Figure 401)

A. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

C. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

D. Prepare for the Removal

SUBTASK 22-23-21-860-006

(1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-21-860-007

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-21-010-003

(3) Find this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

(a) Remove the screws [1] and the skin panel [2] on the right side of the vertical fin to get access to the main rudder PCU:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

E. Procedure

SUBTASK 22-23-21-020-001

(1) Do these steps to remove the solenoid valve [4]:

(a) Remove the bolts [5] that attach the solenoid valve [4] to the main rudder PCU.

(b) Remove the solenoid valve [4].

(c) Remove the gasket plate [3].

1) If the seals on the gasket plate [3] are in bad condition, discard the gasket plate [3].

(d) Remove and discard the o-ring [8].

(e) Put plugs on the main rudder PCU ports to avoid hydraulic fluid contamination.

SUBTASK 22-23-21-020-002

(2) Do these steps to remove the electrohydraulic servo valve [6]:

(a) Remove the bolts [7] that attach the electrohydraulic servo valve [6] to the main rudder PCU.

(b) Remove the electrohydraulic servo valve [6].

(c) Remove the gasket plate [9].

1) If the seals on the gasket plate [9] are in bad condition, discard the gasket plate [9].

(d) Remove and discard the o-ring [8].

(e) Put plugs on the main rudder PCU ports to avoid hydraulic fluid contamination.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation
Figure 401/22-23-21-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MAIN RUDDER POWER CONTROL UNIT (PCU)

B

W22659 S0006564170_V4

Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation
Figure 401/22-23-21-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-23-21-400-801

3. Main Rudder PCU Solenoid and Electrohydraulic Servo Valves - Installation

(Figure 401)

A. References

Reference	Title
22-23-21-740-801	Rudder Solenoid and Electrohydraulic Servo Valves - Post Installation Test (P/B 501)
24-22-00-860-814	Remove External Power (P/B 201)
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket plate	27-21-91-02-329	LOM ALL
4	Solenoid valve	27-21-91-02-230	LOM ALL
		27-21-91-02-232	LOM ALL
		27-21-91-02-330	LOM ALL
		27-21-91-02-332	LOM ALL
6	Electrohydraulic servo valve	27-21-91-02-300	LOM ALL
		27-21-91-02-302	LOM ALL
8	O-ring	27-21-91-02-296	LOM ALL
		27-21-91-02-328	LOM ALL
9	Gasket plate	27-21-91-02-298	LOM ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

F. Prepare for the Installation

SUBTASK 22-23-21-860-008

(1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-21-860-009

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-21-010-004

(3) Find this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

(a) Remove the screws [1] and the skin panel [2] on the right side of the vertical fin to get access to the main rudder PCU:

G. Procedure

SUBTASK 22-23-21-020-003

(1) Do these steps to install the solenoid valve [4]:

(a) Remove the plugs on the main rudder PCU ports.

(b) Lubricate the o-ring [8] with hydraulic fluid, D00153.

(c) Install the new o-ring [8].

(d) Install the gasket plate [3].

(e) Install the solenoid valve [4].

(f) Install the bolts [5] that attach the solenoid valve [4] to the main rudder PCU.

(g) Tighten the bolts [5] to 54 in-lb (6.1 N·m) - 72 in-lb (8.1 N·m).

(h) Install the MS20995C32 lockwire, G01048 on the bolts [5].

SUBTASK 22-23-21-020-004

(2) Do these steps to install the electrohydraulic servo valve [6]:

(a) Remove the plugs on the main rudder PCU ports.

(b) Lubricate the o-ring [8] with hydraulic fluid, D00153.

(c) Install new o-ring [8].

(d) Install the gasket plate [9].

(e) Install the electrohydraulic servo valve [6].

(f) Install the bolts [7] that attach the electrohydraulic servo valve [6] to the main rudder PCU.

(g) Tighten the bolts [7] to 54 in-lb (6.1 N·m) - 72 in-lb (8.1 N·m).

(h) Install the MS20995C32 lockwire, G01048 on the bolts [7].

H. Solenoid and Electrohydraulic Valves Installation Test

SUBTASK 22-23-21-710-001

(1) Do this task: Rudder Solenoid and Electrohydraulic Servo Valves - Post Installation Test, TASK 22-23-21-740-801.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-21-010-005

(1) Install the skin panel [2] to the correct access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

(a) Install the screws [1] and the skin panel [2] on the right side of the vertical fin to close access to the main rudder PCU:

NOTE: The skin panel that contains the access panels is on the left side of the vertical fin. Do not remove this skin panel. Remove the skin panel on the right side of the vertical fin at the same level.

SUBTASK 22-23-21-860-010

(2) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

MAIN RUDDER POWER CONTROL UNIT (PCU) SOLENOID AND ELECTROHYDRAULIC SERVO VALVES - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

(1) An installation test of the main rudder power control unit (PCU) solenoid and electrohydraulic servo valves.

B. The rudder solenoid and electrohydraulic servo valves are located on the main rudder PCU in the vertical fin.

TASK 22-23-21-740-801

2. Rudder Solenoid and Electrohydraulic Servo Valves - Post Installation Test

A. General

(1) The post installation test makes sure that the solenoid and electrohydraulic servo valves are installed correctly.

B. References

Reference	Title
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
27-21-00-800-801	Rudder Hydraulic System A, B, or Standby Pressurization (P/B 201)
27-21-00-840-801	Put the Rudder Hydraulic systems A, B, and Standby Back to the Condition Before the Pressurization (P/B 201)
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)
34-61-00-400-801	Setting Zero Fuel Weight (P/B 201)

C. Location Zones

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

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Post Installation Test

SUBTASK 22-23-21-860-001

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-23-21-860-002

WARNING KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-21-860-003

(3) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-21-010-001

(4) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-21-820-001

(5) Align ADIRS. To align it, do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801.

SUBTASK 22-23-21-860-012

(6) Do this task to enter the zero fuel weight: Setting Zero Fuel Weight, TASK 34-61-00-400-801.

SUBTASK 22-23-21-740-001

(7) Do the Stall Management Yaw Damper Computer 1 servo test:

(a) Push the ON/OFF key on Stall Management Yaw Damper (SMYD) Computer 1 (E3-2).

NOTE: SMYD BITE will operate only when the engines are off or when the flaps are up and the airspeed is less than 60 knots.

(b) Make sure that the display shows EXISTING FAULTS?

(c) Push and release the down arrow key until the display shows GROUND TESTS?

(d) Push the YES key on the keypad.

(e) Push and release the down arrow key until the display shows SERVO TEST?

NOTE: The display will show some warnings.

(f) Push the YES key on the keypad.

(g) Make sure that the display shows these indications:

1) WARNING! WARNING!

2) RUDDER MOVEMENT

3) RUDDER CLEAR?

(h) Make sure that all personnel are clear of the rudder.

(i) Push the YES key on the keypad.

1) Make sure that the display shows SYS B HYD ON?

ECCN 9E991 BOEING PROPRIETARY - See title page for details

2) Make sure that HYD PUMPS B switch on the P5 panel is ON.

(j) Push the YES key on the keypad.

1) Make sure that the display shows FLT CONT B ON?

2) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to ON.

(k) Push the YES key on the keypad.

1) Make sure that the display shows YAW DMPR ENGAGED?

WARNING THE STEPS THAT FOLLOW WILL CAUSE THE RUDDER TO MOVE. MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER BEFORE YOU DO THESE STEPS. RUDDER MOVEMENT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(l) Set the yaw damper engage switch on the P5 overhead panel to ON.

(m) Push the YES key on the keypad.

1) Make sure that the display shows ZERO COMMAND?

(n) Push the YES key on the keypad.

(o) Make sure that the display shows this indication:

1) RUDDER MOVING

(p) After approximately ten seconds, make sure that the display shows these indications:

1) YD 0.0 ±0.2

2) LVDT 0.0 ±0.2

3) END ZERO COMMAND?

(q) Push the YES key on the keypad.

(r) Make sure that the display shows these indications:

1) RUDDER MOVING

(s) Push and release the down arrow key until the display shows SWEEP TEST?

(t) Push the YES key on the keypad.

LOM 402, 404, 406, 407, 412, 415, 416, 420 PRE SB 737-22-1213

(u) Make sure that the yaw damper indicator on the P2 center instrument panel moves in the same direction as the rudder.

LOM ALL

(v) After approximately two seconds, make sure that the display shows this indication:

1) RUDDER CMD LEFT

(w) After approximately ten seconds, make sure that the display shows this indication:

1) LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

(x) After approximately two seconds, make sure that the display shows this indication:

1) RUDDER CMD RIGHT

(y) After approximately ten seconds, make sure that the display shows this indication:

1) LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(z) After approximately two seconds, make sure that the display shows this indication:

1) RUDDER CMD ZERO

(aa) After approximately ten seconds, make sure that the display shows these indications in sequence:

1) LVDT XXXXX

NOTE: The Xs are a number. You can ignore the value of the number.

2) TEST PASSED

(ab) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 1.

1) Make sure that the display shows TURN OFF DISPLAY?

(ac) Push the YES key on the keypad.

SUBTASK 22-23-21-860-004

WARNING KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Do this task: Put the Rudder Hydraulic systems A, B, and Standby Back to the Condition Before the Pressurization, TASK 27-21-00-840-801.

SUBTASK 22-23-21-010-002

(9) Close this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-21-860-005

(10) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOTHROTTLE SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Autothrottle System Deactivation.

(2) Autothrottle System Activation.

TASK 22-31-00-040-801

2. Autothrottle System - Deactivation

A. General

(1) This procedure removes electrical power to the Autothrottle System.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Autothrottle System Deactivation

SUBTASK 22-31-00-860-016

(1) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

SUBTASK 22-31-00-860-017

(2) Make sure that the engine start levers are in cutoff position and attach DO NOT OPERATE tag, STD-858.

E. Autothrottle System - Tryout

NOTE: This tryout is to make sure the Autothrottle system is in a zero energy state.

SUBTASK 22-31-00-860-018

(1) Make sure that this circuit breaker is open and has safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

SUBTASK 22-31-00-860-025

(2) Re-configure the M2539 and M2540 Autopilot System A and B switch modules as follows:

(a) Switch No. 12 - ON.

SUBTASK 22-31-00-860-026

(3) Re-configure the M1992 and M1993 Autopilot System A and B switch modules as follows:

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(a) Switch No. 24 - Change from OFF to ON or from ON to OFF.

NOTE: Switch 24 is an Odd Parity input and changes with each change in switch positions.

——— END OF TASK ———

TASK 22-31-00-440-801

3. Autothrottle System - Activation

A. General

(1) This procedure adds electrical power to the Autothrottle System.

B. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Autothrottle System Activation

SUBTASK 22-31-00-860-029

(1) Re-configure the M2539 and M2540 Autopilot System A and B switch modules as follows:

(a) Put switch No. 12 to OFF position.

SUBTASK 22-31-00-860-030

(2) Re-configure the M1992 and M1993 Autopilot System A and B switch modules as follows:

(a) Put switch No. 24 from OFF to ON or from ON to OFF position.

NOTE: Switch 24 is an Odd Parity input and changes with each change in switch position.

SUBTASK 22-31-00-860-019

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

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOTHROTTLE SYSTEM - ADJUSTMENT/TEST

1. General
   A. This procedure contains scheduled maintenance task data.
   B. This procedure has these tasks:
      (1) The autothrottle system operational test.
      (2) The autothrottle system test.

TASK 22-31-00-710-801

2. Autothrottle System - Operational Test

A. General

(1) The operational test uses autothrottle Built-In-Test Equipment (BITE) to do a fast check of the system. Use the Flight Management Computer (FMC) Control Display Unit (CDU) on the P9 panel to do the BITE procedure.

NOTE: The A/T - P/RST and the A/P - P/RST lights will stay on during Autothrottle BITE testing.

(2) Use the CURRENT STATUS test in autothrottle BITE to do the operational test.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
24-22-00-860-813	Supply External Power (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 22-31-00-860-001

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-31-00-860-003

(2) Make sure that the IRS-L and IRS-R mode select switches on the P5 panel are not in the OFF position.

SUBTASK 22-31-00-860-014

(3) Set the Captain and Center panel light control to full bright.

SUBTASK 22-31-00-740-001

(4) Do this BITE test:
   (a) Push the INIT REF key on the MC CDU keyboard.
   (b) Push the Line Select Key (LSK) adjacent to INDEX.
   (c) Push the LSK adjacent to MAINT.
   (d) Push the LSK adjacent to A/T.
      1) Make sure the autothrottle warning lights on the autoflight status annunciators (P1 and P3 panels) come on continuously.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **WARNING** MAKE SURE THAT ENGINE START LEVERS ARE IN THE CUTOFF POSITION. IF THE ENGINE START LEVERS ARE NOT IN THE CUTOFF POSITION, THE ENGINE START SEQUENCE CAN OCCUR. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(e) Push the LSK adjacent to CURRENT STATUS.

(f) Do the instructions on the CDU.

(g) Push the LSK adjacent to CONTINUE.

1) Make sure that the A/T switch on the P7 panel automatically goes back to OFF.

2) Make sure that NO FAULTS shows on the CDU when the test is completed.

(h) Push the LSK adjacent to INDEX.

(i) Do the instructions on the CDU.

(j) Push the LSK adjacent to CONTINUE.

1) Make sure that A/T BITE TEST index shows.

(k) Push the LSK adjacent to INDEX.

(l) Push the INIT REF key on the FMC CDU keyboard.

(m) If the autothrottle warning lights flash, push the front of the lights to turn them off.

NOTE: The autothrottle warning lights are on the autoflight status annunciators on the P1 and P3 panels.

SUBTASK 22-31-00-860-004

(5) If IRS outputs are no longer necessary, set the IRS-L and IRS-R mode select switches on the P5 panel to OFF.

SUBTASK 22-31-00-860-005

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

TASK 22-31-00-710-802

3. Autothrottle System - System Test

A. General

(1) The system test uses autothrottle BITE to make sure that the system operates correctly. Use the flight management computer control display unit (FMC CDU) on the P9 panel to do the BITE procedures.

NOTE: The A/T - P/RST and the A/P - P/RST light will stay on during Autothrottle BITE testing.

(2) Use the INTERACTIVE tests in autothrottle BITE to do the system test.

B. References

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
24-22-00-860-813	Supply External Power (P/B 201)

C. Location Zones

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

ECCN 9E991 BOEING PROPRIETARY - See title page for details

D. Prepare for the System Test

SUBTASK 22-31-00-860-006

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-31-00-860-021

(2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	13	C00120	WEATHER RADAR RT

SUBTASK 22-31-00-710-001

(3) Unless you have completed it, do this task: Autothrottle System - Operational Test, TASK 22-31-00-710-801.

SUBTASK 22-31-00-860-008

(4) Make sure that the IRS-L and IRS-R mode select switches on the P5 panel are not in the OFF position.

SUBTASK 22-31-00-860-015

(5) Set the Captain and Center panel light control to full bright.

E. Mode Annunciation Test

SUBTASK 22-31-00-740-002

(1) Do these steps for the mode annunciation test:

(a) Push the INIT REF key on the FMC CDU keyboard.

(b) Push the line select key (LSK) adjacent to INDEX.

(c) Push the LSK adjacent to MAINT.

(d) Push the LSK adjacent to A/T.

NOTE: The two autothrottle warning lights come on during BITE.

(e) Push the LSK adjacent to INTERACTIVE.

(f) Push the LSK adjacent to MODE ANNUNCIATION.

(g) Follow the instructions on the CDU.

(h) Push the LSK adjacent to INTERACTIVE.

(i) Push the LSK adjacent to MODE ANNUNCIATION.

(j) Set the displays source switch, on the P5 panel, to ALL ON 1.

1) Make sure that N1 shows on the captain's and first officer's outboard display on the P1 panel.

(k) Push the LSK adjacent to YES.

1) Make sure that FMC SPD shows on the captain's and first officer's outboard display on the P1 panel.

(l) Set the displays source switch on the P5 panel to ALL ON 2.

(m) Push the LSK adjacent to YES.

1) Make sure that RETARD shows on the captain's and first officer's outboard display on the P1 panel.

(n) Push the LSK adjacent to YES.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Make sure that MCP SPD shows on the captain's and first officer's outboard display on the P1 panel.

(o) Push the LSK adjacent to YES.

(p) Set the displays source switch on the P5 panel to AUTO.

(q) Push the LSK adjacent to YES.

1) Make sure that TEST shows on the captain's and first officer's outboard display on the P1 panel.

(r) Push the LSK adjacent to YES.

1) Make sure that A/T LIM shows on the engine display.

(s) Push the LSK adjacent to YES.

1) Make sure that ARM shows on the captain's and first officer's outboard display on the P1 panel.

(t) Push the LSK adjacent to YES.

1) Make sure that GA shows on the captain's and first officer's outboard display on the P1 panel.

(u) Push the LSK adjacent to YES.

1) Make sure that THR HLD shows on the captain's and first officer's outboard display on the P1 panel.

(v) Push the LSK adjacent to YES.

(w) Push the LSK adjacent to INDEX to return to the INTERACTIVE INDEX page.

F. Input Discretes Test

SUBTASK 22-31-00-740-003

(1) Do these steps for the input discretes test:

(a) Push the LSK adjacent to INPUT DISCRETES.

(b) Follow the instructions on the CDU.

NOTE: This test checks numerous inputs of the A/T system. If a fault does occur during the tests troubleshooting tips will be displayed at test completion.

(c) Make sure that TEST PASSED shows on the CDU.

(d) Push the LSK adjacent to INDEX to return to the INTERACTIVE INDEX page.

G. Disengage/Warnings Test

SUBTASK 22-31-00-740-004

(1) Do these steps for the disengage/warnings test:

(a) Push the LSK adjacent to DISENG/WARNINGS.

(b) Follow these instructions shown on the CDU:

1) Set the autothrottle switch to ARM.

2) Push and release the A/T disengage thumb switch on thrust lever number 1.

a) Make sure that the autothrottle switch goes to OFF and the captain's and first officer's autothrottle warning lights flash.

NOTE: The autothrottle warning lights are on the autoflight status annunciators on the P1 and P3 panels. When one light comes on, the other light goes out in a continuous sequence of flashes.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

3) Set the autothrottle switch to ARM.
4) Push and release the A/T disengage thumb switch on thrust lever number 2.
   a) Make sure that the autothrottle switch goes to OFF and the captain's and first officer's autothrottle warning lights flash.
5) Set the autothrottle switch to ARM.
6) Push the LSK adjacent to PRESS.
   a) Make sure that the autothrottle switch goes to OFF and the captain's and first officer's autothrottle warning lights flash.

(c) Follow these instructions shown on the CDU:
1) Set the autothrottle switch to ARM.
2) Disengage the autothrottle.
   a) Make sure that the captain's and first officer's autothrottle warning lights flash.
3) Push the captain's autothrottle warning light.
   a) Make sure that the autothrottle warning lights go out.
4) Set the autothrottle switch to ARM.
5) Push the LSK adjacent to PRESS.
   a) Make sure that the captain's and first officer's autothrottle warning lights flash.
6) Push the first officer's autothrottle warning light.
   a) Make sure that the autothrottle warning lights go out.
7) Set the autothrottle switch to ARM.
8) Push the LSK adjacent to PRESS.
   a) Make sure that the captain's and first officer's autothrottle warning lights flash.
9) Push and release the A/T disengage thumb switch on thrust lever number 1.
   a) Make sure that the autothrottle warning lights go out.
10) Set the autothrottle switch to ARM.
11) Push the LSK adjacent to PRESS.
   a) Make sure that the captain's and first officer's autothrottle warning lights flash.
12) Push and release the A/T disengage thumb switch on thrust lever number 2.
   a) Make sure that the autothrottle warning lights go out.
   b) Make sure that TEST PASSED shows on the CDU.
13) Push the LSK adjacent to INDEX.
   a) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

H. Servo Motor Test

SUBTASK 22-31-00-860-011

(1) Do these steps for the servo motor test:
   (a) Push the LSK adjacent to THROTTLE TESTS.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

> **WARNING** MAKE SURE THAT ENGINE START LEVERS ARE IN THE CUTOFF POSITION. IF THE ENGINE START LEVERS ARE NOT IN THE CUTOFF POSITION, THE ENGINE START SEQUENCE CAN OCCUR. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(b) Do the instructions on the CDU.

(c) Set the engine start switches to CONT.

(d) Set the throttle levers to idle.

(e) Push the LSK adjacent to CONTINUE.

SUBTASK 22-31-00-740-008

(2) Push the LSK adjacent to SERVO MOTOR TEST.

(a) Do the instructions on the CDU.

1) Make sure that the throttle levers are set to idle and the autothrottle is engaged.

(b) Push the LSK adjacent to CONTINUE.

1) Make sure that TEST IN PROGRESS is replaced by NO FAULTS when the test is completed.

NOTE: No corrective action is required if only maintenance messages 22–31762, 22–31763, 22-31790 and/or 22–31791 show with no other maintenance messages on the CDU display. This is a nuisance fault.

(c) Push the LSK adjacent to INDEX.

1) Make sure that the A/T BITE TEST INTERACTIVE THROTTLE TESTS page shows on the CDU.

(d) Push the LSK adjacent to INDEX again.

(e) Do the instructions on the CDU.

(f) Push the LSK adjacent to CONTINUE.

1) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

I. Range Check

SUBTASK 22-31-00-860-012

(1) Do these steps for the range check:

(a) Push the LSK adjacent to THROTTLE TESTS.

> **WARNING** MAKE SURE THAT ENGINE START LEVERS ARE IN THE CUTOFF POSITION. IF THE ENGINE START LEVERS ARE NOT IN THE CUTOFF POSITION, THE ENGINE START SEQUENCE CAN OCCUR. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(b) Do the instructions on the CDU.

(c) Push the LSK adjacent to CONTINUE.

SUBTASK 22-31-00-740-009

(2) Push the LSK adjacent to RANGE CHECK.

(a) Do the instructions on the CDU.

(b) Push the LSK adjacent to INDEX.

1) Make sure that the A/T BITE TEST INTERACTIVE THROTTLE TESTS page shows on the CDU.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(c) Push the LSK adjacent to INDEX again.

(d) Do the instructions on the CDU.

(e) Push the LSK adjacent to CONTINUE.

1) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

J. Torque Test

SUBTASK 22-31-00-860-013

(1) Do these steps for the torque test:

(a) Push the LSK adjacent to THROTTLE TESTS.

WARNING	MAKE SURE THAT ENGINE START LEVERS ARE IN THE CUTOFF POSITION. IF THE ENGINE START LEVERS ARE NOT IN THE CUTOFF POSITION, THE ENGINE START SEQUENCE CAN OCCUR. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(b) Do the instructions on the CDU.

(c) Push the LSK adjacent to CONTINUE.

SUBTASK 22-31-00-740-007

(2) Push the LSK adjacent to TORQUE TEST.

(a) Do the instructions on the CDU.

(b) Push the LSK adjacent to CONTINUE.

(c) Make sure that the torque does not exceed 11 in-oz while the thrust levers are moving.

(d) Make sure that the torque does not exceed 17 in-oz while motors are driving the thrust levers against the aft stop.

(e) Make sure that the torque on the CDU is within approximately +/- 1.5 in-oz of stable values during these phases of the test:

1) Start of test, no thrust levers movement

2) Thrust levers moving toward forward stop

3) Thrust levers moving toward aft stop.

NOTE: 1) It is important that the thrust levers reach steady state torques and stay within +/- 1.5 in-oz of stable values at each phase, this is testing for smooth lever movement free of restrictions.

2) When the thrust levers get to their limits of travel the torque may increase by approximately 3.0 to 6.0 in-oz.

3) The CDU has a 2 second screen update rate, the torque shown may not be consistent with a stable value during phase changes due to this delay.

4) It is not expected that Throttle-1 and Throttle-2 torque reading to be the same value.

(f) Push the LSK adjacent to INDEX.

1) Make sure that the A/T BITE TEST INTERACTIVE THROTTLE TESTS page shows on the CDU.

(g) Push the LSK adjacent to INDEX again.

(h) Do the instructions on the CDU.

(i) Push the LSK adjacent to CONTINUE.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

(j) Push the LSK adjacent to INDEX.

(k) Push the LSK adjacent to INDEX again.

(l) Make sure that the MAIN BITE INDEX page shows on the CDU.

K. Identification/Configuration Test

SUBTASK 22-31-00-740-006

(1) Do these steps for the identification/configuration test:

(a) Push the LSK adjacent to A/T.

1) Make sure that the A/T BITE TEST page shows on the CDU.

(b) Push the LSK adjacent to IDENT/CONFIG.

1) Make sure that the CDU options page shows:

NOTE: It can be necessary to push the NEXT PAGE button to see the other options if there are multiple pages of options available on the CDU.

Table 501/22-31-00-993-805

A/T BITE TEST
CONFIG
*OPTIONS SELECTED
(Applicable Model)
AIRPLANE CNFG
LOM 402, 404, 406, 407, 416, 432, 437, 438, 445, 461-463; LOM 457 POST SB 737-31-2184
ALT ALERT OPT 0*[1]
LOM 450
ALT ALERT OPT 2
LOM 411, 412, 415, 420, 422-431, 433, 434, 439-444, 446, 447, 451-456, 458-460, 464-999; LOM 457 PRE SB 737-31-2184
ALT ALERT OPT 3
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-447, 450, 453-456, 458-460, 464; LOM 457 PRE SB 737-31-2184
A/S WARN
LOM 402, 404, 406, 407, 412, 415, 416, 422-425, 432-434, 437-442, 445-447 WITHOUT COLLINS E-FCC SOFTWARE P8.0 AND WITHOUT COLLINS E-FCC SOFTWARE P9.0 AND WITHOUT COLLINS E-FCC SOFTWARE P11.1; LOM 420 PRE SB 737-22-1218 AND WITHOUT COLLINS E-FCC SOFTWARE P8.0 AND WITHOUT COLLINS E-FCC SOFTWARE P9.0 AND WITHOUT COLLINS E-FCC SOFTWARE P11.1; AIRPLANES WITH COLLINS FCC SOFTWARE BEFORE P8.0 VERSION
CWS OVERRIDE
LOM 466-999; LOM 402, 404, 406, 407, 412, 415, 416, 422-425, 432-434, 437-442, 445-447 WITH COLLINS E-FCC SOFTWARE P8.0 OR WITH COLLINS E-FCC SOFTWARE P9.0 OR WITH COLLINS E-FCC SOFTWARE P11.1; LOM 420 PRE SB 737-22-1218 AND (WITH COLLINS E-FCC SOFTWARE P8.0 OR WITH COLLINS E-FCC SOFTWARE P9.0 OR WITH COLLINS E-FCC SOFTWARE P11.1)
RESRV1
LOM 404, 411, 412, 415, 416, 422-426, 429-434, 437-445, 450-454, 464; LOM 457 PRE SB 737-31-2184
CWS WARN

ECCN 9E991 BOEING PROPRIETARY - See title page for details

LOM 404, 411, 412, 415, 416, 422-426, 429-434, 437-445, 450-454, 464; LOM 457 PRE SB 737-31-2184 (Continued)

Table 501/22-31-00-993-805 (Continued)

A/T BITE TEST
LOM ALL
DUAL CHAN
LOM 422, 425, 427, 428, 434, 440, 442, 453, 454, 465-999; LOM 433 POST SB 737-22-1464
IRU - A/P INTLK ENABLE
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 422-434, 437-444, 446, 447, 450-999; LOM 445 POST SB 737-22-1448
INHIBIT G/S BEFORE LOC
LOM 427-431, 439, 441, 446, 447, 450, 455, 456, 461-464
MMR/GLS
LOM 422, 425, 427, 428, 433, 434, 437, 438, 440, 442, 450-454, 457, 465-999
HDG SEL TOGA
LOM 402, 404, 406, 407, 411, 412, 415, 416, 420, 423, 424, 426, 429-432, 439, 441, 443-447, 455, 456, 458-464
W/NGS LEVEL TOGA
LOM ALL
FMC LNAV
LOM 406, 407, 411, 412, 415, 420, 422-425, 427-434, 437-447, 450-999
SPD/ALT INTERVENTION
LOM ALL
EDFCS
BL-01
LOM 428-431, 450, 465-999; LOM 427 PRE SB 737-22-1306
CAT IIIB AIRPLANE
LOM ALL
OPC ENABLED (if applicable)
A/T OPER DISABLED (if applicable)
WINGLETS INSTALLED*[2]
LOM 411, 422, 425, 427-431, 433, 434, 440, 442, 450-454, 457, 464-999
SHORT FIELD PERF
LOM ALL
USE EXTERNAL A/T (if applicable)

*[1] ALT ALERT OPT 0 is equivalent to ALT ALERT STD.

*[2] This label will not show if the applicable FCC programming pin is not set. It is not necessary to set the pin if the APB winglets are installed.

(c) Push the LSK adjacent to INDEX.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

1) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

(d) Push the INIT REF key on the FMC CDU keyboard.

SUBTASK 22-31-00-860-022

(2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	13	C00120	WEATHER RADAR RT

SUBTASK 22-31-00-860-009

(3) If IRS outputs are no longer necessary, set the IRS-L and IRS-R mode select switches on the P5 panel to OFF.

SUBTASK 22-31-00-860-010

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOTHROTTLE DISENGAGE SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) A removal of the autothrottle disengage switch (S113 or S114).

(2) An installation of the autothrottle disengage switch.

(3) The autothrottle disengage switches are installed in the handles of the forward thrust levers.

TASK 22-31-51-000-801

2. Autothrottle Disengage Switch Removal

(Figure 401)

A. Location Zones

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

B. Prepare for the Removal

SUBTASK 22-31-51-860-001

(1) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

C. Autothrottle Disengage Switch Removal

SUBTASK 22-31-51-020-001

(1) Remove the snap ring [1] from the knob [6].

SUBTASK 22-31-51-020-002

(2) Remove the retainer [2].

SUBTASK 22-31-51-020-003

(3) Remove the O-ring [3].

SUBTASK 22-31-51-020-004

(4) Remove the autothrottle disengage switch [7] from the knob [6].

SUBTASK 22-31-51-020-005

(5) Remove the screws [4] that attach the electrical terminal lugs [5] to the autothrottle disengage switch [7].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FLIGHT COMPARTMENT

LEFT FORWARD THRUST LEVER
(RIGHT FORWARD THRUST LEVER IS EQUIVALENT)

A

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Autothrottle Disengage Switch Installation
Figure 401/22-31-51-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

B

G49441 S0006564189_V2

Autothrottle Disengage Switch Installation
Figure 401/22-31-51-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-31-51-400-801

3. **Autothrottle Disengage Switch Installation**
(Figure 401)

A. **References**

Reference	Title
24-22-00-860-812	Remove Electrical Power (P/B 201)
24-22-00-860-813	Supply External Power (P/B 201)

B. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	22-31-51-03-025	LOM ALL
7	Disengage switch	22-31-51-03-030	LOM ALL

C. **Location Zones**

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

D. **Autothrottle Disengage Switch Installation**

SUBTASK 22-31-51-862-001

(1) Make sure that this circuit breaker is open and has safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

SUBTASK 22-31-51-020-006

(2) Install the screws [4] that attach the electrical terminal lugs [5] to the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-001

(3) Install the autothrottle disengage switch [7] into the knob [6].

SUBTASK 22-31-51-420-002

(4) Install the O-ring [3] on the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-003

(5) Install the retainer [2] on the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-004

(6) Install the snap ring [1].

E. **Installation Test**

SUBTASK 22-31-51-860-002

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-31-51-860-018

(2) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-31-51-860-005

(3) Push the INIT REF key on the Flight Management Computer (FMC) Control Display Unit (CDU) keyboard.

SUBTASK 22-31-51-860-006

(4) Push the Line Select Key (LSK) adjacent to INDEX.

SUBTASK 22-31-51-860-007

(5) Push the LSK adjacent to MAINT.

SUBTASK 22-31-51-860-008

(6) Push the LSK adjacent to A/T.

NOTE: The two autothrottle warning lights come on during BITE.

SUBTASK 22-31-51-860-009

(7) Push the LSK adjacent to INTERACTIVE.

SUBTASK 22-31-51-860-010

(8) Push the LSK adjacent to INPUT DISCRETES TEST.

SUBTASK 22-31-51-860-020

(9) Follow the instructions on the CDU.

NOTE: This test checks numerous inputs of the A/T system. If a fault does occur during the tests troubleshooting tips will be displayed at test completion.

SUBTASK 22-31-51-860-021

(10) Make sure that TEST PASSED shows on the CDU.

SUBTASK 22-31-51-860-022

(11) Push the LSK adjacent to INDEX to return to the INTERACTIVE INDEX page.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-31-51-860-004

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOTHROTTLE BRAKE ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) A removal of the autothrottle brake assembly.

(2) An installation of the autothrottle brake assembly.

TASK 22-31-81-000-801

2. Autothrottle Brake Assembly - Removal

(Figure 401)

A. General

(1) There are two autothrottle brake assemblies on an airplane.

(2) The autothrottle brake assemblies are installed on the autothrottle assembly. The autothrottle assembly is located inside the forward access door.

B. References

Reference	Title
22-31-91-020-801	Autothrottle Servo Motor and Gearbox Removal (P/B 401)
76-11-05-000-801-F00	Thrust Lever Angle Resolver and Autothrottle Brake Assembly Removal (P/B 401)

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Removal

SUBTASK 22-31-81-000-001

(1) Remove the associated autothrottle servo motor and gearbox. To remove it, do this task: Autothrottle Servo Motor and Gearbox Removal, TASK 22-31-91-020-801.

SUBTASK 22-31-81-010-001

(2) Remove the associated autothrottle resolver. To remove it, do this task: Thrust Lever Angle Resolver and Autothrottle Brake Assembly Removal, TASK 76-11-05-000-801-F00.

E. Autothrottle Brake Assembly Removal

SUBTASK 22-31-81-020-001

(1) Do these steps to disconnect the thrust lever connecting rod [6]:

(a) Remove the cotter pin [3].

(b) Remove the bolt [1], washer [5], and nut [4] that holds the thrust lever connecting rod [6] to the brake assembly [2].

SUBTASK 22-31-81-020-002

(2) Remove the bolt [10], washer [9], and nut [8] to disconnect the control rod [11].

SUBTASK 22-31-81-010-002

(3) Slide the brake assembly [2] off the shaft [7].

END OF TASK

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Brake Assembly Installation
Figure 401/22-31-81-990-801 (Sheet 1 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Brake Assembly Installation
Figure 401/22-31-81-990-801 (Sheet 2 of 2)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-31-81-400-801

3. Autothrottle Brake Assembly - Installation

(Figure 401)

A. References

Reference	Title
22-31-91-400-801	Autothrottle Servo Motor and Gearbox Installation (P/B 401)
76-11-05-400-801-F00	Thrust Lever Angle Resolver and Autothrottle Brake Assembly Installation (P/B 401)

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. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Brake assembly	22-31-81-01-105	LOM ALL
		22-31-81-02-105	LOM ALL
3	Cotter pin	22-31-00-01-005	LOM ALL

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
210	Subzone - Control Compartment - Body Station 178.00 to Body Station 259.50

E. Autothrottle Brake Assembly Installation

SUBTASK 22-31-81-420-001

(1) Do these steps to install the brake assembly [2]:

(a) Apply grease, D00013 or grease, D00633 to the shaft [7].

(b) Install the brake assembly [2] on the autothrottle shaft [7].

(c) Attach the control rod [11] to the brake assembly [2] with the bolt [10], washer [9], and nut [8].

(d) Install the bolt [1] with its head on the inboard side of the thrust lever connecting rod [6].

(e) Install the nut [4] and washer [5].

1) Install the cotter pin [3].

SUBTASK 22-31-81-400-001

(2) Install the autothrottle resolver. To install it, do this task: Thrust Lever Angle Resolver and Autothrottle Brake Assembly Installation, TASK 76-11-05-400-801-F00.

SUBTASK 22-31-81-400-002

(3) Install the autothrottle servo motor and gearbox. To install it, do this task: Autothrottle Servo Motor and Gearbox Installation, TASK 22-31-91-400-801.

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

AUTOTHROTTLE SERVO MOTOR AND GEARBOX - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) A removal of the autothrottle servo motor and the gearbox.

(2) An installation of the autothrottle servo motor and the gearbox.

B. The autothrottle servo motors (M1836 and M1837) are accessed thru opening the forward access door.

TASK 22-31-91-020-801

2. Autothrottle Servo Motor and Gearbox Removal

(Figure 401)

A. General

(1) The autothrottle servo motor (referred to as the servo motor) is installed on the gearbox of the autothrottle assembly.

(2) The gearbox is installed on the autothrottle assembly.

(3) The servo motor and the gearbox can also be removed and installed as a unit. To remove both as a unit, do not remove the servo motor from the gearbox.

B. References

Reference	Title
53-14-01-020-801	Nose Wheel Well Access Panels - Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
112A	Forward Access Door
113AC	Fwd Nose Wheel Well Upper Access Panel
114AC	Fwd Nose Wheel Well Upper Access Panel

F. Prepare for the Removal

SUBTASK 22-31-91-860-001

(1) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

SUBTASK 22-31-91-860-010

(2) Attach the DO NOT OPERATE tag, STD-858, to the thrust levers.

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-31-91-010-001

(3) Open this access door:

Number	Name/Location
112A	Forward Access Door

SUBTASK 22-31-91-010-002

(4) Remove these access panels to get access to the servo motor and gearbox (TASK 53-14-01-020-801).

(a) Remove these access panels:

Number	Name/Location
113AC	Fwd Nose Wheel Well Upper Access Panel
114AC	Fwd Nose Wheel Well Upper Access Panel

G. Autothrottle Servo Motor Removal

SUBTASK 22-31-91-020-001

(1) Remove the electrical connectors [7] from the servo motor [6] and servo motor [13].

SUBTASK 22-31-91-020-002

(2) Remove the left hand servo motor [6] from the gearbox [1]:

(a) Remove the bolts [8], nuts [10], countersunk washers [12], and flat washers [9] that hold the servo motor [6] to the gearbox [1].

(b) Remove the servo motor [6].

SUBTASK 22-31-91-020-004

(3) Remove the right hand servo motor [13] from the gearbox [1]:

(a) Remove the bolts [14], nuts [17], countersunk washers [15], and flat washers [16] that hold the servo motor [13] and guard [18] to the gearbox [1].

(b) Remove the servo motor [13].

H. Gearbox Removal

SUBTASK 22-31-91-020-003

(1) Remove the gearbox [1] from the support bracket:

(a) Remove the screw [4] and washer [3] from the ramp plug [2].

(b) Remove the ramp plug [2].

(c) Remove the bolts [5] and washers [11] from the gearbox [1].

(d) Remove the gearbox [1].

——— END OF TASK ———

ECCN 9E991 BOEING PROPRIETARY - See title page for details

FORWARD ACCESS DOOR

A

F88416 S0006564200_V5

Autothrottle Servo Motor and Gearbox Installation
Figure 401/22-31-91-990-801 (Sheet 1 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

NOSE LANDING GEAR WHEEL WELL

B

3044757 S0000811793_V1

Autothrottle Servo Motor and Gearbox Installation
Figure 401/22-31-91-990-801 (Sheet 2 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autothrottle Servo Motor and Gearbox Installation
Figure 401/22-31-91-990-801 (Sheet 3 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Autothrottle Servo Motor and Gearbox Installation
Figure 401/22-31-91-990-801 (Sheet 4 of 4)

ECCN 9E991 BOEING PROPRIETARY - See title page for details

TASK 22-31-91-400-801

3. **Autothrottle Servo Motor and Gearbox Installation**

(Figure 401)

A. **References**

Reference	Title
22-31-00-710-802	Autothrottle System - System Test (P/B 501)
24-22-00-860-813	Supply External Power (P/B 201)
24-22-00-860-814	Remove External Power (P/B 201)
53-14-01-420-801	Nose Wheel Well Access Panels - Installation (P/B 401)

B. **Consumable Materials**

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gearbox	22-31-81-01-020	LOM ALL
		22-31-81-02-020	LOM ALL
		22-31-91-02-120	LOM ALL
6	Servo motor	22-31-91-01-025	LOM ALL
13	Servo motor	22-31-91-01-025	LOM ALL

D. **Location Zones**

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

E. **Access Panels**

Number	Name/Location
112A	Forward Access Door
113AC	Fwd Nose Wheel Well Upper Access Panel
114AC	Fwd Nose Wheel Well Upper Access Panel

F. **Gearbox Installation**

SUBTASK 22-31-91-640-001

(1) Apply grease, D00633, on all mating surfaces before you assemble the mechanism.

SUBTASK 22-31-91-420-001

(2) Align the gearbox spline on the splined shaft and set the gearbox [1] against the support frame.

SUBTASK 22-31-91-420-002

(3) Install the bolts [5] and washers [11] on the gearbox [1].

ECCN 9E991 BOEING PROPRIETARY - See title page for details

SUBTASK 22-31-91-420-003

(4) Align the spline teeth of the ramp plug [2] with the spline teeth of the shaft so that the adjacent ramp faces make contact with each other.

NOTE: A properly installed ramp plug will have the end of the ramp plug approximately even with the spline relief on the gearbox worm gear. If the end of the ramp plug is too high or below the spline relief, adjust it as follows: remove the ramp plug, turn it, and engage the ramp plug spline again.

SUBTASK 22-31-91-420-004

(5) Install the screw [4] with the washer [3] through the ramp plug [2]:

(a) Tighten the screw [4] to 25 in-lb (2.8 N·m) - 35 in-lb (4.0 N·m).

G. Autothrottle Servo Motor Installation

SUBTASK 22-31-91-640-002

(1) Apply grease, D00633, on all mating surfaces before you assemble the mechanism.

SUBTASK 22-31-91-420-005

CAUTION MAKE SURE THAT YOU INSTALL THE SERVO MOTOR CAREFULLY. IF YOU DO NOT, DAMAGE TO THE SPLINE SHAFT ON THE SERVO MOTOR CAN OCCUR.

(2) Install the servo motor [6] and servo motor [13] on the gearbox [1].

SUBTASK 22-31-91-420-007

(3) Install the bolts [8], countersunk washers [12], flat washers [9], and nuts [10] that hold the left hand servo motor [6] to the gearbox [1].

SUBTASK 22-31-91-420-008

(4) Install the bolts [14], countersunk washers [15], flat washers [16], and nuts [17] that hold the right hand servo motor [13] and guard [18] to the gearbox [1].

SUBTASK 22-31-91-420-006

(5) Connect the electrical connectors [7] to the servo motor [6] and servo motor [13].

SUBTASK 22-31-91-410-002

(6) Install the access panels removed to gain access to the servo motor and gearbox (TASK 53-14-01-420-801).

(a) Install these access panels:

Number	Name/Location
113AC	Fwd Nose Wheel Well Upper Access Panel
114AC	Fwd Nose Wheel Well Upper Access Panel

SUBTASK 22-31-91-410-001

(7) Close this access door:

Number	Name/Location
112A	Forward Access Door

SUBTASK 22-31-91-860-003

(8) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

Row	Col	Number	Name
E	1	C00721	AUTOTHROTTLE DC 1

ECCN 9E991 BOEING PROPRIETARY - See title page for details

H. Autothrottle Servo Motor Installation Test

SUBTASK 22-31-91-860-004

(1) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 22-31-91-860-006

(2) Make sure that the IRS-L and IRS-R mode select switches, on the P5 overhead panel, are not in the OFF position.

SUBTASK 22-31-91-740-001

(3) Do this BITE test:

(a) Push the INIT REF key on the FMC CDU keyboard.

(b) Push the Line Select Key (LSK) adjacent to INDEX.

(c) Push the LSK adjacent to MAINT.

(d) Push the LSK adjacent to A/T.

1) Make sure that the autothrottle warning lights on the autoflight status annunciators (P1 and P3 panels) come on continuously.

WARNING

MAKE SURE THAT ENGINE START LEVERS ARE IN THE CUTOFF POSITION. IF THE ENGINE START LEVERS ARE NOT IN THE CUTOFF POSITION, THE ENGINE START SEQUENCE CAN OCCUR. IF YOU DO NOT OBEY INSTRUCTIONS, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

(e) Push the LSK adjacent to CURRENT STATUS.

(f) Do the instructions on the Control Display Unit (CDU).

(g) Push the LSK adjacent to CONTINUE.

1) Make sure that TEST IN PROGRESS shows on the CDU.

2) Make sure that the A/T switch, on the P7 panel, automatically goes back to OFF.

3) Make sure that NO FAULTS shows on the CDU when the test is completed.

(h) Push the LSK adjacent to INDEX.

(i) Do the instructions on the CDU.

(j) Push the LSK adjacent to CONTINUE.

1) Make sure that A/T BITE TEST index shows.

SUBTASK 22-31-91-700-001

(4) Do the Servo motor test (TASK 22-31-00-710-802).

(a) Push the LSK adjacent to INDEX.

(b) Push the INIT REF key on the FMC CDU keyboard.

SUBTASK 22-31-91-860-007

(5) If IRS outputs are no longer necessary, set the IRS-L and IRS-R mode select switches, on the P5 overhead panel, to the OFF position.

SUBTASK 22-31-91-860-011

(6) Remove the DO-NOT-OPERATE tags on the thrust levers.

SUBTASK 22-31-91-860-008

(7) Do this task: Remove External Power, TASK 24-22-00-860-814.

END OF TASK

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