

CHAPTER

22

AUTOFLIGHT



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AIRCRAFT MAINTENANCE MANUAL

CHAPTER 22
AUTOFLIGHT

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1 thru 7	Sep 15/2023		501	Sep 15/2021		O 537	Sep 15/2023	
8	BLANK		R 502	Sep 15/2023		O 538	Sep 15/2023	
22-CONTENTS			503	Sep 15/2022		O 539	Sep 15/2023	
O 1	Sep 15/2023		504	Sep 15/2022		O 540	Sep 15/2023	
O 2	Sep 15/2023		R 505	Sep 15/2023		O 541	Sep 15/2023	
3	May 15/2023		506	Sep 15/2022		O 542	Sep 15/2023	
4	Sep 15/2022		507	Sep 15/2022		O 543	Sep 15/2023	
5	Sep 15/2021		R 508	Sep 15/2023		O 544	Sep 15/2023	
O 6	Sep 15/2023		O 509	Sep 15/2023		O 545	Sep 15/2023	
7	Sep 15/2021		O 510	Sep 15/2023		O 546	Sep 15/2023	
8	Sep 15/2021		511	Sep 15/2021		O 547	Sep 15/2023	
9	Sep 15/2021		512	Sep 15/2021		O 548	Sep 15/2023	
10	Sep 15/2021		513	Sep 15/2021		O 549	Sep 15/2023	
11	Sep 15/2021		514	Sep 15/2021		O 550	Sep 15/2023	
12	Sep 15/2021		515	Sep 15/2022		O 551	Sep 15/2023	
13	Sep 15/2022		516	Sep 15/2022		O 552	Sep 15/2023	
14	Sep 15/2021		517	Sep 15/2021		553	May 15/2023	
22-00-00			518	Sep 15/2021		554	May 15/2023	
901	Sep 15/2022		519	Sep 15/2021		555	May 15/2023	
902	Sep 15/2022		520	Sep 15/2021		556	May 15/2023	
903	Sep 15/2022		521	Sep 15/2021		557	May 15/2023	
904	BLANK		522	Sep 15/2021		R 558	Sep 15/2023	
22-11-00			R 523	Sep 15/2023		559	May 15/2023	
R 201	Sep 15/2023		R 524	Sep 15/2023		560	May 15/2023	
R 202	Sep 15/2023		R 525	Sep 15/2023		561	May 15/2023	
R 203	Sep 15/2023		R 526	Sep 15/2023		562	May 15/2023	
R 204	Sep 15/2023		O 527	Sep 15/2023		563	May 15/2023	
R 205	Sep 15/2023		O 528	Sep 15/2023		564	May 15/2023	
R 206	Sep 15/2023		O 529	Sep 15/2023		565	May 15/2023	
207	Sep 15/2021		O 530	Sep 15/2023		566	May 15/2023	
208	Sep 15/2022		O 531	Sep 15/2023		567	May 15/2023	
209	Sep 15/2022		O 532	Sep 15/2023		568	May 15/2023	
210	Sep 15/2022		O 533	Sep 15/2023		569	May 15/2023	
211	Sep 15/2021		O 534	Sep 15/2023		570	May 15/2023	
212	BLANK		O 535	Sep 15/2023		571	May 15/2023	
			O 536	Sep 15/2023		572	May 15/2023	

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573	May 15/2023		598.11	May 15/2023		408	Sep 15/2021	
574	May 15/2023		598.12	May 15/2023		409	Sep 15/2021	
575	May 15/2023		598.13	May 15/2023		410	Sep 15/2021	
576	May 15/2023		R 598.14	Sep 15/2023		411	Sep 15/2021	
577	May 15/2023		R 598.15	Sep 15/2023		412	BLANK	
578	May 15/2023		598.16	May 15/2023		22-11-11		
579	May 15/2023		598.17	May 15/2023		501	Sep 15/2021	
580	May 15/2023		598.18	May 15/2023		502	May 15/2023	
581	May 15/2023		598.19	May 15/2023		503	Sep 15/2021	
582	May 15/2023		598.20	May 15/2023		504	Sep 15/2021	
583	May 15/2023		598.21	May 15/2023		505	May 15/2023	
584	May 15/2023		598.22	May 15/2023		506	Sep 15/2021	
585	May 15/2023		598.23	May 15/2023		507	Sep 15/2021	
586	May 15/2023		598.24	May 15/2023		508	Sep 15/2021	
587	May 15/2023		598.25	May 15/2023		509	May 15/2023	
588	May 15/2023		598.26	May 15/2023		510	Sep 15/2021	
589	May 15/2023		598.27	May 15/2023		511	May 15/2023	
590	May 15/2023		598.28	May 15/2023		512	BLANK	
591	May 15/2023		598.29	May 15/2023		22-11-12		
592	May 15/2023		598.30	BLANK		201	Sep 15/2021	
593	May 15/2023		22-11-11			202	Sep 15/2021	
594	May 15/2023		201	May 15/2022		203	Sep 15/2021	
595	May 15/2023		202	May 15/2022		204	Sep 15/2021	
596	May 15/2023		203	Sep 15/2021		205	Sep 15/2021	
597	May 15/2023		204	Sep 15/2021		206	Sep 15/2021	
598	May 15/2023		205	Sep 15/2021		207	Sep 15/2021	
598.1	May 15/2023		206	Sep 15/2021		208	Sep 15/2021	
R 598.2	Sep 15/2023		207	Sep 15/2021		22-11-12		
598.3	May 15/2023		208	BLANK		401	May 15/2023	
598.4	May 15/2023		22-11-11			402	May 15/2023	
598.5	May 15/2023		401	Sep 15/2021		403	May 15/2023	
598.6	May 15/2023		402	Sep 15/2021		404	Sep 15/2022	
598.7	May 15/2023		403	Sep 15/2021		405	Sep 15/2022	
598.8	May 15/2023		404	Sep 15/2021		406	May 15/2023	
598.9	May 15/2023		405	Sep 15/2021		407	Sep 15/2022	
598.10	May 15/2023		406	Sep 15/2021		408	Sep 15/2022	
			407	Sep 15/2021		409	Sep 15/2022	

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410	Sep 15/2022		401	Sep 15/2021		203	Sep 15/2021	
22-11-14			402	Sep 15/2021		204	Sep 15/2021	
201	Sep 15/2021		403	Sep 15/2021		205	Sep 15/2021	
202	Sep 15/2021		404	May 15/2023		206	Sep 15/2021	
203	Sep 15/2021		405	Sep 15/2021		207	Sep 15/2021	
204	Sep 15/2021		406	Sep 15/2021		208	BLANK	
205	Sep 15/2021		22-11-22			22-11-24		
206	Sep 15/2021		501	Sep 15/2021		401	Sep 15/2021	
22-11-14			502	Sep 15/2021		402	Sep 15/2021	
401	Sep 15/2021		22-11-23			403	Sep 15/2021	
402	Sep 15/2021		201	Sep 15/2021		404	Sep 15/2021	
403	Sep 15/2021		202	Sep 15/2021		405	Sep 15/2021	
404	Sep 15/2021		203	Sep 15/2021		406	Sep 15/2021	
405	Sep 15/2021		204	Sep 15/2021		407	Sep 15/2021	
406	Sep 15/2021		205	Sep 15/2021		408	Sep 15/2021	
22-11-14			206	Sep 15/2021		22-11-24		
501	Jan 15/2022		22-11-23			501	Sep 15/2021	
502	Sep 15/2021		401	Sep 15/2021		502	Sep 15/2021	
503	Sep 15/2021		402	Sep 15/2021		22-11-25		
504	Sep 15/2021		403	Sep 15/2021		201	Sep 15/2021	
505	Sep 15/2021		404	Sep 15/2021		202	Sep 15/2021	
506	Sep 15/2021		405	Sep 15/2021		203	Sep 15/2021	
507	Sep 15/2021		406	Sep 15/2021		204	Sep 15/2021	
508	Sep 15/2021		407	Sep 15/2021		205	Sep 15/2021	
509	Sep 15/2021		408	BLANK		206	Sep 15/2021	
510	Sep 15/2021		22-11-23			207	Sep 15/2021	
511	Sep 15/2021		501	Sep 15/2021		208	BLANK	
512	Sep 15/2021		502	Sep 15/2021		22-11-25		
22-11-22			503	Sep 15/2021		O 401	Sep 15/2023	
201	Sep 15/2021		504	Sep 15/2021		R 402	Sep 15/2023	
202	Sep 15/2021		505	Sep 15/2021		R 403	Sep 15/2023	
203	Sep 15/2021		506	Sep 15/2021		R 404	Sep 15/2023	
204	Sep 15/2021		507	Sep 15/2021		R 405	Sep 15/2023	
205	Sep 15/2021		508	BLANK		R 406	Sep 15/2023	
206	BLANK		22-11-24			R 407	Sep 15/2023	
			201	Sep 15/2021		R 408	Sep 15/2023	
			202	Sep 15/2021		R 409	Sep 15/2023	

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O 410	Sep 15/2023		407	Jan 15/2023		406	Jan 15/2022	
O 411	Sep 15/2023		408	Jan 15/2023		22-11-29		
R 412	Sep 15/2023		22-11-26			501	Sep 15/2021	
A 413	Sep 15/2023		501	Jan 15/2022		502	Sep 15/2021	
A 414	BLANK		502	Sep 15/2021		503	Sep 15/2021	
22-11-25			503	Sep 15/2021		504	Sep 15/2021	
501	May 15/2023		504	Sep 15/2021		505	Sep 15/2021	
502	May 15/2023		505	Sep 15/2021		506	Sep 15/2021	
503	May 15/2023		506	Sep 15/2021		507	Sep 15/2021	
504	May 15/2023		507	Sep 15/2021		508	BLANK	
505	Sep 15/2021		508	Sep 15/2021		22-11-30		
506	May 15/2023		509	Sep 15/2021		201	Sep 15/2021	
507	May 15/2023		510	Sep 15/2021		202	Sep 15/2021	
508	May 15/2023		511	Sep 15/2021		203	Sep 15/2021	
22-11-25			512	BLANK		204	Sep 15/2021	
601	Sep 15/2021		22-11-26			205	Sep 15/2021	
602	Sep 15/2021		601	Sep 15/2021		206	Sep 15/2021	
603	Sep 15/2021		602	Sep 15/2021		207	Sep 15/2021	
604	Sep 15/2021		603	Sep 15/2021		208	BLANK	
605	Sep 15/2021		604	Sep 15/2021		22-11-30		
606	BLANK		605	Sep 15/2021		401	Sep 15/2021	
22-11-26			606	Sep 15/2021		402	Sep 15/2021	
201	Sep 15/2021		22-11-29			403	Sep 15/2021	
202	Sep 15/2021		201	Sep 15/2021		404	Sep 15/2021	
203	Sep 15/2021		202	Sep 15/2021		405	Sep 15/2021	
204	Sep 15/2021		203	Sep 15/2021		406	Sep 15/2021	
205	Sep 15/2021		204	Sep 15/2021		407	Jan 15/2022	
206	Sep 15/2021		205	Sep 15/2021		408	Sep 15/2021	
207	Sep 15/2021		206	Sep 15/2021		409	Sep 15/2021	
208	BLANK		207	Sep 15/2021		410	Sep 15/2021	
22-11-26			208	BLANK		22-11-30		
401	Sep 15/2021		22-11-29			501	Jan 15/2022	
402	Sep 15/2021		401	Sep 15/2021		502	Sep 15/2021	
403	Sep 15/2021		402	Sep 15/2021		503	Sep 15/2021	
404	Sep 15/2021		403	Sep 15/2021		504	Sep 15/2021	
405	Sep 15/2021		404	Jan 15/2022		505	Sep 15/2021	
406	Jan 15/2023		405	Jan 15/2022		506	Sep 15/2021	

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507	Sep 15/2021		511	Sep 15/2021		401	Sep 15/2021	
508	Sep 15/2021		512	BLANK		402	Sep 15/2021	
509	Sep 15/2021		22-11-32			403	Sep 15/2021	
510	Sep 15/2021		201	Sep 15/2021		R 404	Sep 15/2023	
511	Sep 15/2021		202	Sep 15/2021		R 405	Sep 15/2023	
512	BLANK		203	Sep 15/2021		R 406	Sep 15/2023	
22-11-31			204	Sep 15/2021		R 407	Sep 15/2023	
201	Sep 15/2021		205	Sep 15/2021		R 408	Sep 15/2023	
202	Sep 15/2021		206	BLANK		22-11-34		
203	Sep 15/2021		22-11-32			201	Sep 15/2021	
204	Sep 15/2021		401	Sep 15/2021		202	Sep 15/2021	
205	Sep 15/2021		402	Sep 15/2021		203	Sep 15/2021	
206	Sep 15/2021		403	Sep 15/2021		204	Sep 15/2021	
207	Sep 15/2021		404	Sep 15/2021		205	Sep 15/2021	
208	BLANK		405	Sep 15/2021		206	Sep 15/2021	
22-11-31			406	BLANK		207	Sep 15/2021	
401	Sep 15/2021		22-11-32			208	Sep 15/2021	
402	Sep 15/2021		501	Sep 15/2021		22-11-34		
403	Sep 15/2021		502	Sep 15/2021		401	Sep 15/2021	
404	Sep 15/2021		503	Sep 15/2021		402	Sep 15/2021	
405	Sep 15/2021		504	BLANK		403	Sep 15/2021	
406	Sep 15/2021		22-11-33			404	May 15/2022	
407	Jan 15/2022		201	Sep 15/2021		405	May 15/2022	
408	Sep 15/2021		202	Sep 15/2021		406	BLANK	
409	Sep 15/2021		203	Sep 15/2021		22-11-34		
410	Sep 15/2021		204	Sep 15/2021		501	Sep 15/2021	
22-11-31			205	Sep 15/2022		502	Sep 15/2021	
R 501	Sep 15/2023		206	Sep 15/2021		22-11-34		
R 502	Sep 15/2023		207	Sep 15/2021		701	Sep 15/2021	
R 503	Sep 15/2023		208	Sep 15/2021		702	BLANK	
R 504	Sep 15/2023		209	Jan 15/2023		22-11-37		
505	Sep 15/2021		210	Sep 15/2022		201	Sep 15/2021	
506	Sep 15/2021		211	Sep 15/2021		202	Sep 15/2021	
507	Sep 15/2021		212	Sep 15/2021		203	Sep 15/2021	
508	Sep 15/2021		213	Sep 15/2021		204	Sep 15/2021	
509	Sep 15/2021		214	BLANK		205	Sep 15/2021	
510	Sep 15/2021					206	Sep 15/2021	

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22-11-37 (cont)			22-11-40 (cont)			22-11-92		
207	Sep 15/2021		407	Jan 15/2022		501	Sep 15/2022	
208	BLANK		408	Sep 15/2021		502	Sep 15/2022	
22-11-37			409	Sep 15/2021		503	Sep 15/2022	
401	Sep 15/2021		410	BLANK		504	Sep 15/2022	
402	Sep 15/2021		22-11-41			505	Sep 15/2022	
403	Sep 15/2021		201	Sep 15/2021		506	Sep 15/2021	
404	Sep 15/2021		202	Sep 15/2021		507	Sep 15/2021	
405	Sep 15/2021		203	Sep 15/2021		508	Sep 15/2021	
406	Sep 15/2021		204	Sep 15/2021		509	Sep 15/2022	
407	Sep 15/2021		22-11-41			510	Sep 15/2022	
408	BLANK		401	Sep 15/2021		511	Sep 15/2022	
22-11-39			402	Sep 15/2021		512	Sep 15/2022	
201	Sep 15/2021		403	Sep 15/2021		513	Sep 15/2022	
202	Sep 15/2021		404	Sep 15/2021		514	Sep 15/2022	
203	Sep 15/2021		405	Sep 15/2021		22-23-00		
204	Sep 15/2021		406	Sep 15/2021		501	Sep 15/2021	
22-11-39			407	Sep 15/2021		502	Sep 15/2021	
401	Sep 15/2021		408	BLANK		503	Sep 15/2021	
402	Sep 15/2021		22-11-81			504	Sep 15/2021	
403	Sep 15/2021		501	Sep 15/2021		505	Sep 15/2021	
404	May 15/2023		502	Sep 15/2021		506	Sep 15/2021	
405	Sep 15/2021		503	Sep 15/2021		507	Sep 15/2021	
406	Sep 15/2021		504	BLANK		508	Sep 15/2021	
22-11-40			22-11-92			509	Sep 15/2021	
201	Sep 15/2021		201	Sep 15/2021		510	BLANK	
202	Sep 15/2021		202	Sep 15/2021		22-23-11		
203	Sep 15/2021		203	Sep 15/2021		R 401	Sep 15/2023	
204	Sep 15/2021		204	Sep 15/2021		R 402	Sep 15/2023	
205	Sep 15/2021		22-11-92			403	Sep 15/2021	
206	Sep 15/2021		401	Sep 15/2022		404	Sep 15/2021	
22-11-40			402	Sep 15/2021		R 405	Sep 15/2023	
401	Sep 15/2021		403	Sep 15/2021		R 406	Sep 15/2023	
402	Jan 15/2022		404	Sep 15/2022		R 407	Sep 15/2023	
403	Sep 15/2021		405	Sep 15/2022		R 408	Sep 15/2023	
404	Sep 15/2021		406	Sep 15/2022		A 409	Sep 15/2023	
405	Sep 15/2021		407	Sep 15/2022		A 410	Sep 15/2023	
406	Sep 15/2021		408	BLANK				

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502	Sep 15/2021		404	Sep 15/2021				
503	Sep 15/2021		405	Sep 15/2021				
504	Sep 15/2021		406	BLANK				
22-23-21			22-31-81					
401	Jan 15/2023		401	Sep 15/2021				
402	Jan 15/2023		402	Sep 15/2021				
403	Sep 15/2021		403	Sep 15/2021				
404	Jan 15/2023		404	Jan 15/2022				
405	Jan 15/2023		22-31-91					
406	Jan 15/2023		401	Sep 15/2021				
407	Jan 15/2023		402	Sep 15/2021				
408	Jan 15/2023		403	Sep 15/2021				
409	Jan 15/2023		404	Sep 15/2021				
410	BLANK		405	Sep 15/2021				
22-23-21			406	Sep 15/2021				
501	Sep 15/2021		R 407	Sep 15/2023				
502	Sep 15/2021		R 408	Sep 15/2023				
503	Sep 15/2021		R 409	Sep 15/2023				
504	Sep 15/2021		410	BLANK				
22-31-00								
201	Sep 15/2021							
202	Sep 15/2021							
22-31-00								
R 501	Sep 15/2023							
R 502	Sep 15/2023							
R 503	Sep 15/2023							
R 504	Sep 15/2023							
R 505	Sep 15/2023							
R 506	Sep 15/2023							
R 507	Sep 15/2023							
R 508	Sep 15/2023							
A 509	Sep 15/2023							
A 510	BLANK							
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<u>AUTOFLIGHT - DDG MAINTENANCE PROCEDURES</u>	22-00-00		901	SIA ALL
DDG 22-21-01 Mach Trim Systems Inoperative - Preparation TASK 22-00-00-040-803			901	SIA ALL
DDG 22-21-01 Mach Trim Systems Inoperative - Restoration TASK 22-00-00-440-803			903	SIA ALL
<u>DIGITAL FLIGHT CONTROL SYSTEM - MAINTENANCE PRACTICES</u>	22-11-00		201	SIA ALL
Land Verify Test TASK 22-11-00-700-801			201	SIA ALL
Reset Latches Procedure TASK 22-11-00-700-802			208	SIA ALL
In-Flight Autopilot Disconnect Fault Review Using CDU TASK 22-11-00-730-801			208	SIA ALL
<u>DIGITAL FLIGHT CONTROL SYSTEM - ADJUSTMENT/TEST</u>	22-11-00		501	SIA ALL
Digital Flight Control System (DFCS) - Operational Test TASK 22-11-00-740-801			502	SIA ALL
Digital Flight Control System (DFCS) - System Test TASK 22-11-00-740-802			512	SIA ALL
Flight Control Computer Option Pins Test TASK 22-11-00-740-803			512	SIA ALL
BITE Library Test TASK 22-11-00-740-804			514	SIA ALL
Wheel Spin Up Test TASK 22-11-00-740-805			519	SIA ALL
Power Bus Transfer Test TASK 22-11-00-740-806			521	SIA ALL
Power Bus Isolation Test TASK 22-11-00-740-807			523	SIA ALL
Circuit Breaker Interface Test TASK 22-11-00-740-808			527	SIA ALL

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<u>AUTOTHROTTLE SERVO MOTOR AND GEARBOX - REMOVAL/INSTALLATION</u>	22-31-91		401	SIA ALL
Autothrottle Servo Motor and Gearbox Removal TASK 22-31-91-020-801			401	SIA ALL
Autothrottle Servo Motor and Gearbox Installation TASK 22-31-91-400-801			407	SIA ALL

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AUTOFLIGHT - DDG MAINTENANCE PROCEDURES

1. General

- A. This procedure has maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks are used to 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) DDG 22-21-01 Mach Trim Systems Inoperative - Preparation
 - (2) DDG 22-21-01 Mach Trim Systems Inoperative - Restoration

TASK 22-00-00-040-803

2. DDG 22-21-01 Mach Trim Systems Inoperative - Preparation

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
22-11-00-740-804	BITE Library 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)

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 22-00-00-860-001

- (1) Do one of steps that follow to deactivate the applicable Mach Trim system:

NOTE: The airplane must also be dispatched using MMEL item 22-11-07.

- (a) If Mach Trim system channel A is inoperative:

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 Mach Trim system channel B is inoperative:

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

SUBTASK 22-00-00-730-001

- (2) Do one of the steps that follows to make sure that the remaining Mach Trim system channel is operable:

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- (a) If channel A is inoperative, do the DFCS library test No. 33, Mach Trim, for channel B (TASK 22-11-00-740-804).
 - 1) Make sure that the test passes.
- (b) If channel B is inoperative, do the DFCS library test No. 33, Mach Trim, for channel A (TASK 22-11-00-740-804).
 - 1) Make sure that the test passes.

E. Dual Mach Trim System Deactivation

SUBTASK 22-00-00-860-002

- (1) Do these steps to deactivate the Mach Trim Systems:

NOTE: The airplane must also be dispatched using MMEL item 22-11-07.



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 power to hydraulic systems A and B (TASK 29-11-00-860-801).
- (b) Put the flaps to the UP position.
- (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 the elevator trailing edge is aligned with the elevator index mark on the tailcone at 0.00 ± 0.06 in. (0.00 ± 1.52 mm).

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

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

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 (TASK 29-11-00-860-805).

———— **END OF TASK** ————

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TASK 22-00-00-440-803

3. DDG 22-21-01 Mach Trim Systems Inoperative - Restoration

A. General

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

B. Location Zones

Zone	Area

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

C. Mach Trim System Restoration

SUBTASK 22-00-00-860-003

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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

————— END OF TASK —————

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DIGITAL FLIGHT CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure contains these tasks:

- (1) Land Verify Test - Maintenance Practices
- (2) Reset Latches Procedure - Maintenance Practices
- (3) In-flight autopilot disconnect fault review using Flight Management Computer (FMC) Control Display Unit (CDU).

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 Units.
- (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:

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1) Autotests

NOTE: The autotests are automatic.

2) Interactive Tests

NOTE: 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.

3) Surface Tests.

NOTE: 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
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

(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

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

Test Name	Group No./ Test No.
Speed/Stab Trim	49.32

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Table 203/22-11-00-993-803 (Continued)

Test Name	Group No./ Test No.
Flaps	49.34
Dual Stab	49.35

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)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-002

- (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 22-11-00-860-003

- (2) Set the B/U CUTOOUT switch on the aft area of the control stand to the CUTOOUT position.

SUBTASK 22-11-00-860-004

- (3) Make sure that the VHF NAV and IRS Switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-005

- (4) Set the Left and Right IRS Select Switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

E. Procedure

SUBTASK 22-11-00-740-001

- (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 Built-In-Test Equipment (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) LAND VERIFY

- (b) Autotest:

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- 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, then 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, then 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, then do these steps:
 - b) Push the LSK adjacent to TEST DATA.
 - c) Push the LSK adjacent to RERUN.
- 5) Refer to IFIM and do the applicable procedure(s) for the applicable maintenance message.
 - a) Push the LSK adjacent to CONTINUE.

(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.
- 2) If INTERACTIVE TEST PASSED shows on the CDU display, then 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, then 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.

- a) If it is necessary to do the test again, then do these steps:
 - b) Push the LSK adjacent to TEST DATA.

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- c) Push the LSK adjacent to RERUN.
- 5) Refer to 22-Maintenance Message Index in the Interactive Fault Isolation Manual (IFIM) 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.



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.

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



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.

- 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, then 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, then do these steps:
 - a) Push the LSK adjacent to TEST RESULTS.

NOTE: If DFCS test 49.35 is performed and the test fails, select the TEST DATA line select key. If only S004 or S007 failures are shown on the TEST DATA page with maintenance messages 22-11191 or 22-11194 displayed, then these failures can be ignored. Select the CONTINUE line select key and complete the remainder of test 49.35. If the remainder of test 49.35 can be completed without failures, then the test can be considered a PASS.

- 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, then do these steps:
 - b) Push the LSK adjacent to TEST DATA.
 - c) Push the LSK adjacent to RERUN.
- 6) Refer to 22-Maintenance Message Index in the IFIM to find the fault isolation task for the applicable maintenance message.



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F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-007

- (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 22-11-00-860-008

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-009

- (3) Set the B/U CUTOFF switch on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-010

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

SUBTASK 22-11-00-860-011

- (5) Turn the Air Data Inertial Reference Unit (ADIRU)'s off on the Nav Mode Select Panel, by turning the IRS Select Switches to off.

————— **END OF TASK** —————

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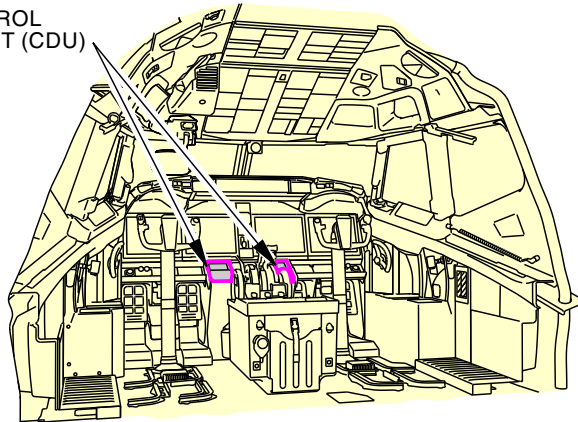
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



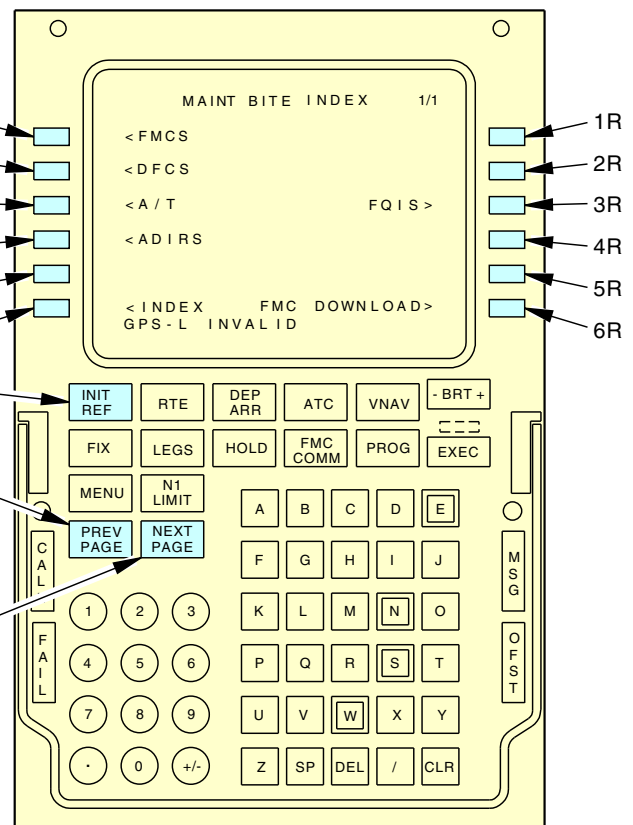
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



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A

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Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 201/22-11-00-990-801

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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. **Location Zones**

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

C. **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:

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.

————— **END OF TASK** —————

TASK 22-11-00-730-801

4. **In-Flight Autopilot Disconnect Fault Review Using CDU**

(Figure 202)

A. **General**

- (1) This procedure is used to review autopilot disconnect faults that occur during flight.

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)

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(Continued)

Reference	Title
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. Prepare for Fault Review

SUBTASK 22-11-00-860-259



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 systems A and B (TASK 29-11-00-860-801).

SUBTASK 22-11-00-860-260

- (2) Set the B/U CUTOOUT switch on the aft area of the control stand to the CUTOOUT position.

SUBTASK 22-11-00-860-261

- (3) Make sure the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL position.

SUBTASK 22-11-00-860-262

- (4) Align the left and right IRS (TASK 34-21-00-820-802 or TASK 34-21-00-820-801 or TASK 34-21-00-820-803).

E. Procedure

SUBTASK 22-11-00-700-001

- (1) Push the INIT REF key on the CDU.
 - (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 DECK EFFECT.

SUBTASK 22-11-00-730-001

- (2) Push the CHANNEL A or CHANNEL B LSK.

SUBTASK 22-11-00-730-002

- (3) Push the A/P DISC LSK.

SUBTASK 22-11-00-730-003

- (4) Review all faults shown on the CDU.

NOTE: Use the NEXT PAGE function key if multiple pages are available.

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SUBTASK 22-11-00-730-004

- (5) Record all maintenance messages shown on the CDU.

SUBTASK 22-11-00-730-005

- (6) Refer to IFIM and do the applicable procedure(s) to troubleshoot any faults.

F. Put the Airplane Back to its Usual Condition

SUBTASK 22-11-00-860-263

- (1) Set the B/U CUTOFF switch on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-264

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

SUBTASK 22-11-00-860-265

- (3) Set the L/R IRS switches, on the NAV Mode Select Panel, to the OFF position.

———— **END OF TASK** ————

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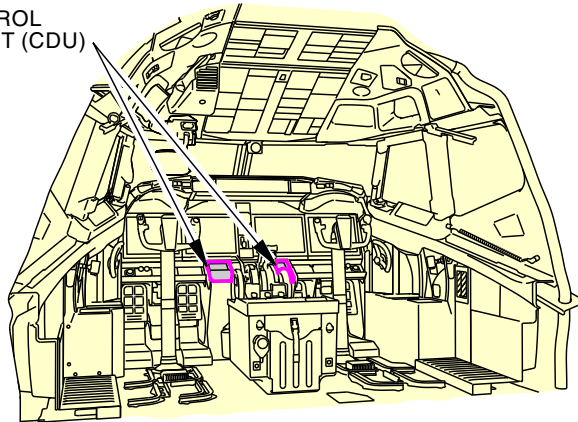
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FMCS CONTROL
DISPLAY UNIT (CDU)

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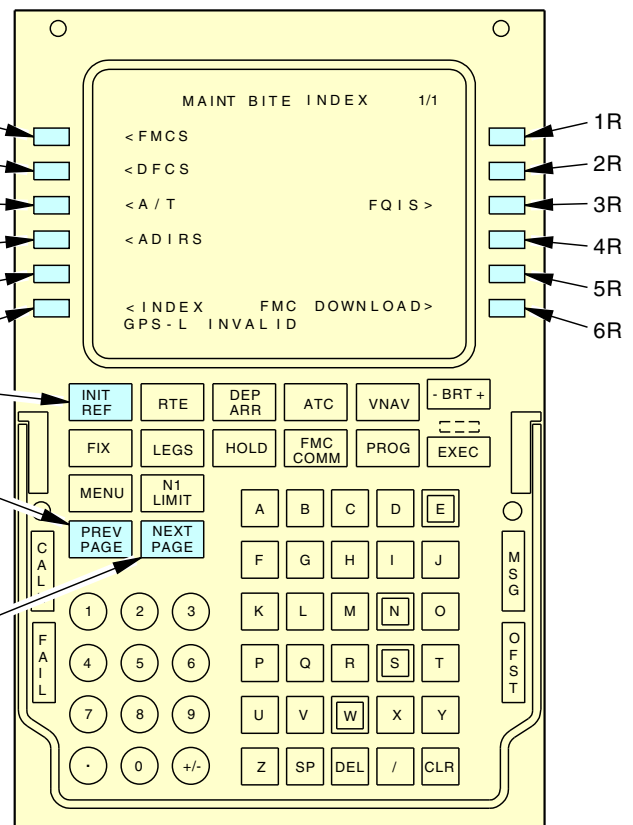
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

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Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 202/22-11-00-990-809

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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
- (14) Elevator Rigging Test
- (15) Elevator Single Authority Test
- (16) Elevator Dual Authority Test
- (17) Aileron Rigging Test
- (18) Flaps Rigging Test
- (19) Stabilizer Rigging Test
- (20) Pitch Control Wheel Steering Rigging Test
- (21) Roll Control Wheel Steering Rigging Test
- (22) Mach Trim Rigging Test
- (23) Alpha Vane Rigging Test
- (24) Remote Light Sensor Input Test
- (25) Elevator Centering Unit Test
- (26) Rudder Rigging Test
- (27) Digital Flight Control System LRU Replacement Test
- (28) Digital Flight Control System BITE Procedure
- (29) Digital Flight Control System Speed Trim/Stab Trim BITE Test
- (30) Digital Flight Control System Dual Stab Surface Test
- (31) Digital Flight Control System Continuity 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)

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- (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

(Figure 501)

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) Stab/Speed Trim System (Group 14)
 - 5) Altitude Alert (Group 15).

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- (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 501/22-11-00-993-804

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
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	10.27

- (7) Autopilot (Group 11)

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Table 502/22-11-00-993-805

Library Test Name	Group No./ Library Test No.
Interactive	
ADIRU	11.01
FMC	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	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

(8) Flight Director (Group 12)

Table 503/22-11-00-993-806

Library Test Name	Group No./ Library Test No.
Interactive	
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

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Table 503/22-11-00-993-806 (Continued)

Library Test Name	Group No./ Library Test No.
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

(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) Stab/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)

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)

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(Continued)

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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-013

- (1) Open this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-015

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-016

- (3) 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 or TASK 34-21-00-820-803).

SUBTASK 22-11-00-860-017

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

SUBTASK 22-11-00-860-018



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.

- (5) 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.

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- 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 FCC A is correct.
NOTE: The software part number shows below FCC 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 FCC B is correct.
NOTE: The software part number shows below FCC OPS.

F. Current Status Tests

SUBTASK 22-11-00-740-002

- (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
 - 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, then 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.

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- 4) Make a record of the channel (A, B, or A/B), suspect Line Replaceable Unit (LRU)s, and 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 the IFIM and do the applicable procedure(s) for the applicable maintenance message.

(c) Additional Test

NOTE: The additional test comes immediately after the last autotest is completed.

- 1) If the additional test does not appear immediately after the last autotest then select CONTINUE to go to the additional test.
- 2) 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 the CURRENT STATUS SELECT ADDITIONAL TEST menu is seen again.

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

3) AUTOPILOT

- a) Do the interactive tests.
- b) Do the surface tests.
- c) Make sure that the Autopilot Test is completed with no failure.

4) FLIGHT DIRECTOR

- a) Do the interactive tests.
- b) Do the surface test.
- c) Make sure that the Flight Director Test is completed with no failure.

5) 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.

6) STAB/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.

7) ALT ALERT

- a) Do the interactive tests.

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

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- 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, then 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.
 - b) Make a record of the channel (A, B, or A/B), suspect LRUs, and 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 the IFIM and do the applicable procedure(s) for the applicable maintenance message.
- (e) Surface Test
- NOTE: The surface test comes immediately after the last interactive test is completed.



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.

- 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, then 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:
 - a) Push the LSK adjacent to TEST RESULTS.
 - b) Make a record of the channel (A, B, or A/B), suspect LRUs, and 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.



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- 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 the IFIM and do the applicable procedure(s) for the applicable maintenance message.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-019

- (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 22-11-00-860-020

- (2) Close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-021

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-022

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

———— **END OF TASK** ————

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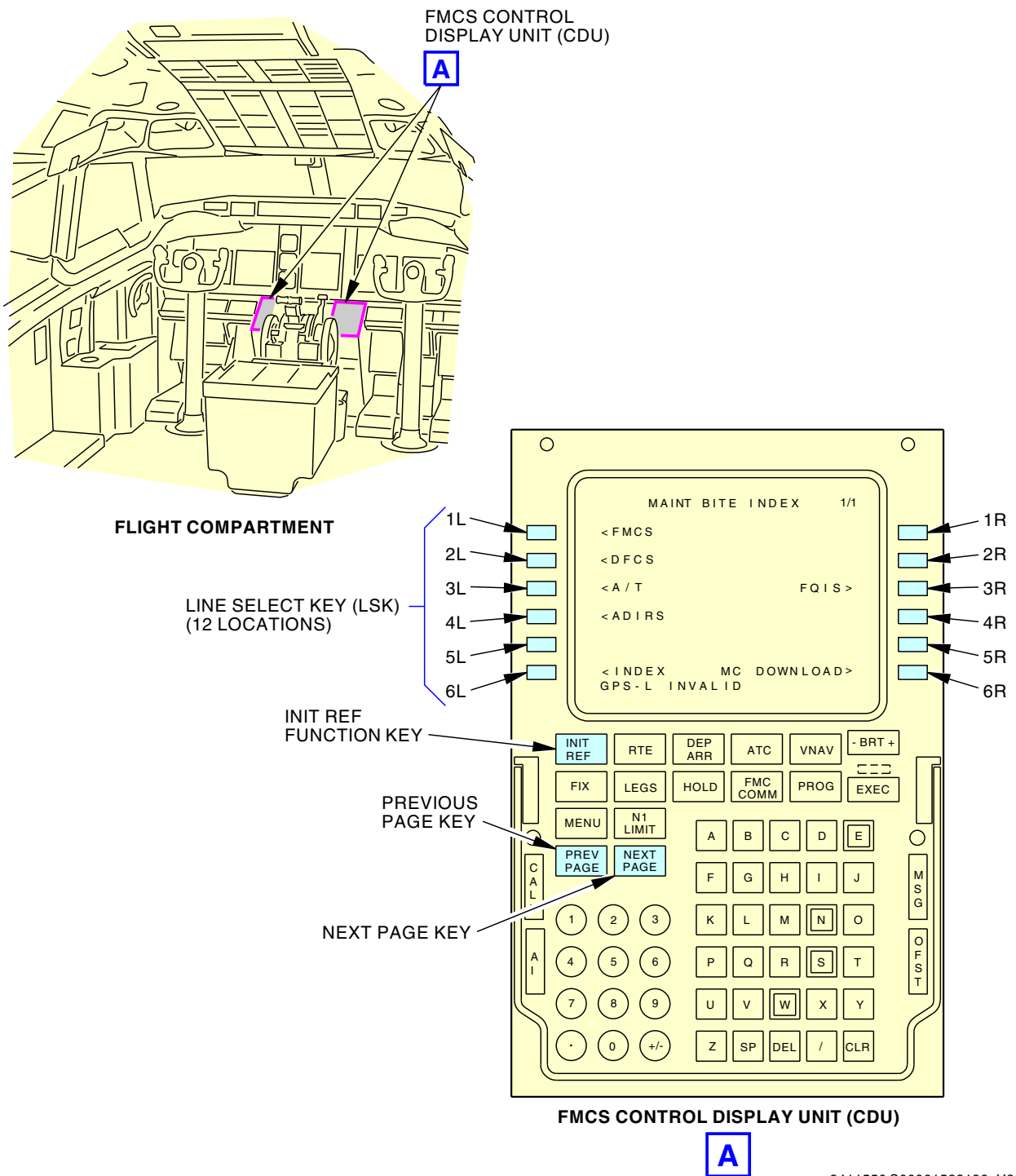
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Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 501/22-11-00-990-802

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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. Digital Flight Control System (DFCS) System Test

SUBTASK 22-11-00-740-003

- (1) Do this task: Flight Control Computer Option Pins Test, TASK 22-11-00-740-803.

SUBTASK 22-11-00-740-004

- (2) Do this task: BITE Library Test, TASK 22-11-00-740-804.

SUBTASK 22-11-00-740-005

- (3) Do this task: Wheel Spin Up Test, TASK 22-11-00-740-805.

SUBTASK 22-11-00-740-006

- (4) Do this task: Power Bus Transfer Test, TASK 22-11-00-740-806.

SUBTASK 22-11-00-740-007

- (5) Do this task: Power Bus Isolation Test, TASK 22-11-00-740-807.

SUBTASK 22-11-00-740-008

- (6) Do this task: Circuit Breaker Interface Test, TASK 22-11-00-740-808.

SUBTASK 22-11-00-740-009

- (7) Do this task: Air/Ground Discrete Test, TASK 22-11-00-740-809.

SUBTASK 22-11-00-740-010

- (8) Do this task: Other Discrete Inputs Test, TASK 22-11-00-740-810.

SUBTASK 22-11-00-740-011

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

SUBTASK 22-11-00-740-012

- (10) Do this task: Maintenance Monitor Test, TASK 22-11-00-740-811.

SUBTASK 22-11-00-740-013

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

————— **END OF TASK** —————

TASK 22-11-00-740-803

4. Flight Control Computer Option Pins Test

A. General

- (1) The option pins test lets you do a check of the option and program pins for the flight control computers A (FCC-A) and B (FCC-B).

B. Location Zones

Zone	Area

211	Flight Compartment - Left

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Zone	Area

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 22-11-00-860-024

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-025

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

SUBTASK 22-11-00-860-026

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

D. Flight Control Computer Option Pins Test

SUBTASK 22-11-00-740-014

- (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.

- 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.

Table 507/22-11-00-993-810 FCC Program Pin Options

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AIRPLANE CNFG STD
ALT ALERT OPT 3
A/S WARN

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Table 507/22-11-00-993-810 FCC Program Pin Options (Continued)

CWS WARN
DUAL CHAN
IRU-A/P INTLK ENABLE
INHIBIT G/S BEFORE LOC
MMR/GLS
WINGS LEVEL TOGA
FMC LNAV
SPD/ALT INTERVENTION
EDFCS
BL-01
CAT IIIB AIRPLANE

- 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-027

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— **END OF TASK** —————

TASK 22-11-00-740-804

5. BITE Library Test

A. General

- (1) The BITE library test does a check of the interfaces between the Digital Flight Control System (DFCS) and its Line Replaceable Units (LRU).
- (2) The BITE library test contains three types of tests. The quick test (autotest), interactive test and surface test.
- (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 CDU display to complete the interactive tests.

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- (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 508/22-11-00-993-811

Library Test Name	Group No./ Library Test No.
ADIRU/ISFD	60.01
Autothrottle	60.04
DME	60.05
LRRA	60.07
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

(4) Interactive Tests

Table 509/22-11-00-993-812

Library Test Name	Group No./ Library Test No.
ADIRU/ISFD	60.01
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

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Table 509/22-11-00-993-812 (Continued)

Library Test Name	Group No./ Library Test No.
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 510/22-11-00-993-813

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

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)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-029

- (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 22-11-00-860-030

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-031

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

SUBTASK 22-11-00-860-032

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

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SUBTASK 22-11-00-860-033



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.

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

NOTE: Hydraulic power is necessary for the surface test.

E. BITE Library Test

SUBTASK 22-11-00-740-015

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

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

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 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, then 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, then do the library test(s) that shows on the CDU display.
- 4) Make a record of the maintenance messages that show on the CDU display.
- 5) If it is necessary to do the test again, do these steps:
 - a) Push the LSK adjacent to TEST DATA.
 - b) Push the LSK adjacent to RERUN.
- 6) Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

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(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.
- 2) If INTERACTIVE TEST PASSED shows on the CDU display, then 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, then do these steps:
 - a) Push the LSK adjacent to TEST RESULTS.
 - b) Make a record of the maintenance messages that show on the CDU display.
 - c) If it is necessary to do the test again, then do these steps:
 - d) Push the LSK adjacent to TEST DATA.
 - e) Push the LSK adjacent to RERUN.
- 4) Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

(d) Surface Test

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



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.

- 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, then 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:

NOTE: If EDFCS-BITE library test 60.35 is performed and the test fails, select the TEST DATA line select key. If only S004 or S007 failures are shown on the TEST DATA page with maintenance messages 22-11191 or 22-11194 displayed, then these failures can be ignored. Select the CONTINUE line select key and complete the remainder of library test 60.35. If the remainder of library test 60.35 can be completed without failures, then the entire BITE library test can be considered a PASS.

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 is centered, and then push LSK 6L “CONTINUE”. The system will be centered and the test should pass. If not, refer to the IFIM and do the applicable procedure(s).

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- a) Push the LSK adjacent to TEST RESULTS.
 - b) Make a record of the maintenance messages that show on the CDU display.
 - c) If it is necessary to do the test again, then do these steps:
 - d) Push the LSK adjacent to TEST DATA.
 - e) Push the LSK adjacent to RERUN.
- 4) Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-034

- (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 22-11-00-860-035

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-036

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-037

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

— END OF TASK —

TASK 22-11-00-740-805

6. Wheel Spin Up Test

A. General

- (1) The wheel spin up test does a check of the interfaces between the Digital Flight Control System (DFCS) and the wheel spin logic circuit.

B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Prepare for the Test

SUBTASK 22-11-00-860-040

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-041

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

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SUBTASK 22-11-00-860-042

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

SUBTASK 22-11-00-860-043

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

D. Wheel Spin Up Test

SUBTASK 22-11-00-740-016

- (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 ENBALE/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.

E. 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

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SUBTASK 22-11-00-860-046

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— END OF TASK —————

TASK 22-11-00-740-806

7. Power Bus Transfer Test

A. General

- (1) The power bus transfer test does a check of the interface between the Digital Flight Control System (DFCS) and the bus transfer relay.

B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 22-11-00-860-050

- (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 22-11-00-860-051

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-052

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

SUBTASK 22-11-00-860-053

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

SUBTASK 22-11-00-860-054

- (5) Start the APU (TASK 49-11-00-860-801).

SUBTASK 22-11-00-860-248

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

SUBTASK 22-11-00-210-001

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

E. Power Bus Transfer Test

SUBTASK 22-11-00-740-017

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

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- (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 forward overhead panel, P5, 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 forward overhead panel, P5, 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 forward overhead panel, P5, 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 forward overhead panel, P5, to the ON position.
 - d) Make sure that the CDU display shows "28" on the B side for the "BUS TRANSFER H14".
 - 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 22-11-00-860-055

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

SUBTASK 22-11-00-860-056

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

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SUBTASK 22-11-00-860-057

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-058

- (4) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— END OF TASK —————

TASK 22-11-00-740-807

8. Power Bus Isolation Test

A. General

- (1) The power bus isolation test does a check of the interface between the Digital Flight Control System (DFCS) and the bus isolation relay.

B. Location Zones

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

C. Access Panels

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

D. Prepare for the Test

SUBTASK 22-11-00-860-062

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-063

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-064

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

SUBTASK 22-11-00-860-065

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

E. Power Bus Isolation Test

SUBTASK 22-11-00-860-066

- (1) Set the DC Meter Selector switch, on the forward overhead panel, P5, to the TR 1 position.

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SUBTASK 22-11-00-860-067

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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:

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

SUBTASK 22-11-00-860-294



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

SUBTASK 22-11-00-860-068

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

SUBTASK 22-11-00-740-040

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

SUBTASK 22-11-00-740-018

- (7) Push the Line Select Key (LSK) that is adjacent to each of these selections:

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.

- (a) INDEX
- (b) MAINT
- (c) DFCS
- (d) EXTENDED MAINTENANCE
- (e) SENSOR VALUES

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- (f) DISCRETE OUTPUTS
- (g) DC BUS ISOLATION OUTPUT

SUBTASK 22-11-00-210-002

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

SUBTASK 22-11-00-210-003

- (9) Make sure that the DC VOLTS Meter Display, on the forward overhead panel, P5, shows -2.0 to +2.0 VDC.

SUBTASK 22-11-00-740-041

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

SUBTASK 22-11-00-210-004

- (11) Make sure that the DC VOLTS Meter Display, on the forward overhead panel, P5, shows 22 to 30 VDC.

SUBTASK 22-11-00-740-042

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

NOTE: It is necessary to do the instructions that show on the CDU display.

SUBTASK 22-11-00-860-069

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

CAPT Electrical System Panel, P18-1

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

SUBTASK 22-11-00-860-070

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

F/O Electrical System Panel, P6-2

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

SUBTASK 22-11-00-860-071

- (15) Make sure that the DC VOLTS Meter Display, on the forward overhead panel, P5, shows 22 to 30 VDC.

SUBTASK 22-11-00-860-072

- (16) 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 22-11-00-740-043

- (17) Push the INIT REF key on the CDU keyboard.

SUBTASK 22-11-00-740-019

- (18) Push the Line Select Key (LSK) that is adjacent to each of these selections:

- (a) INDEX
- (b) MAINT
- (c) DFCS
- (d) EXTENDED MAINTENANCE
- (e) SENSOR VALUES

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- (f) DISCRETE OUTPUTS
- (g) DC BUS ISOLATION OUTPUT

SUBTASK 22-11-00-740-044

- (19) 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 22-11-00-860-073

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

F/O Electrical System Panel, P6-2

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

SUBTASK 22-11-00-860-295



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

SUBTASK 22-11-00-410-007

- (22) Close this access panel:

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

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-074

- (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 22-11-00-860-075

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

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SUBTASK 22-11-00-860-076

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— END OF TASK —————

TASK 22-11-00-740-808

9. Circuit Breaker Interface Test

A. General

- (1) The circuit breaker interface test does a check of the interfaces between the Digital Flight Control System (DFCS) and all of its circuit breakers.

B. Location Zones

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

C. Prepare for the Test

SUBTASK 22-11-00-860-080

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-081

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-082

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

SUBTASK 22-11-00-860-083

- (4) Set the Left and Right IRS Select switches, on the aft overhead panel, P5, to the ALIGN or NAV position.

D. Circuit Breaker Interface Test

SUBTASK 22-11-00-980-001

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

- (a) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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.

- (b) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

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- 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 50 seconds for this to happen after you close the circuit breaker.

- (c) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 50 seconds for this to happen after you close the circuit breaker.

SUBTASK 22-11-00-740-020

- (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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

- a) Make sure that the CDU display shows "ENGAGE INTLK = 0 (± 5)" on the FCCA side.

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- 2) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

- a) Make sure that the CDU display shows "ENGAGE INTLK = 26 (± 4)" on the FCCA side.

- 3) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00457	AFCS SYS A MACH TRIM DC

- a) Make sure that the CDU display shows "MACH TRIM DC = 0 (± 5)" on the FCCA side.

- 4) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C00457	AFCS SYS A MACH TRIM DC

- a) Make sure that the CDU display shows "MACH TRIM DC = 26 (± 4)" on the FCCA side.

- 5) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00456	AFCS SYS A MACH TRIM AC

- a) Make sure that the CDU display shows "MACH TRIM AC = 0 (± 5)" on the FCCA side.

- 6) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00456	AFCS SYS A MACH TRIM AC

- a) Make sure that the CDU display shows "MACH TRIM AC = 113 (± 7)" 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00716	AFCS SYS B ENGAGE INTLK

- a) Make sure that the CDU display shows "ENGAGE INTLK = 0 (± 5)" on the FCCB side.

- 2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	4	C00716	AFCS SYS B ENGAGE INTLK

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- a) Make sure that the CDU display shows "ENGAGE INTLK = 26 (± 4)" on the FCCB side.

- 3) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	2	C01064	AFCS SYS B MACH TRIM DC

- a) Make sure that the CDU display shows "MACH TRIM DC = 0 (± 5)" on the FCCB side.

- 4) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	2	C01064	AFCS SYS B MACH TRIM DC

- a) Make sure that the CDU display shows "MACH TRIM DC = 26 (± 4)" on the FCCB side.

- 5) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C01037	AFCS SYS B MACH TRIM AC

- a) Make sure that the CDU display shows "MACH TRIM AC = 0 (± 5)" on the FCCB side.

- 6) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C01037	AFCS SYS B MACH TRIM AC

- a) Make sure that the CDU display shows "MACH TRIM AC = 113 (± 7)" 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC

- a) Make sure that the CDU display shows "SNSR EXC AC = 0 (± 5)" on the FCCA side.

- 2) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC

- a) Make sure that the CDU display shows "SNSR EXC AC = 26 (± 5)" on the FCCA side.

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- 3) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

- a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 0 (± 5)" on the FCCA side.

- 4) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

- a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 27 (± 9)" on the FCCA side.

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

- 1) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C01042	AFCS SYS B SNSR EXC AC

- a) Make sure that the CDU display shows "SNSR EXC AC = 0 (± 5)" on the FCCB side.

- 2) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C01042	AFCS SYS B SNSR EXC AC

- a) Make sure that the CDU display shows "SNSR EXC AC = 26 (± 5)" on the FCCB side.

- 3) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

- a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 0 (± 5)" on the FCCB side.

- 4) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

- a) Make sure that the CDU display shows "WARN LIGHT (BAT) = 27 (± 9)" 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.



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E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-084

- (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 22-11-00-860-085

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-086

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— END OF TASK —————

TASK 22-11-00-740-809

10. Air/Ground Discrete Test

A. General

- (1) The air/ground discrete test does a check of the interface between the Digital Flight Control System (DFCS) and the main landing gear squat switch logic circuit.

B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Air/Ground Discrete Test

SUBTASK 22-11-00-860-090

- (1) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-740-021

- (2) 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 this message shows on the CDU display:

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Table 511/22-11-00-993-814

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

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

SUBTASK 22-11-00-860-091

- (3) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-00-860-092

- (4) Open these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-00-740-022

- (5) 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 512/22-11-00-993-815

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

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

SUBTASK 22-11-00-860-093

- (6) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01047	AFCS MCP DC 2

————— END OF TASK —————

TASK 22-11-00-740-810

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. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Prepare for the Test

SUBTASK 22-11-00-860-096

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-097

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-098

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

SUBTASK 22-11-00-860-099

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

D. Other Discrete Inputs Test

SUBTASK 22-11-00-740-023

- (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

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- 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.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-100

- (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 22-11-00-860-101

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-102

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— **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

<u>Reference</u>	<u>Title</u>
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

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left

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Zone	Area

212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 22-11-00-860-106

- (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 22-11-00-860-107

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position

SUBTASK 22-11-00-860-108

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

SUBTASK 22-11-00-860-109

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

SUBTASK 22-11-00-860-110



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.

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

NOTE: Hydraulic power is necessary for surface test.

E. Sensor Excitation Test

SUBTASK 22-11-00-740-024

- (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
A	3	C01631	AFCS INTLK 2
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 forward overhead panel, P5, to the ALL ON 1 position.
- (e) Continue to push the LSK that is adjacent to each selection:
- 1) DFCS
- 2) EXTENDED MAINTENANCE

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- 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 513/22-11-00-993-816

30 ELEVATOR
31 AILERON
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01631	AFCS INTLK 2
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK

- (h) Set the DISPLAYS SOURCE switch, on the forward overhead panel, P5, 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

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- 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 514/22-11-00-993-817

30 ELEVATOR
31 AILERON
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC
D	2	C01045	AFCS SYS A FCC DC
D	3	C01048	AFCS SYS A ENGAGE INTLK

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

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-111

- (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 22-11-00-860-112

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

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SUBTASK 22-11-00-860-113

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position

SUBTASK 22-11-00-860-114

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

————— END OF TASK —————

TASK 22-11-00-740-811

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
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. Maintenance Monitor Test

SUBTASK 22-11-00-860-117

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

SUBTASK 22-11-00-980-014

- (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, P6-1

Row	Col	Number	Name
SIA 001-005			
A	12	C01375	RADIO NAVIGATION VOR 2

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
SIA ALL			
D	18	C00451	LANDING GEAR AURAL WARN

This circuit breaker is inoperative and should remain open:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
SIA 006, 007			

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SIA 006, 007 (Continued)

(Continued)

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C01375	RADIO NAVIGATION VOR 2 (INOP)

SIA ALL

SUBTASK 22-11-00-860-118



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.

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

SUBTASK 22-11-00-980-002

- (4) 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01400	PSEU ALTN

- (c) Stop for 12 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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.

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- (l) 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.
- (m) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC

- (n) Stop for 12 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.
- (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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C01042	AFCS SYS B SNSR EXC AC

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

- (aa) Stop for 20 seconds.

SUBTASK 22-11-00-740-025

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

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(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.

Table 515/22-11-00-993-818

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 display:

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

Table 516/22-11-00-993-819

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

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SUBTASK 22-11-00-980-003

- (6) Do this check on the autopilot:
- (a) Stop for 50 seconds.
 - (b) Make sure that 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

- (d) Stop for 12 seconds.
- (e) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOFF position.
- (f) Push the A/P engage switches on the MCP to make sure that the autopilot cannot be engaged.
- (g) Make sure that these occur:
 - 1) The red A/P light on the ASA flashes.
 - 2) The aural warning module makes an aural warning.
- (h) 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.
- (i) Stop for 12 seconds.
- (j) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

- (k) Stop for 20 seconds.

SUBTASK 22-11-00-740-026

- (7) 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 display:

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

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Table 517/22-11-00-993-820

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 display:

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

Table 518/22-11-00-993-821

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

- (b) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

- (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

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

- (a) Stop for 50 seconds.
- (b) Make sure that 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01047	AFCS MCP DC 2

- (d) Stop for 5 seconds.

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- (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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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.
- (l) Close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01044	AFCS MCP DC 1

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-00-740-027

- (9) 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 display:

Table 519/22-11-00-993-822

DFCS BITE TEST
ERASE FAULT HISTORY
FAULT HISTORY ERASED

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

Table 520/22-11-00-993-823

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 22-11-00-860-119

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

————— **END OF TASK** —————

TASK 22-11-00-800-801

14. Master Caution Test

A. General

- (1) The master caution test does a check of the interfaces between the Digital Flight Control System (DFCS) and the master caution annunciators.

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B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Master Caution Test

SUBTASK 22-11-00-980-005

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

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

- 1) Stop for 7 seconds.
 - 2) Make sure that the MACH TRIM FAIL light, on the forward overhead panel, P5, remains off.
- (b) Push the left system annunciator lights on the glareshield panel, P7.
- (c) Make sure that these lights come on:
- 1) MACH TRIM FAIL light on the forward overhead panel, P5.
 - 2) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 3) Captain's master caution annunciator on the glareshield panel, P7.
 - 4) First officer's master caution annunciator on the glareshield panel, P7.
- (d) Push the captain's master caution annunciator.
- (e) Make sure that these lights go off:
- 1) MACH TRIM FAIL light on the forward overhead panel, P5.
 - 2) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 3) Captain's master caution annunciator on the glareshield panel, P7.
 - 4) First officer's master caution annunciator on the glareshield panel, P7.
- (f) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

- (2) 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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

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

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- (b) Push the right system annunciator lights on the glareshield panel, P7.
- (c) Make sure that these lights come on:
 - 1) MACH TRIM FAIL light on the forward overhead panel, P5.
 - 2) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 3) Captain's master caution annunciator on the glareshield panel, P7.
 - 4) First officer's master caution annunciator on the glareshield panel, P7.
- (d) Push the first officer's master caution annunciator.
- (e) Make sure that these lights go off:
 - 1) MACH TRIM FAIL light on the forward overhead panel, P5.
 - 2) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 3) Captain's master caution annunciator on the glareshield panel, P7.
 - 4) First officer's master caution annunciator on the glareshield panel, P7.
- (f) Open this circuit breaker and install safety tag:
CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 forward overhead panel, P5.
 - 2) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 3) Captain's master caution annunciator on the glareshield panel, P7.
 - 4) First officer's master caution annunciator on the glareshield panel, P7.
- (i) Push the first officer's master caution annunciator.
 - 1) Make sure that the MACH TRIM FAIL light, on the forward overhead panel, P5, stays on.
- (j) Make sure that these lights go off.
 - 1) Master caution FLT CONT annunciator on the glareshield panel, P7.
 - 2) Captain's master caution annunciator on the glareshield panel, P7.
 - 3) First officer's master caution annunciator on the glareshield panel, P7.
- (k) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

- (l) Stop for 50 seconds.
 - 1) Make sure that the MACH TRIM FAIL light, on the forward overhead panel, P5, goes off.

————— **END OF TASK** —————

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TASK 22-11-00-820-802

15. **Elevator Rigging Test**
(Figure 502, Figure 503)

A. General

- (1) The elevator rigging 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	Assembly - Trammel Bar, 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 22-11-00-860-124

- (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 22-11-00-860-125

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-126

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

SUBTASK 22-11-00-860-127

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

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SUBTASK 22-11-00-010-001

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-129



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 (TASK 29-11-00-860-801).

SUBTASK 22-11-00-980-007

- (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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

G. Elevator Rigging Test

SUBTASK 22-11-00-740-028

- (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) ELEVATOR RIG

NOTE: This selection contains the ELEV RIG 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.

- (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.

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Table 521/22-11-00-993-824

Test		Limits:
51.01	STAB POS (VAC)	-0.07 to 0.07

- 2) Use the trammel bar, SPL-1677, to measure the B dimension.
- 3) Make sure that the B dimension is 39.17 $\pm$ 0.01 in. (99.49 $\pm$ 0.03 cm).

Table 522/22-11-00-993-825

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		
51.04	NSS POS (VAC)	-1.77 to -1.67

- 4) Make sure that the elevator trailing edge aligns with the elevator index on the tail cone at 0 ($\pm$ 0.06) inch.

Table 523/22-11-00-993-826

Test		Limits
51.05	ELEV POS (VAC)	-0.55 to -0.45
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 ($\pm$ 0.06) inch.

Table 524/22-11-00-993-827

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 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 525/22-11-00-993-828

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

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- 9) Do these steps to get out of the BITE test at the "END OF ELEV RIG TEST".
 - a) Push the LSK adjacent to PREV MENU on test 51.15 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 22-11-00-860-130

- (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 22-11-00-860-131

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-132

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-133

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

SUBTASK 22-11-00-410-001

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— **END OF TASK** —————

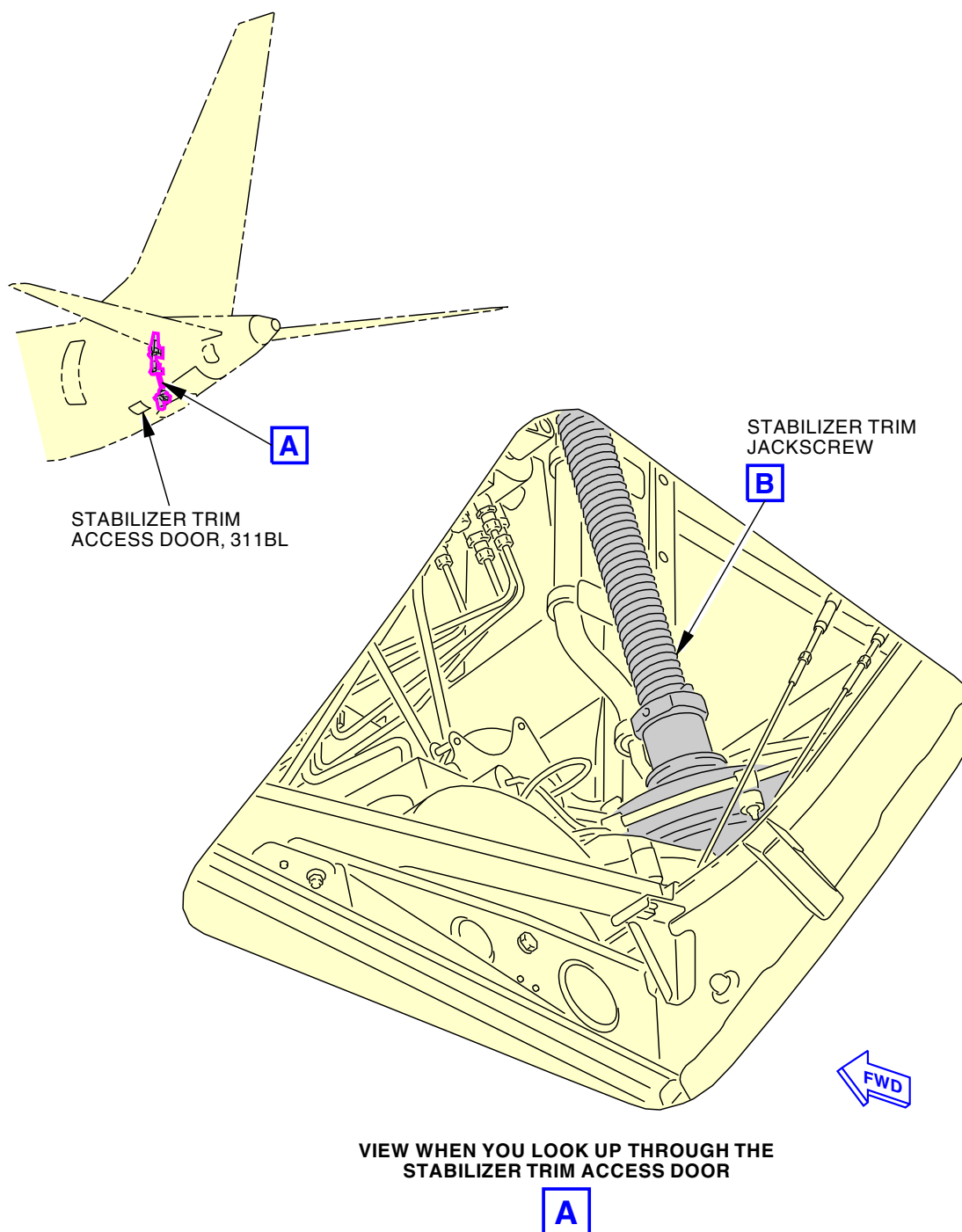
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2411551 S00061528200_V1

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-00-990-803 (Sheet 1 of 2)

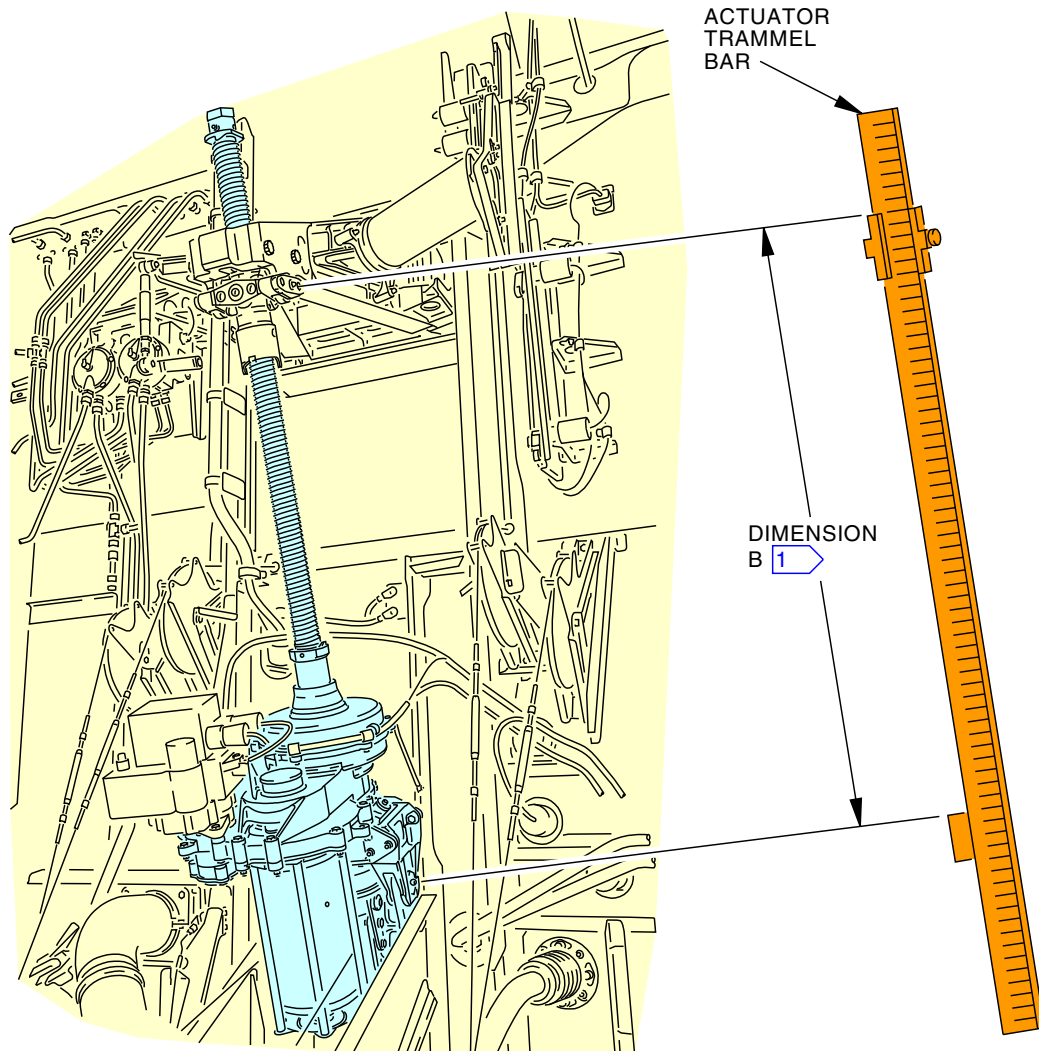
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FWD

STABILIZER TRIM JACKSCREW



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.

2411552 S00061528201_V1

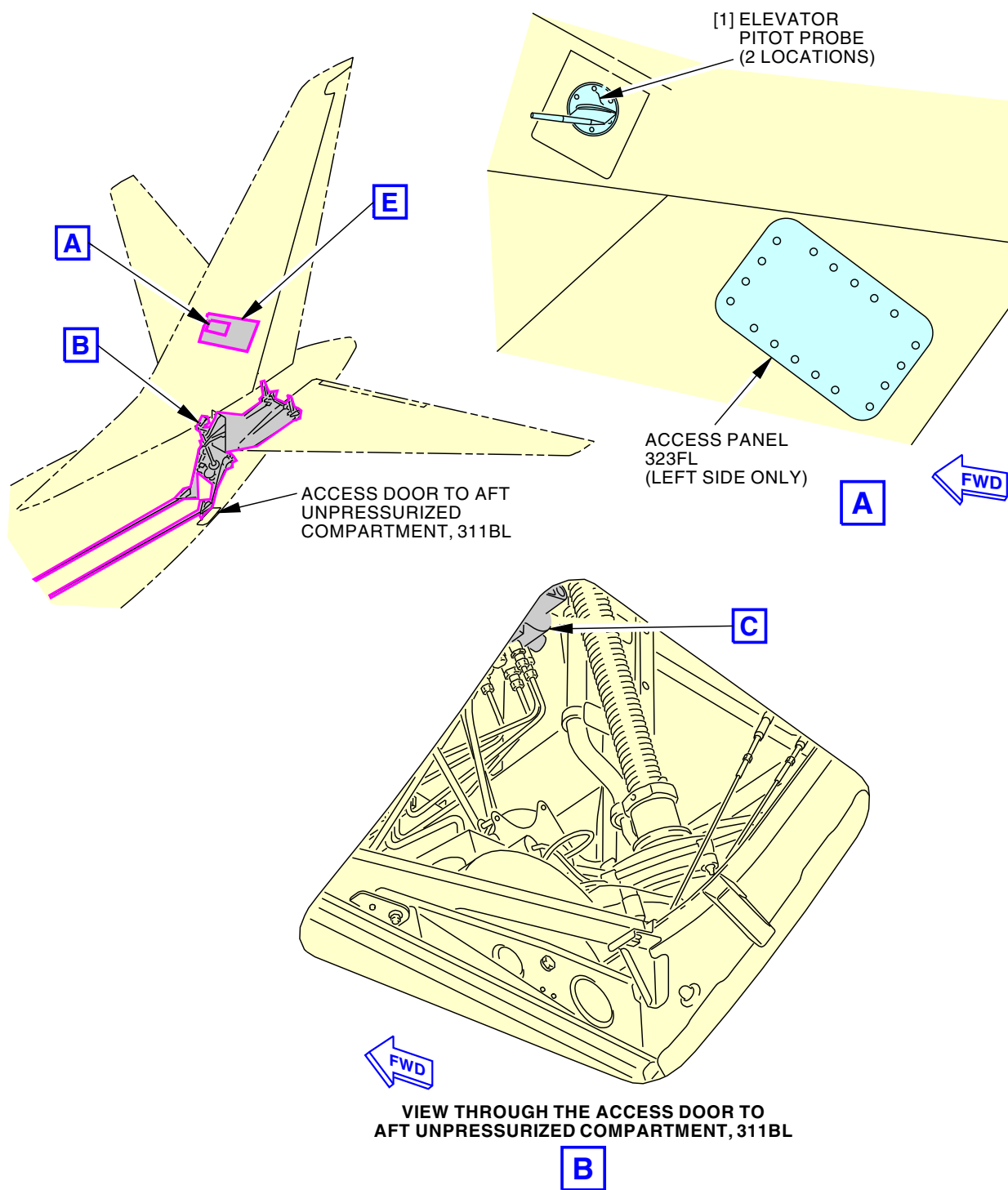
Stabilizer Trim Jackscrew Setting
Figure 502/22-11-00-990-803 (Sheet 2 of 2)

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2411553 S00061528202_V3

Elevator Pitot Static System Installation
Figure 503/22-11-00-990-804 (Sheet 1 of 3)

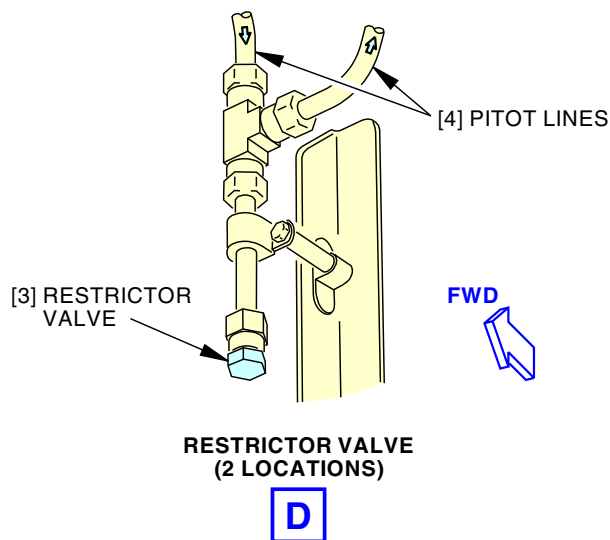
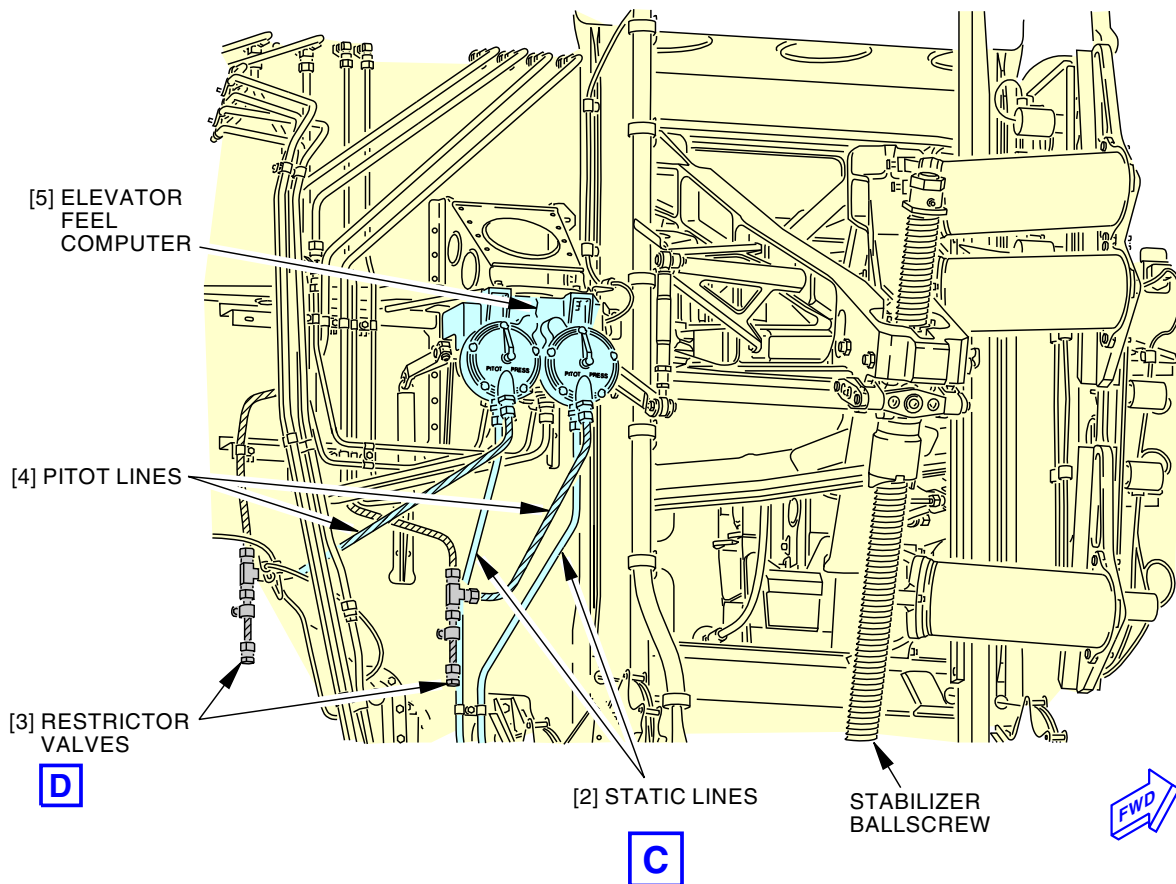
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2411554 S00061528203_V2

Elevator Pitot Static System Installation
Figure 503/22-11-00-990-804 (Sheet 2 of 3)

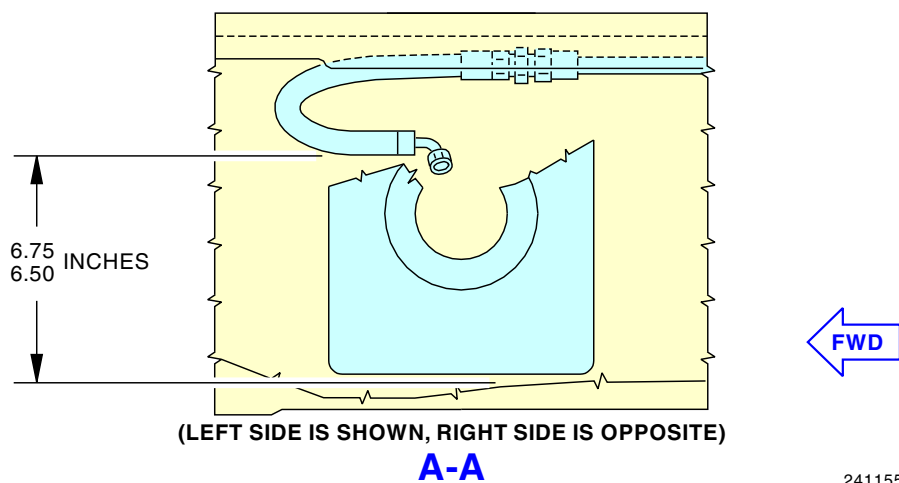
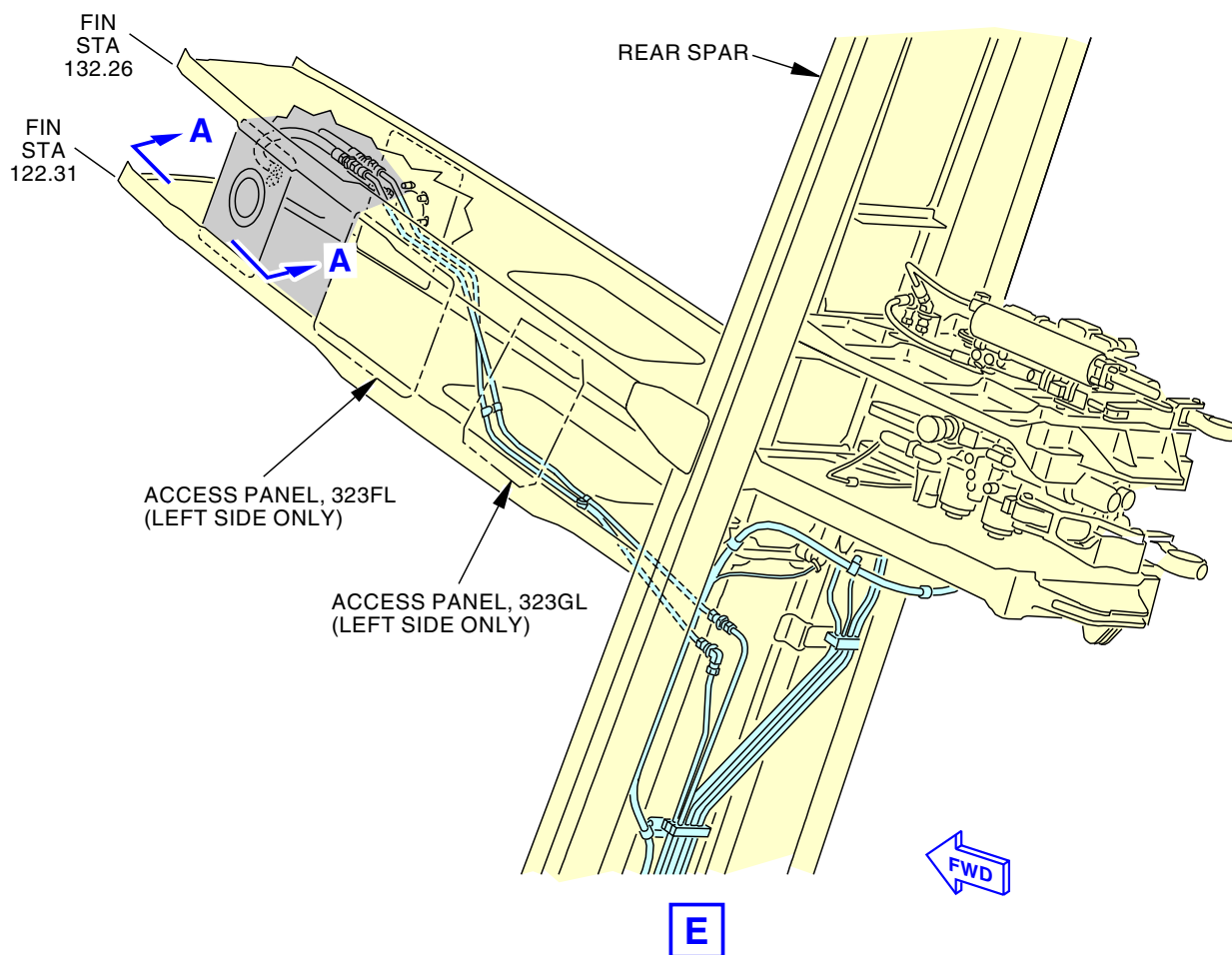
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Elevator Pitot Static System Installation
Figure 503/22-11-00-990-804 (Sheet 3 of 3)

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TASK 22-11-00-820-813

16. Elevator Single Authority Test

(Figure 502, Figure 503)

A. General

- (1) The elevator single 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
COM-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: 18910920000 Supplier: 89944 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 #: DPS350 Supplier: 21844 Part #: DPS450 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 #: 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 #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
SPL-1677	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

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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 22-11-00-860-266

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	10	C01676	ELEVATOR FEEL LIMIT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-267

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-268

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

SUBTASK 22-11-00-860-269

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

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SUBTASK 22-11-00-390-002



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.



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 22-11-00-010-005

- (6) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-270

- (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 22-11-00-860-271



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.

- (8) Supply hydraulic power to hydraulic systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).

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SUBTASK 22-11-00-930-001

- (9) 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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

G. Elevator Single Authority Test

SUBTASK 22-11-00-740-048

- (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 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 than 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:

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- a) Set the B dimension to 37.77 ±0.01 in. (95.94 ±0.03 cm).
- b) Use the trammel bar, SPL-1677, to measure the B dimension.
- c) Make sure that the B dimension is 37.77 ±0.01 in. (95.94 ±0.03 cm).

Table 526/22-11-00-993-897

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20

- 16) Remove hydraulic power from the hydraulic system B (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).
- 17) Engage autopilot A to CMD mode.

Table 527/22-11-00-993-898

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 18) Apply a mark on tail cone opposite the trailing edge of the elevator.

Table 528/22-11-00-993-899

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

- 19) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 20) Make sure that the deflection distance is between 1.25 in. (31.75 mm) and 2.32 in. (58.93 mm).
- 21) Write the number on a piece of paper (A=_____).

Table 529/22-11-00-993-901

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

- 22) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 23) Make sure that the deflection distance is between 1.13 in. (28.70 mm) and 2.2 in. (55.88 mm).
- 24) Write the number on a piece of paper (B=_____).

Table 530/22-11-00-993-906

Test		Limits:
51.22	SURF AUTH (DEG)	4.00 (MIN)

- 25) Add the two numbers A and B (absolute values) in tests 51.19 and 51.21.
- 26) Make sure that the total sum of the A and B is 2.38 in. (60.45 mm) (Minimum).
- 27) 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.

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- 28) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.
29) Keep the same pitot pressure and the B dimension.



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.

- 30) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).
31) Engage autopilot A to CMD mode.
32) Make sure that the values are between the limits that show on the CDU display or in this task.

Table 531/22-11-00-993-907

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 33) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 532/22-11-00-993-908

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

- 34) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
35) Make sure that the deflection distance is between 1.25 in. (31.75 mm) and 2.32 in. (58.93 mm).
36) Write the number on a piece of paper (C=_____).

Table 533/22-11-00-993-913

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

- 37) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
38) Make sure that the deflection distance is between 1.13 in. (28.70 mm) and 2.2 in. (55.88 mm).
39) Write the number on a piece of paper (D=_____).

Table 534/22-11-00-993-914

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

- 40) Add the two numbers C and D (absolute values) in tests 51.19 and 51.21.
41) Make sure that the total sum of C and D is 2.38 in. (60.45 mm) (Minimum).

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- 42) 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.

- 43) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.
44) Keep the same pitot pressure and the B dimension.
45) Remove hydraulic power from the Hydraulic System A (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).
46) Engage autopilot B to CMD mode.
47) Make sure that the values are between the limits that show on the CDU display or in this task.

Table 535/22-11-00-993-915

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 48) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 536/22-11-00-993-909

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

- 49) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
50) Make sure that the deflection distance is between 1.25 in. (31.75 mm) and 2.32 in. (58.93 mm).
51) Write the number on a piece of paper (E=_____).

Table 537/22-11-00-993-916

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

- 52) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
53) Make sure that the deflection distance is between 1.13 in. (28.70 mm) and 2.2 in. (55.88 mm).
54) Write the number on a piece of paper (F=_____).

Table 538/22-11-00-993-917

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

- 55) Add the two numbers E and F (absolute values) in tests 51.19 and 51.21.
56) Make sure that the total sum of E and F is 2.38 in. (60.45 mm) (Minimum).
57) 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.

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- 58) Push the LSK that is adjacent to CONTINUE on test 51.16 and test 51.17.
59) Keep the same pitot pressure and the B dimension.



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- 60) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).
61) Engage autopilot B to CMD mode.
62) Make sure that the values are between the limits that show on the CDU display or in this task.

Table 539/22-11-00-993-918

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 63) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 540/22-11-00-993-910

Test		Limits
51.19	SURF AUTH (DEG)	-3.90 to -2.10

- 64) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
65) Make sure that the deflection distance is between 1.25 in. (31.75 mm) and 2.32 in. (58.93 mm).
66) Write the number on a piece of paper (G=_____).

Table 541/22-11-00-993-919

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.90 to 3.70

- 67) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
68) Make sure that the deflection distance is between 1.13 in. (28.70 mm) and 2.2 in. (55.88 mm).
69) Write the number on a piece of paper (H=_____).

Table 542/22-11-00-993-920

Test		Limits
51.22	SURF AUTH (DEG)	4.00 (MIN)

- 70) Add the two numbers G and H (absolute values) in tests 51.19 and 51.21.
71) Make sure that the total sum of G and H is 2.38 in. (60.45 mm) (Minimum).

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- 72) 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.

- 73) Test 51.16, set up the Feel System Condition I as follows:



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.

- 74) 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 psig (3.10 kPa) = 138 ±10 knots (256 ±19 km/h).
- 75) Use the CDU keyboard to put code 100 into the scratchpad.
- 76) Push the LSK 6R.
- 77) Push the LSK that is adjacent to CONTINUE.
- 78) Make sure that the values are between the limits that show on the CDU display or in this task.
- 79) Do these steps:
- a) Set the B dimension to 37.77 ±0.01 in. (95.94 ±0.03 cm).
 - b) Use the trammel bar, SPL-1677, to measure the B dimension.
 - c) Make sure that the B dimension is 37.77 ±0.01 in. (95.94 ±0.03 cm).

Table 543/22-11-00-993-927

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20



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- 80) Supply hydraulic power to Hydraulic Systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).
- 81) Engage autopilot A to CMD mode.

Table 544/22-11-00-993-921

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 82) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 545/22-11-00-993-911

Test		Limits
51.19	SURF AUTH (DEG)	-12.00 to -7.30

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- 83) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 84) Make sure that the deflection distance is between 4.34 in. (110.24 mm) and 7.14 in. (181.36 mm).
- 85) Write the number on a piece of paper (I=_____).

Table 546/22-11-00-993-922

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	4.10 to 6.40

- 86) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 87) Make sure that the deflection distance is between 2.44 in. (61.98 mm) and 3.80 in. (96.52 mm).
- 88) Write the number on a piece of paper (J=_____).

Table 547/22-11-00-993-923

Test		Limits
51.22	SURF AUTH (DEG)	11.40 (MIN)

- 89) Add the two numbers I and J (absolute values) in tests 51.19 and 51.21.
- 90) Make sure that the total sum of the I and J is 6.78 in. (172.21 mm) (Minimum).
- 91) 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.
- 92) 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).
- 93) Use the CDU keyboard to put code 100 into the scratchpad.
- 94) Push the LSK 6R.
- 95) Push the LSK that is adjacent to CONTINUE.
- 96) Make sure that the values are between the limits that show on the CDU display or in this task.
- 97) Do these steps:
 - a) Set the B dimension to 37.77 ±0.01 in. (95.94 ±0.03 cm).
 - b) Use the trammel bar, SPL-1677, to measure the B dimension.
 - c) Make sure that the dimension is 37.77 ±0.01 in. (95.94 ±0.03 cm).

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Table 548/22-11-00-993-928

Test		Limits
51.17	STAB POS (DEG)	0.80 to 1.20



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- 98) Supply hydraulic power to hydraulic systems A and B (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801).
- 99) Engage autopilot B to CMD mode.

Table 549/22-11-00-993-924

Test		Limits
51.18	ELEV POS (DEG)	1.60 to 2.00

- 100) Apply a mark on the tail cone opposite the trailing edge of the elevator.

Table 550/22-11-00-993-912

Test		Limits
51.19	SURF AUTH (DEG)	-2.20 to -1.20

- 101) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 102) Make sure that the deflection distance is between 0.71 in. (18.03 mm) and 1.31 in. (33.27 mm).
- 103) Write the number on a piece of paper (K=_____).

Table 551/22-11-00-993-925

Test		Limits
51.20	ELEV POS (DEG)	1.60 to 2.00
51.21	SURF AUTH (DEG)	1.20 to 2.30

- 104) Measure the elevator trailing edge deflection from the mark applied in test 51.18.
- 105) Make sure that the deflection distance is between 0.58 in. (14.73 mm) and 1.36 in. (34.54 mm).
- 106) Write the number on a piece of paper (L=_____).

Table 552/22-11-00-993-926

Test		Limits
51.22	SURF AUTH (DEG)	2.40 (MIN)

- 107) Add the two numbers K and L (absolute values) in tests 51.19 and 51.21.
- 108) Make sure that the total sum of the K and L is 1.74 in. (44.20 mm) (Minimum).
- 109) Push the LSK that is adjacent to the NO (on second screen page of Test 51.22)
- 110) At the two pitot probes on the vertical fin, do these steps:

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- 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.
- 111) 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.
- 112) Do these steps to get out of the BITE test on screen "END OF ELEV AUTH SINGLE"
- a) Push the LSK adjacent to 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 22-11-00-860-272

- (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 22-11-00-860-273

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	10	C01676	ELEVATOR FEEL LIMIT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-274

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-275

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

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SUBTASK 22-11-00-410-006

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-814

17. Elevator Dual Authority Test

(Figure 502, Figure 503)

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

<u>Reference</u>	<u>Title</u>
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.

<u>Reference</u>	<u>Description</u>
SPL-1677	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. Location Zones

<u>Zone</u>	<u>Area</u>
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

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

F. Prepare for the Test

SUBTASK 22-11-00-860-276

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-277

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

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SUBTASK 22-11-00-860-278

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

SUBTASK 22-11-00-860-279

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

SUBTASK 22-11-00-010-006

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-280



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

SUBTASK 22-11-00-980-013

- (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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 $\pm$ 0.01 in. (99.49 $\pm$ 0.03 cm).

G. Elevator Dual Authority Test

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) 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 AUTH DUAL

NOTE: This selection contains the ELEV AUTH DUAL test.

- 8) During this test, do the instructions that show on the CDU display.

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- 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 39.17 ±0.01 in. (99.49 ±0.03 cm).

 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 bar, SPL-1677, to measure the B dimension.
 - c) Make sure that the B dimension is 39.17 ±0.01 in. (99.49 ±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 553/22-11-00-993-902

Test		Limits
51.23	STAB POS (VAC)	-0.07 to 0.07

Table 554/22-11-00-993-903

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 555/22-11-00-993-904

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.

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Table 556/22-11-00-993-905

Test		Limits
51.34	-SURF DELTA (DEG)	-1.00 to 0.00
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.

- Push the LSK adjacent to PREV MENU on test 51.37 screen.
- Push the LSK adjacent to PREV MENU on the ELEVATOR RIGGING screen.
- Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.
- Push the LSK adjacent to EXIT on the RIGGING INDEX screen.
- Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.
- Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-281

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

SUBTASK 22-11-00-860-282

- Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-283

- Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-284

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

SUBTASK 22-11-00-080-006

- Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-803

18. Aileron Rigging Test

A. General

- The aileron rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the aileron system wiring and sensors.

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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 22-11-00-860-136

- (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 22-11-00-860-137

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-00-860-138

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

SUBTASK 22-11-00-860-139

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

SUBTASK 22-11-00-860-140



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

SUBTASK 22-11-00-980-008

- (6) Set the aileron trim to 0 unit.

SUBTASK 22-11-00-980-009

- (7) Set the speed brake handle to the down position.

E. Aileron Rigging Test

SUBTASK 22-11-00-740-029

- (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

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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 as follows:

- 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 557/22-11-00-993-860

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 0.318 $\pm$ 0.050 in. (0.81 $\pm$ 0.13 cm) down from the adjacent fixed structure panel.

3) Test limits

Table 558/22-11-00-993-861

Test		Limits
52.02	AIL POS (VAC)	-0.06 to 0.06

- 4) Make sure that the left and right ailerons do not move.

Table 559/22-11-00-993-862

Test		Limits
52.03	AIL POS (VAC)	-0.06 to 0.06
52.04	AIL LVDT (VAC)	-0.08 to 0.08
52.05	AIL POS (VAC)	-0.06 to 0.06

(c) Do the Aileron Authority Check:

- 1) Push the LSK that is adjacent to CONTINUE.

Table 560/22-11-00-993-863

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 0.90 $\pm$ 0.15 in. (22.86 $\pm$ 3.81 mm) above the adjacent fixed structure panel.

- 3) Make sure that the outboard surface of the left aileron is 1.54 $\pm$ 0.15 in. (39.12 $\pm$ 3.81 mm) below the adjacent fixed structure panel.

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4) Test limits

Table 561/22-11-00-993-864

Test		Limits
52.09	AIL LVDT (DEG)	-5.10 to -4.90
52.10	AIL POS (VAC)	-2.47 to -2.00

- 5) Make sure that the outboard surface of the left aileron is 0.91 ± 0.15 in. (23.11 $\pm$ 3.81 mm) above the adjacent fixed structure panel.
- 6) Make sure that the outboard surface of the right aileron is 1.54 ± 0.15 in. (39.12 $\pm$ 3.81 mm) below the adjacent fixed structure panel.
- 7) Test limits:

Table 562/22-11-00-993-865

Test		Limits
52.11	SURF DELTA (VAC)	0.00 to 0.38
52.12	AIL POS (VAC)	-0.44 to 0.44
52.13	SURF DELTA (VAC)	0.00 to 0.38
52.14	AIL POS (VAC)	-0.44 to 0.44
52.15	AIL LVDT (VAC)	-0.08 to 0.08
52.16	AIL POS (VAC)	-0.06 to 0.06
52.17	AIL POS (VAC)	-0.06 to 0.06
52.18	AIL POS (VAC)	-0.06 to 0.06
52.19	AIL POS (VAC)	-0.06 to 0.06
52.20	AIL POS (VAC)	-0.38 to 0.38
52.21	AIL POS (VAC)	-0.38 to 0.38

- (d) Do the Spoiler Check as follows:
- 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.

Table 563/22-11-00-993-866

Test		Limits
52.23	SPOILER 4 (DEG)	-1.00 to 2.00
52.24	SPOILER 9 (DEG)	-1.00 to 2.00
52.25	SPOILER 4 (DEG)	47.00 to 57.00
NOTE: Ignore limits displayed on CDU.		
52.26	SPOILER 9 (DEG)	47.00 to 57.00
NOTE: Ignore limits displayed on CDU.		

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- 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 22-11-00-860-141

- (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 22-11-00-860-142

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-143

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-144

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

————— END OF TASK —————

TASK 22-11-00-820-804

19. Flaps Rigging Test

A. General

- (1) The flaps Rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the flap system wiring and sensors.

B. References

<u>Reference</u>	<u>Title</u>
27-58-01-820-801	Flap Position Transmitter Adjustment and 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)

C. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

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D. Prepare for the Test

SUBTASK 22-11-00-860-147

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-148

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-149

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

SUBTASK 22-11-00-860-150

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

SUBTASK 22-11-00-860-151



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.

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

E. Flaps Rigging Test

SUBTASK 22-11-00-740-030

- (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) 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.

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- 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.

NOTE: Rigging as close as possible to the nominal values is preferred.

NOTE: At each test screen below (53.xx), the CDU will tell maintenance personnel to move the flap handle to a specified detent. The CDU will then show the value of the flap position transmitter.

Table 564/22-11-00-993-867

Test		Limits	Nominal
53.01	FLAP SYNCRO (DEG)	315 to 8	0.0
53.02	FLAP SYNCRO (DEG)	26 to 42	37.0
53.03	FLAP SYNCRO (DEG)	71 to 84	76.0
53.04	FLAP SYNCRO (DEG)	105 to 122	113.0
53.05	FLAP SYNCRO (DEG)	146 to 159	150.0
53.06	FLAP SYNCRO (DEG)	171 to 193	180.0
53.07	FLAP SYNCRO (DEG)	199 to 219	210.0
53.08	FLAP SYNCRO (DEG)	234 to 246	240.0
53.09	FLAP SYNCRO (DEG)	266 to 315	270.0

- 10) If the values obtained are not within the limits specified, then perform an adjustment of the flap sensor until within limits. Do this task: Flap Position Transmitter Adjustment and Test, TASK 27-58-01-820-801.

- 11) 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.

- Push the LSK adjacent PREV MENU on test 53.09 screen.
- Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.
- 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.

SUBTASK 22-11-00-860-153

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-154

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-155

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

————— **END OF TASK** —————

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TASK 22-11-00-820-805

20. Stabilizer Rigging Test

A. General

- (1) The stabilizer rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the stabilizer 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	Assembly - Trammel Bar, 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 22-11-00-860-158

- (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 22-11-00-860-159

- (2) Make sure that the STAB TRIM PRI switch, S272, on the aft area of 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 22-11-00-860-160

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

SUBTASK 22-11-00-860-161

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

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SUBTASK 22-11-00-860-162



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

SUBTASK 22-11-00-010-002

- (6) To get access to the stabilizer trim jackscrew, open this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-980-010

- (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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

G. Stabilizer 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) 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 565/22-11-00-993-868

Test		Limits
54.01	STAB POS (vac)	-0.07 to 0.07

- 10) Use the trammel bar, SPL-1677, to measure the B dimension.

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- 11) Make sure that the B dimension is 39.17 $\pm$ 0.01 in. (99.49 $\pm$ 0.03 cm).

Table 566/22-11-00-993-869

Test		Limits
54.02	STAB POS (VAC)	-1.43 to -1.03
54.03	STAB POS (VAC)	-2.99 to -2.39

- 12) Do these steps when the stabilizer stops to move:
- Use the trammel bar, SPL-1677, to measure the B dimension.
 - Make sure that the B dimension is between 45.38 in. (115.27 cm) and 45.58 in. (115.77 cm).
- 13) Push the LSK adjacent to NO if the test shows no failures.

Table 567/22-11-00-993-870

Test		Limits
54.04	STAB POS (VAC)	4.84 to 5.44
54.05	STAB POS (VAC)	6.47 to 7.07

- 14) Do these steps when the stabilizer stops to move:
- Use the trammel bar, SPL-1677, to measure the B dimension.
 - Make sure that the B dimension is between 24.70 in. (627.38 mm) and 24.90 in. (632.46 mm).
- 15) Push the LSK adjacent to NO if the test shows no failures.
- (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.

Table 568/22-11-00-993-871

Test		Limits
54.06	STAB POS (VAC)	-0.07 to 0.07
54.07	ELEV POS (DEG)	4.10 to 6.20

- 1) Use these limits:

Table 569/22-11-00-993-872

Test		Limits
54.08	ELEV POS (DEG)	-9.61 to -7.44

- 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.
- Push the LSK adjacent PREV MENU on the END OF STAB RIG screen.
 - Push the LSK adjacent to EXIT on the RIGGING INDEX screen.
 - Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.
 - Push the LSK adjacent to EXIT until you get out of the BITE test.



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H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-163

- (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 22-11-00-860-164

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-166

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

SUBTASK 22-11-00-410-002

- (4) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-806

21. Pitch Control Wheel Steering Rigging Test

A. General

- (1) The pitch control wheel steering rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the pitch Control Wheel Steering (CWS) system wiring and sensors.

B. References

<u>Reference</u>	<u>Title</u>
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.

<u>Reference</u>	<u>Description</u>
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

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Reference	Description
SPL-1677	Assembly - Trammel Bar, 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 22-11-00-860-169

- (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 22-11-00-860-170

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-171

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

SUBTASK 22-11-00-860-172

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

SUBTASK 22-11-00-860-173

 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.

- (5) Supply hydraulic power to Hydraulic Systems A and B (TASK 29-11-00-860-801).

SUBTASK 22-11-00-010-003

- (6) To get access to the stabilizer trim jackscrew, open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

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SUBTASK 22-11-00-980-011

- (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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

G. Pitch Control Wheel Steering Rigging Test

SUBTASK 22-11-00-740-032

- (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) 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.

- 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 570/22-11-00-993-873

Test		Limits
55.01	STAB POS (vac)	-0.07 to 0.07

- 13) Use the trammel bar, SPL-1677, to measure the B dimension.
- 14) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

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Table 571/22-11-00-993-874

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
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.

- Push the LSK adjacent to CONTINUE on test 55.16 screen.
- Push the LSK adjacent to PREV MENU on the CWS RIGGING INDEX screen.
- Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.
- Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-174

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

SUBTASK 22-11-00-860-175

- 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 22-11-00-860-176

- Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-177

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

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SUBTASK 22-11-00-410-003

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-807

22. Roll Control Wheel Steering Rigging Test

A. General

- (1) The roll control wheel steering rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the roll Control Wheel Steering (CWS) system wiring and sensors.

B. References

<u>Reference</u>	<u>Title</u>
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.

<u>Reference</u>	<u>Description</u>
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

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Prepare for the Test

SUBTASK 22-11-00-860-180

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-181

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-182

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

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SUBTASK 22-11-00-860-183

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

SUBTASK 22-11-00-860-184



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.

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

SUBTASK 22-11-00-480-001

- (6) Install the control wheel torque wrench adapter, SPL-1674.

F. Roll Control Wheel Steering Rigging Test

SUBTASK 22-11-00-740-033

- (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 572/22-11-00-993-875

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

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Table 572/22-11-00-993-875 (Continued)

55.21	RCWS FORCE (IN-LBS)	14 to 26
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.

- Push the LSK adjacent to PREV MENU on test 55.22 screen.
- Push the LSK adjacent to PREV MENU on the CWS RIGGING INDEX screen.
- Push the LSK adjacent to CONTINUE on the RIGGING INDEX screen.
- Push the LSK adjacent to EXIT until you get out of the BITE test.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-080-003

- Remove the control wheel torque wrench adapter, SPL-1674.

SUBTASK 22-11-00-860-185

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

SUBTASK 22-11-00-860-186

- Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-187

- Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-188

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

————— **END OF TASK** —————

TASK 22-11-00-820-808

23. Mach Trim Rigging Test

A. General

- The mach trim rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the Mach trim system wiring and sensors.

B. References

<u>Reference</u>	<u>Title</u>
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.

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Reference	Description
SPL-1677	Assembly - Trammel Bar, 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 22-11-00-860-191

- (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 22-11-00-860-192

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-193

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

SUBTASK 22-11-00-860-194

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

SUBTASK 22-11-00-860-195



KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Supply hydraulic power to hydraulic systems A and B (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 22-11-00-980-012

- (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.

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- (a) Turn the stab trim wheel handle on the control stand to set the B dimension.



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 bar, SPL-1677, to measure the B dimension.
(c) Make sure that the B dimension is 39.17 ±0.01 in. (99.49 ±0.03 cm).

G. Mach Trim Rigging Test

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:

- 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.

NOTE: For aircraft equipped with Collins FCCs, ignore the limits on the FMC-CDU screen for tests 57.11 and 57.29 and use the limits of -0.10 to 0.20. See MT 22-034 for more information.

Table 573/22-11-00-993-876

Test		Limits
57.01	STAB POS (vac)	-0.07 to 0.07



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.

- 11) Use the trammel bar, SPL-1677, to measure the B dimension.
12) Make sure that the B dimension is 39.17 ±0.01 in. (99.49 ±0.03 cm).

Table 574/22-11-00-993-877

Test		Limits

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Table 574/22-11-00-993-877 (Continued)

57.02	MT ACT POS (vac)	-0.20 to +0.20

Table 575/22-11-00-993-878

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 576/22-11-00-993-879

Test		Limits
57.04	RETRACTION (sec)	8 to 20

Table 577/22-11-00-993-880

Test		Limits
57.05	MT ACT POS (deg)	4.55 to 4.90

Table 578/22-11-00-993-881

Test		Limits
57.06	-DELTA SURF (deg)	4.30 to 5.10

NOTE: Ignore limits on FMC-CDU screen for test 57.06.

- 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 in. (64.77 mm) and 3.05 in. (77.47 mm) from the elevator index mark.

Table 579/22-11-00-993-882

Test		Limits
57.07	EXTENSION (sec)	8 to 20

Table 580/22-11-00-993-883

Test		Limits
57.08	MT ACT POS (vac)	-0.10 to +0.10

Table 581/22-11-00-993-884

Test		Limits
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 582/22-11-00-993-885

Test		Limits
57.11	MT ACT POS (DEG)	-0.10 to 0.20

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Table 582/22-11-00-993-885 (Continued)

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
57.27	MT ACT POS (DEG)	0.10 to 0.20
57.29	MT ACT POS (DEG)	-0.10 to 0.20
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
57.37	MT ACT POS (DEG)	-0.10 to 0.10

- 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.

NOTE: For aircraft equipped with Collins FCCs, ignore the limits on the FMC-CDU screen for tests 57.11 and 57.29 and use the limits of -0.10 to 0.20. See MT 22-034 for more information.

Table 583/22-11-00-993-886

Test		Limits
57.01	STAB POS (vac)	-0.07 to 0.07



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.

- 20) Use the trammel bar, SPL-1677, to measure the B dimension.
21) Make sure that the B dimension is 39.17 ±0.01 in. (99.49 ±0.03 cm).

Table 584/22-11-00-993-887

Test		Limits
57.02	MT ACT POS (vac)	-0.20 to +0.20

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Table 585/22-11-00-993-888

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 586/22-11-00-993-889

Test		Limits
57.04	RETRACTION (sec)	8 to 20

Table 587/22-11-00-993-890

Test		Limits
57.05	MT ACT POS (deg)	4.55 to 4.90

Table 588/22-11-00-993-891

Test		Limits
57.06	-DELTA SURF (deg)	4.30 to 5.10

NOTE: Ignore limits on FMC-CDU screen for test 57.06.

- 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 in. (64.77 mm) and 3.05 in. (77.47 mm) from the elevator index mark.

Table 589/22-11-00-993-892

Test		Limits
57.07	EXTENSION (sec)	8 to 20

Table 590/22-11-00-993-893

Test		Limits
57.08	MT ACT POS (vac)	-0.10 to +0.10

Table 591/22-11-00-993-894

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 592/22-11-00-993-895

Test		Limits
57.11	MT ACT POS (DEG)	-0.10 to 0.20
57.13	MT ACT POS (DEG)	0.56 to 0.68
57.15	MT ACT POS (DEG)	1.31 to 1.60

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Table 592/22-11-00-993-895 (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
57.27	MT ACT POS (DEG)	0.10 to 0.20
57.29	MT ACT POS (DEG)	-0.10 to 0.20
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
57.37	MT ACT POS (DEG)	-0.10 to 0.10

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.

- Push the LSK adjacent to CONTINUE on Test 57.37 screen.
- Push the LSK adjacent to PREV MENU on the END OF MACH TRIM RIG screen.
- Push the LSK adjacent to PREV MENU on the SELECT CHANNEL FOR TEST screen.
- Push the LSK adjacent to EXIT on the RIGGING INDEX screen.
- Push the LSK adjacent to CONTINUE on the END OF BITE RIGGING screen.
- Push the LSK adjacent to EXIT until you get out of the BITE test.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-196

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

SUBTASK 22-11-00-860-197

- Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-198

- Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-199

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

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SUBTASK 22-11-00-410-004

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-809

24. Alpha Vane Rigging Test

A. General

- (1) The alpha vane rigging test verifies that the Digital Flight Control System (DFCS) is receiving an accurate angle of attack value from the Air Data Inertial Reference Unit (ADIRU).

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.

<u>Reference</u>	<u>Description</u>
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 22-11-00-860-202

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-203

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-204

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

SUBTASK 22-11-00-860-205

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

SUBTASK 22-11-00-860-206

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01072	HEATERS ALPHA VANE LEFT
D	3	C01071	HEATERS ALPHA VANE RIGHT

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D. Alpha Vane Rigging Test

SUBTASK 22-11-00-740-035

- (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 probe test fixture, SPL-1917, on the left alpha vane.
 - (c) Set the 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 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 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 probe test fixture, SPL-1917, from the left alpha vane.
 - (g) Install the angle of attack probe test fixture, SPL-1917, on the right alpha vane.
 - (h) Set the 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 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 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°
 - (k) Remove the angle of attack probe test fixture, SPL-1917, from the right alpha vane.

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- 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 22-11-00-860-207

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01072	HEATERS ALPHA VANE LEFT
D	3	C01071	HEATERS ALPHA VANE RIGHT

SUBTASK 22-11-00-860-208

- (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 22-11-00-860-209

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-210

- (4) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

————— **END OF TASK** —————

TASK 22-11-00-820-810

25. Remote Light Sensor Input Test

A. General

- (1) The remote light sensor input test does checks of 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

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Remote Light Sensor Input Test

SUBTASK 22-11-00-740-036

- (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
 - (e) SENSOR VALUES

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- (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) Make sure 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) Make sure 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) Make sure 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) Makes sure 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 22-11-00-820-811

26. 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.

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Reference	Description
COM-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: 18910920000 Supplier: 89944 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 #: DPS350 Supplier: 21844 Part #: DPS450 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 #: 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 #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
SPL-1677	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205
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

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F. Prepare for the Test

SUBTASK 22-11-00-860-216

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-217

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-218

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

SUBTASK 22-11-00-860-219

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

SUBTASK 22-11-00-860-220



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 steps that follow:
- (a) Seal the drain hole on each pitot probe.



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 22-11-00-860-221

- (6) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-00-860-222

- (7) Inside the aft unpressurized compartment, below the elevator feel computer, do these steps:
- (a) Remove the restrictor valves from the bottom of the pitot lines.
- (b) If you use the regulator, SPL-1742, or equivalent, do the steps that follow:
- 1) Connect the pressure gage lines from the regulator, SPL-1742, or equivalent, to the drain holes of the pitot lines.
- (c) If you use the air data model test set, COM-1914, then do these steps:

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- 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 22-11-00-860-223



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.

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

SUBTASK 22-11-00-860-224

- (9) 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 bar, SPL-1677, to measure the B dimension.
- (c) Make sure that the B dimension is 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

G. Elevator Centering Unit Test

SUBTASK 22-11-00-860-225

- (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) COMPLETE 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:

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- 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.
- (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 (TASK 27-31-91-000-801 and TASK 27-31-91-400-801).

NOTE: If the maintenance capability is not available, tighten all eight of the fasteners attaching the cranks to 105 in-lb (12 N·m). Replace the torque tube at the next maintenance opportunity.

SUBTASK 22-11-00-860-226

- (2) Do the land verify test (TASK 22-11-00-700-801).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-227

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

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SUBTASK 22-11-00-860-228

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-229

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-230

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

SUBTASK 22-11-00-860-231

- (5) At the two pitot probes on the vertical fin, do this step:
- (a) Remove the pressure lines from the air data model test set, COM-1914, or regulator, SPL-1742, or equivalent, to the pitot probes.

SUBTASK 22-11-00-860-232

- (6) In the aft unpressurized compartment, below the elevator feel computer, do these steps:
- (a) If you use the regulator, SPL-1742, or equivalent, do this step:
- 1) 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 that were installed over 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.

SUBTASK 22-11-00-410-005

- (7) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

TASK 22-11-00-820-812

27. Rudder Rigging Test

A. General

- (1) The rudder rigging test does a check of the interfaces between the Digital Flight Control System (DFCS) and the rudder rollout control system wiring sensors.

B. References

<u>Reference</u>	<u>Title</u>
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

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left

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Zone	Area

212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 22-11-00-860-235

- (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 22-11-00-860-236

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-00-860-237

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-00-860-238

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-00-860-239



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.

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

E. Rudder Rigging Test

SUBTASK 22-11-00-740-037

- (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) CONTINUE
- 10) COMPLETE RUDDER RIG

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- (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.
 - 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 593/22-11-00-993-896

TEST		LIMITS
58.01	RUDDER POS (vac)	-0.06 to 0.06
58.02	RUDDER POS (deg)	-27.50 to -24.50
58.03	RUDDER POS (deg)	24.50 to 27.50
58.04	RUDDER POS (vac)	-0.06 to 0.06
58.05	RUDDER POS (deg)	-27.50 to -24.50
58.06	RUDDER POS (deg)	24.50 to 27.50
58.07	RUDDER POS (vac)	-0.06 to 0.06
58.08	RUDDER POS (deg)	23.00 to 26.00
58.09	RUDDER POS (deg)	-26.00 to 23.00
58.10	RUDDER POS (vac)	-0.06 to 0.06

- 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 22-11-00-860-240

- (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 22-11-00-860-241

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-242

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

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SUBTASK 22-11-00-860-243

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

————— END OF TASK —————

TASK 22-11-00-740-812

28. Digital Flight Control System LRU Replacement Test

A. General

- (1) The LRU replacement test lets you do a quick test of the LRU that has been replaced to make sure that it is functioning.

B. Location Zones

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

C. Digital Flight Control System LRU Replacement 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) 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 the AUTOTEST INITIALIZATION screen and follow the instructions on the CDU to run the test.
- (d) Make sure the ALL TEST PASSED message shows on the CDU.
- NOTE: Some tests may be completed so fast that they may not be visible on the CDU.
- NOTE: The test can be considered as having passed unless a TEST FAILED message appeared.
- (e) Push CONTINUE on the test SUMMARY screen.
- (f) Push CONTINUE after having complied with the instructions TURN OFF HYD A-B .
- (g) Push EXIT on the TEST COMPLETE screen.
- (h) Push EXIT after having complied with the instructions on the END OF DFCS BITE screen.

————— END OF TASK —————

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TASK 22-11-00-740-814

29. Digital Flight Control System (DFCS) BITE Procedure

A. General

- (1) The DFCS BITE flowchart (Figure 504) is the guide for you to use the DFCS BITE. The DFCS BITE is based on the on-condition maintenance philosophy. The on-condition maintenance philosophy says that maintenance begins when the pilot reports a problem.
- (2) You do the DFCS BITE tests from the control display unit (CDU). You use the FAULT REVIEW item on the DFCS BITE TEST MAIN MENU in this task.
 - (a) These are the items that you can use in the FAULT REVIEW menu:
 - 1) CURRENT STATUS
 - 2) FAULT HISTORY SORTED BY FLIGHT LEG
 - 3) FAULT HISTORY SORTED BY FLIGHT DECK EFFECT
- (3) Normal Sequence:
 - (a) From the pilot report (PIREP) or flight deck effect (FDE), you go to the FAULT HISTORY SORTED BY FLIGHT LEG or FAULT HISTORY SORTED BY FLIGHT DECK EFFECT to look for faults.
 - (b) If there are faults in the FAULT HISTORY SORTED BY FLIGHT LEG or FAULT HISTORY SORTED BY FLIGHT DECK EFFECT, then run the applicable LRU TESTS and correct the faults.
 - (c) If there are no faults in the FAULT HISTORY SORTED BY FLIGHT LEG or FAULT HISTORY SORTED BY FLIGHT DECK EFFECT, then continue to look for faults in the CURRENT STATUS. Do the Current Status Quick Test and the applicable additional test(s) in the CURRENT STATUS.
- (4) The FAULT HISTORY SORTED BY FLIGHT LEG display shows faults occur in each flight leg (LEG).
 - (a) The display can show data from the last 40 flight legs (LEG 01 through LEG 40). The flight legs are shown with the flight leg that had the most recent fault at the top of the first page.
 - (b) Only the flight legs during which faults occurred will show. You can use the PREV PAGE and NEXT PAGE keys to see all the flight legs.
 - (c) When you push the line select key adjacent to the prompt for one of the flight legs, you will see more data. For each fault in the flight leg you will see this data:
 - 1) The flight leg.
 - 2) The flight deck effect.
 - 3) The channel that had the fault.
 - 4) The roll and pitch modes that were active when the fault occurred.
 - 5) The fault message. Each fault message shows this fault data:
 - a) The maintenance monitor that found the fault.
 - b) The failed (suspect) LRU.
 - c) The flight number.
 - d) The time, altitude, airspeed and the airplane mode that the fault occurred.

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- e) LRU TESTS prompt.

NOTE: The LRU TESTS prompt will initiate the BITE Library tests that are associated with the fault.

- (5) **FAULT HISTORY SORTED BY FLIGHT DECK EFFECT** display shows faults sorted by flight deck effect instead of flight leg.
- (a) Once a flight deck effect is selected the fault data is the same data that shows in the **FAULT HISTORY SORTED BY FLIGHT LEG** display. You can use the **PREV PAGE** and **NEXT PAGE** keys to see all the faults that have occurred in the flight legs under that flight deck effect.
- (b) These are the flight deck effect selections that you can make:
- 1) A/P DISC (Autopilot Disconnect)
 - 2) ENG ATTMPT (Engage Attempt)
 - 3) F/D BOV (Flight Director Bias out of view)
 - 4) MODE REV (Mode Reversion)
 - 5) SPEED TRIM
 - 6) MACH TRIM
 - 7) STAB TRIM
 - 8) F/D FLAG (Flight Director Flag)
 - 9) MISC (Miscellaneous)
 - 10) GND FAULTS (Ground Faults).
- (6) The **CURRENT STATUS** display will show any maintenance messages that are currently active.
- (a) A maintenance message identifies a specific failure which is found by the DFCS BITE. The maintenance messages are usually abbreviations for line replaceable units (LRUs).
- (b) The **CURRENT STATUS** item on the DFCS BITE TEST **FAULT REVIEW** menu contains these tests:
- NOTE: For more detailed data about the library tests in the Current Status Quick Test and the additional tests, refer to the Digital Flight Control System (DFCS) - Operational Test, TASK 22-11-00-740-801.
- 1) Current Status Quick Test (Group 10)
 - 2) Additional Tests:
 - a) Autopilot (Group 11)
 - b) Flight Director (Group 12)
 - c) Mach Trim System (Group 13)
 - d) Speed Trim System (Group 14)
 - e) Stab/Speed Trim System (Group 14)
 - f) Altitude Alert (Group 15).
- (c) The Current Status Quick Test comes before the additional tests. In each additional test, 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 tests:

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- a) Interactive tests
- b) Surface tests.
- (d) The Current Status Quick Test contains a number of library tests. These library tests are automatic and they are referred to as autotests. The current status quick test quickly does a check on the DFCS interfaces.
- (e) There are five additional tests. Each additional test contains a number of library tests. These library tests are interactive and/or surface tests.
 - 1) The interactive tests are not automatic. You must do the instructions that show on the CDU display to complete the interactive tests.
 - 2) 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.
- (f) If there are faults in the Current Status Quick Test (Group 10) or additional test (Group 11, 12, 13, 14 or 15), then correct the faults.
- (7) 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.
 - (a) CONTINUE
 - 1) If you push the LSK adjacent to CONTINUE, then the BITE will take you to the subsequent page of the test.
 - (b) PREV MENU
 - 1) If you push the LSK adjacent to PREV MENU, then the BITE will take you to the previous selection page.
 - (c) EXIT
 - 1) If you push the LSK adjacent to EXIT, then the BITE will take you out of BITE test and put the airplane back to its usual condition.
 - (d) NEXT PAGE or PREV PAGE key
 - 1) 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.

B. BITE Procedure

SUBTASK 22-11-00-740-045

- (1) Do the BITE procedure for the Digital Flight Control System (Figure 504).
 - (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 (LSK) next to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.
 - (b) Push the Line Select Key (LSK) adjacent to each of these prompts:
 - 1) MAINT

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2) DFCS

NOTE: If FCC-A SELFTEST FAIL, FCC-B SELFTEST FAIL or CROSS CHANNEL TEST FAIL message shows, then refer to the Interactive Fault Isolation Manual to find the applicable fault isolation tasks.

3) FAULT REVIEW

4) FAULT HISTORY SORTED BY FLIGHT LEG or FAULT HISTORY SORTED BY FLIGHT DECK EFFECT

5) Make a selection for the applicable channel:

- a) CHANNEL A
- b) CHANNEL B

(c) Push the LSK adjacent to the flight deck effect or flight leg.

(d) If SUSPECT LRU(S) shows on the CDU display, then do these steps:

1) Make a record of the suspect LRUs that show on the CDU display.

NOTE: If there is more than one page of faults, you can use the NEXT PAGE or PREV PAGE key to change page.

2) Push the LSK adjacent to LRU TESTS.

3) Do the instructions that show on the CDU display to complete the LRU TESTS.

NOTE: The LRU TESTS can be an autotest, interactive test or surface test.

NOTE: The TEST PASSED or TEST FAILED shows after you complete the LRU TESTS.

4) If TEST PASSED shows, then do these steps:

NOTE: When TEST PASSED shows, the DFCS BITE found no problem with the suspect LRUs. The problem could be an intermittent fault, or a fault that occurs only under flight conditions in the suspect LRUs that you recorded earlier.

- a) Go to other applicable system BITE (For example: FMCS, A/T or CDS) or use a self-test of the applicable LRUs to do a check on the suspect LRUs that you recorded earlier.

5) If TEST FAILED shows, then push the LSK adjacent to TEST RESULTS.

- a) 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: The maintenance monitor that triggered the fault message will be shown, followed by a list of suspect LRU(s). The suspect LRU list and interface pins are used as the maintenance message that determines the fault isolation task. The maintenance monitor message is shown only when fault history is run. If a ground test is run, only the suspect LRU list is shown.

- b) If it is necessary to do the test again, then do these steps:

c) Push the LSK adjacent to TEST DATA.

d) Push the LSK adjacent to RERUN.

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- 6) If TEST FAILED shows with the Message Text " FCC-A " or " FCC-B " with Monitor Text " FGN FAILS TO ENT TOGA " or " FGN DROPPED IN APP ", do the off side FCC BITE TEST to find the necessary troubleshooting task.
- 7) Refer to the Interactive Fault Isolation Manual to find the applicable fault isolation tasks.
- (e) If NO FAULTS shows on the CDU display, then do these steps to do the Current Status Quick Test and the applicable additional test(s) in CURRENT STATUS:
 - 1) Push the LSK adjacent to PREV MENU until the DFCS BITE TEST FAULT REVIEW menu shows.
 - 2) Push the LSK adjacent to CURRENT STATUS.
NOTE: The STATUS AUTOTEST INITIALIZATION display shows.
- (f) Autotest:
 - 1) Do the instructions that show on the CDU display.
NOTE: If the initialization setup is correct, then the AUTOTEST IN PROGRESS shows on the CDU display.
 - 2) If AUTOTEST PASSED shows on the CDU display, then 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 is 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, then do the library test(s) that show on the CDU display.
 - a) 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: The maintenance monitor that triggered the fault message will be shown, followed by a list of suspect LRU(s). The suspect LRU list and interface pins are used as the maintenance message that determines the fault isolation task. The maintenance monitor message is shown only when fault history is run. If a ground test is run, only the suspect LRU list is shown.
 - b) If it is necessary to do the test again, then do these steps:
 - c) Push the LSK adjacent to TEST DATA.
 - d) Push the LSK adjacent to RERUN.
 - 4) Refer to the Interactive Fault Isolation Manual to find the applicable fault isolation tests.
- (g) Additional Test:
NOTE: The additional test comes immediately after you complete the last autotest.
 - 1) If the additional test does not appear immediately after the last autotest then select CONTINUE to go to the additional test.

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- 2) Make a selection for the applicable channel:

NOTE: The Current Status Additional Test menu shows after you make the selection. This menu lets you make the selection for the Autopilot, Flight Director, Mach Trim System, Speed Trim System or Alt Alert System.

- a) CHANNEL A
- b) CHANNEL B
- c) CHANNEL A AND B

- (h) Push the LSK adjacent to the applicable additional test:

- 1) AUTOPILOT
- 2) FLIGHT DIRECTOR
- 3) MACH TRIM SYSTEM

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

- 4) STAB/SPEED TRIM SYSTEM
- 5) ALT ALERT

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

- (i) Interactive Test:

- 1) Do the instructions that show on the CDU display to complete all interactive tests.
- 2) If INTERACTIVE TEST PASSED shows on the CDU display, then 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, then do these steps:
 - 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: The maintenance monitor that triggered the fault message will be shown, followed by a list of suspect LRU(s). The suspect LRU list and interface pins are used as the maintenance message that determines the fault isolation task. The maintenance monitor message is shown only when fault history is run. If a ground test is run, only the suspect LRU list is shown.

- c) If it is necessary to do the test again, then do these steps:
 - d) Push the LSK adjacent to TEST DATA.
 - e) Push the LSK adjacent to RERUN.
- 4) Refer to the Interactive Fault Isolation Manual to find the applicable fault isolation tasks.

- (j) Surface Test:

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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.

- 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, then 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, then do these steps:
 - 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: The maintenance monitor that triggered the fault message will be shown, followed by a list of suspect LRU(s). The suspect LRU list and interface pins are used as the maintenance message that determines the fault isolation task. The maintenance monitor message is shown only when fault history is run. If a ground test is run, only the suspect LRU list is shown.

- c) If it is necessary to do the test again, then do these steps:
 - d) Push the LSK adjacent to TEST DATA.
 - e) Push the LSK adjacent to RERUN.
- 4) Refer to the Interactive Fault Isolation Manual to find the applicable fault isolation tasks.

————— END OF TASK —————

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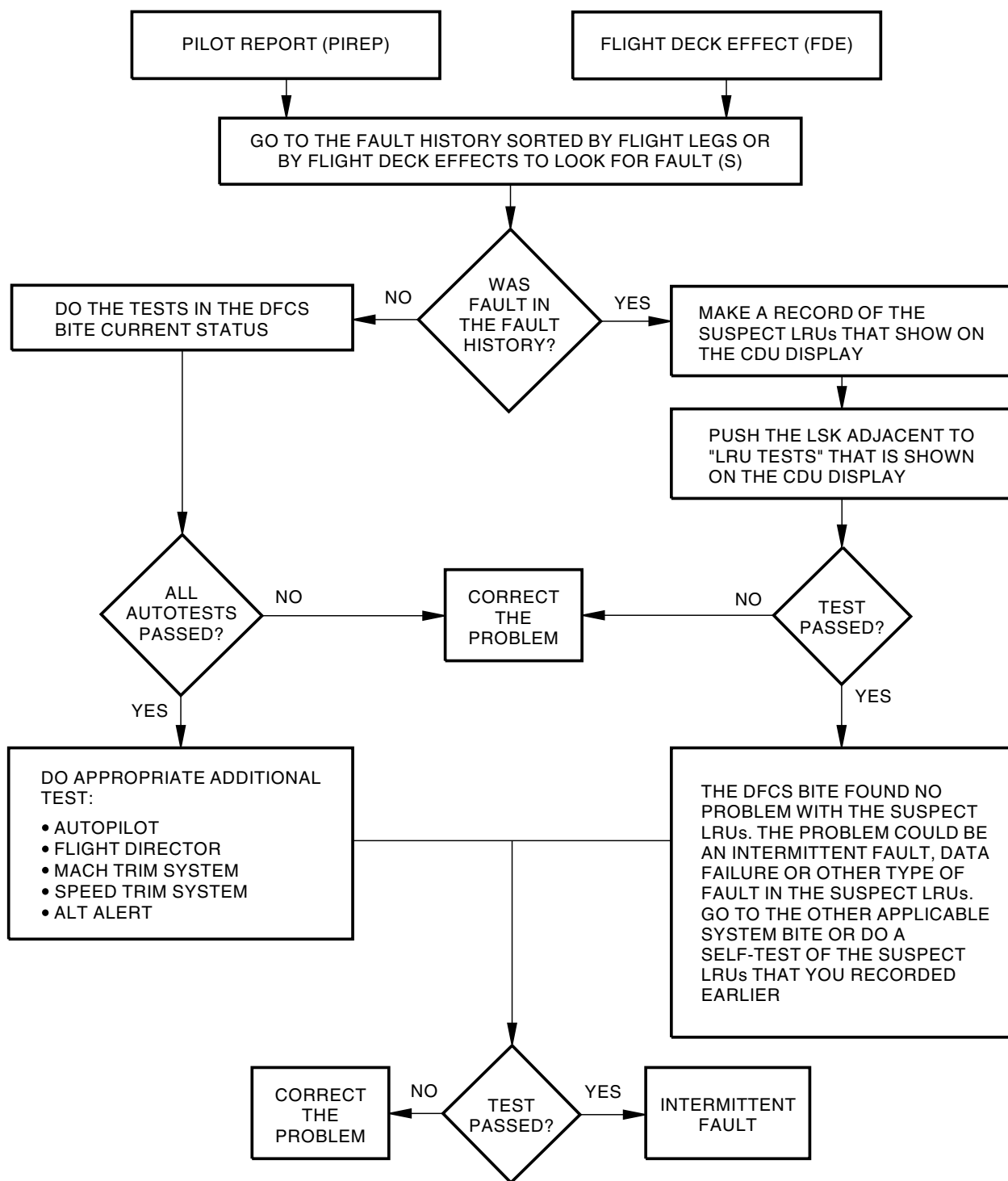
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DFCS BITE Flowchart
Figure 504/22-11-00-990-805

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TASK 22-11-00-740-815

30. **Digital Flight Control System (DFCS) Speed Trim/Stab Trim Discrete BITE Test**

(Figure 505, Figure 506, Figure 507)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure test the interface between both Flight Control Computers (FCC) and the AFCS SYS A ENGAGE INTLK and AFCS INTLK 2 circuit breakers.
- (2) This speed trim and stab trim discrete BITE test checks the interfaces between the Digital Flight Control System (DFCS) and the speed trim/stab trim components.
- (3) This BITE test is an interactive test and is not automatic. You must do the instructions that show on the CDU display to complete the interactive test.

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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Prepare for the Test

SUBTASK 22-11-00-860-249

- (1) Open this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-250

- (2) Make sure that both STAB TRIM cut out switches, PRI and B/U, on the aft area of the control stand are in the NORMAL position.

SUBTASK 22-11-00-860-251

- (3) 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 or TASK 34-21-00-820-803).

SUBTASK 22-11-00-860-252

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

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SUBTASK 22-11-00-860-253



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- (5) Supply hydraulic power to Hydraulic Systems A and B (TASK 29-11-00-860-801).

D. FCC and Circuit Breaker Interface 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.

NOTE: 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
- NOTE: An automatic BITE test will run after the DFCS is selected.
- 4) EXTENDED MAINTENANCE
- 5) SENSOR VALUES
- 6) DISCRETE INPUTS
- 7) J1C

- (b) Make sure that the MAIN TRM INTLK pin D03 shows 28 for both A and B.
- (c) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

- 1) Make sure that the MAIN TRM INTLK pin D03 shows 28 for both A and B.

- (d) Close this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

- (e) Open this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01631	AFCS INTLK 2

- 1) Make sure that the MAIN TRM INTLK pin D03 shows 28 for both A and B.

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- (f) Open this circuit breaker:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

- 1) Make sure that the MAIN TRM INTLK pin D03 shows OP for both A and B.

- (g) Close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C01048	AFCS SYS A ENGAGE INTLK

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01631	AFCS INTLK 2

- 1) Make sure that the MAIN TRM INTLK pin D03 shows 28 for both A and B.

- (h) Select EXIT LSK.

E. Speed Trim/ Stab Trim Channel A Discrete BITE Test

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: 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

NOTE: An automatic BITE test will run after the DFCS is selected.

- 4) EXTENDED MAINTENANCE
- 5) BITE LIBRARY TESTS
- 6) Select channel A
- 7) RUN SELECT LIBRARY TESTS
- 8) SPD/STB TRIM

- a) Make sure an asterisk (*) is displayed next to the SPD/STB TRIM test.

- 9) EXECUTE



WARNING

MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- a) Do the instructions that show on the CDU display.
- b) If any of the test fails, then do these steps:

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- <1> Make a record of the maintenance messages that show on the CDU display.
- <2> Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

F. Speed Trim/ Stab Trim Channel B Discrete BITE Test

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.

NOTE: 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

NOTE: An automatic BITE test will run after DFCS is selected.

- 4) EXTENDED MAINTENANCE
- 5) BITE LIBRARY TESTS
- 6) Select channel B
- 7) RUN SELECT LIBRARY TESTS
- 8) SPD/STB TRIM

- a) Make sure an asterisk (*) is displayed next to the SPD/STB TRIM test.

- 9) EXECUTE



WARNING

MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- a) Do the instructions that show on the CDU display.
- b) If any of the test fails, then do these steps:
 - <1> Make a record of the maintenance messages that show on the CDU display.
 - <2> Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-258

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

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SUBTASK 22-11-00-860-255

- (2) Close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-256

- (3) Set both STAB TRIM cut out switches, PRI and B/U, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-257

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

————— **END OF TASK** —————

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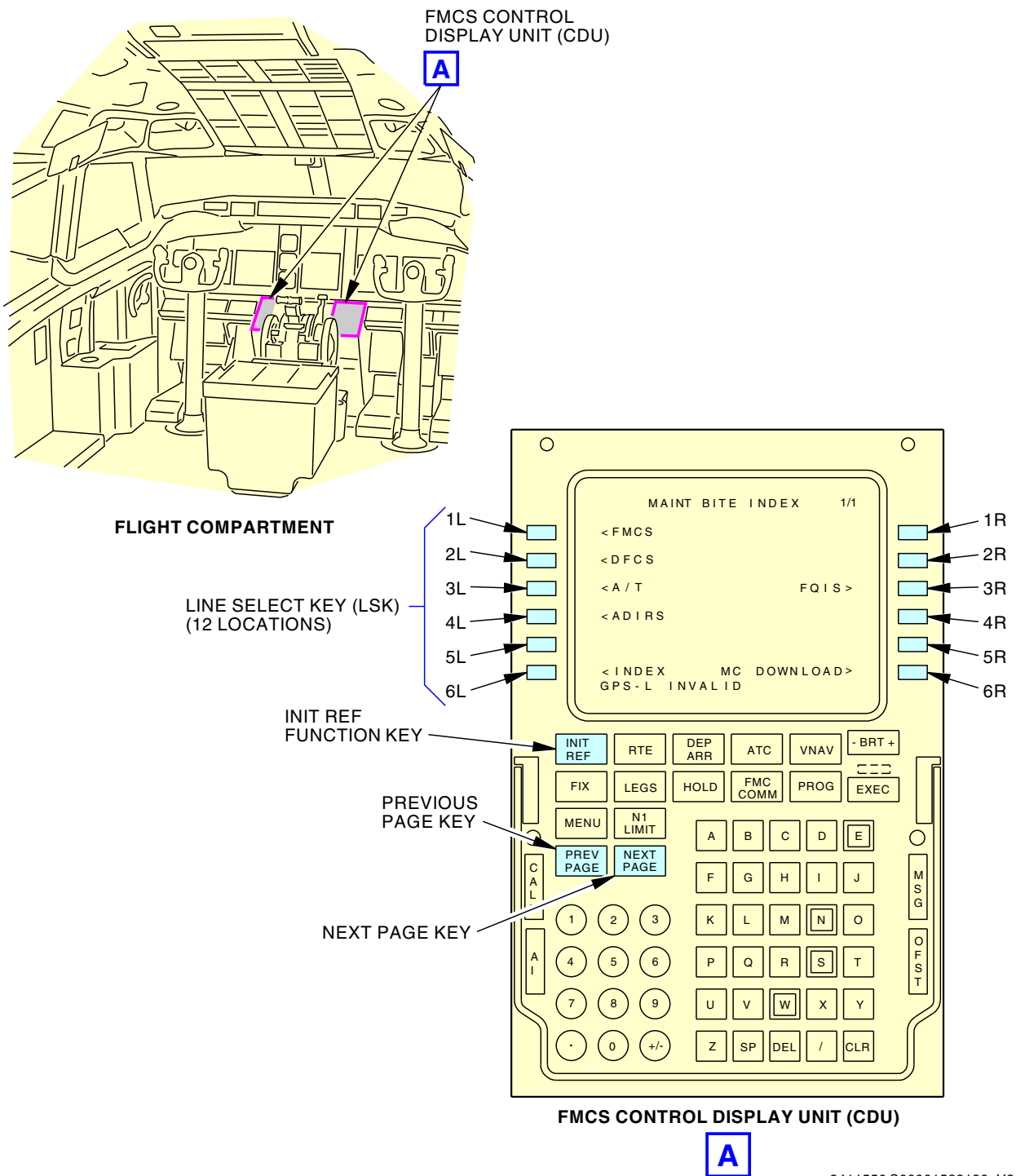
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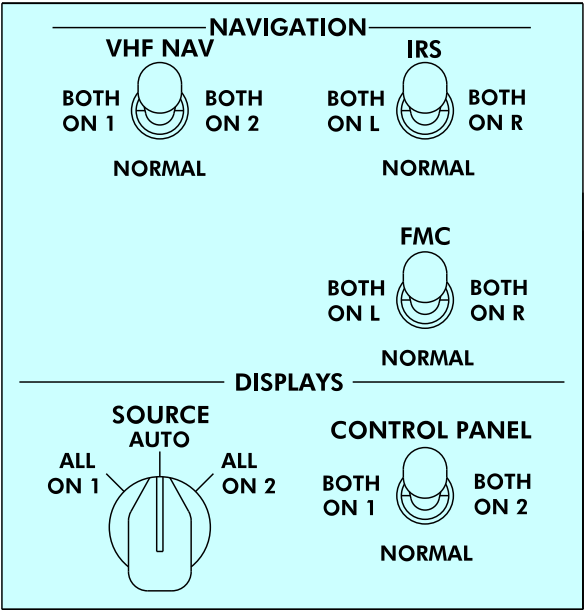
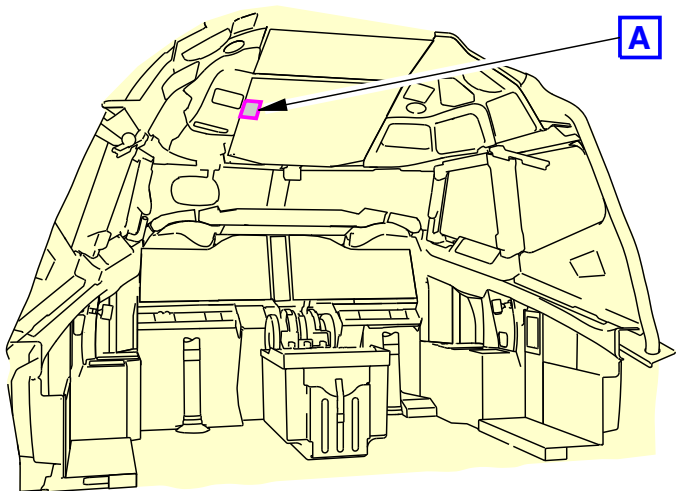
Flight Management Computer (FMC)/Control Display Unit (CDU)
Figure 505/22-11-00-990-806

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Navigation/Displays Panel
Figure 506/22-11-00-990-807

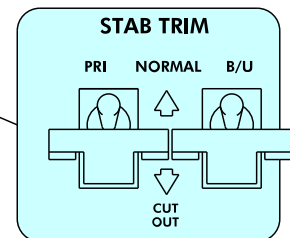
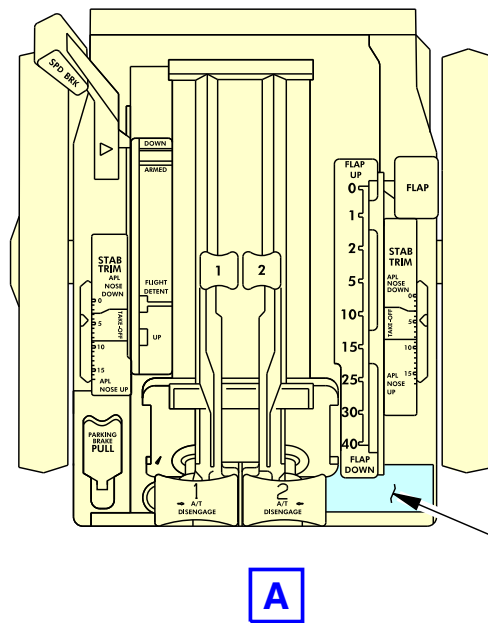
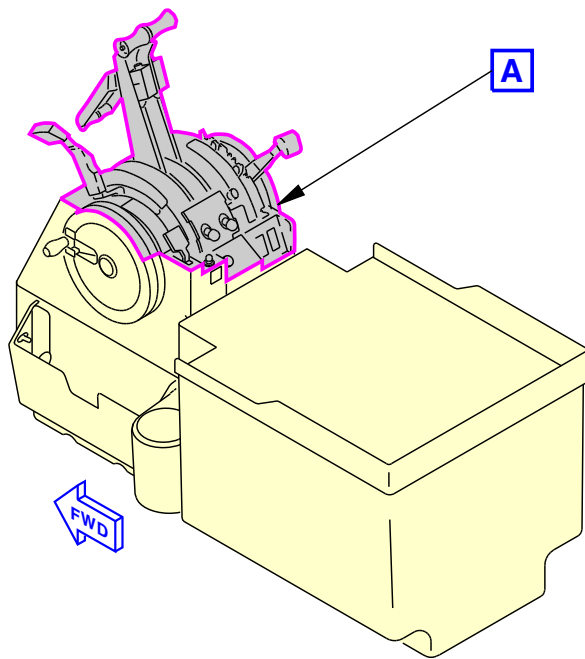
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22-11-00

BOEING
737-7/8/8200/9/10
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2887178 S0000686521_V1

Stab Trim Cutout Switch
Figure 507/22-11-00-990-808

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22-CMR-01

TASK 22-11-00-740-816

31. Digital Flight Control System (DFCS) Dual Stab - Surface Test

(Figure 505, Figure 506, Figure 507)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This dual stab surface test verifies that both Flight Control Computer No. 1 (FCC-1) and Flight Control Computer No. 2 (FCC-2) can control the aileron, elevator, rudder, stabilizer, and mach trim control systems. These tests check the control authority for each axis when both autopilots are engaged.
- (2) The dual stab surface test shall only be performed if both FCC's (channels A and B) are available.
- (3) This BITE test is an interactive test and is not automatic. You must do the instructions that show on the CDU display to complete the interactive test.

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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Prepare for the Test

SUBTASK 22-11-00-860-285

- (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 22-11-00-860-286

- (2) Make sure that both STAB TRIM cut out switches, PRI and B/U, on the aft area of the control stand are in the NORMAL position.

SUBTASK 22-11-00-860-287

- (3) 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 or TASK 34-21-00-820-803).

SUBTASK 22-11-00-860-288

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

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SUBTASK 22-11-00-860-289



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.

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

NOTE: Hydraulic power is necessary for the surface test.

D. Dual Stab Surface Test

SUBTASK 22-11-00-740-050

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

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

NOTE: 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
- NOTE: An automatic BITE test will run after the DFCS is selected.
- 4) EXTENDED MAINTENANCE
- 5) BITE LIBRARY TESTS
- 6) Select CHANNEL A AND B
- 7) RUN SELECT LIBRARY TESTS
- 8) DUAL STAB
 - a) Make sure an asterisk (*) is displayed next to the DUAL STAB test.
- 9) EXECUTE



MAKE SURE THAT ALL PERSONNEL, AND EQUIPMENT ARE AWAY FROM THE HORIZONTAL STABILIZER. THE MOVEMENT OF THE HORIZONTAL STABILIZER DURING MAINTENANCE CAN CAUSE INJURY TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- a) Do the instructions that show on the CDU display.
- b) If the dual stab surface test fails, select the TEST DATA LSK.
 - <1> Make a record of the maintenance messages that show on the CDU display.

NOTE: If only S004 or S007 failures are shown on the TEST DATA page with maintenance messages 22-11191 or 22-11194 displayed, then these failures can be ignored. Select the CONTINUE line select key and complete the remainder of library test 60.35.

- <2> Refer to the IFIM and do the applicable procedure(s) for the applicable maintenance message.

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- <3> Repeat the dual stab surface test after all maintenance messages have been cleared.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-860-290

- (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 22-11-00-860-291

- (2) Close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-00-860-292

- (3) Set both STAB TRIM cut out switches, PRI and B/U, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-00-860-293

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

————— **END OF TASK** —————

 22-CMR-02

TASK 22-11-00-700-803

32. Digital Flight Control System (DFCS) - Continuity Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task checks the wiring between these components:
- (a) Flight Control Computer (FCC)-A, FCC-B, primary stabilizer trim cutout switch (P8) and stabilizer trim motor.

B. References

<u>Reference</u>	<u>Title</u>
22-11-33-000-801	Flight Control Computer Removal (P/B 401)
22-11-33-400-801	Flight Control Computer Installation (P/B 401)
27-41-71-000-801	Stabilizer Trim Motor Removal (P/B 401)
27-41-71-400-801	Stabilizer Trim Motor Installation (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
312	Area Aft of Pressure Bulkhead - Right

D. Prepare for the Test

SUBTASK 22-11-00-020-001

- (1) Remove both the FCC-A and FCC-B (TASK 22-11-33-000-801).

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E. Primary Stabilizer Trim Cutout Switch Continuity Check

SUBTASK 22-11-00-020-004

- (1) Disconnect the connector D700 from the stabilizer trim motor (TASK 27-41-71-000-801).

SUBTASK 22-11-00-760-006

- (2) Do the wiring check for the FCC-A to the stabilizer trim motor.
- (a) Make sure that the PRI STAB TRIM switch is in NORMAL position.
 - (b) Do a wiring check between the pin H3 of connector D10135C at the E1-1 rack and pin 10 of connector D700 from the stabilizer trim motor.
 - 1) Make sure that there is continuity in the wiring.
 - (c) Put the PRI STAB TRIM switch in the CUTOUT position.
 - (d) Do a wiring check between the pin H3 of connector D10135C at the E1-1 rack and pin 10 of connector D700 from the stabilizer trim motor.
 - 1) Make sure that there is no continuity in the wiring.

SUBTASK 22-11-00-760-007

- (3) Do the wiring check for the FCC-B to the stabilizer trim motor.
- (a) Do a wiring check between the pin H3 of connector D10137C at the E1-4 rack and pin 10 of connector D700 from the stabilizer trim motor.
 - 1) Make sure that there is no continuity in the wiring.
 - (b) Put the PRI STAB TRIM switch in the NORMAL position.
 - (c) Do a wiring check between the pin H3 of connector D10137C at the E1-4 rack and pin 10 of connector D700 from the stabilizer trim motor.
 - 1) Make sure that there is continuity in the wiring.

SUBTASK 22-11-00-760-008

- (4) If you find a problem with the wiring, repair the wiring.

SUBTASK 22-11-00-420-003

- (5) Connect the connector D700 to the stabilizer trim motor (TASK 27-41-71-400-801).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-00-420-005

- (1) Install both FCC-A and FCC-B (TASK 22-11-33-400-801).

SUBTASK 22-11-00-740-051

- (2) Do this task: Digital Flight Control System (DFCS) Speed Trim/Stab Trim Discrete BITE Test, TASK 22-11-00-740-815.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

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 201, Figure 203 and Figure 202)

A. General

- (1) This procedure removes electrical power and hydraulic pressure from the roll control wheel steering force transducer.
- (2) The procedure also makes sure that the Integrated Flight System Accessory Unit (IFSAU) interface to the Flight Management Computer (FMC) Control Display Unit (CDU) shows no voltage for the transducer sensor.
- (3) The tryout in this task makes sure that roll control wheel steering force transducer is in a zero energy state.

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

E. Roll Control Wheel Steering Force Transducer Deactivation

SUBTASK 22-11-11-020-001

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

SUBTASK 22-11-11-860-001

- (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

F/O Electrical System Panel, P6-2

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

SUBTASK 22-11-11-860-002

- (3) Attach DO NOT OPERATE tags, STD-858, to the captain's and first officer's control columns.

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F. Roll Control Wheel Steering Force Transducer Tryout

SUBTASK 22-11-11-860-038

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-004

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
C	1	C01037	AFCS SYS B MACH TRIM AC
C	3	C01047	AFCS MCP DC 2
D	3	C01630	AFCS SYS B RUDDER DC

SUBTASK 22-11-11-860-037

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-11-700-001

- (4) Use the FMC - CDU and do the subsequent test:
- (a) Select INIT/REF on the keyboard.
 - (b) Select INDEX (LSK 6L).

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- (c) Select MAINT (LSK 6R).
- (d) Select DFCS (LSK 2L).
 - 1) Make sure that the DFCS runs the self test and display as follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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 NEXT PAGE on the keyboard.
- (l) Make sure that the reading 0.00 ± 5.00 VAC appears on both FCC-A and FCC-B opposite SNSR EXC AC (J1C-G05).
- (m) Select INIT/REF on the keyboard, to exit BITE.
- (n) End of test.

———— **END OF TASK** ————

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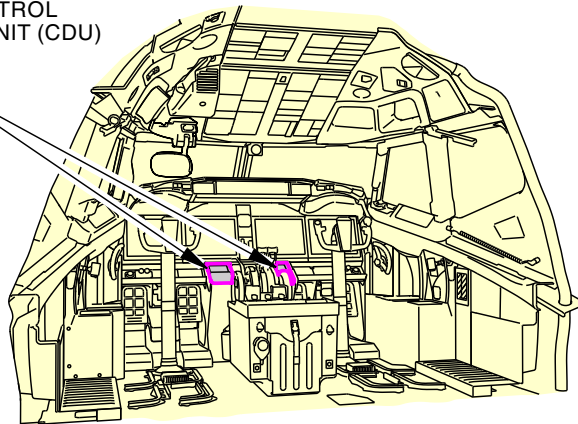
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



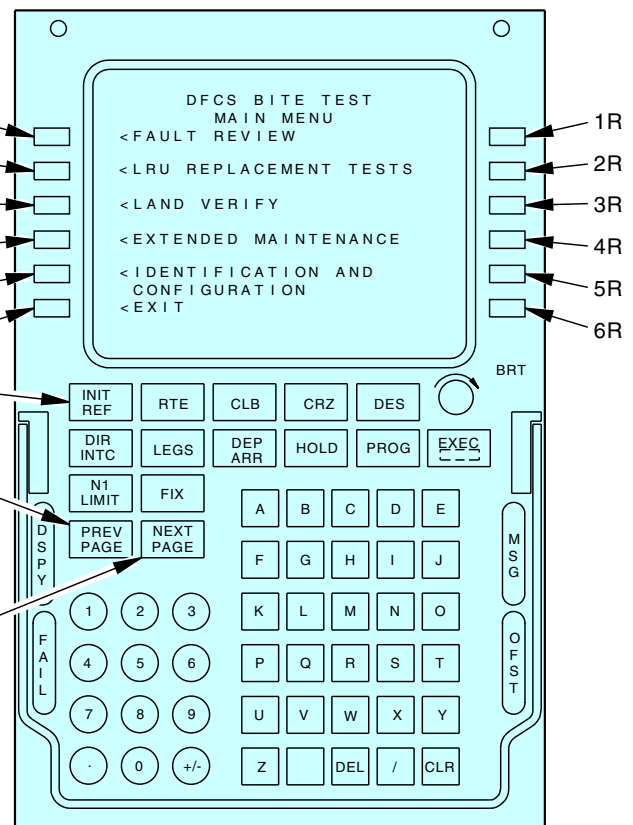
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Multifunction Control Display Unit
Figure 201/22-11-11-990-801

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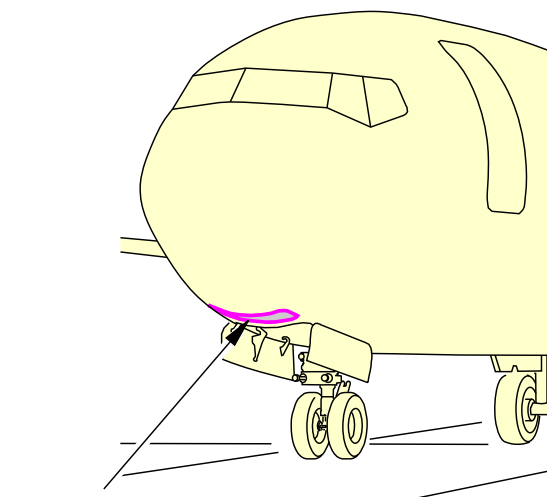
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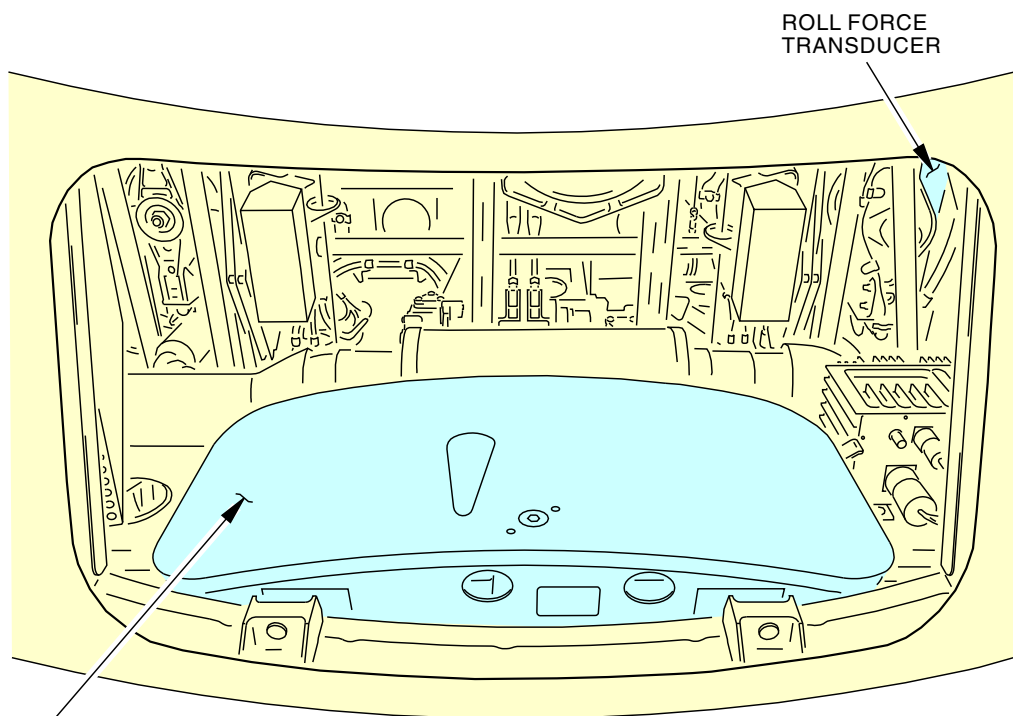


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FORWARD ACCESS
DOOR, 112A

A



ROLL FORCE
TRANSDUCER

FORWARD ACCESS
DOOR, 112A

VIEW WHEN YOU LOOK UP THROUGH
THE FORWARD ACCESS DOOR, 112A

A



2411556 S00061528218_V2

Roll Force Transducer
Figure 202/22-11-11-990-802

EFFECTIVITY
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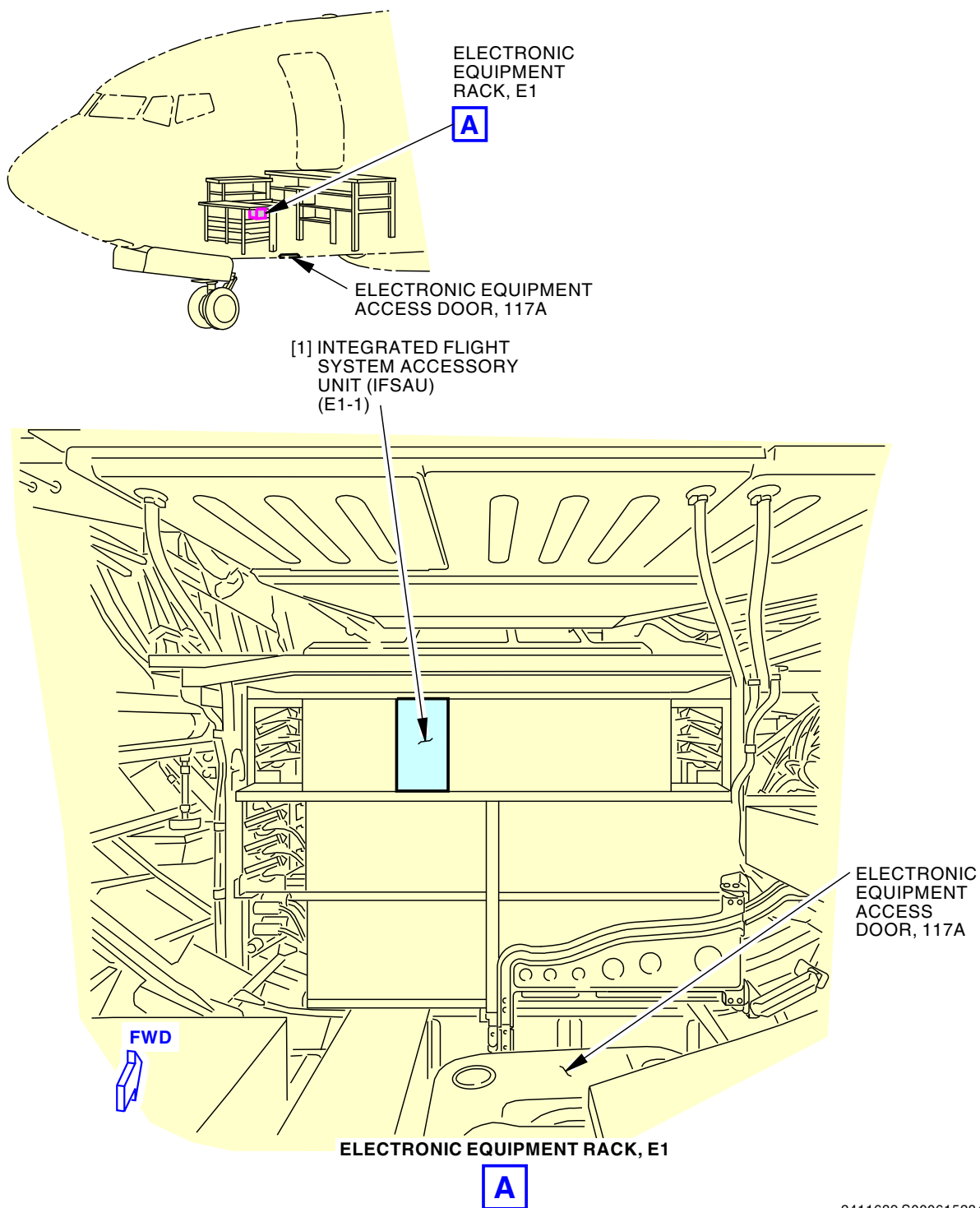
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2411639 S00061528437_V1

Integrated Flight System Accessory Unit (IFSAU)
Figure 203/22-11-11-990-806

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TASK 22-11-11-440-801

3. **Roll Control Wheel Steering Force Transducer - Activation**

(Figure 202)

A. General

- (1) This task restores 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
117	Electrical and Electronics Compartment - Left
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Roll Control Wheel Steering Force Transducer Activation

SUBTASK 22-11-11-860-005



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 (TASK 29-11-00-860-801).

SUBTASK 22-11-11-860-006

- (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

F/O Electrical System Panel, P6-2

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

————— **END OF TASK** —————

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ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of roll force transducer [1].
 - (2) Installation of roll force transducer [1].
- B. You can find the roll force transducer [1] (M221) on the aileron drum at the bottom of the captain's control column.
- C. The roll control wheel steering force transducer can also refer to the roll force transducer [1].

TASK 22-11-11-000-801

2. Roll Force Transducer Removal

(Figure 401)

A. General

- (1) This task is for the removal of the roll force transducer.

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

D. Access Panels

Number	Name/Location
112A	Forward Access Door

E. Prepare for the Removal

SUBTASK 22-11-11-860-007

- (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 22-11-11-860-008

- (2) Install the DO NOT OPERATE tags, STD-858, to the control columns.

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SUBTASK 22-11-11-010-001

- (3) To get access to the roll force transducer, open this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

F. Roll Force Transducer Removal

SUBTASK 22-11-11-020-002

- (1) Disconnect the connectors of the roll force transducer [1].

SUBTASK 22-11-11-020-003

- (2) For the upper spool, do these steps to remove the cable [5] of the roll force transducer [1]:
- (a) Remove the nut [18], bolt [14], washers [19], spacer [13], cable clamp [11], and plug [12] (View G, Figure 401).
 - (b) Remove the screws [9], washers [10], cable clamps [11], plugs [12], screw [15], cable clamps [16], and washers [19] (View D, Figure 401).
 - (c) 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 [5].

SUBTASK 22-11-11-020-004

- (3) For the lower spool, do these steps to remove the cable [5] of the roll force transducer [1] (View E, Figure 401):
- (a) Remove the screws [9], screw [15], bolt [14], bolt [17], washers [19], washers [10], nut [18], cable clamps [11], 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 [5].

SUBTASK 22-11-11-020-005

- (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** —————

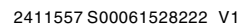
EFFECTIVITY
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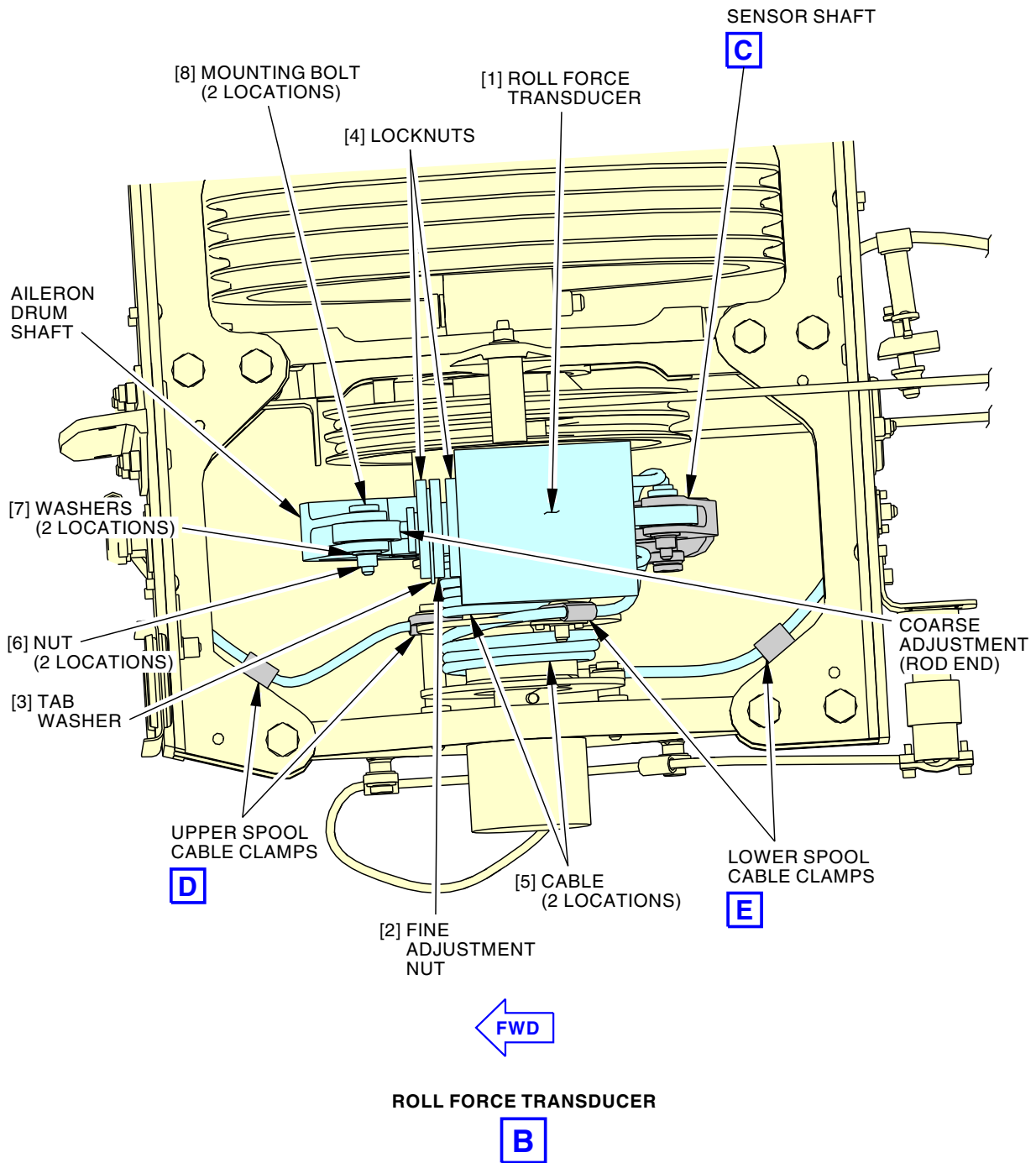


Roll Force Transducer Installation

Figure 401/22-11-11-990-803 (Sheet 1 of 5)

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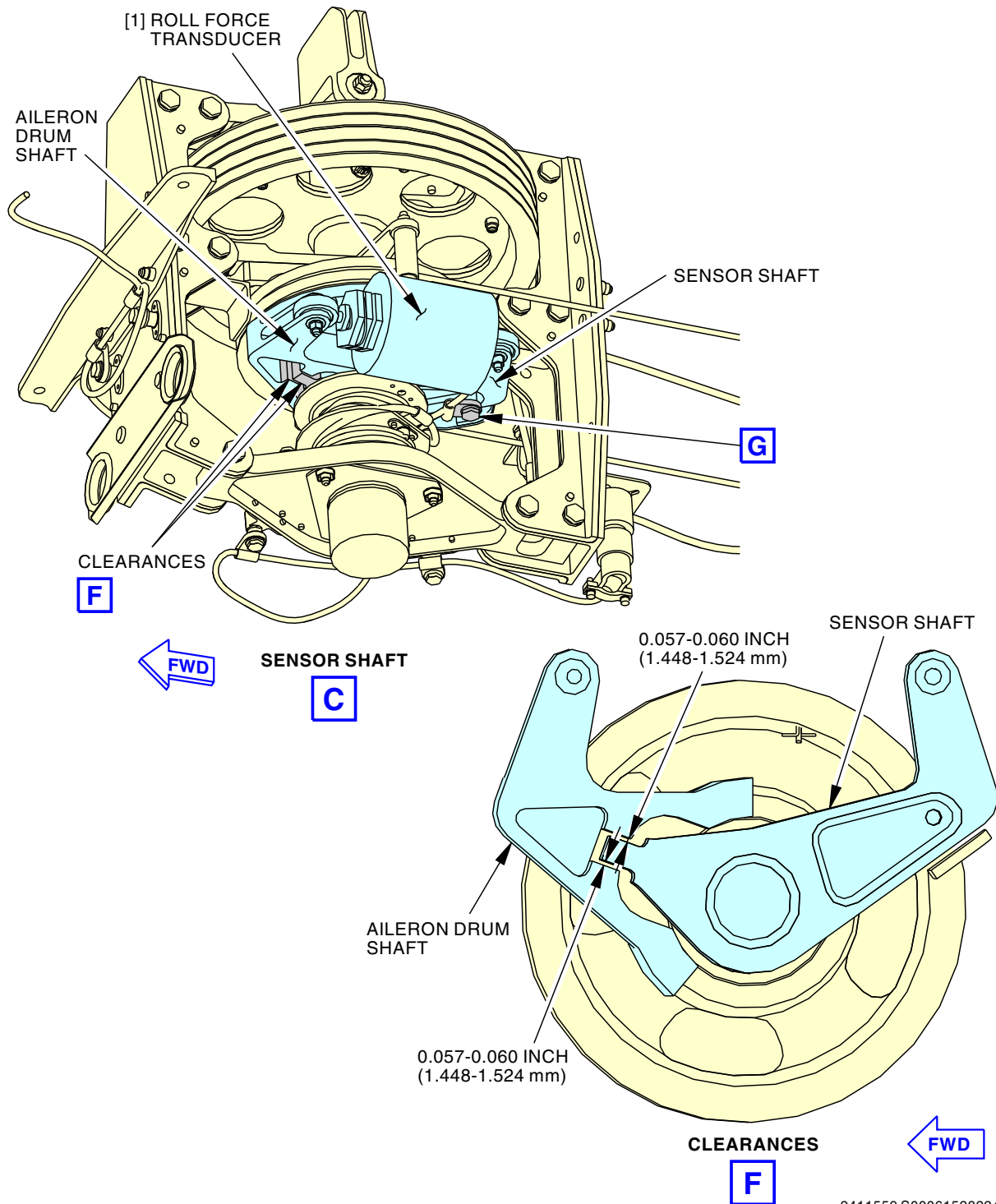
Roll Force Transducer Installation
Figure 401/22-11-11-990-803 (Sheet 2 of 5)

EFFECTIVITY
SIA ALL

22-11-11

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details



2411559 S00061528224_V3

Roll Force Transducer Installation
Figure 401/22-11-11-990-803 (Sheet 3 of 5)

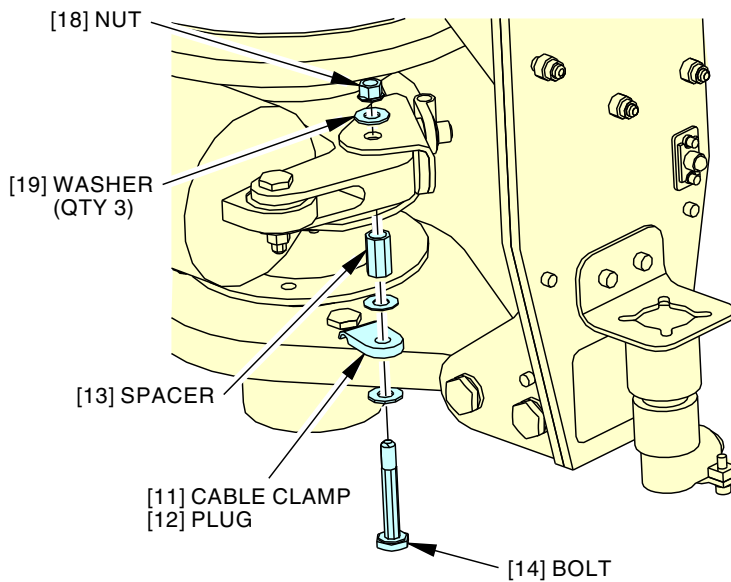
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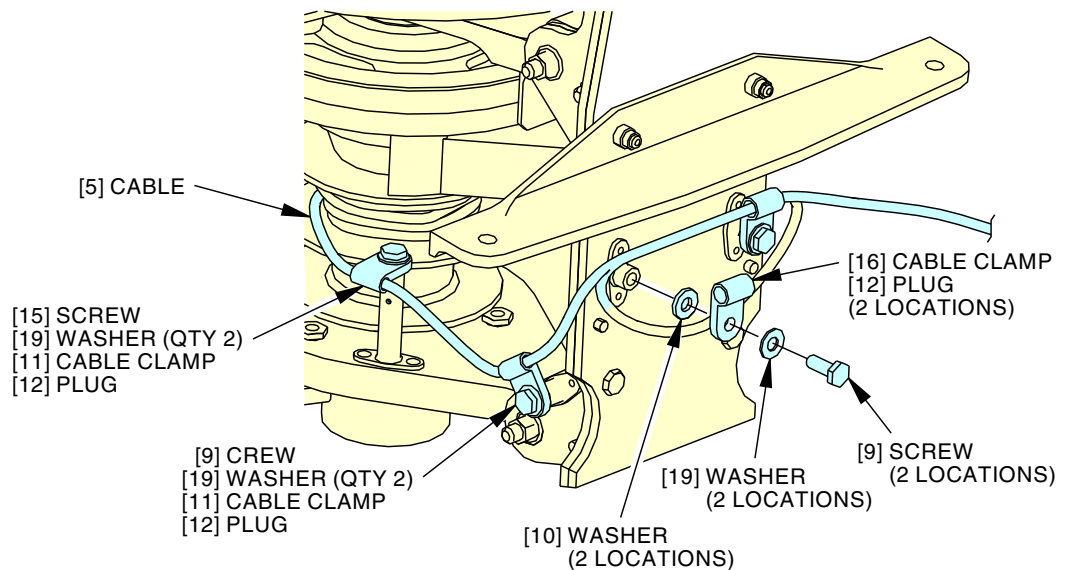
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G



UPPER SPOOL CABLE CLAMPS

D

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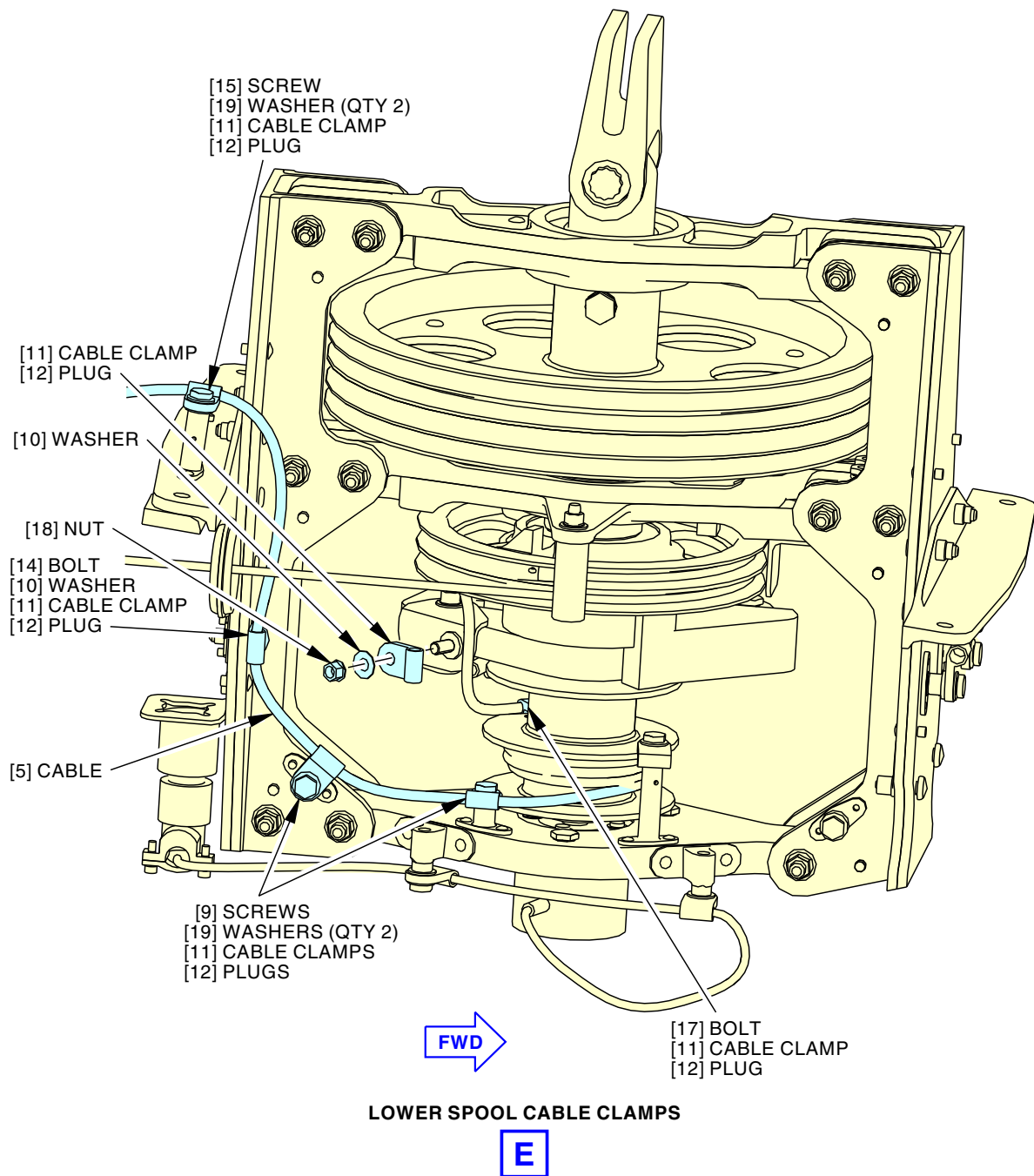
Roll Force Transducer Installation
Figure 401/22-11-11-990-803 (Sheet 4 of 5)

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Roll Force Transducer Installation
Figure 401/22-11-11-990-803 (Sheet 5 of 5)

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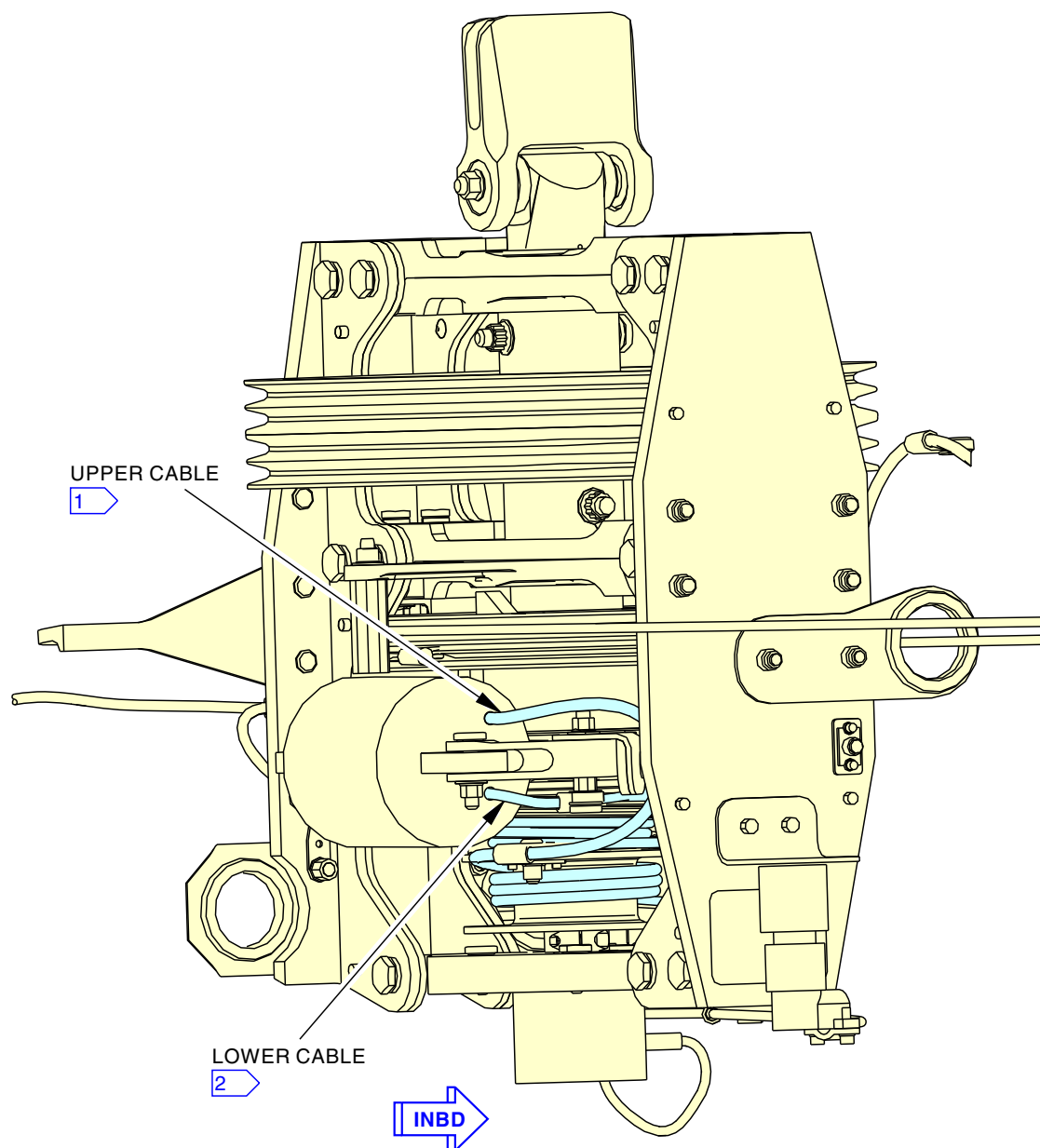
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ROLL FORCE TRANSDUCER CABLES

- 1 UPPER CABLE GOES TO LOWER SPOOL
- 2 LOWER CABLE GOES TO UPPER SPOOL

2464703 S0000572874_V2

Roll Force Transducer Cables
Figure 402/22-11-11-990-805

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TASK 22-11-11-400-801

3. Roll Force Transducer Installation

(Figure 401, Figure 402)

A. General

- (1) This task is for the installation of the roll force transducer.

B. 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)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1107	Gauge - Feeler, 0.0 - 0.5 Inch, Readable to 1/1000th

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

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.
- (a) Make sure that each clearance is 0.057 in. (1.448 mm) - 0.060 in. (1.524 mm).

SUBTASK 22-11-11-820-001

- (2) For the non-adjustable end of the roll force transducer [1], do these steps:
- (a) Hold the roll force transducer [1] in its position for installation with the cables [5] on the inboard side.
- (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].
- 1) Do these steps if you cannot freely engage the mounting bolt [8]:
- a) Loosen the locknuts [4].
- b) Adjust the transducer length.

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] (View G, Figure 401).

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- 1) Install the nut [18], bolt [14], washers [19], spacer [13], 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 5 turns, in the clockwise 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] and cable clamps [16] on the bracket (View D, Figure 401).
 - 1) Install the screws [9], washers [10], plugs [12], screw [15], and washers [19].
- (e) Turn the control wheel in the clockwise direction and then in the counterclockwise direction, to the limit, 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 upper cable [5] of the roll force transducer [1] in the lower spool (View E, Figure 401):
 - (a) Attach the cable [5] with the cable clamp [11] adjacent to the roll force transducer [1].
 - 1) Install the nut [18], washers [10], and plugs [12].
 - (b) Attach the cable [5] with the cable clamp [11] on the middle flange of the spool.
 - 1) Install the bolt [17] 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 3.5 turns, in the counterclockwise 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 clamps [11] on the bracket.
 - 1) Install the screws [9], screw [15], bolt [14], washers [19], washers [10], and plugs [12].
 - (f) Turn the control wheel in the clockwise direction and then in the counterclockwise direction, to the limit, 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 touch 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.

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.
 - (a) Make sure that each clearance is 0.057 in. (1.448 mm) - 0.060 in. (1.524 mm).

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G. Roll Force Transducer Installation Test

SUBTASK 22-11-11-860-010

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	5	C01041	AFCS SYS A SNSR EXC AC
D	1	C01049	AFCS SYS A WARN LIGHT (BAT)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-11-860-036

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-11-820-002

- (3) Do this task: Roll Force Transducer Adjustment and Test, TASK 22-11-11-820-801.

SUBTASK 22-11-11-740-001

- (4) Do this task: Roll Force Transducer Test, TASK 22-11-11-740-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-11-800-003

- (1) Remove the DO NOT OPERATE tags, STD-858, from the control columns.

SUBTASK 22-11-11-410-001

- (2) Close this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

————— END OF TASK —————

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ROLL CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST

1. **General**

- A. This procedure has these tasks:
- (1) Roll force transducer adjustment and test.
 - (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. General

- (1) This task is for the adjustment and test of the roll force transducer.

B. 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)
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-858	Tag - DO NOT OPERATE
STD-1107	Gauge - Feeler, 0.0 - 0.5 Inch, Readable to 1/1000th
STD-1293	Wrench - Torque (100 Lb-In)

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

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F. Prepare for the Adjustment

SUBTASK 22-11-11-010-002

- (1) To get access to the roll force transducer, open this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 22-11-11-860-012

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-013



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

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

SUBTASK 22-11-11-980-001

- (4) 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 30 degrees in the clockwise direction.
- (b) Turn the control wheel 30 degrees in the counterclockwise direction.
- (c) Slowly turn the control wheel to the center.

SUBTASK 22-11-11-860-014

- (5) Attach the DO NOT OPERATE tags, STD-858, to the control columns.

SUBTASK 22-11-11-860-015

- (6) Set the aileron trim to 0.0 unit.

SUBTASK 22-11-11-860-016

- (7) Set the STAB TRIM PRI and STAB TRIM B/U switches, on the aft area of the control stand, to the CUTOFF position.

SUBTASK 22-11-11-860-017

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

SUBTASK 22-11-11-860-018

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

G. Roll Force Transducer Adjustment and Test

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-11-740-002

- (1) Do these steps to get access to DFCS BITE:
- (a) Push the INIT REF key on the CDU keyboard.

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- (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
 - a) DFCS BITE TEST, TEST IN PROGRESS
 - <1> Set the FUNC to BOTH or 1. Then follow the screen instructions.
- 5) RIGGING
- 6) CWS
- 7) CONTINUE
- 8) ROLL CWS
- 9) 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



DO NOT PUSH THE LSK THAT IS ADJACENT TO CONTINUE DURING THE ADJUSTMENT. THE FLIGHT CONTROL MECHANISMS AND FLIGHT CONTROL SURFACES WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONNEL, AND 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.
 - (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.

NOTE: For example, if the cable is tightly pulled, then it can cause the voltage to increase.
 - 2) Remove the lockwires from the locknuts, fine adjustment nut and the tab washer (TASK 20-10-44-000-801).
 - 3) Loosen the locknuts.
 - 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.

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- (e) Record the voltage.
- (f) Turn the coarse adjustment (rod end) until the rod end mounting hole is parallel to the aileron drum shaft 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.
 - 1) Use the fine adjustment nut if it is 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.
- (n) Make sure that each clearance is between 0.057 in. (1.448 mm) and 0.060 in. (1.524 mm)
- (o) Do these steps to do a check of the adjustments:



DO NOT PUSH THE LSK THAT IS ADJACENT TO CONTINUE DURING THE ADJUSTMENT. THE FLIGHT CONTROL MECHANISMS AND FLIGHT CONTROL SURFACES WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONNEL, AND 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 counterclockwise) 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.

H. 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.

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SUBTASK 22-11-11-860-020

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-021

- (3) Set the STAB TRIM PRI and STAB TRIM B/U switches, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-11-860-022

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

SUBTASK 22-11-11-860-024

- (5) Remove the DO NOT OPERATE tags, STD-858, on the control columns.

SUBTASK 22-11-11-410-002

- (6) Close this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

————— **END OF TASK** —————

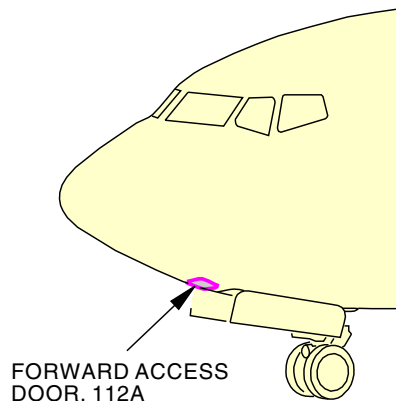
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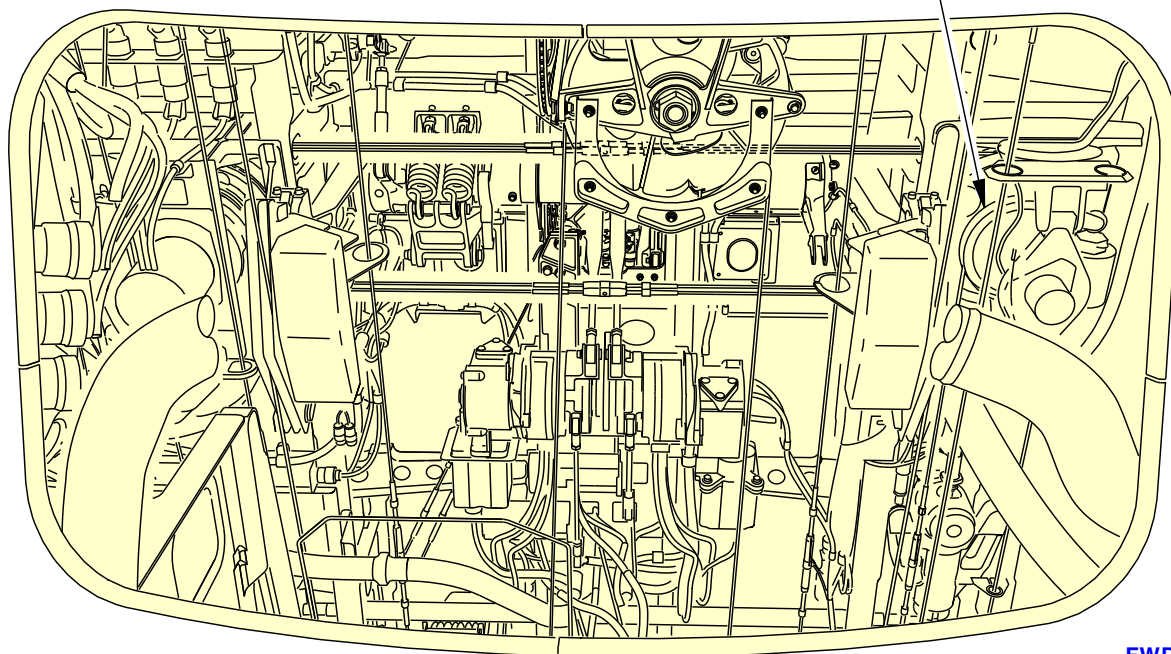
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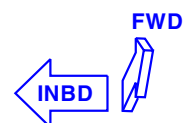
FORWARD ACCESS
DOOR, 112A

A

AILERON
CONTROL
WHEEL DRUM



A



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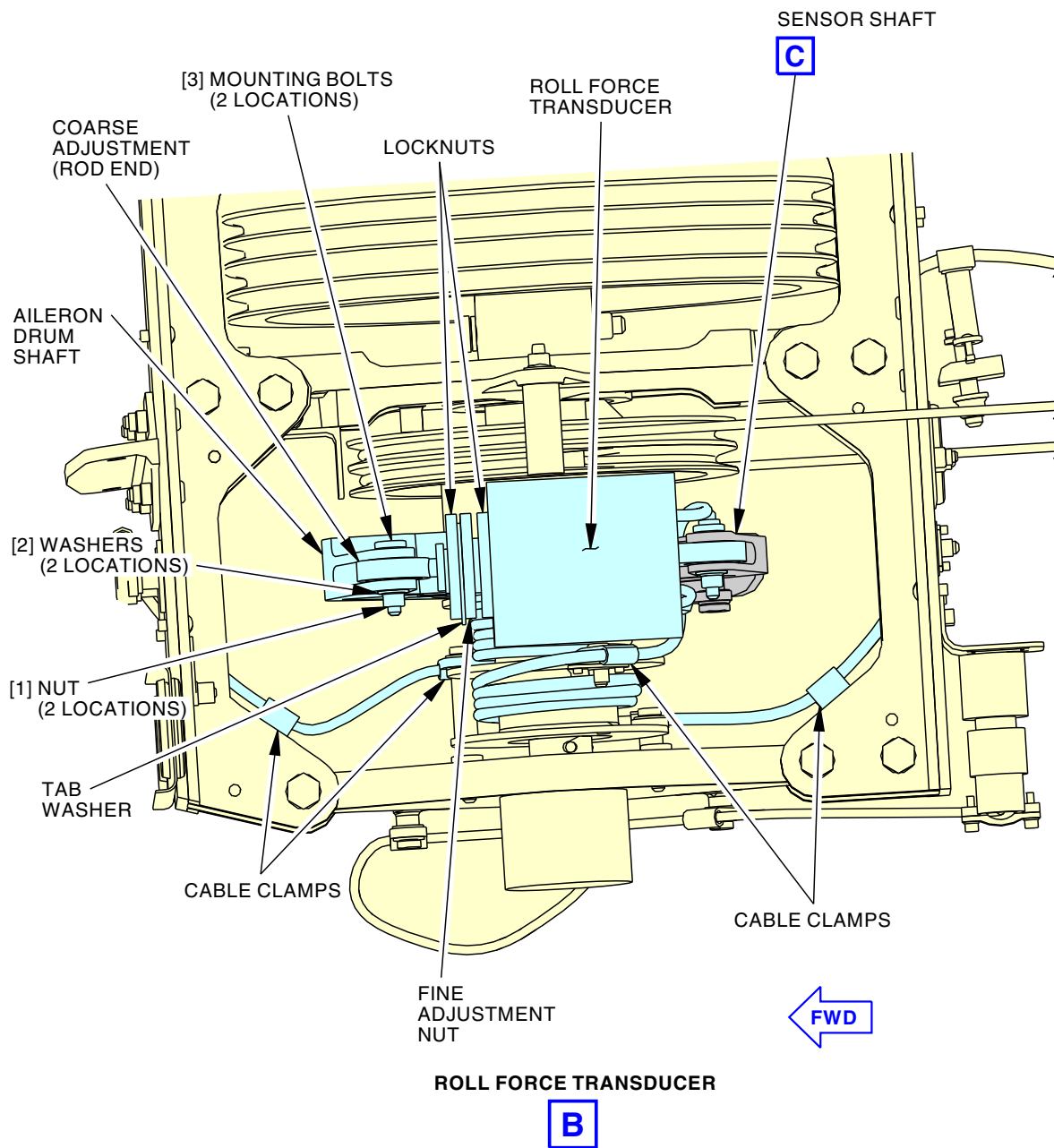
Roll Force Transducer Adjustment
Figure 501/22-11-11-990-804 (Sheet 1 of 3)

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Roll Force Transducer Adjustment
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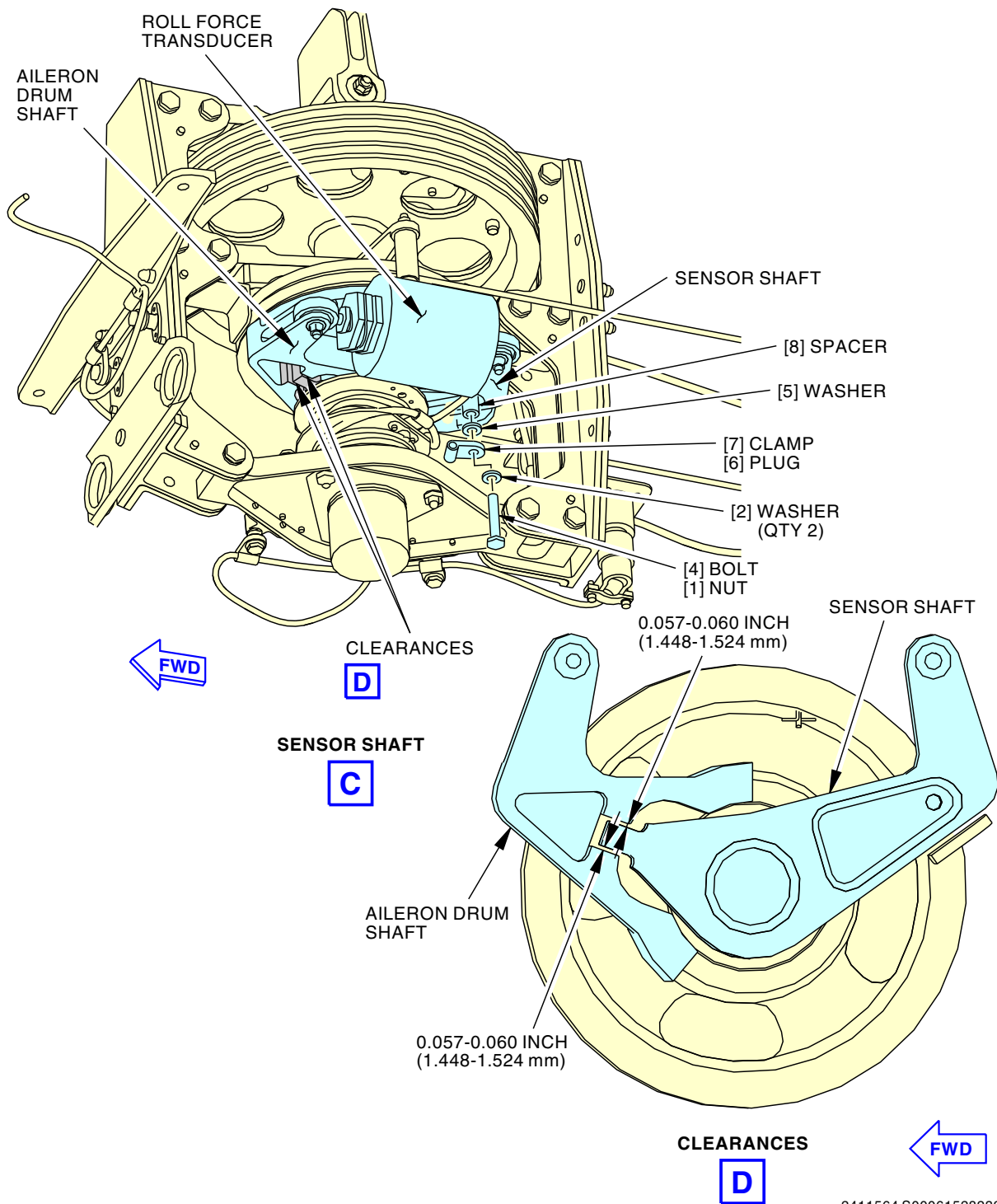
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Roll Force Transducer Adjustment
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TASK 22-11-11-740-801

3. Roll Force Transducer Test

A. General

(1) This task is for the test of the roll force transducer.

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-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 22-11-11-860-026

(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 22-11-11-860-027

(2) Set the STAB TRIM PRI and STAB TRIM B/U switches, on the aft area of the control stand, to the CUTOFF position.

SUBTASK 22-11-11-860-028

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

SUBTASK 22-11-11-860-029

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

SUBTASK 22-11-11-480-001

(5) Install the control wheel torque wrench adapter, SPL-1674 with a torque wrench (100 Lb-In), STD-1293.

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SUBTASK 22-11-11-860-030



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 (TASK 29-11-00-860-801).

NOTE: Hydraulic power is necessary for surface test.

F. Roll Force Transducer Test

SUBTASK 22-11-11-740-003

- (1) Do these steps to do a test of the roll force transducer:
- (a) Push INIT/REF on the keyboard.
 - (b) Push the LSK adjacent to the INDEX prompt.
 - (c) Push the LSK adjacent to the MAINT prompt.
 - (d) Push the LSK adjacent to the DFCS prompt.
 - (e) Push the LSK adjacent to the EXTENDED MAINTENANCE prompt.
 - (f) Push the LSK adjacent to the RIGGING prompt.
 - (g) Push the LSK adjacent to the CWS prompt.
 - (h) Push the LSK adjacent to the CONTINUE prompt.
 - 1) Do the instructions that show on the CDU and then push CONTINUE when it is necessary.
 - (i) Push the LSK adjacent to the ROLL CWS prompt.
 - (j) Make sure that the values for the A and B sides are between the limits that show on the CDU display.

NOTE: Do not apply force to the wheel for test 55.18.
 - (k) Push the LSK adjacent to the PREV MENU prompt on the 55.22 screen.
 - (l) Push the LSK adjacent to the PREV MENU prompt on the CWS RIGGING INDEX screen.
 - (m) Push the LSK adjacent to the EXIT prompt on the RIGGING INDEX screen.
 - (n) Do the instructions that show on the END OF BITE RIGGING screen.
 - 1) Push the LSK adjacent to the CONTINUE prompt.
 - (o) Push the LSK adjacent to the EXIT prompt on the TEST COMPLETE screen.
 - (p) Do the instructions on the END OF DFCS BITE screen.
 - 1) Push the LSK adjacent to the EXIT prompt.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-11-860-031

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

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SUBTASK 22-11-11-860-032

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-11-860-033

- (3) Set the STAB TRIM PRI and STAB TRIM B/U switches, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-11-860-034

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

SUBTASK 22-11-11-080-001

- (5) Remove the control wheel torque wrench adapter, SPL-1674 and the torque wrench (100 Lb-In), STD-1293.

————— **END OF TASK** —————

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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 201 and Figure 202)

A. General

- (1) This task removes electrical power and hydraulic pressure to the A/P actuator solenoid and electrohydraulic servo valves.
- (2) The tryout in this task makes sure that the A/P actuator Solenoid and electrohydraulic servo valves are in a zero energy state.

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	Pressure from the Elevator Hydraulic Systems A and B 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
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. A/P Actuator Solenoid and Electrohydraulic Servo Valves Deactivation

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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

MAKE SURE THAT THE GROUND LOCKS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, 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 22-11-12-010-002

- (3) For the A/P elevator actuators, do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

SUBTASK 22-11-12-860-002

- (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

SUBTASK 22-11-12-860-004

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
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:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** ————

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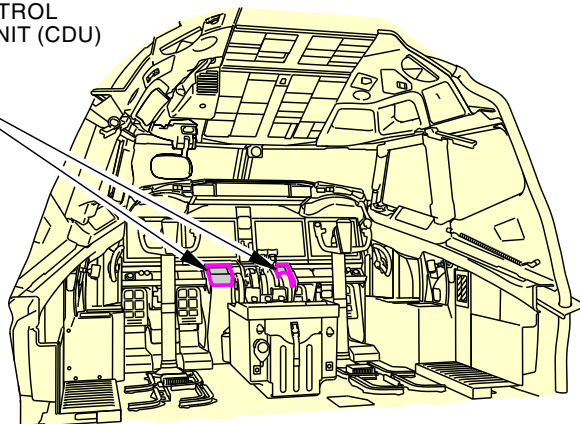
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



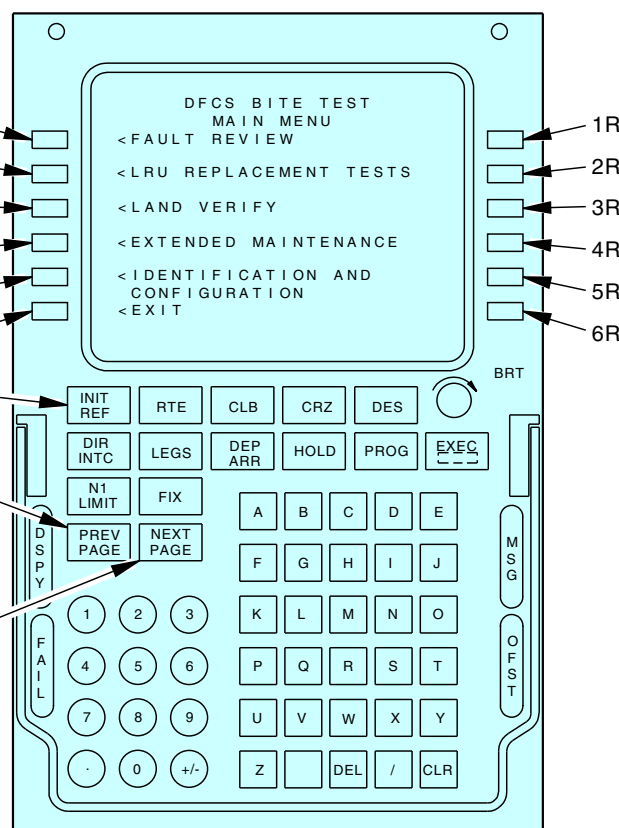
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

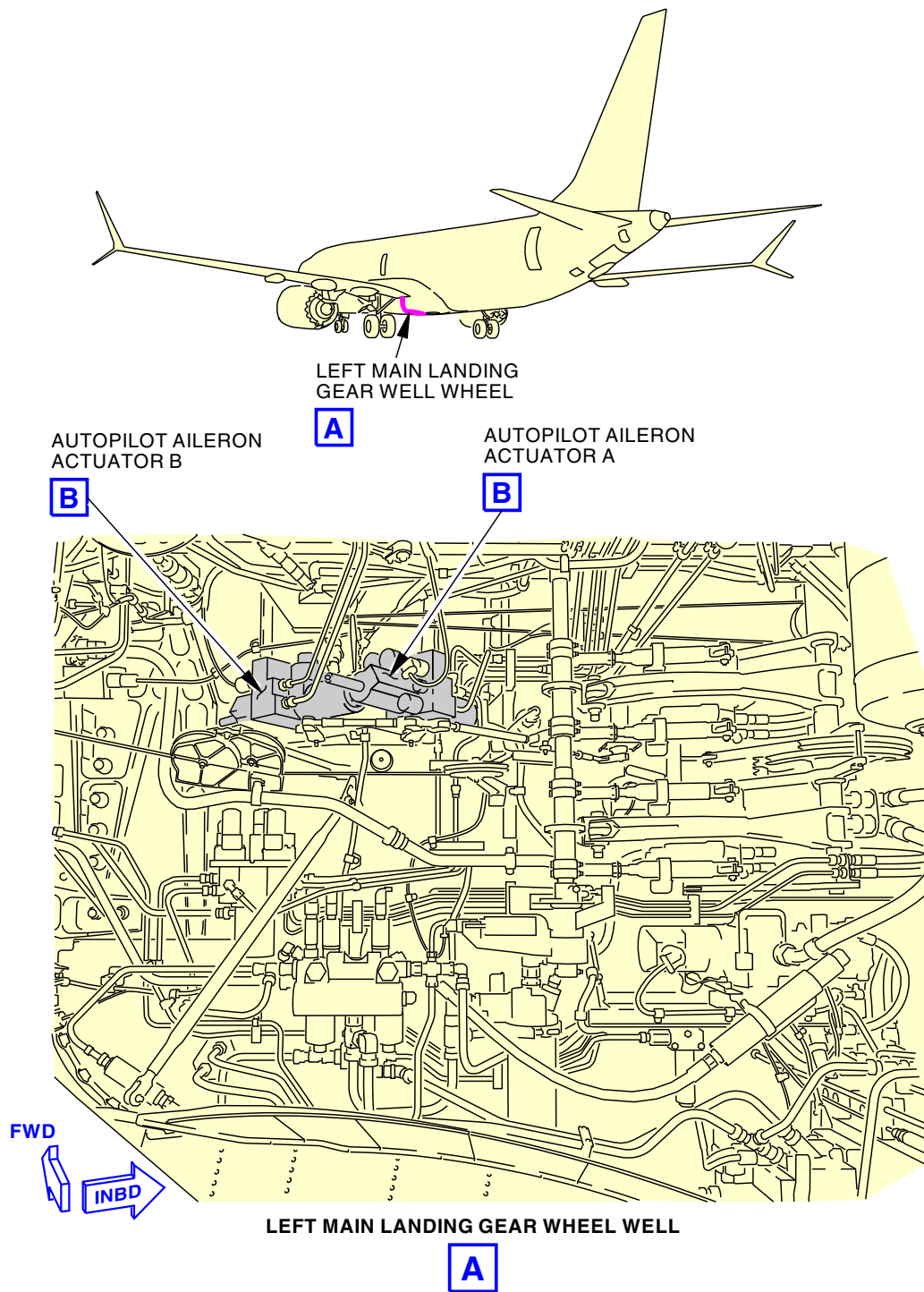
Flight Management Computer Control Display Unit
Figure 201/22-11-12-990-801

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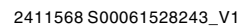
Solenoid and Electrohydraulic Valve
Figure 202/22-11-12-990-802 (Sheet 1 of 2)

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Solenoid and Electrohydraulic Valve
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TASK 22-11-12-440-801

3. A/P Actuator Solenoid and Electrohydraulic Servo Valves - Activation

(Figure 202)

A. General

- (1) This task restores electrical power and hydraulic pressure to the 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)

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 22-11-12-860-005

- (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

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SUBTASK 22-11-12-860-022

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-12-410-001

- (3) For the A/P aileron actuators, do these steps:



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.

- (a) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

SUBTASK 22-11-12-410-002



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.

- (4) For the A/P elevator actuators, do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

————— **END OF TASK** —————

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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 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. General

- (1) This task is for the removal of the autopilot 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)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

E. Prepare for the Removal

SUBTASK 22-11-12-860-006

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-12-010-003

- (2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-12-480-002

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

- (3) Make sure that the downlock pins are installed on the nose and main landing gear (TASK 32-00-01-480-801).

SUBTASK 22-11-12-010-004

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

F. A/P Solenoid and Electrohydraulic Servo Valves Removal

SUBTASK 22-11-12-020-001

- (1) Do these steps to remove the solenoid valve [1]:
- Remove lockwires from the screws [2].
 - Remove the screws [2] and washers [3] that attach the solenoid valve [1].
 - Remove the solenoid valve [1].
 - Remove the O-ring [5].
 - Discard the O-ring [5].
 - Remove the gasket plate [4].
 - Discard the gasket plate [4].

SUBTASK 22-11-12-020-002

- (2) Do these steps to remove the electrohydraulic servo valve [7]:
- Remove lockwires from the screws [8].
 - Remove the screws [8] and washers [9] that attach the electrohydraulic servo valve [7].
 - Remove the electrohydraulic servo valve [7].
 - Remove the O-ring [5].

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- 1) Discard the O-ring [5].
- (d) Remove the gasket plate [6].
 - 1) Discard the gasket plate [6].

———— **END OF TASK** ————

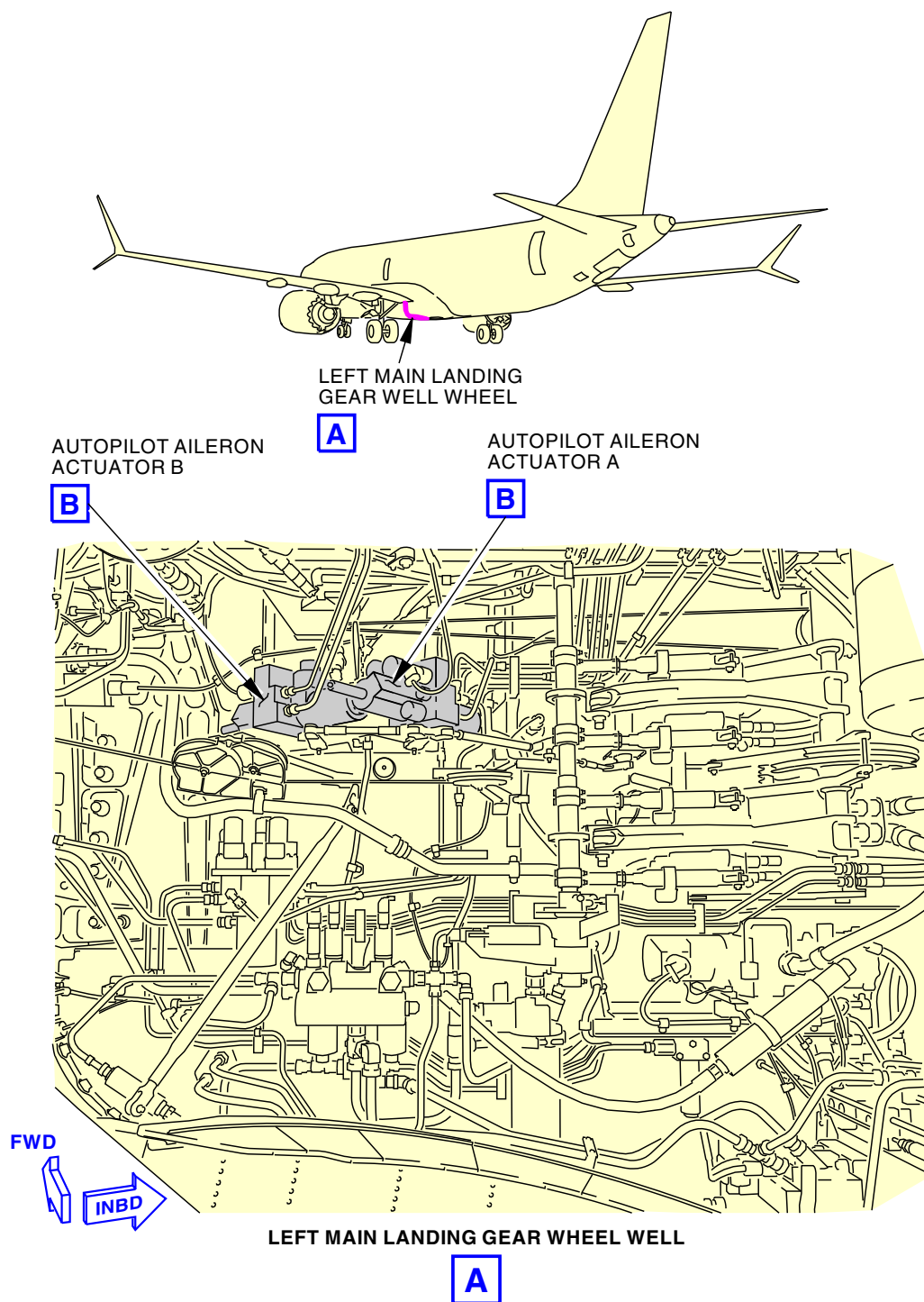
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A/P Solenoid and Electrohydraulic Servo Valves Installation
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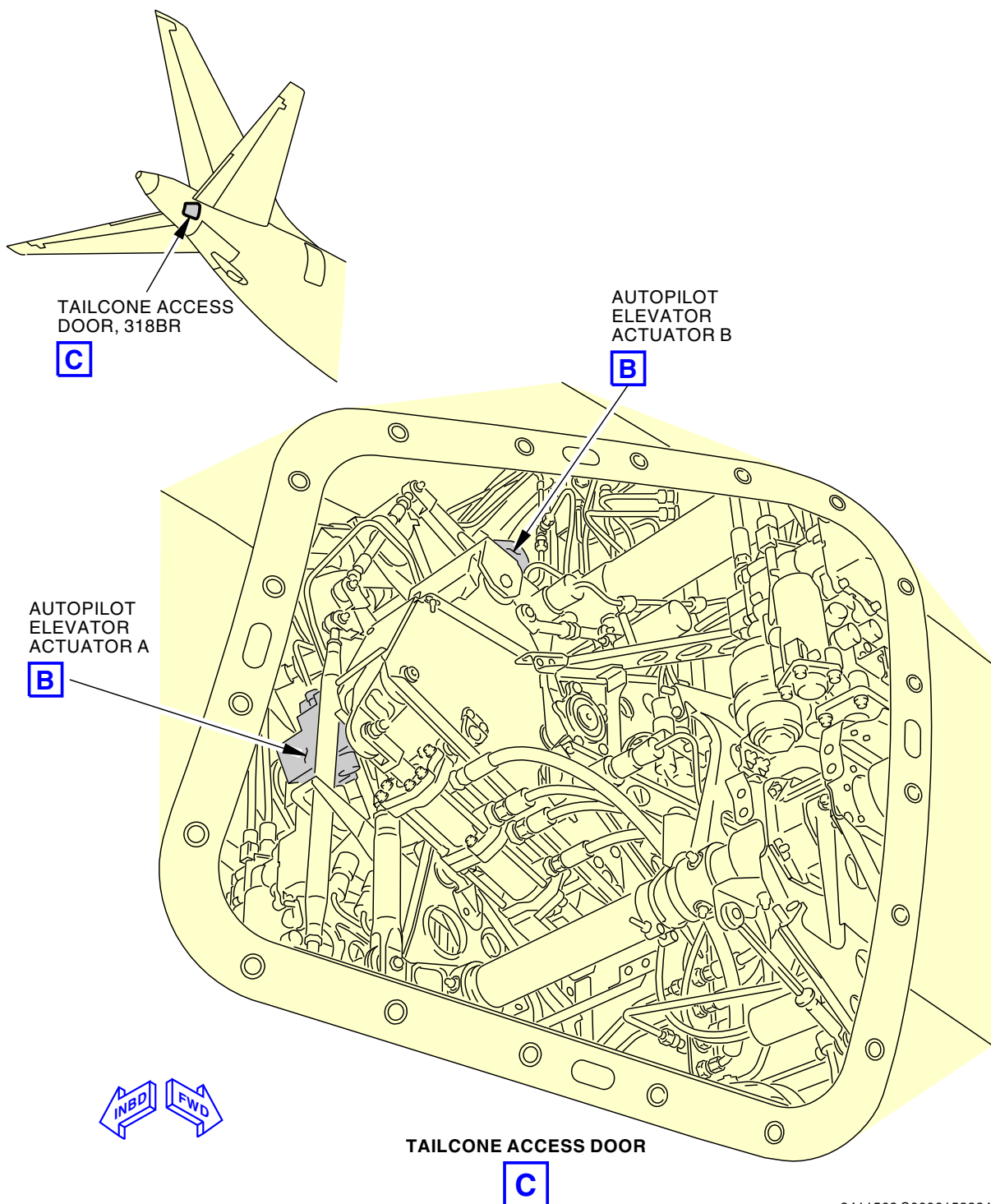
EFFECTIVITY
SIA ALL

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2411568 S00061528243_V1

A/P Solenoid and Electrohydraulic Servo Valves Installation
Figure 401/22-11-12-990-803 (Sheet 2 of 3)

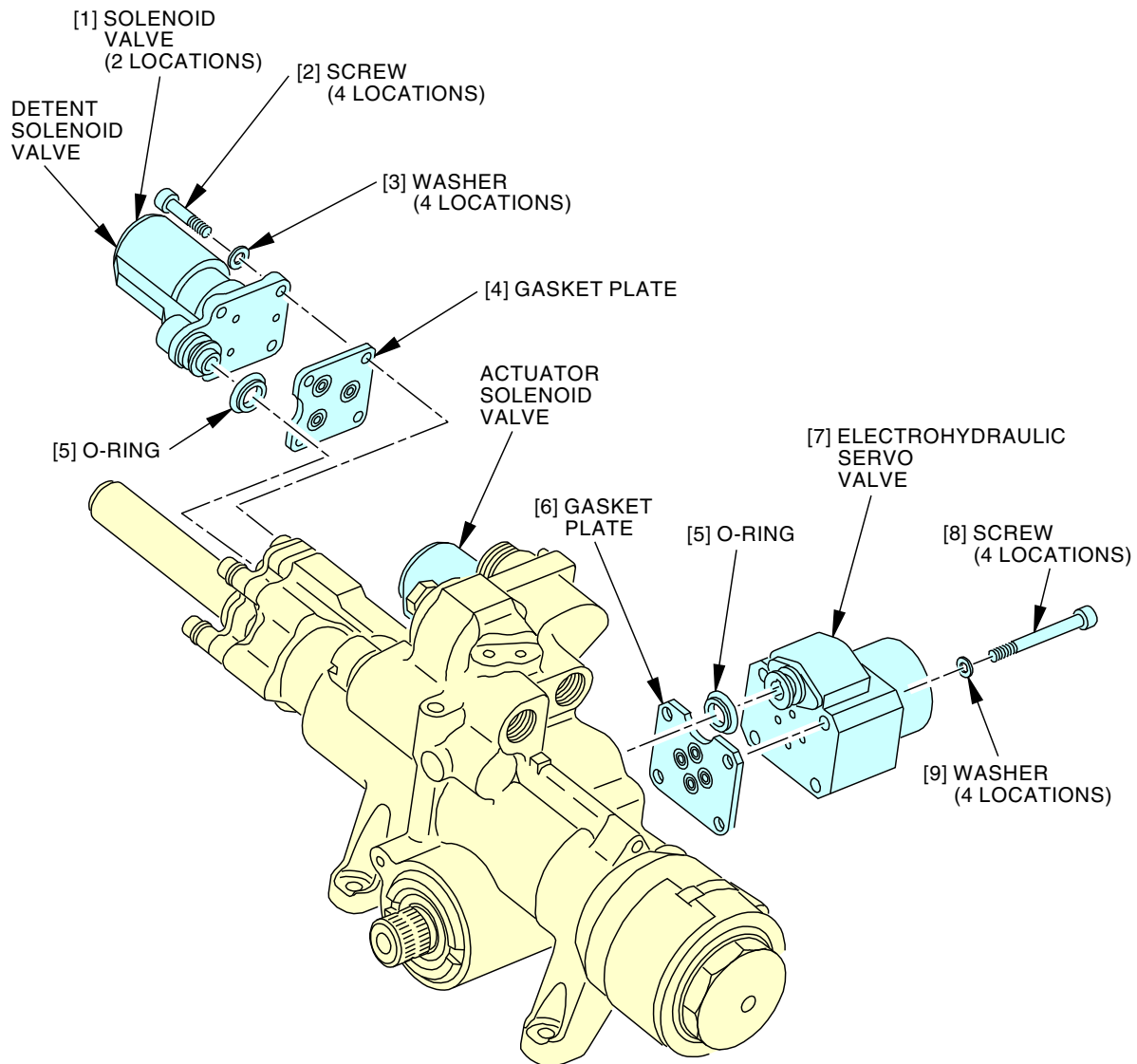
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**AUTOPILOT ACTUATOR
(EXAMPLE)**

B

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A/P Solenoid and Electrohydraulic Servo Valves Installation
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TASK 22-11-12-400-801

3. **A/P Solenoid and Electrohydraulic Servo Valves Installation**

(Figure 401)

A. General

(1) This task is for the installation of the autopilot solenoid and electrohydraulic servo valves.

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. 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Solenoid valve	27-11-54-50-007	SIA ALL
		27-11-54-50-210	SIA ALL
		27-11-54-50-310	SIA ALL
4	Gasket plate	27-11-54-50-320	SIA ALL
5	O-ring	27-11-54-50-330	SIA ALL
6	Gasket plate	27-11-54-50-410	SIA ALL
7	Electrohydraulic servo valve	27-11-54-50-345	SIA ALL
		27-11-54-50-390	SIA ALL

E. 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

F. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

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].

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- (b) Apply a layer of hydraulic fluid, D00153, or MCS 352B fluid, D00054, to the two sides of the new gasket plate [4].
- (c) Put the 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) - 70 in-lb (7.9 N·m).
 - 1) Install MS20995C20 lockwires, G50225, on the screws [2] with double twist method.
 - 2) Apply compound, A00226, to the end of the MS20995C20 lockwires, 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].
 - (b) Apply a layer of hydraulic fluid, D00153, or MCS 352B fluid, D00054, to the two sides of the new gasket plate [6].
 - (c) Put the 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) - 70 in-lb (7.9 N·m).
 - 1) Install MS20995C20 lockwires, G50225, on the screws [8] with double twist method.
 - 2) Apply compound, A00226, to the end of the MS20995C20 lockwires, G50225.

H. A/P Solenoid and Electrohydraulic Servo Valves Installation Test

SUBTASK 22-11-12-860-010

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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SUBTASK 22-11-12-860-023

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-12-860-011

- (3) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-12-860-012

- (4) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-12-860-013

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

SUBTASK 22-11-12-860-014

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

SUBTASK 22-11-12-860-015



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.

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

SUBTASK 22-11-12-740-001

- (8) 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, 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

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- 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 A (Channel A). A/P aileron actuator B and A/P elevator actuator B have interfaces with the Flight Control Computer B (Channel B).

- a) CHANNEL A
 - b) CHANNEL B
 - c) CHANNEL A AND B.
- 7) RUN SELECT LIBRARY TESTS
- 8) 30 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

- (9) Visually examine the solenoid valve [1] and electrohydraulic servo valve [7].
- (a) Make sure that there is no hydraulic leak.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-12-410-003

- (1) Install this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-12-860-017

- (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 22-11-12-860-018

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-12-860-019

- (4) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-12-860-020

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

———— **END OF TASK** ————

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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.

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. **Elevator Neutral Shift Sensor - Deactivation**

SUBTASK 22-11-14-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-14-010-001

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-14-860-002

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Elevator Neutral Shift Sensor - Tryout

SUBTASK 22-11-14-700-001

(1) Use the FMC - CDU and do the following test (Figure 201):

NOTE: This tryout is to make sure the elevator neutral shift sensor is in a zero energy state.

- (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:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** —————

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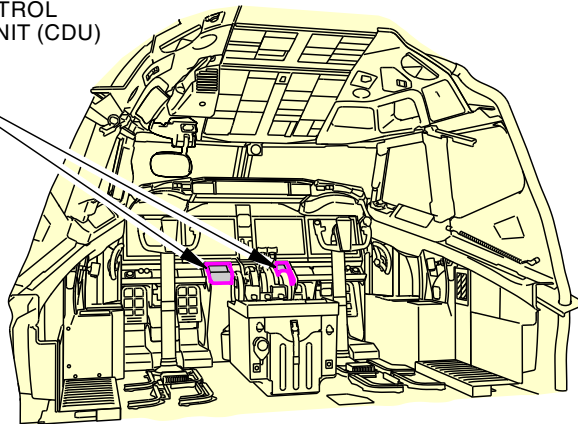
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



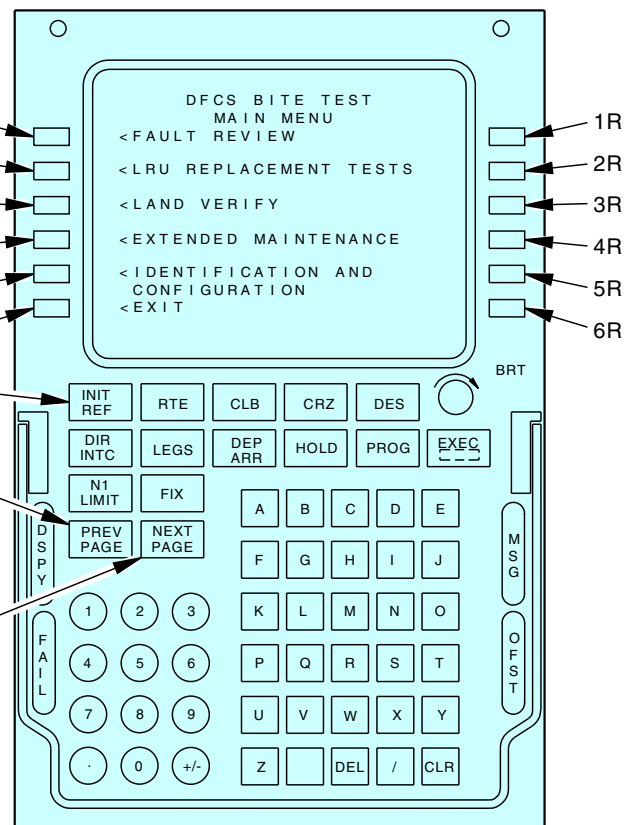
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

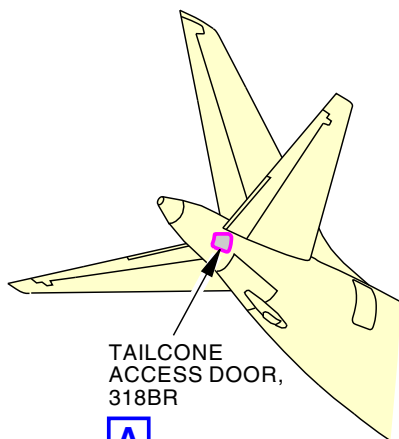
Flight Management Computer Control Display Unit
Figure 201/22-11-14-990-801

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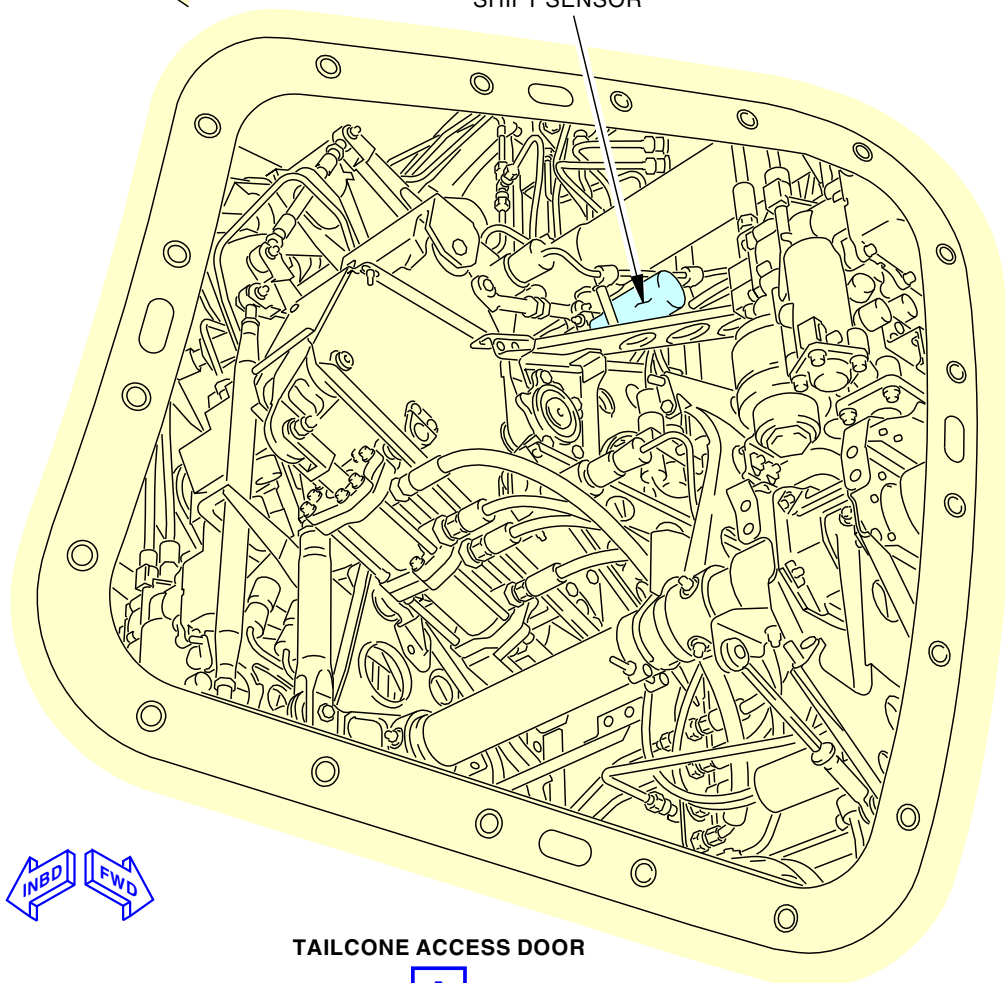
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A

ELEVATOR NEUTRAL
SHIFT SENSOR



A



2411570 S00061528249_V1

Elevator Neutral Shift Sensor
Figure 202/22-11-14-990-802

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TASK 22-11-14-440-801

3. Elevator Neutral Shift Sensor - Activation

(Figure 202)

A. General

- (1) This task restores 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 22-11-14-860-005

- (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

SUBTASK 22-11-14-860-033

- (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

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SUBTASK 22-11-14-410-001



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.

- (3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

———— **END OF TASK** ————

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ELEVATOR NEUTRAL SHIFT SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the elevator neutral shift sensor [5].
- (2) An installation of the elevator neutral shift sensor [5].

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 [5] is installed on the aft bulkhead at Body Station 1156.

TASK 22-11-14-000-801

2. Elevator Neutral Shift Sensor Removal

(Figure 401)

A. General

- (1) This task is for the removal of the elevator neutral shift sensor.

B. Location Zones

Zone	Area
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 22-11-14-860-006

- (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

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

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SUBTASK 22-11-14-010-002

- (2) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

E. Elevator Neutral Shift Sensor Removal

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** —————

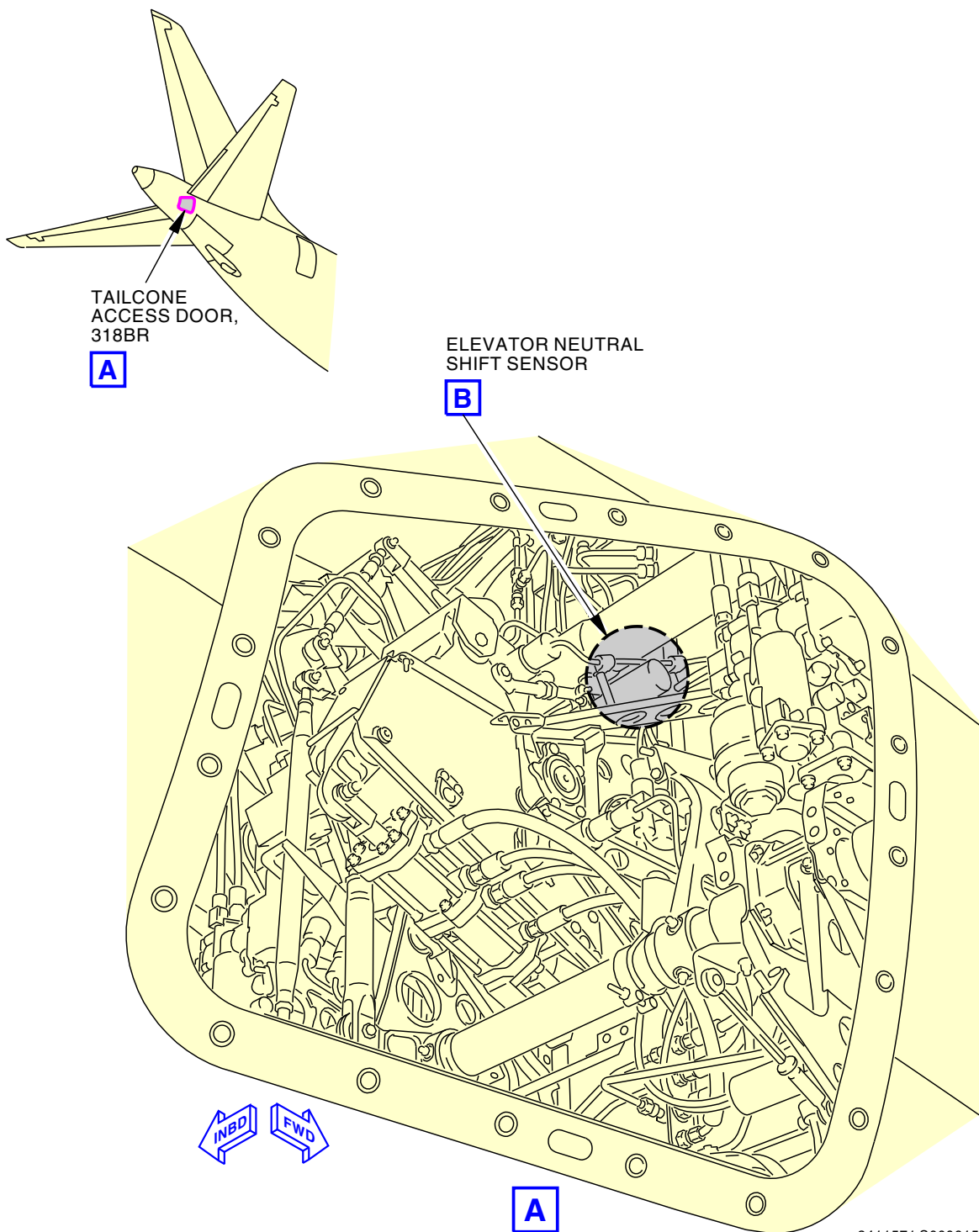
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2411571 S00061528253_V1

Elevator Neutral Shift Sensor Installation
Figure 401/22-11-14-990-803 (Sheet 1 of 2)

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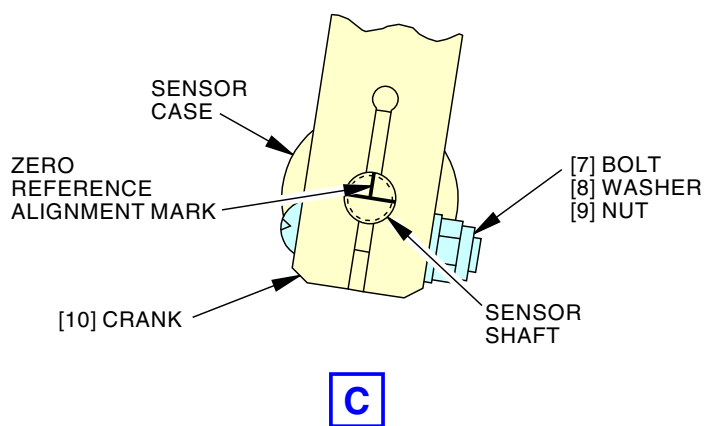
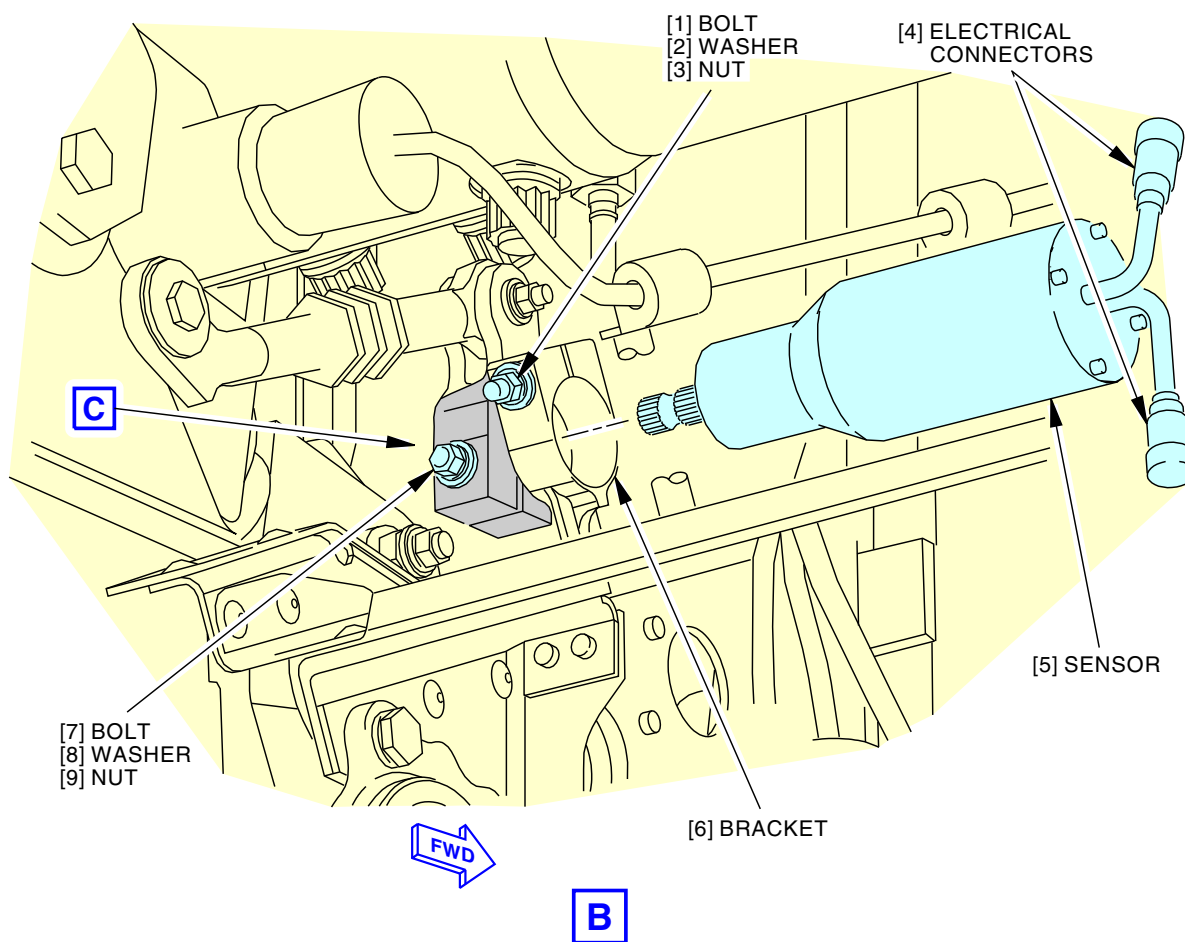
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2411572 S00061528254_V1

Elevator Neutral Shift Sensor Installation
Figure 401/22-11-14-990-803 (Sheet 2 of 2)

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TASK 22-11-14-400-801

3. Elevator Neutral Shift Sensor Installation

(Figure 401)

A. General

- (1) This task is for the installation of the elevator neutral shift sensor.

B. 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)

C. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Elevator Neutral Shift Sensor Installation

SUBTASK 22-11-14-980-001

- (1) Turn the stab trim wheel handle on the control stand to set the stab to 11.6 units.

NOTE: This is the position where the Neutral Shift Sensor voltage is null

SUBTASK 22-11-14-820-001

- (2) 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

- (3) 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 35 in-lb (3.95 N·m).

SUBTASK 22-11-14-420-002

- (4) Connect the electrical connectors [4].

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-14-860-032

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-14-860-034

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

F. Elevator Neutral Shift Sensor Installation Test

SUBTASK 22-11-14-820-002

- (1) Do this task: Elevator Neutral Shift Sensor Adjustment and Test, TASK 22-11-14-820-801.

SUBTASK 22-11-14-710-001

- (2) Do this task: Elevator Neutral Shift Sensor Test, TASK 22-11-14-710-801.

———— **END OF TASK** ————

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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.

TASK 22-11-14-820-801

2. Elevator Neutral Shift Sensor Adjustment and Test

(Figure 501, Figure 502)

A. General

- (1) This task is for the adjustment and test of the elevator neutral shift sensor.

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	Assembly - Trammel Bar, 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
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 Adjustment and Test

SUBTASK 22-11-14-860-010

- (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

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SUBTASK 22-11-14-860-011

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-14-010-004

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-14-010-005

- (5) To get access to the stabilizer trim jackscrew, open this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-14-980-002

- (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 STAB TRIM PRI switch, S272, on the aft area of the control stand are in the NORMAL position.

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WARNING

STAY AWAY FROM THE STABILIZER TRIM WHEEL ON THE CONTROL STAND IF YOU USE THE STABILIZER TRIM SWITCH ON THE CONTROL WHEEL. THE STABILIZER TRIM SWITCH CAN CAUSE THE STABILIZER TRIM WHEEL TO TURN QUICKLY. INJURY TO PERSONS CAN OCCUR IF YOU TOUCH IT WHEN IT TURNS.

- (b) Set the B dimension to 39.17 ±0.01 in. (99.49 ±0.03 cm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim.



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 bar, SPL-1677, to measure the B dimension.

- 1) Make sure that the B dimension is 39.17 ±0.01 in. (99.49 ±0.03 cm).

SUBTASK 22-11-14-860-012

- (7) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-14-860-013



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

SUBTASK 22-11-14-860-014

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

SUBTASK 22-11-14-860-015

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

G. Elevator Neutral Shift Sensor Adjustment and Test

SUBTASK 22-11-14-740-001

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

SUBTASK 22-11-14-740-002

- (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 CDU display before you push the LSK that is adjacent to CONTINUE. Use the NEXT PAGE or PREV PAGE key to change pages if it is necessary.

- (a) INDEX
- (b) MAINT
- (c) DFCS
- (d) EXTENDED MAINTENANCE
- (e) RIGGING



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- (f) ELEVATOR
- (g) CONTINUE
- (h) CONTINUE
- (i) ELEV RIG.

SUBTASK 22-11-14-740-003

- (3) Select CONTINUE to advance to test 51.01.

SUBTASK 22-11-14-820-003

- (4) Make sure that the jackscrew B dimension equals 39.17 $\pm$ 0.01 in. (99.49 $\pm$ 0.03 cm).

SUBTASK 22-11-14-820-004

- (5) Select CONTINUE to access display screen 51.02.

SUBTASK 22-11-14-820-005

- (6) Select CONTINUE to access display screen 51.03.

SUBTASK 22-11-14-820-006

- (7) Make sure that A is within limits shown on screen 51.03

SUBTASK 22-11-14-820-007

- (8) Select CONTINUE on screen 51.03

SUBTASK 22-11-14-820-008

- (9) Jiggle the Column and wheel per instructions on the CDU.

SUBTASK 22-11-14-820-009

- (10) Select CONTINUE after following the instruction on the CDU to access display screen 51.04.

SUBTASK 22-11-14-820-012

- (11) 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 30 in-lb (3.4 N·m) - 35 in-lb (4 N·m).

SUBTASK 22-11-14-820-013

- (12) For fine adjustment, remove the lockwire on thumbnut on the micro adjustment rod.
 - (a) Turn knurled thumb nut on micro-adjustment rod 69-73371 to obtain -1.72 volts $\pm$ 0.03 volts on FMC-CDU display.
 - (b) Install lockwire on the thumbnut on micro-adjustment rod.

SUBTASK 22-11-14-820-014

- (13) Make sure that the neutral shift sensor reads -1.72 volts $\pm$ 0.03.

SUBTASK 22-11-14-820-015

- (14) Set stabilizer to 11.6 units of trim.
 - (a) Make sure that the jackscrew "B" dimension equals 29.00 $\pm$ 0.01 in. (736.60 $\pm$ 0.25 mm).

SUBTASK 22-11-14-820-016

- (15) Jiggle the control column to center the system.



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SUBTASK 22-11-14-820-017

- (16) Make sure that the voltage for the A and B value on the FMC-CDU screen 51.04 read 0.00 ± 0.10 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 adjustment rod length is $5.33 \pm .01$ inches and installed correctly. Adjust the micro-adjustment rod 69-73371 using the knurled thumb nut to obtain a reading of $0.00 \pm .05$ VAC

SUBTASK 22-11-14-820-018

- (17) Continue to adjust as necessary to make sure that the voltage readings meet the tolerance requirements as follows:

NOTE: The tolerance requirements after micro-adjustment rod thumb nut has been lockwired.

- (a) The neutral shift sensor reads $-7.72 \pm .03$ volts.
(b) The voltage for the A and B value on the FMC-CDU screen 51.04 reads 0.00 ± 0.10 VAC.

NOTE: Ignore the limits on FMC-CDU screen.

SUBTASK 22-11-14-820-019

- (18) Set the horizontal stabilizer to 0° (4 units of trim).
(a) Make sure that the jackscrew B dimension equals 39.17 ± 0.01 in. (99.49 ± 0.03 cm).

SUBTASK 22-11-14-820-020

- (19) Select CONTINUE to advance to screen 51.05.

SUBTASK 22-11-14-820-010

- (20) Verify that the right elevator trailing edge aligns with tailcone index mark within ± 0.06 in. (1.5 mm).

H. Put Airplane Back to Its Usual Condition

SUBTASK 22-11-14-410-002

- (1) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-14-410-003

- (2) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-14-860-016

- (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 22-11-14-860-017

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-14-860-018

- (5) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

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SUBTASK 22-11-14-860-019

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

———— **END OF TASK** ————

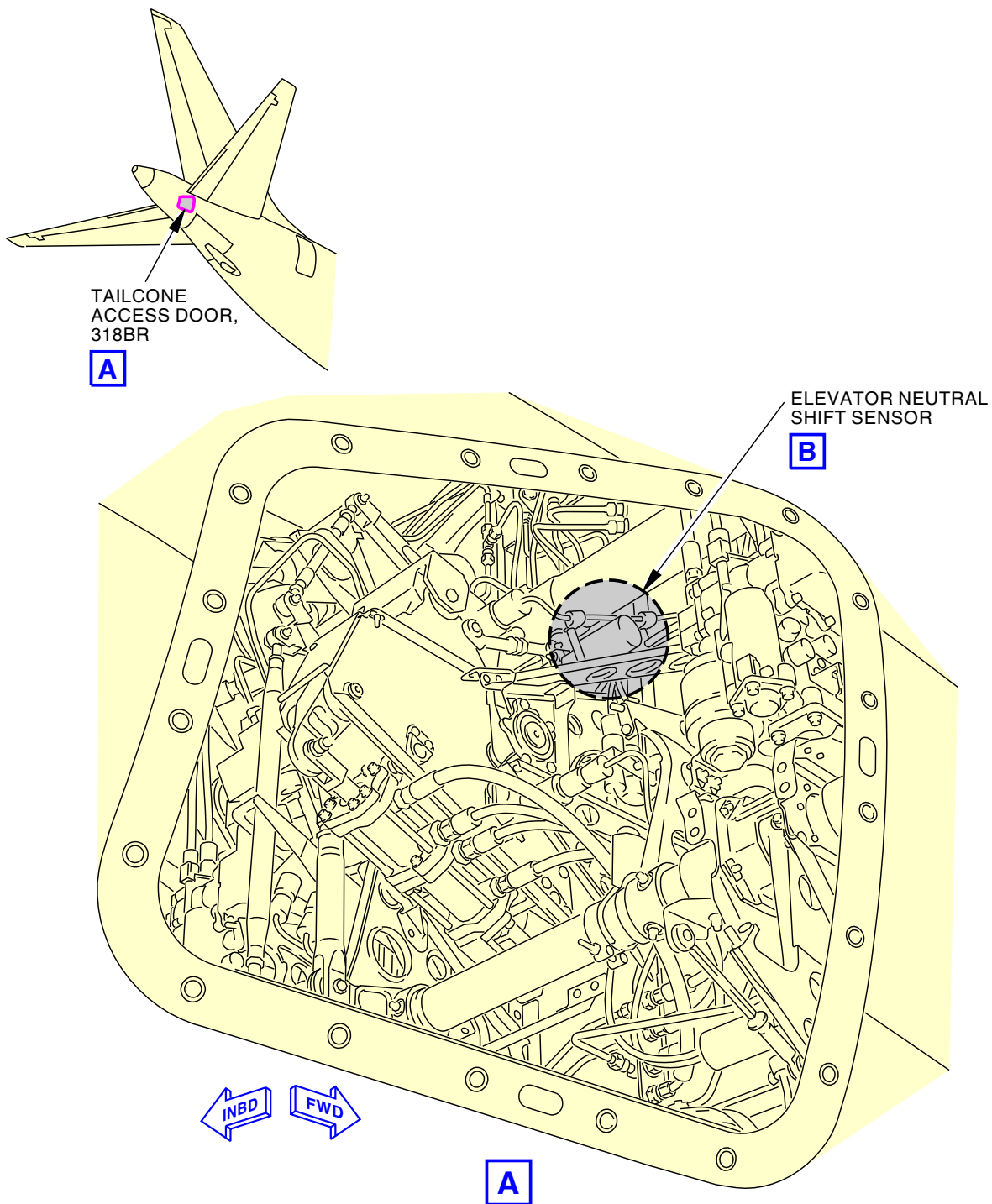
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2411573 S00061528258_V1

Elevator Neutral Shift Sensor Installation
Figure 501/22-11-14-990-804 (Sheet 1 of 2)

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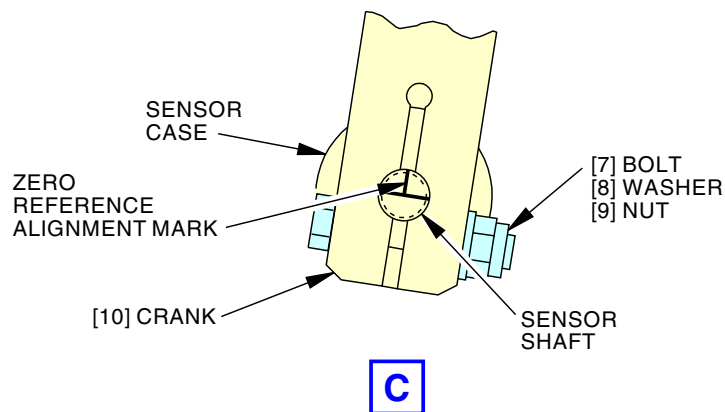
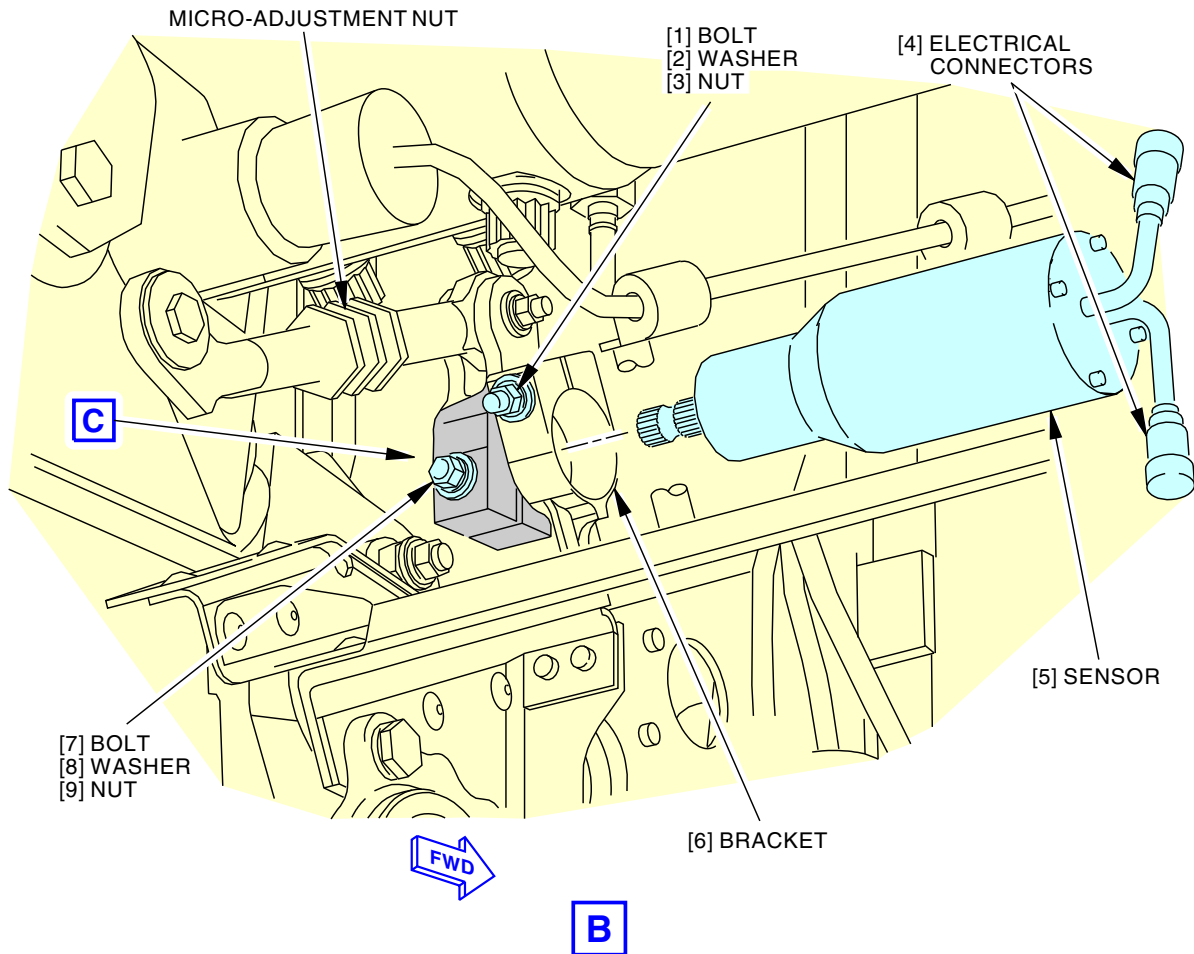
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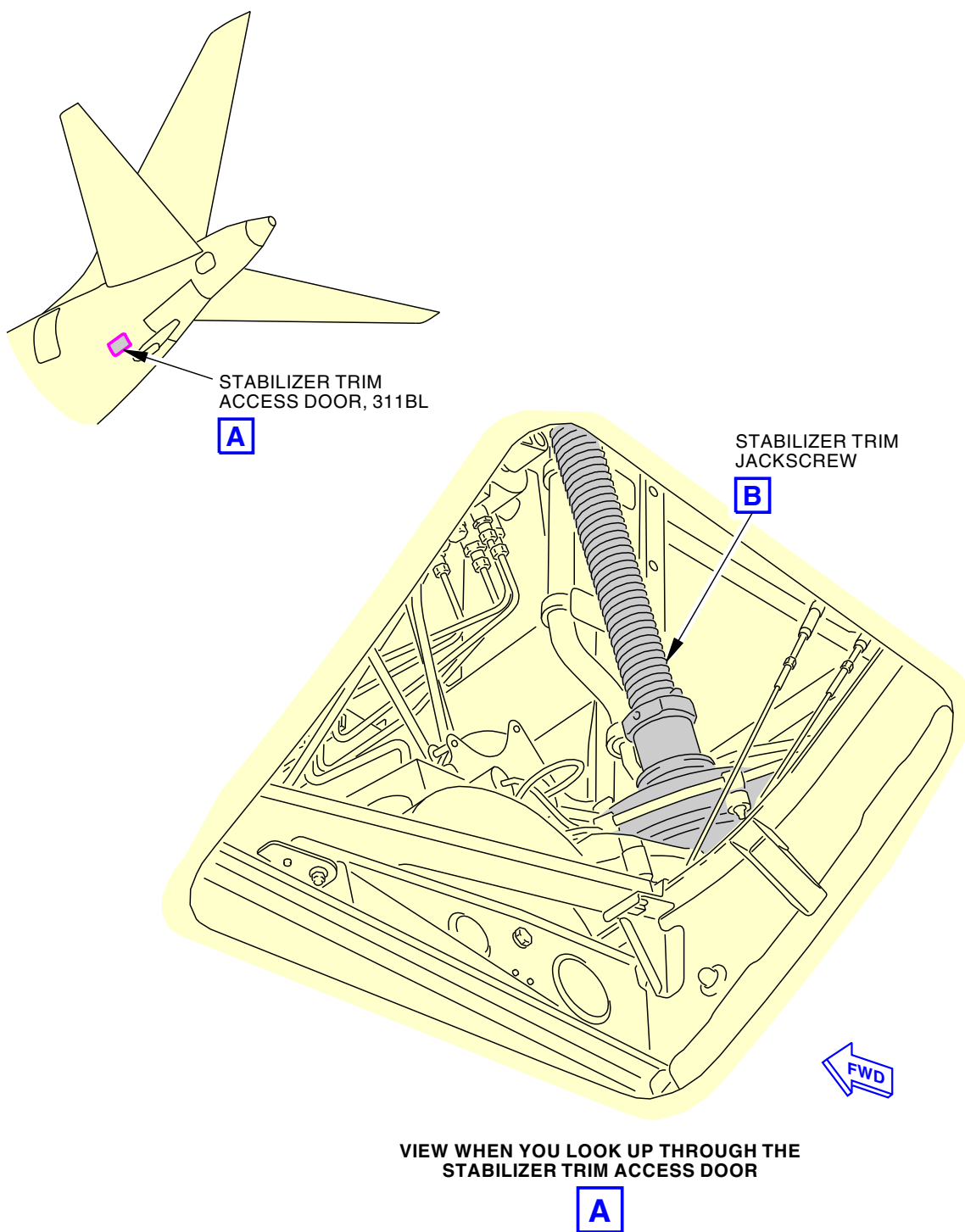
Elevator Neutral Shift Sensor Installation
Figure 501/22-11-14-990-804 (Sheet 2 of 2)

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2411575 S00061528260_V1

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-14-990-805 (Sheet 1 of 2)

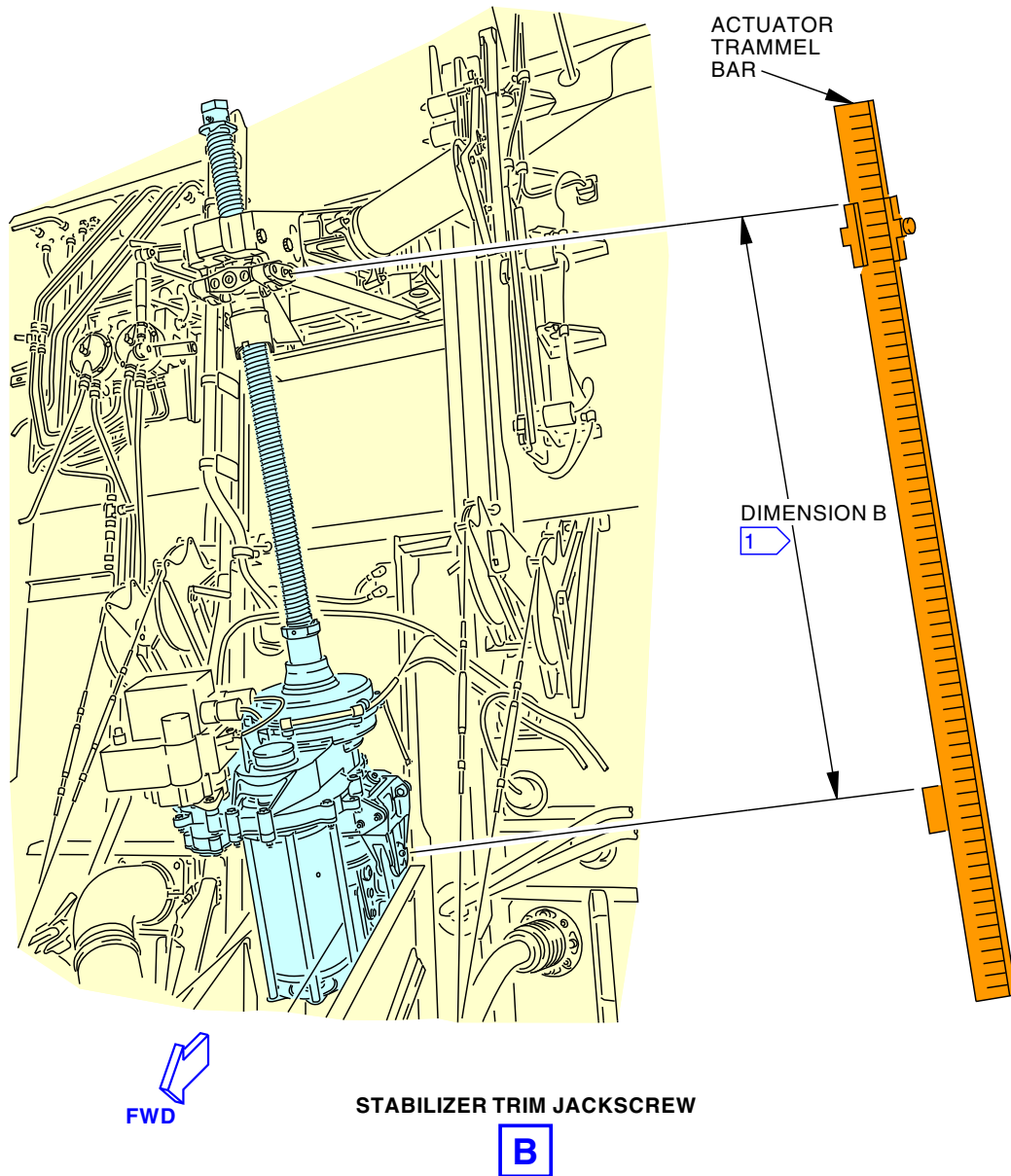
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NOTE:

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.

2411576 S00061528261_V1

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-14-990-805 (Sheet 2 of 2)

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TASK 22-11-14-710-801

3. Elevator Neutral Shift Sensor Test

A. General

- (1) This task is for the test of the elevator neutral shift sensor.

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 22-11-14-860-022

- (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 22-11-14-860-023

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-14-860-024

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-14-860-025

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-14-860-026



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.

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

E. Elevator Neutral Shift Sensor Test

SUBTASK 22-11-14-740-004

- (1) Do this BITE test:
- (a) Push the INIT REF key on the CDU keyboard.

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- (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
- 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 22-11-14-860-027

- (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 22-11-14-860-028

- (3) Close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-14-860-029

- (4) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-14-860-030

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

———— **END OF TASK** ————

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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 201)

A. General

- (1) This task removes electrical power and hydraulic pressure to rudder rollout guidance actuator.
- (2) The tryout in this task makes sure that the rudder rollout guidance actuator is in a zero energy state.

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

E. Rudder Rollout Guidance Actuator Deactivation

SUBTASK 22-11-22-860-010

- (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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-22-010-002

- (2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-22-860-011

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Rudder Rollout Guidance Actuator - Tryout

SUBTASK 22-11-22-740-002

- (1) Use the FMC - CDU and do the test that follows:
- (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 follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** —————

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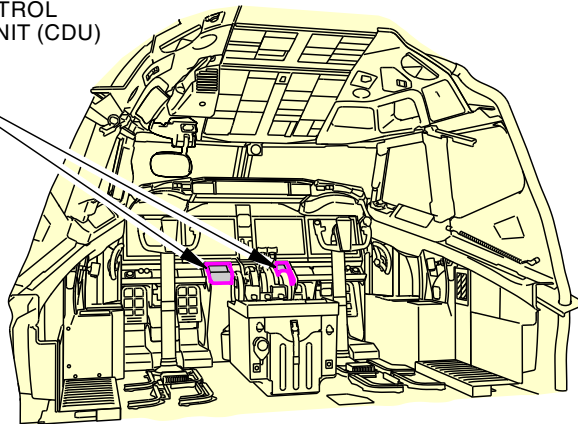
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



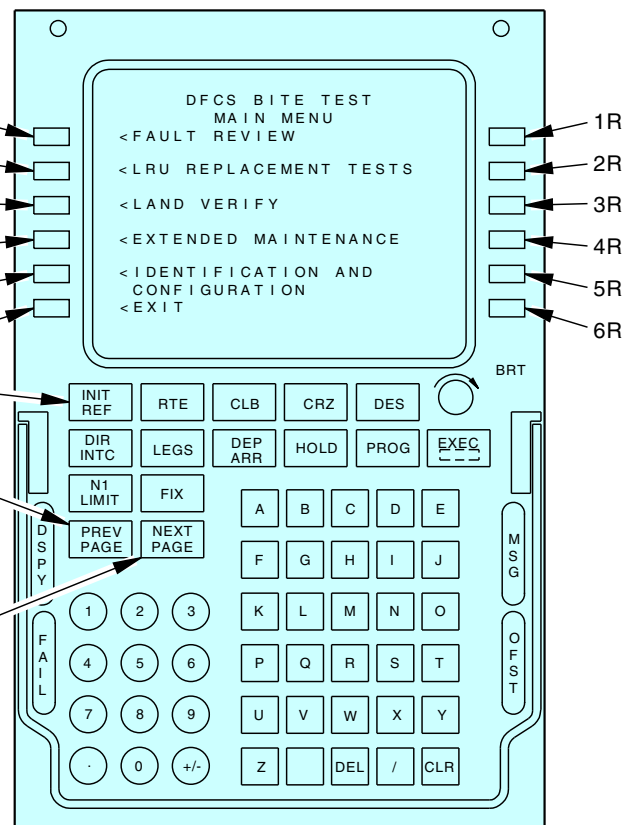
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-22-990-802

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TASK 22-11-22-440-801

3. Rudder Rollout Guidance Actuator - Activation

A. General

- (1) This task restores electrical power to the 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. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Rudder Rollout Guidance Actuator Activation

SUBTASK 22-11-22-440-002

- (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
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-22-860-012

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-22-020-003

- (3) Remove DO NOT OPERATE tag, STD-858 from the captain's and first officer's control columns.

SUBTASK 22-11-22-440-001



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.

- (4) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

————— END OF TASK —————

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RUDDER ROLLOUT GUIDANCE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) The removal of the rollout guidance actuator.
- (2) The installation of the rollout guidance actuator.

TASK 22-11-22-000-801

2. Rudder Rollout Guidance Actuator Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the rudder rollout guidance actuator.

B. **References**

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

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 Removal**

SUBTASK 22-11-22-040-001

- (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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-22-040-002

- (2) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-11-22-040-005

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

SUBTASK 22-11-22-010-001

- (4) Remove this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

G. Rudder Rollout Guidance Actuator Removal

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 autopilot rollout guidance actuator [1]:
- Remove the bolt [6] and washers [2] on the jumpers [9].
 - Remove the bolt [3], the washers [4], and nut [7] that hold the pushrod assembly [8] on the actuator output crank [5].
 - Remove the four bolts [13] and four washers [12] that hold the autopilot rollout guidance actuator [1] on the actuator support bracket [10].
 - Remove the autopilot rollout guidance actuator [1].

————— **END OF TASK** —————

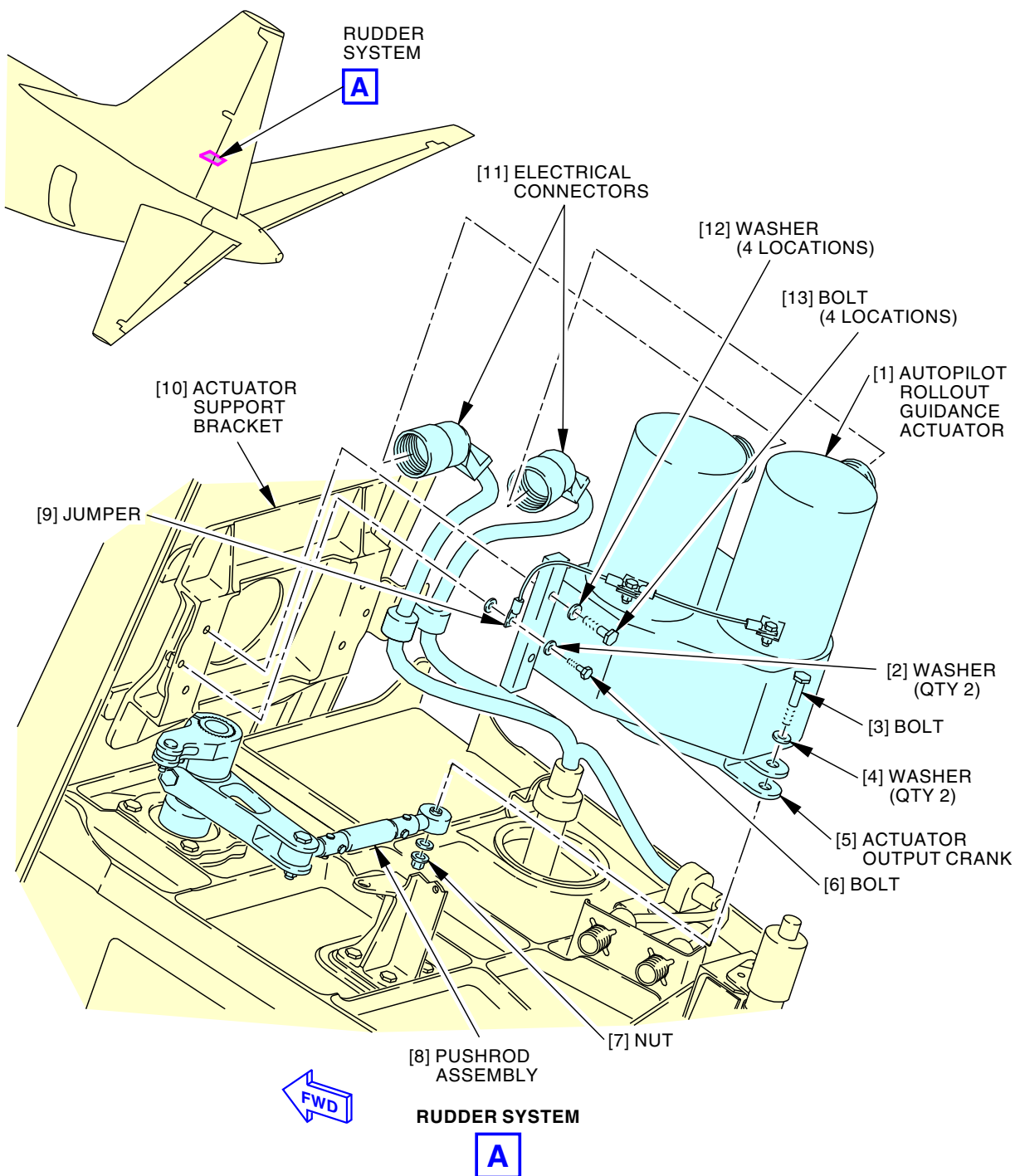
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Autopilot Rollout Guidance Actuator Installation
Figure 401/22-11-22-990-801

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TASK 22-11-22-400-801

3. Rudder Rollout Guidance Actuator Installation

(Figure 401)

A. General

- (1) This task is for the installation of the rudder rollout guidance actuator.

B. References

Reference	Title
22-11-22-710-801	Rudder Rollout Guidance Actuator Test (P/B 501)
27-21-00-840-802	Pressure to the Rudder Systems A, B, and Standby - Activation (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

F. Rudder Rollout Guidance Actuator Installation

SUBTASK 22-11-22-400-001

- (1) Install the autopilot rollout guidance actuator [1]:
- (a) Hold the autopilot rollout guidance actuator [1] in position for the installation.
 - (b) Install the four bolts [13] and four washers [12] that hold the autopilot rollout guidance actuator [1] to the actuator support bracket [10].
 - (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 jumper [9].

SUBTASK 22-11-22-400-002

- (2) Connect the two electrical connectors [11].

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SUBTASK 22-11-22-200-002

- (3) Measure the resistance between the actuator and the support bracket with an intrinsically safe approved bonding meter, COM-1550, as follows:
- (a) Make sure that the resistance is less than 0.008 ohms (8.0 milliohms).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-22-440-003

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-22-860-013

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-22-410-001

- (3) Install this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

SUBTASK 22-11-22-010-004

- (4) Remove DO NOT OPERATE tag, STD-858, from the captain's and first officer's control columns.

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H. Rudder Rollout Guidance Actuator Installation Test

SUBTASK 22-11-22-440-004

- (1) 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

- (2) Do this task: Rudder Rollout Guidance Actuator Test, TASK 22-11-22-710-801.

————— END OF TASK —————

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RUDDER ROLLOUT GUIDANCE ACTUATOR - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) The rudder rollout guidance actuator test.

TASK 22-11-22-710-801

2. Rudder Rollout Guidance Actuator Test

A. **General**

- (1) This task is for the test of the rudder rollout guidance actuator.

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 22-11-22-860-001

- (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 22-11-22-860-002

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-22-860-003

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

SUBTASK 22-11-22-860-004

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

SUBTASK 22-11-22-860-005



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.

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

NOTE: Hydraulic power is necessary for surface test.

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E. Rudder Rollout Guidance Actuator Test

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.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-22-860-006

- (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 22-11-22-860-007

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-22-860-008

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-22-860-009

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

————— END OF TASK —————

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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 201 and Figure 202)

A. General

- (1) This task removes electrical power and hydraulic pressure to the autopilot rudder position sensor.
- (2) The tryout in this task makes sure that the autopilot rudder position sensor is in a zero energy state.

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

E. Autopilot Rudder Position Sensor Deactivation

SUBTASK 22-11-23-860-012

- (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
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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-23-010-004

- (2) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-23-860-013

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Rudder Position Sensor Tryout

SUBTASK 22-11-23-700-001

- (1) Use the FMC - CDU and do the that follows:
- (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:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** ————

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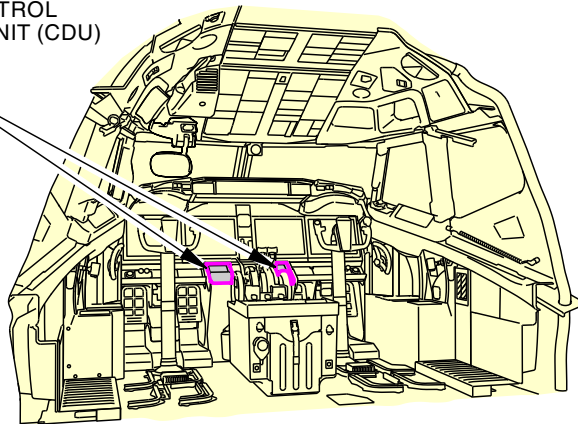
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



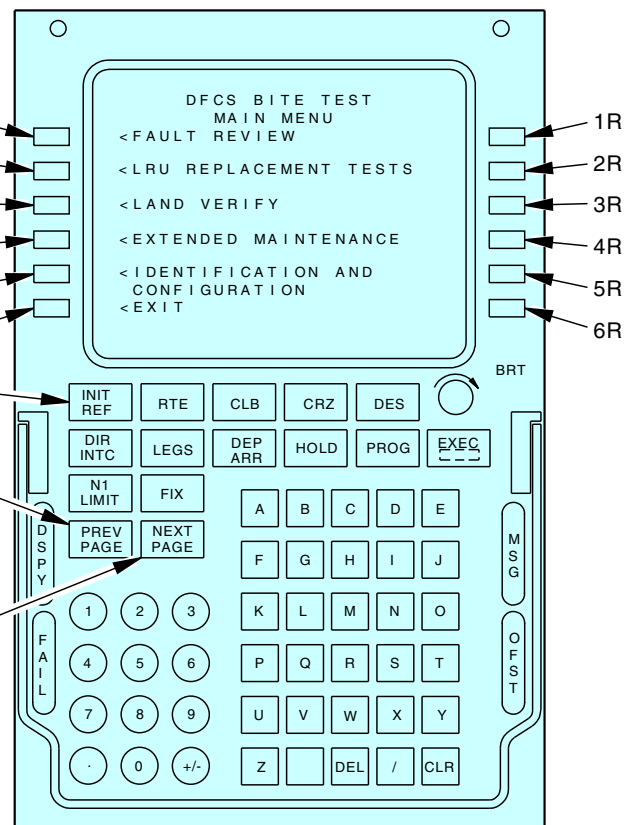
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

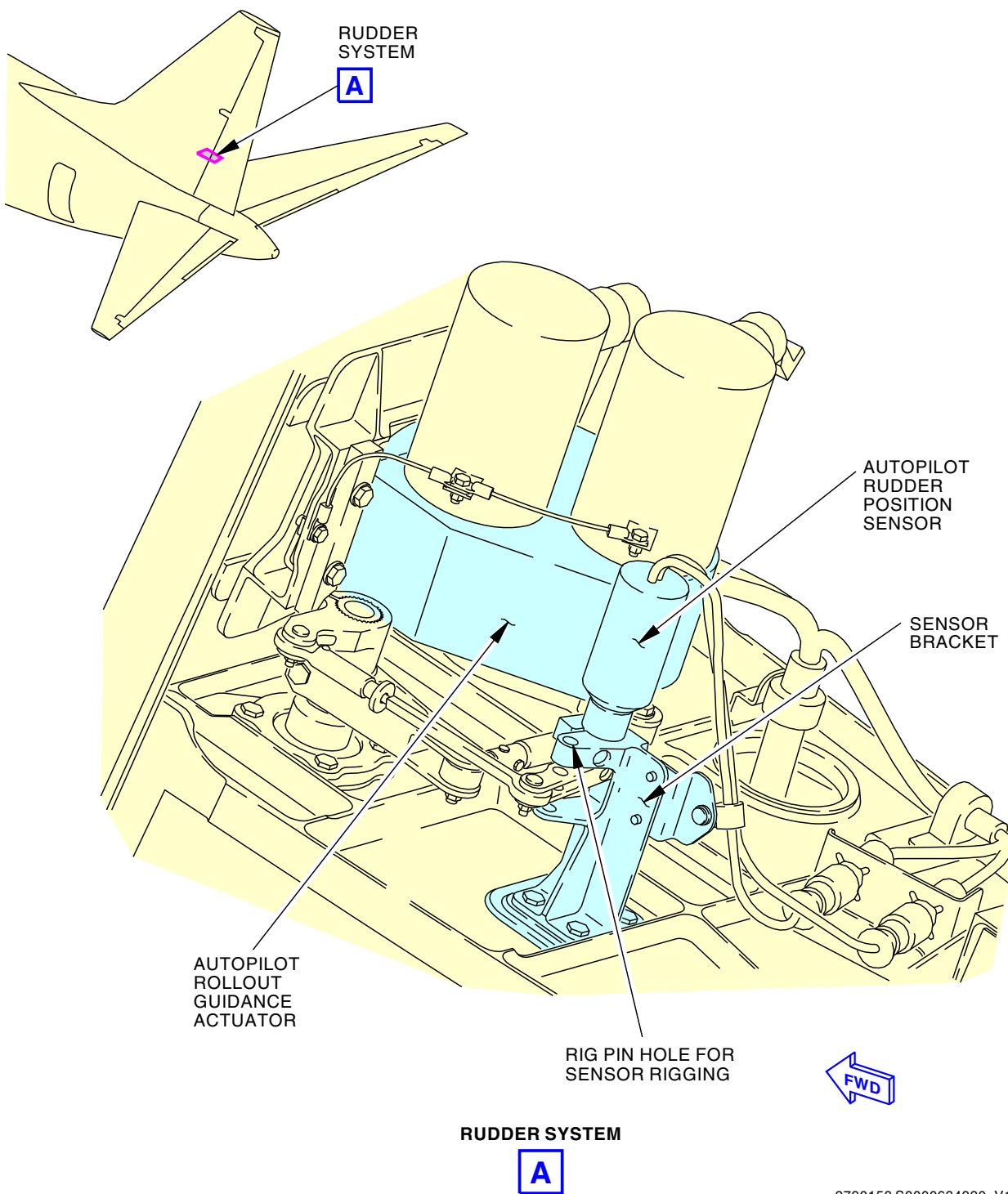
Flight Management Computer Control Display Unit
Figure 201/22-11-23-990-804

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Autopilot Rudder Position Sensor
Figure 202/22-11-23-990-805

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TASK 22-11-23-440-801

3. Autopilot Rudder Position Sensor - Activation

A. General

- (1) This task restores electrical power and hydraulic pressure to the 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. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Autopilot Rudder Position Sensor Activation

SUBTASK 22-11-23-860-014

- (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
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

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SUBTASK 22-11-23-860-015

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-23-020-002

- (3) Remove DO NOT OPERATE tag, STD-858 from the captain's and first officer's control columns.

SUBTASK 22-11-23-440-004



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.

- (4) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

————— **END OF TASK** —————

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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. General

- (1) This task is for the removal of the autopilot rudder position sensor.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - 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. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

F. Prepare for the Removal

SUBTASK 22-11-23-040-001

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-23-040-002

- (2) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-11-23-040-006

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

SUBTASK 22-11-23-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

G. Autopilot Rudder Position Sensor Removal

SUBTASK 22-11-23-000-001

- (1) Disconnect the two electrical connectors [4].

SUBTASK 22-11-23-020-001

- (2) Do these steps to remove the autopilot rudder position transmitter [1]:
- Remove the bolt [6], washers [5], and nut [3] from the cable clamp [2].
 - Remove the cable clamp [2].
 - Remove the bolt [9], washer [11], and nut [12] in the lever [10].
 - Remove the bolt [7], washer [14], and nut [13] in the sensor mounting bracket [8].
 - Remove the autopilot rudder position transmitter [1].

————— **END OF TASK** —————

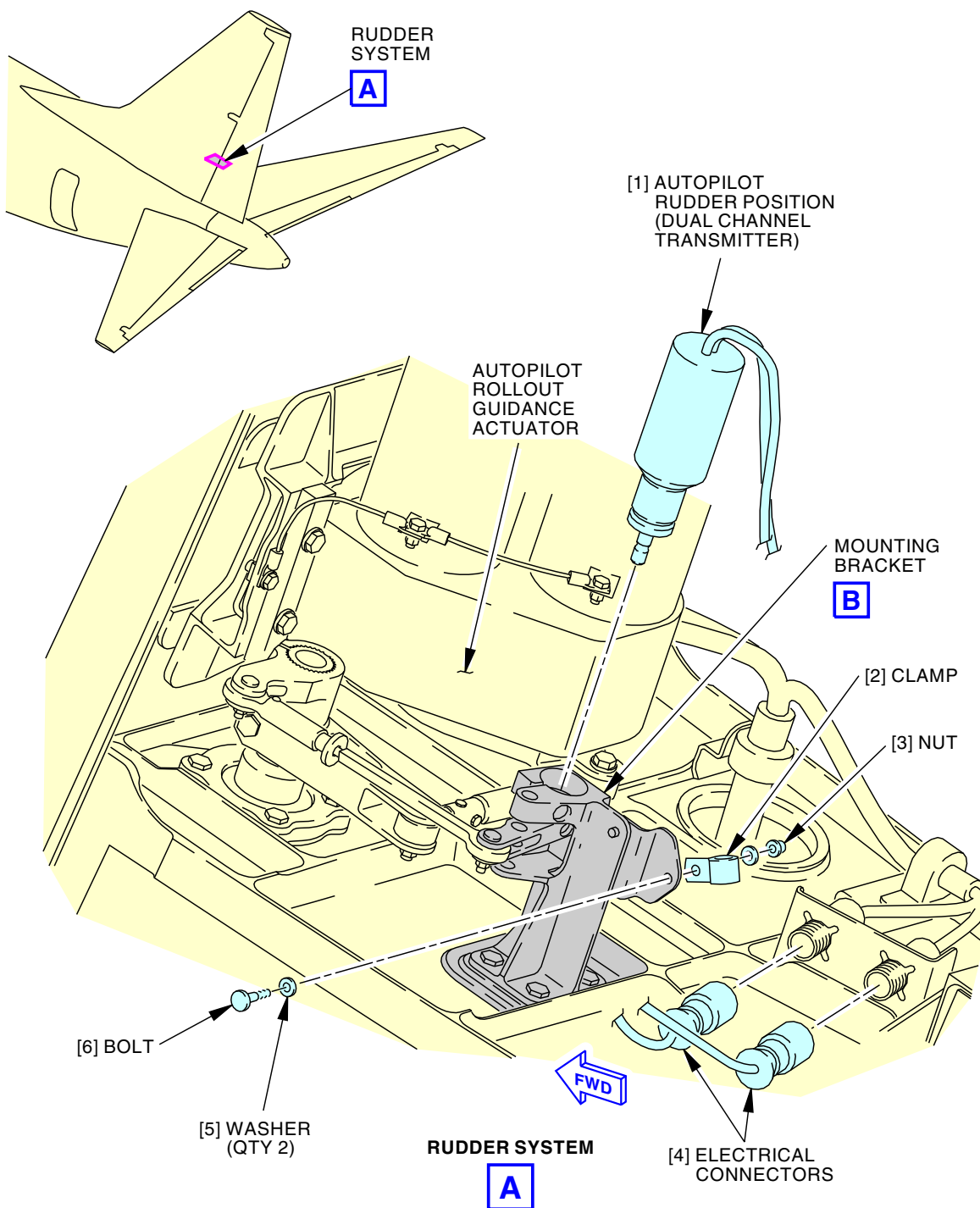
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Autopilot Rudder Position Sensor Installation
Figure 401/22-11-23-990-801 (Sheet 1 of 2)

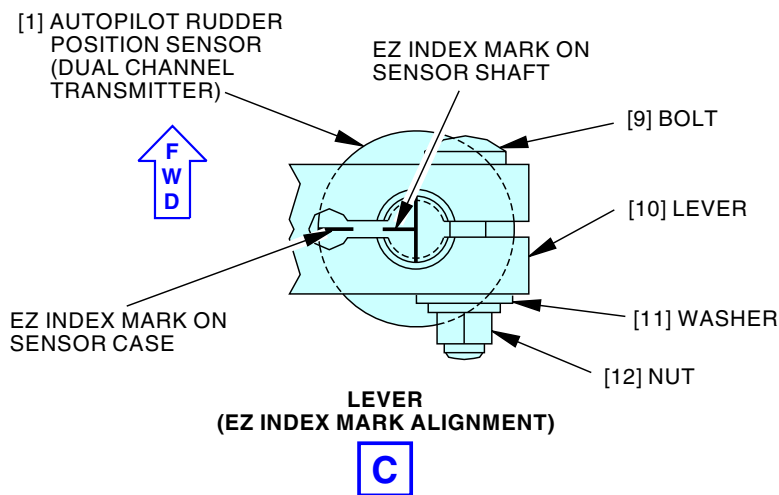
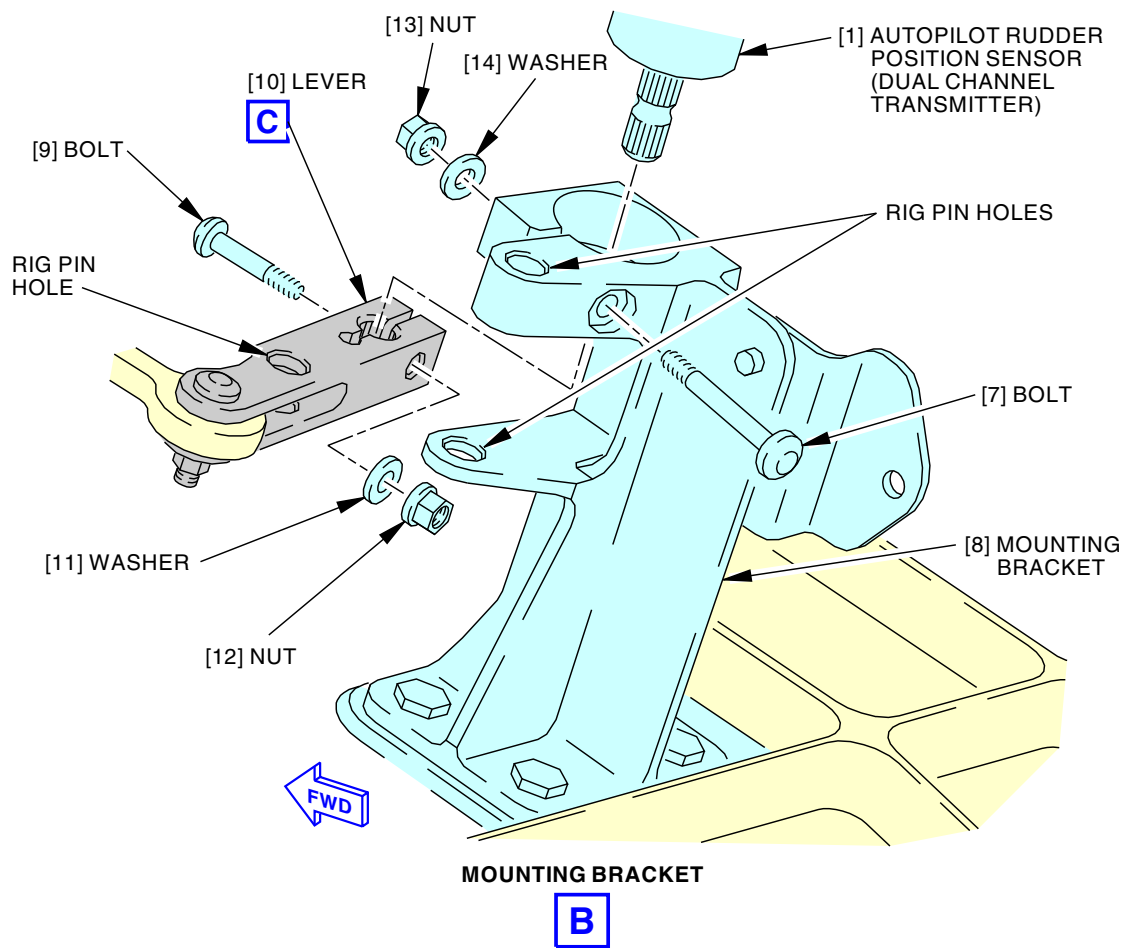
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Autopilot Rudder Position Sensor Installation
Figure 401/22-11-23-990-801 (Sheet 2 of 2)

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TASK 22-11-23-400-801

3. **Autopilot Rudder Position Sensor Installation**

(Figure 401)

A. General

(1) This task is for the installation of the autopilot rudder position sensor.

B. References

Reference	Title
22-11-23-710-801	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)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324JL	Vertical Fin, Access

F. Autopilot Rudder Position Sensor Installation

SUBTASK 22-11-23-420-001

- (1) Install the autopilot rudder position sensor autopilot rudder position transmitter [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 transmitter [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 autopilot rudder position transmitter [1].
 - (f) Tighten the clamp bolt to 30 ± 5 in-lb (3 ± 1 N·m).
 - (g) Install the bolt [9], washer [11], and nut [12] to clamp the lever [10] to the autopilot rudder position transmitter [1] shaft.
 - (h) Tighten the clamp bolt to 30 ± 5 in-lb (3 ± 1 N·m).
 - (i) Install the cable clamp [2] with the bolt [6], washer [5], and nut [3].

SUBTASK 22-11-23-420-002

- (2) Connect the two electrical connectors [4].

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-23-440-002

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-23-860-016

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-23-440-001



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.

- (3) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-11-23-820-001

- (4) Do this task: Rudder Position Sensor Adjustment and Test, TASK 22-11-23-820-801.

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SUBTASK 22-11-23-410-001

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

SUBTASK 22-11-23-010-005

- (6) Remove DO NOT OPERATE tag, STD-858, from the captain's and first officer's control columns.

H. Autopilot Rudder Position Sensor Installation Test

SUBTASK 22-11-23-710-001

- (1) Do this task: Rudder Position Sensor Test, TASK 22-11-23-710-801.

———— **END OF TASK** ————

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AUTOPILOT 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 and 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)
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 #: F70207-151 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

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 22-11-23-420-003

 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.

- (1) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

SUBTASK 22-11-23-860-001

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

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SUBTASK 22-11-23-860-002

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

SUBTASK 22-11-23-860-003

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

SUBTASK 22-11-23-420-004

- (5) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

SUBTASK 22-11-23-010-003

- (6) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

SUBTASK 22-11-23-780-001



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.

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

F. Procedure

NOTE: Two persons are necessary for this task.

SUBTASK 22-11-23-820-002

- (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
- 2) MAINT
- 3) DFCS
- 4) EXTENDED MAINTENANCE
- 5) RIGGING
- 6) RUDDER
- 7) RUDDER POSITION
- 8) Jiggle the rudder feel centering Unit input arm to make sure it is centered in the cam.

NOTE: 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) Install rig pin #6 of rigging pin kit, SPL-1585 and make sure that the rig pin can be freely inserted.

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- 10) Loosen the clamp bolt [7] for the autopilot rudder position transmitter [1] 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 [7] to 30 ±5 in-lb (3 ±1 N·m).
- 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 to the "EXIT" screen.
- 19) Do the instructions on the "END OF BITE" screen on the CDU.
- 20) Press the LSK next to "EXIT" on the "TEST COMPLETE" screen.
- 21) Press the LSK next to "EXIT" after you do the instructions on the "END OF DFCS BITE" screen.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-23-860-004

- (1) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-23-860-005

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

SUBTASK 22-11-23-410-002

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
324JL	Vertical Fin, Access

SUBTASK 22-11-23-000-002

- (4) Remove DO NOT OPERATE tag, STD-858 from the captain's and first officer's control columns.

————— **END OF TASK** —————

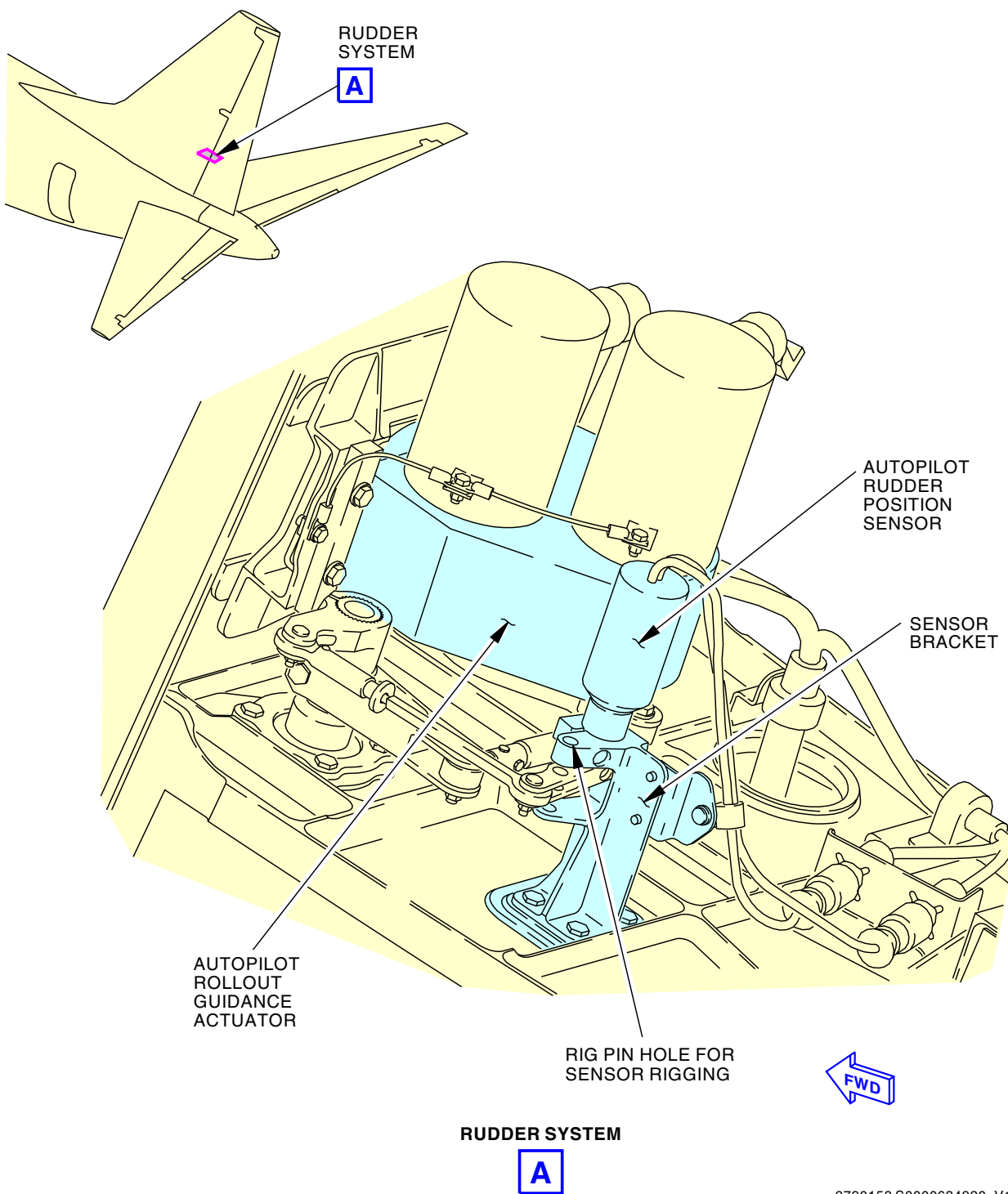
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Autopilot Rudder Position Sensor Adjustment/Test
Figure 501/22-11-23-990-802

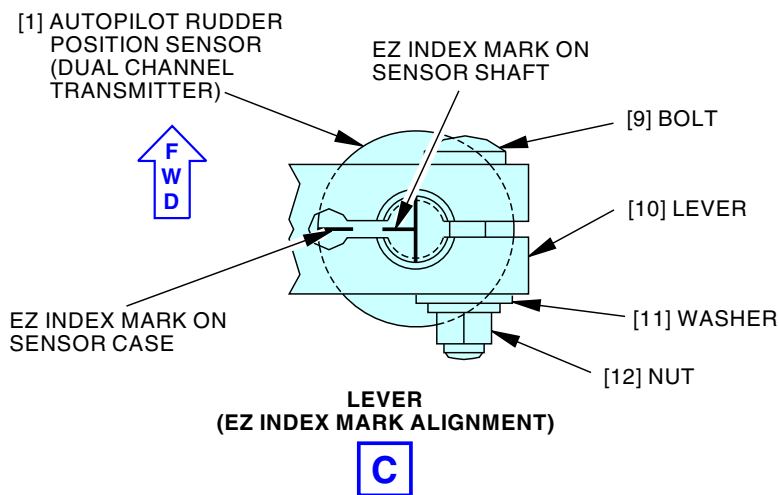
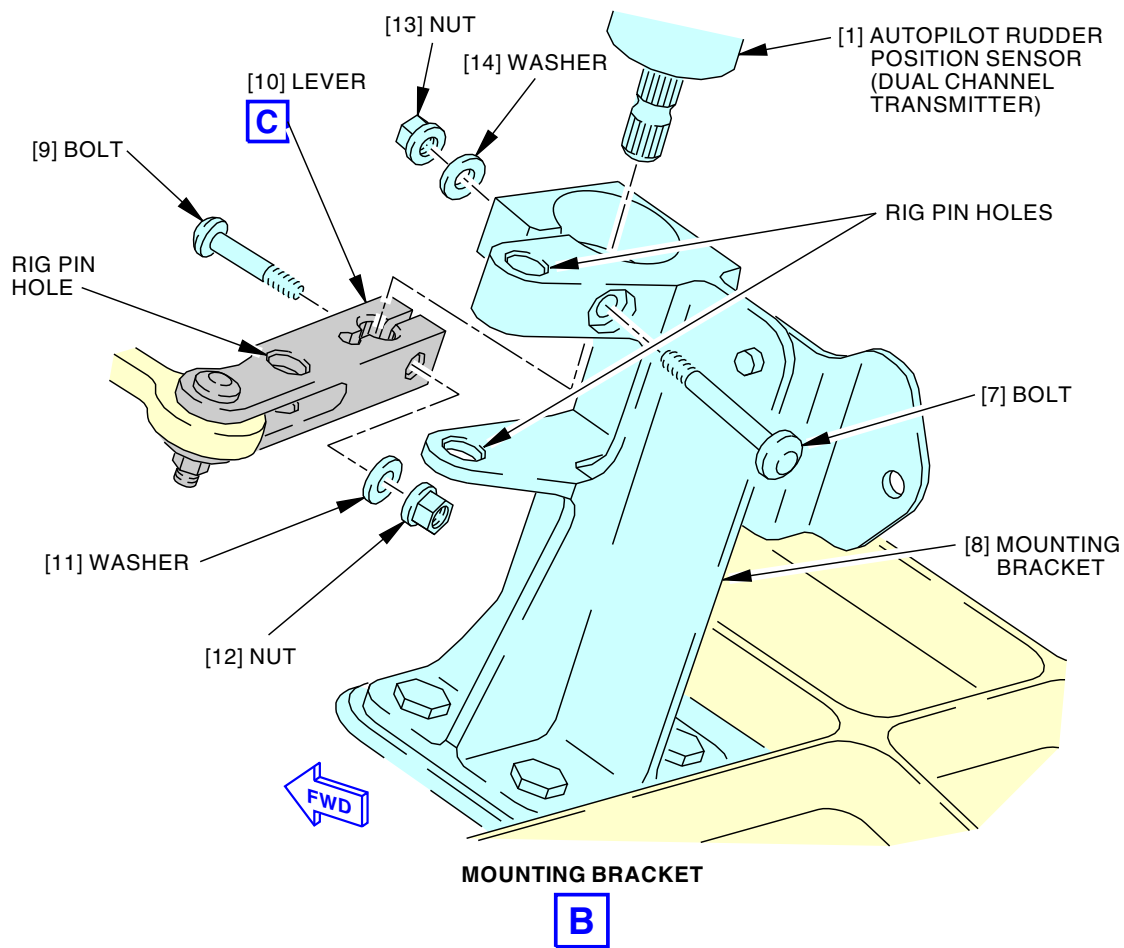
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Autopilot Rudder Position Sensor Installation
Figure 502/22-11-23-990-803

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TASK 22-11-23-710-801

3. Rudder 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 22-11-23-040-005

- (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 22-11-23-860-006

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-23-860-007

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

SUBTASK 22-11-23-860-008

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

SUBTASK 22-11-23-780-002



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.

- (5) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

D. Procedure

SUBTASK 22-11-23-710-002

- (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
- 2) MAINT

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- 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.

E. Put Airplane Back to Its Usual Condition

SUBTASK 22-11-23-860-009

- (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 22-11-23-440-003

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-23-860-010

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the normal position.

SUBTASK 22-11-23-860-011

- (4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

———— **END OF TASK** ————

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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 task removes electrical power and hydraulic pressure to the mach trim servo.
- (2) The tryout in this task makes sure that the mach trim actuator is in a zero energy state.

B. **References**

Reference	Title
27-31-00-800-802	Pressure from the Elevator Hydraulic Systems A and B 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
315	APU Compartment - Left
316	APU Compartment - Right

E. **Mach Trim Actuator Deactivation**

SUBTASK 22-11-24-860-001

- (1) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, 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

F/O Electrical System Panel, P6-2

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

SUBTASK 22-11-24-860-003

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

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F. Mach Trim Actuator Tryout

SUBTASK 22-11-24-860-005

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

SUBTASK 22-11-24-700-001

- (2) Ensure that the Mach Trim warning light is turned ON.

SUBTASK 22-11-24-700-002

- (3) Use the FMC - CDU and do the test that follows:

- (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 follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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)"

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- (k) SELECT, INIT/REF on the keyboard, to exit of BITE.
- (l) End of test.

———— **END OF TASK** ————

EFFECTIVITY
SIA ALL

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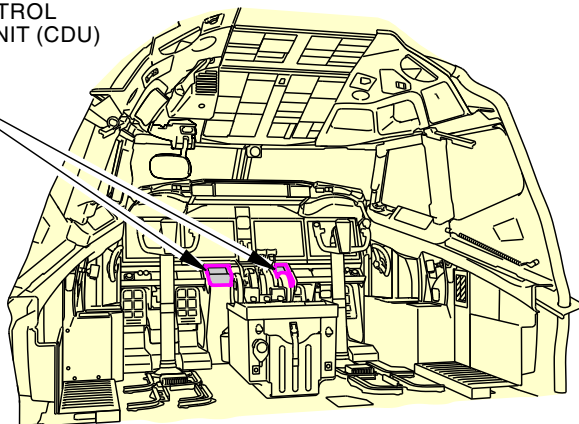
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



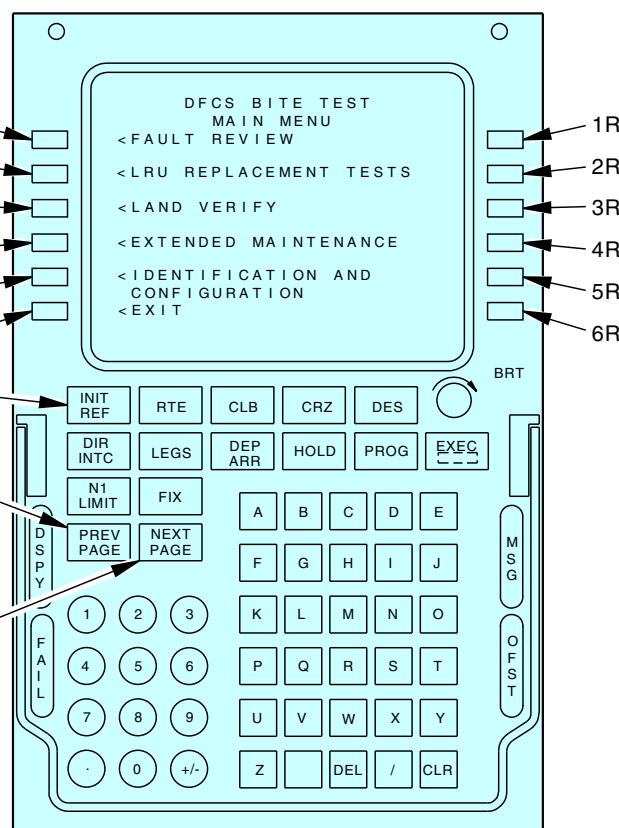
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-24-990-801

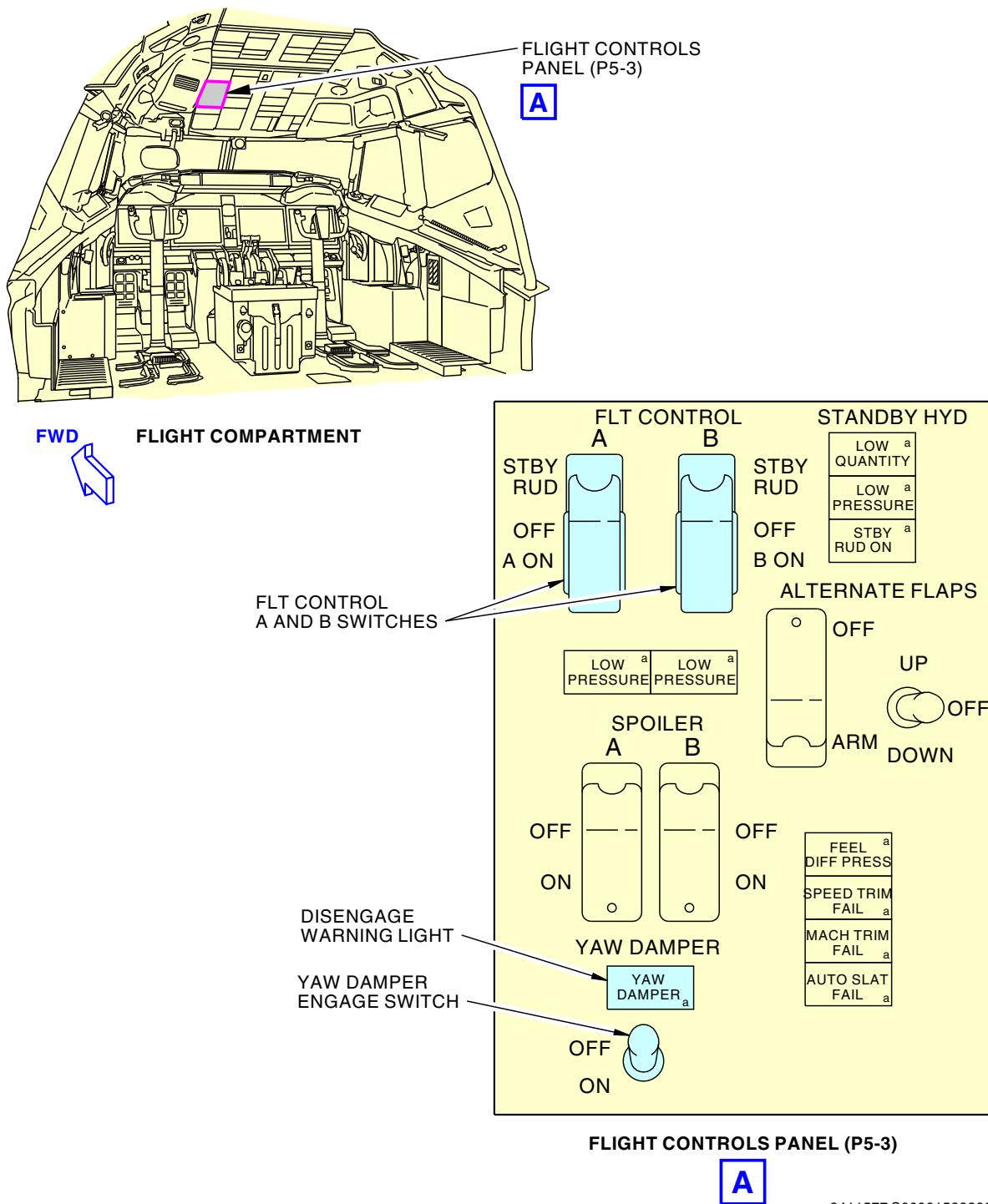
EFFECTIVITY
SIA ALL

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2411577 S00061528266_V1

Flight Control Panel P5-3
Figure 202/22-11-24-990-802

EFFECTIVITY
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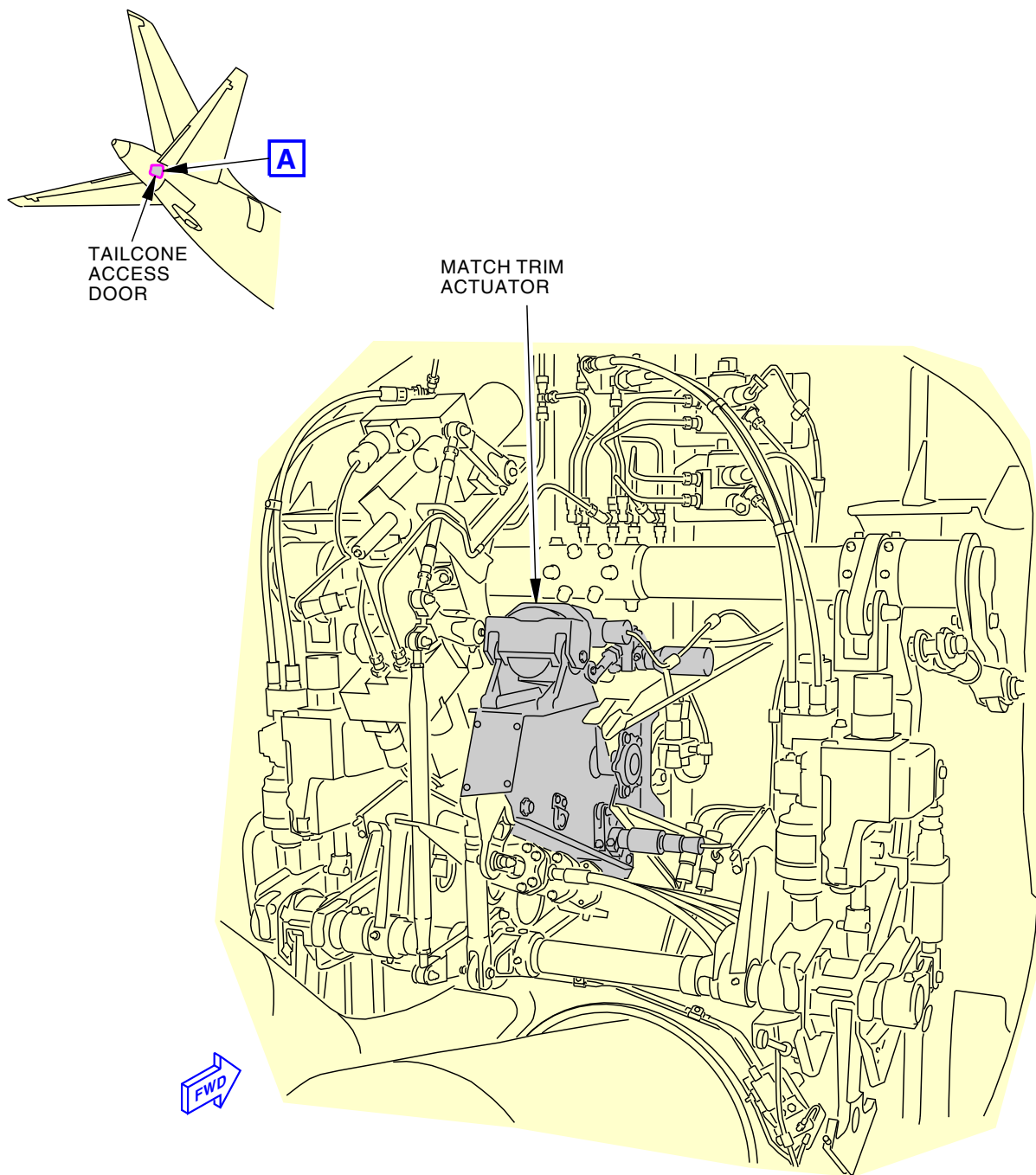
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VIEW WHEN YOU ARE LOOKING THROUGH THE TAILCONE ACCESS DOOR

A

2411578 S00061528267_V1

Mach Trim Actuator
Figure 203/22-11-24-990-803

EFFECTIVITY
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TASK 22-11-24-440-801

3. **Mach Trim Actuator - Activation**

(Figure 202 and Figure 203)

A. General

- (1) This task restores 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 22-11-24-860-006

- (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 22-11-24-860-007



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.

- (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 warning light is turned OFF.

————— **END OF TASK** —————

EFFECTIVITY
SIA ALL

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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. **General**

- (1) This task is for the removal of the Mach trim actuator.

B. **References**

Reference	Title
27-31-00-800-802	Pressure from the Elevator Hydraulic Systems A and B 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-1585	Kit - Rigging Pin Part #: F70207-151 Supplier: 81205

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

F. **Prepare for the Removal**

SUBTASK 22-11-24-860-008

- (1) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

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SUBTASK 22-11-24-860-009

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

CAPT Electrical System Panel, P18-1

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

G. Mach Trim Actuator Removal

SUBTASK 22-11-24-820-001

- (1) Put rigging pin E-5 from the 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 22-11-24-020-003

- (4) Remove the two bolts [2] that attach the mach trim actuator [1] to the elevator feel and centering unit.

SUBTASK 22-11-24-020-004

- (5) Remove the mach trim actuator [1].

————— **END OF TASK** —————

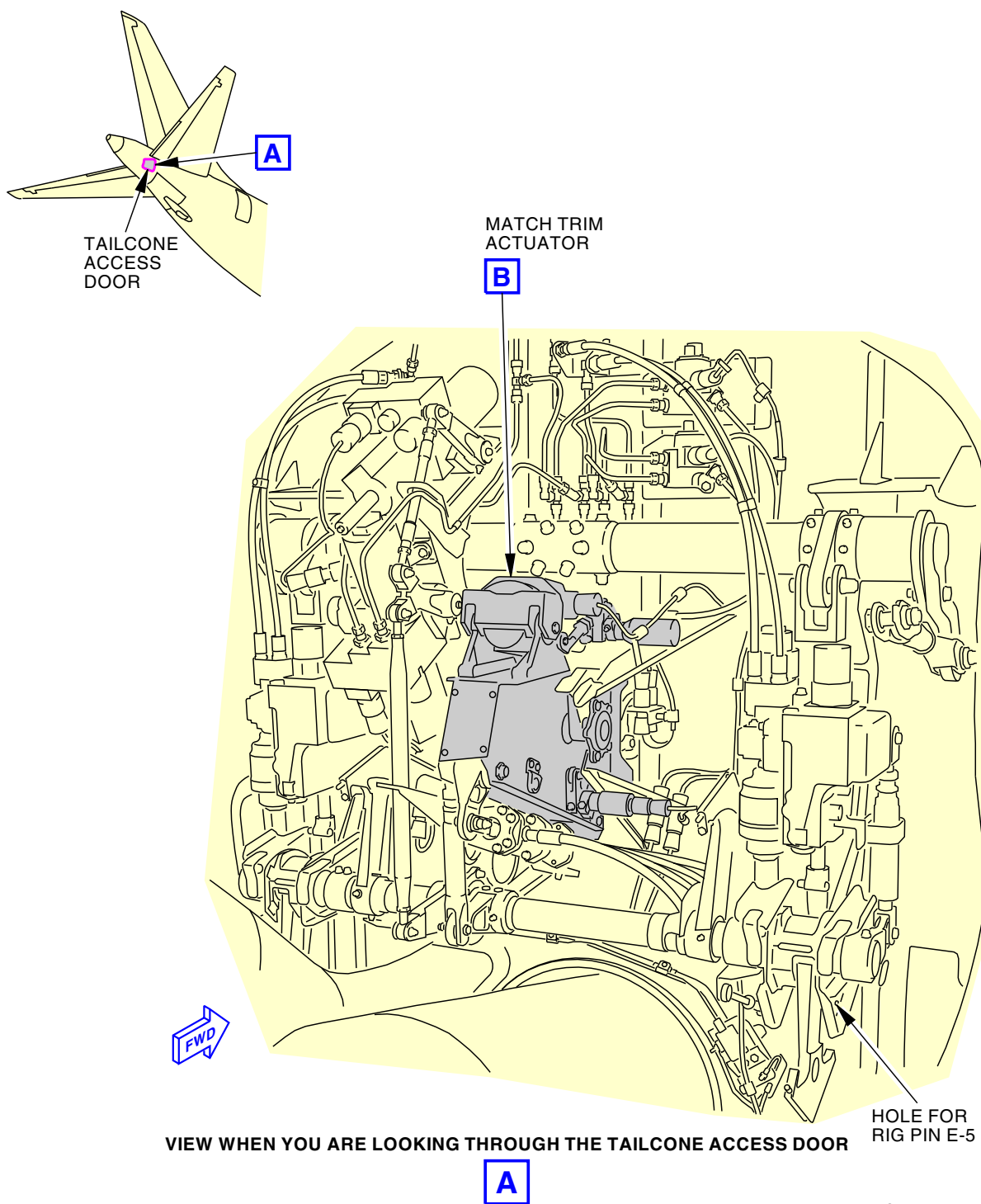
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2411579 S00061528271_V1

Mach Trim Actuator Installation
Figure 401/22-11-24-990-804 (Sheet 1 of 3)

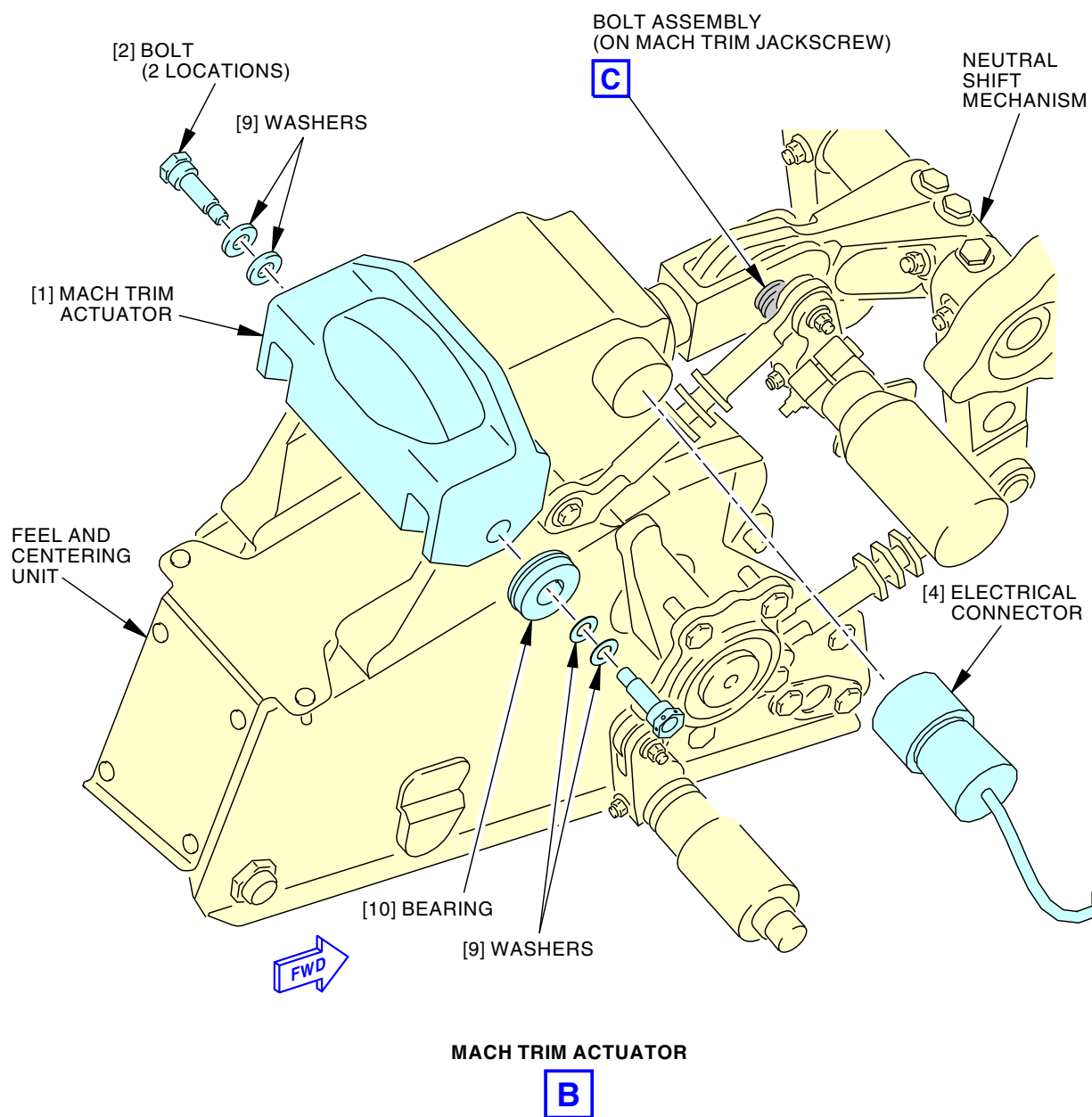
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2411580 S00061528272_V2

Mach Trim Actuator Installation
Figure 401/22-11-24-990-804 (Sheet 2 of 3)

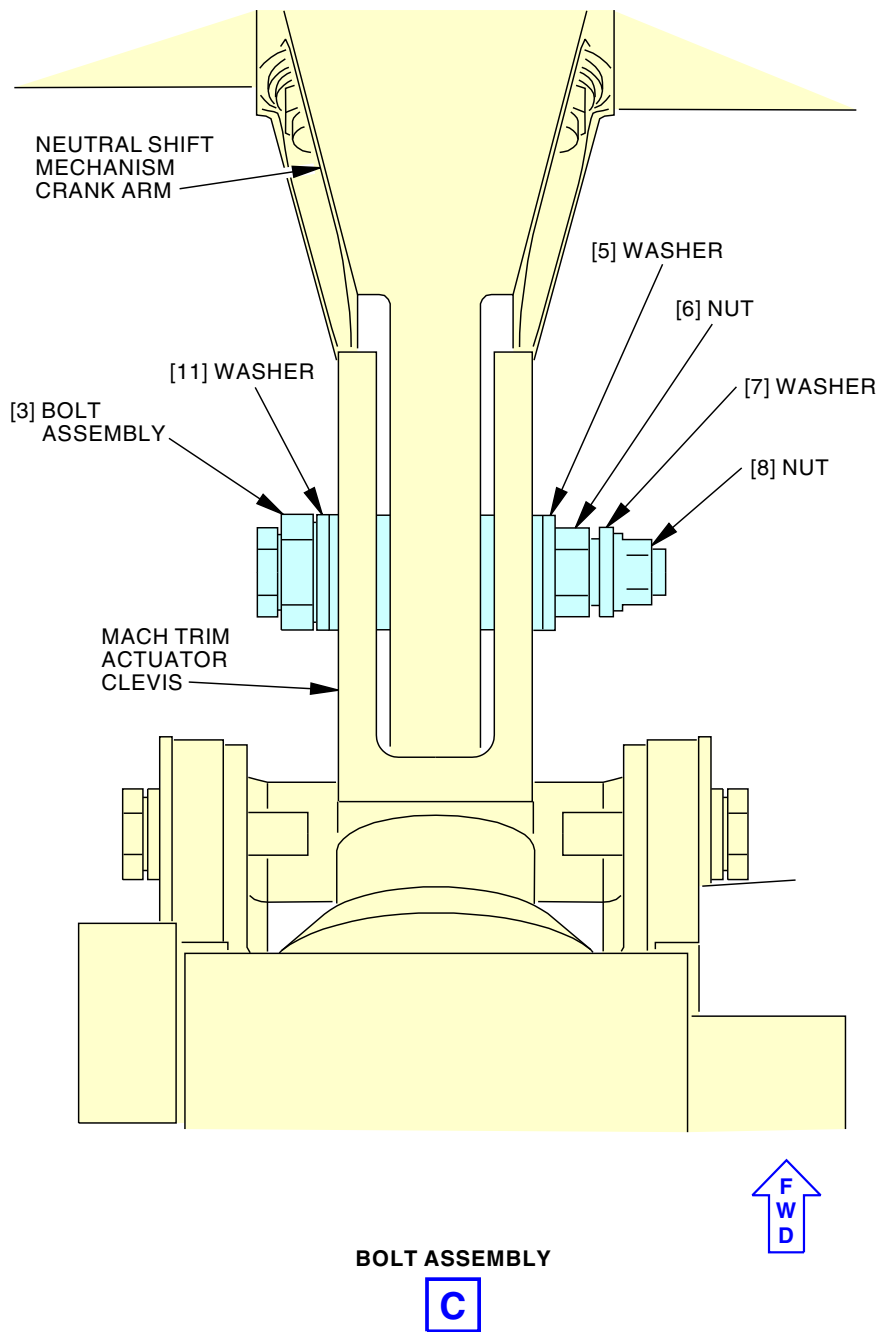
EFFECTIVITY
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2411581 S00061528273_V1

Mach Trim Actuator Installation
Figure 401/22-11-24-990-804 (Sheet 3 of 3)

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TASK 22-11-24-400-801

3. **Mach Trim Actuator Installation**

(Figure 401)

A. General

(1) This task is for the installation of the Mach trim actuator.

B. References

Reference	Title
22-11-24-740-801	Mach Trim Actuator Installation Test (P/B 501)

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-1585	Kit - Rigging Pin Part #: F70207-151 Supplier: 81205

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Mach trim actuator	22-11-24-01-065	SIA 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 rigging pin kit, SPL-1585, into its hole in the aft control quadrant.

SUBTASK 22-11-24-420-001

(2) Make sure that the bearing and washers 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 two bolts [2], four washers [9], and bearing [10] on the sides.

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.

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SUBTASK 22-11-24-420-004



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).



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 two bolts [2] with four washers [9] and bearing [10] 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 22-11-24-420-006

- (7) Connect the electrical connector [4] to the mach trim actuator [1].

SUBTASK 22-11-24-940-001

- (8) 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:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-24-860-012

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

CAPT Electrical System Panel, P18-1

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

F/O Electrical System Panel, P6-2

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

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I. Mach Trim Actuator Installation Test

SUBTASK 22-11-24-710-001

(1) Do this task: Mach Trim Actuator Installation Test, TASK 22-11-24-740-801.

———— **END OF TASK** ————

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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 acutator 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 installation of the mach trim actuator is correct.

B. References

Reference	Title
27-31-00-800-801	Elevator Hydraulic System A and B - Pressurization (P/B 201)
27-31-00-800-802	Pressure from the Elevator Hydraulic Systems A and B Removal (P/B 201)

C. Location Zones

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

D. Installation Test

SUBTASK 22-11-24-860-014



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.

- (1) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

SUBTASK 22-11-24-860-015

- (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	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

- (3) Do this BITE test:

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- (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 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 22-11-24-860-016

- (4) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

SUBTASK 22-11-24-740-002

- (5) 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.

———— **END OF TASK** ————

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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 task removes electrical power and hydraulic pressure to the autopilot aileron actuator.
- (2) The tryout in this task makes sure that the autopilot aileron actuator is in a zero energy state.

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. Autopilot Aileron Actuator Deactivation

SUBTASK 22-11-25-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-25-860-002



MAKE SURE THAT THE GROUND LOCKS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, 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 22-11-25-860-003

- (4) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Aileron Actuator Tryout

SUBTASK 22-11-25-860-005

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-25-700-001

- (2) Use the FMC - CDU and do the following test:
- (a) SELECT, INIT/REF on the keyboard.
 - (b) SELECT, "INDEX" (LSK 6L).

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- (c) SELECT, "MAINT" (LSK 6R).
- (d) SELECT, "DFCS" (LSK 2L).
 - 1) DFCS will run the self test and display as follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** ————

EFFECTIVITY
SIA ALL

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

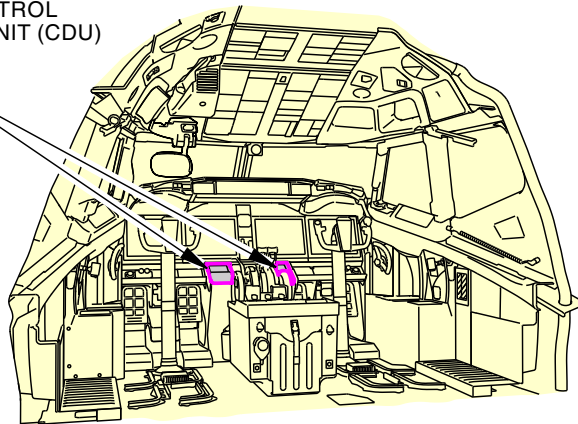
22-11-25

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FMCS CONTROL
DISPLAY UNIT (CDU)

A



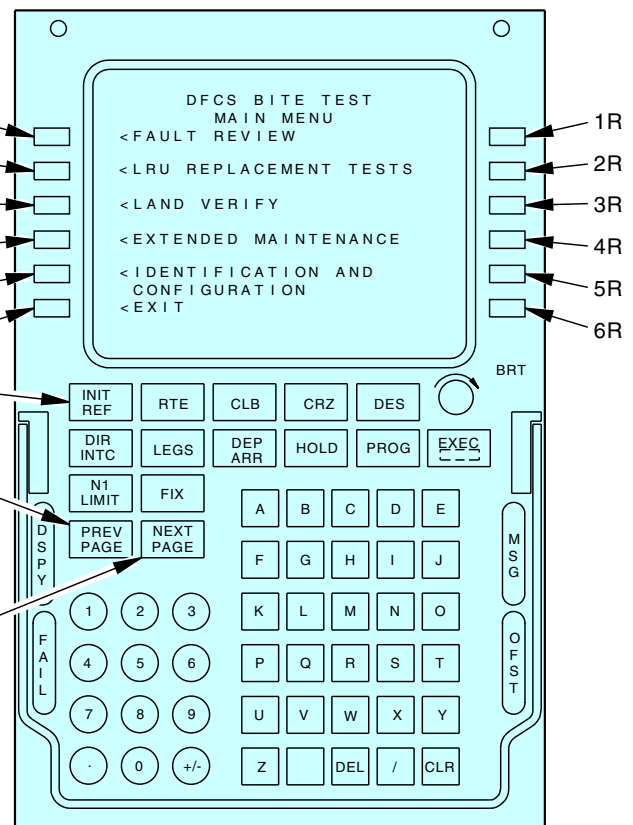
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-25-990-801

EFFECTIVITY
SIA ALL

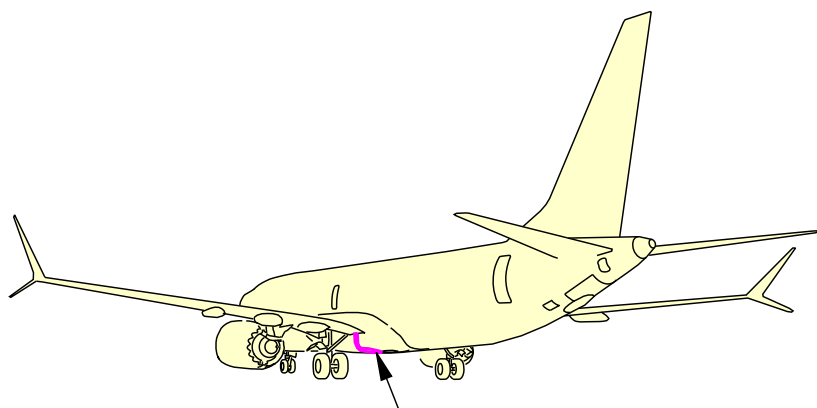
22-11-25

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AIRCRAFT MAINTENANCE MANUAL

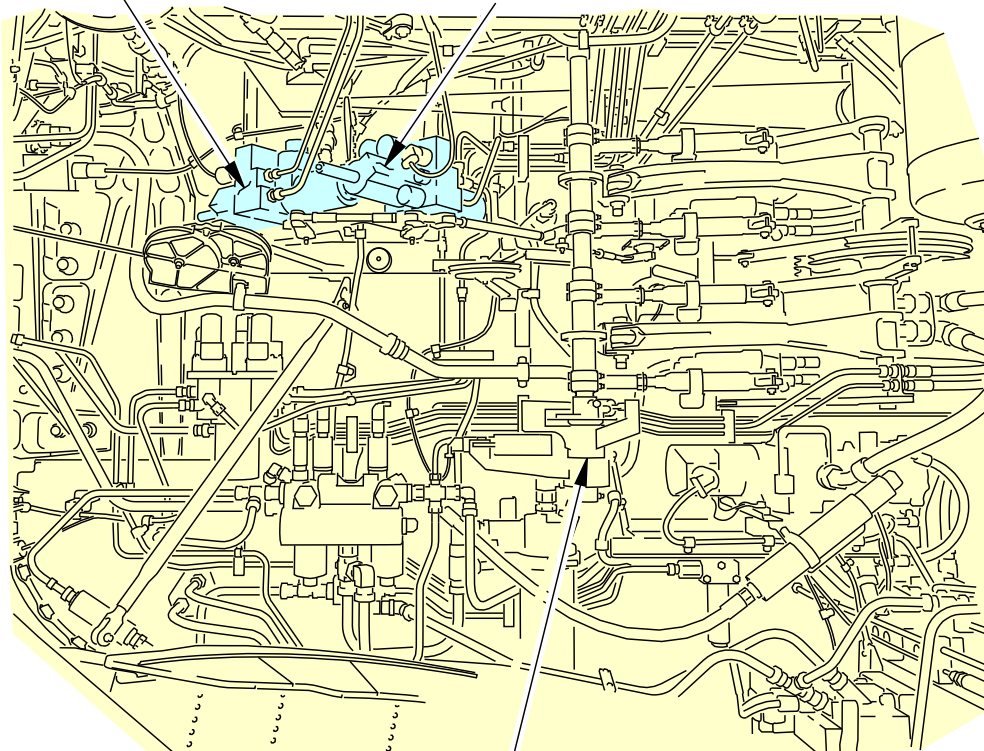


LEFT MAIN LANDING
GEAR WHEEL WELL

A

AUTOPILOT AILERON
ACTUATOR B

AUTOPILOT AILERON
ACTUATOR A



RIG PIN 15

MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)

A

FWD



2411582 S00061528280_V1

Autopilot Aileron Actuator
Figure 202/22-11-25-990-802

EFFECTIVITY
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TASK 22-11-25-440-801

3. Autopilot Aileron Actuator - Activation

(Figure 202)

A. General

- (1) This task restores electrical power and hydraulic pressure to the 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 22-11-25-860-006

- (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 22-11-25-860-041

- (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

EFFECTIVITY
SIA ALL

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SUBTASK 22-11-25-410-001



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.

- (3) Do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

———— **END OF TASK** ————

EFFECTIVITY
SIA ALL

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AUTOPILOT AILERON ACTUATOR - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) A removal of an autopilot aileron actuator.
 - (2) An installation of an autopilot aileron actuator.
- B. There are two autopilot aileron actuators. The autopilot aileron actuator A (M943) and autopilot aileron actuator B (M1024) can be found 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. General

- (1) This task is for the removal of the 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

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 #: F70207-151 Supplier: 81205

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

E. Prepare for the Removal

SUBTASK 22-11-25-860-045

- (1) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-25-860-046

- (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

EFFECTIVITY
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(Continued)

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-25-860-047



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

- (3) Make sure that the landing gear downlock pins are installed (TASK 32-00-01-480-801).

SUBTASK 22-11-25-860-048

- (4) Insert rig pin A/S 15 from the rigging pin kit, SPL-1585.

F. Autopilot Aileron Actuator Removal

SUBTASK 22-11-25-020-010

- (1) Disconnect the hydraulic lines from the hydraulic ports on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-020-011

- (2) Seal the hydraulic lines and the hydraulic ports with plugs.

SUBTASK 22-11-25-020-012

- (3) Remove the electrical connector [18] from the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-020-013

- (4) Remove the electrical connector [5] from the hydraulic pressure switch [4].

SUBTASK 22-11-25-020-014

- (5) Do these steps to remove the autopilot aileron actuator B [1] or autopilot aileron actuator A [1]:

SIA 001-003

- (a) Remove the screw [16], washer [13], and nut [12] that attach the lever assembly [17] or lever assembly [22] to the autopilot aileron actuator B [1] or autopilot aileron actuator A [1].

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SIA ALL

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SIA 004-999

- (b) Remove the bolt [16], washer [23], washer [13], and nut [12] that attach the lever assembly [17] or lever assembly [22] to the autopilot aileron actuator B [1] or autopilot aileron actuator A [1].

SIA ALL

- (c) Remove the nut [14] and washer [15] that attach the output shaft of the autopilot aileron actuator B [1] or autopilot aileron actuator A [1] to the lever assembly [17] or lever assembly [22].

- (d) Move the lever assembly [17] or lever assembly [22] away from the autopilot aileron actuator B [1] or autopilot aileron actuator A [1].

- (e) Remove the mounting bolts [20], mounting bolt [21], and washers [19].

NOTE: The mounting bolt [21] is shorter in length and it is only on the autopilot aileron actuator A.

- (f) Remove the autopilot aileron actuator B [1] or autopilot aileron actuator A [1].

SUBTASK 22-11-25-020-015

- (6) Remove the hydraulic pressure switch [4] and O-ring [3] from the autopilot aileron actuator A [1] or autopilot aileron actuator B [1] as follows:

- (a) Seal the hydraulic port with a plug.
- (b) Keep the hydraulic pressure switch [4].
- (c) Remove the fitting [2], O-ring [6], swivel nut [7], union [8], O-ring [3].

NOTE: These items are only on the autopilot aileron actuator B.

SUBTASK 22-11-25-020-016

- (7) 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].

SUBTASK 22-11-25-020-017

- (8) Seal the ports with plugs.

SUBTASK 22-11-25-020-018

- (9) Keep the reducer [10] and union [9].

———— **END OF TASK** ————

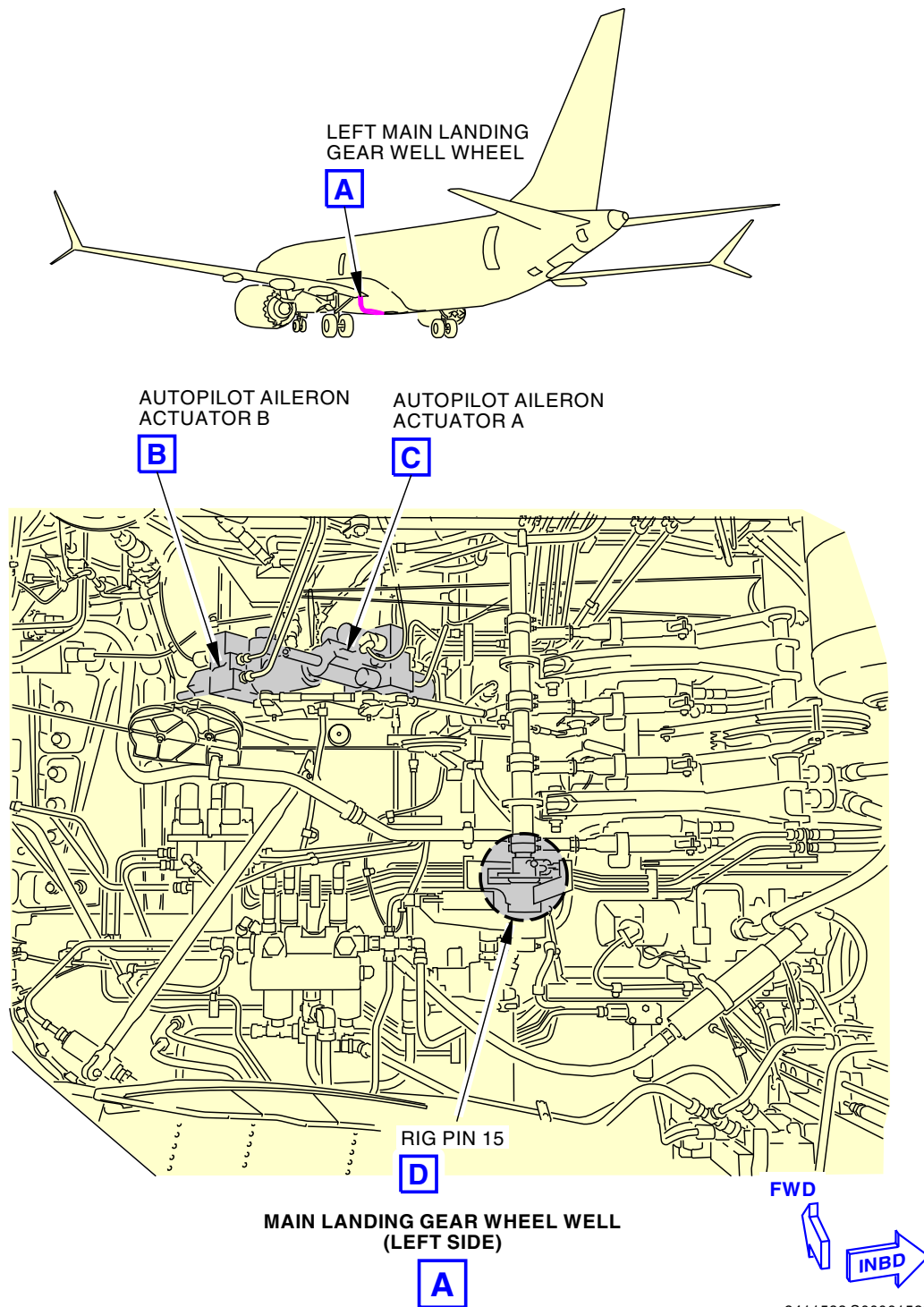
EFFECTIVITY
SIA ALL

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2411583 S00061528284_V1

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 1 of 6)

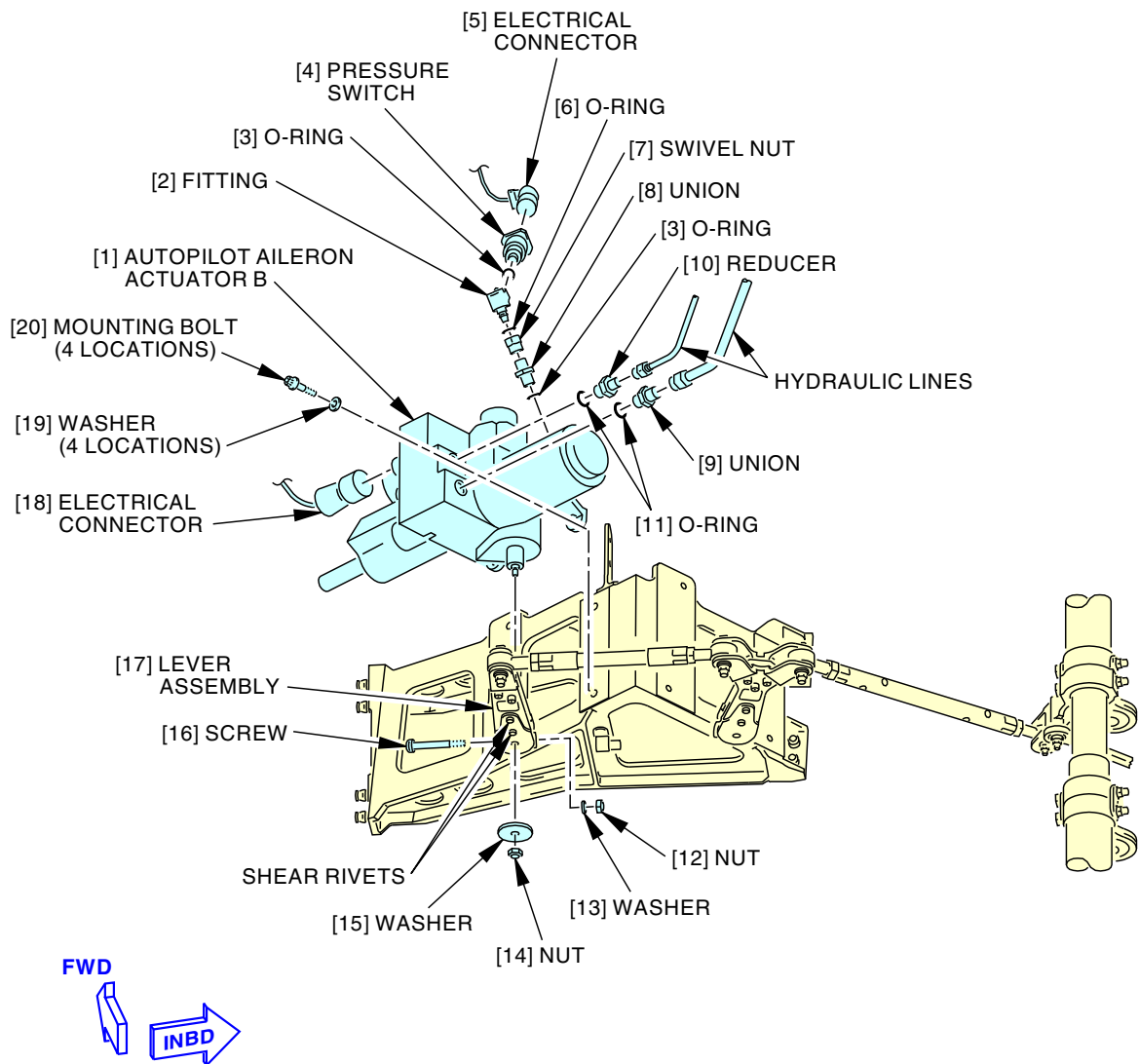
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AUTOPILOT AILERON ACTUATOR B

B

2411584 S00061528285_V1

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 2 of 6)

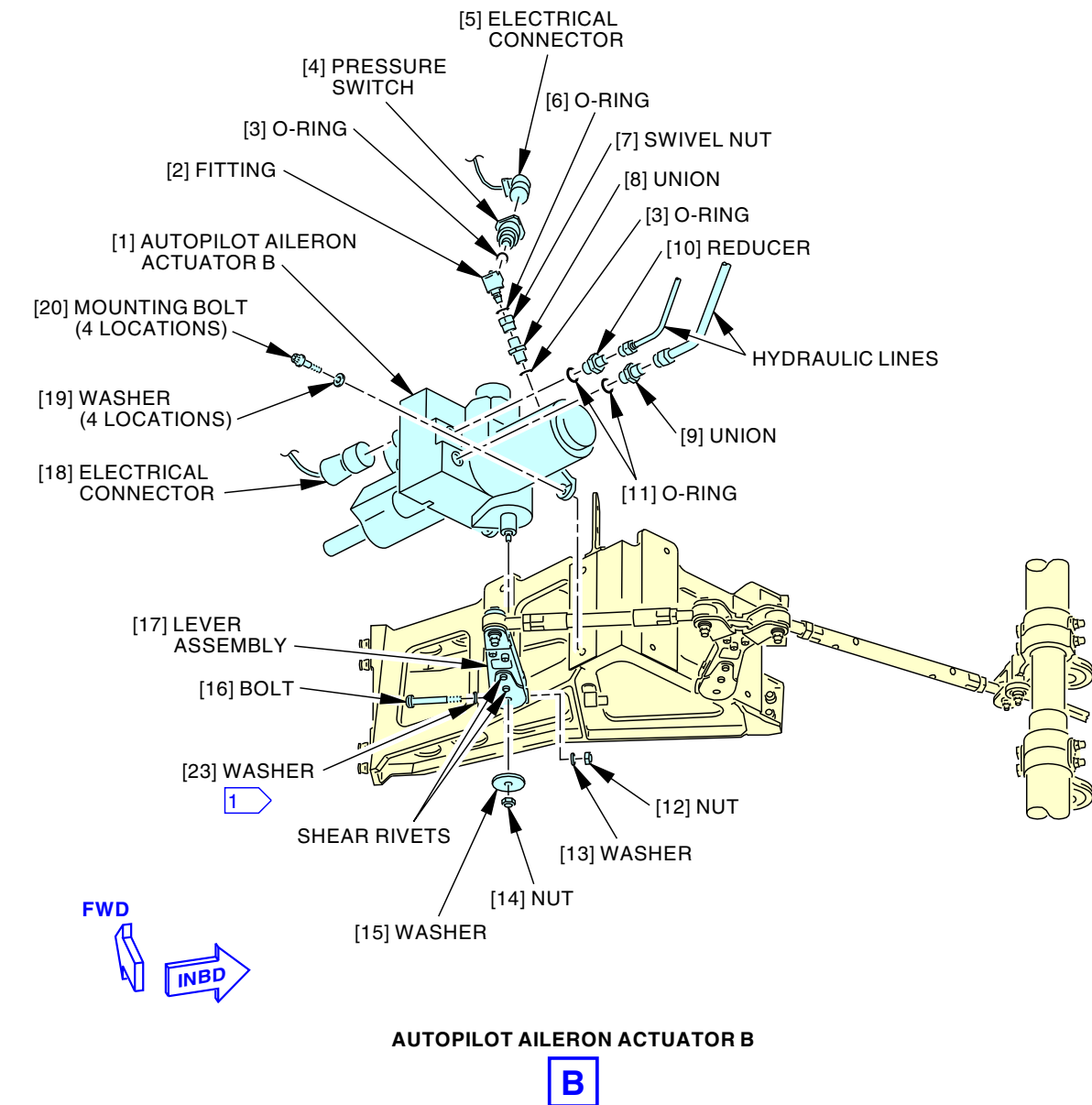
EFFECTIVITY
SIA 001-003

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1 THIS WASHER SHOULD BE INSTALLED IF BOLT P/N BACB30NT3K23 IS USED.

3043944 S0000810532_V1

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 3 of 6)

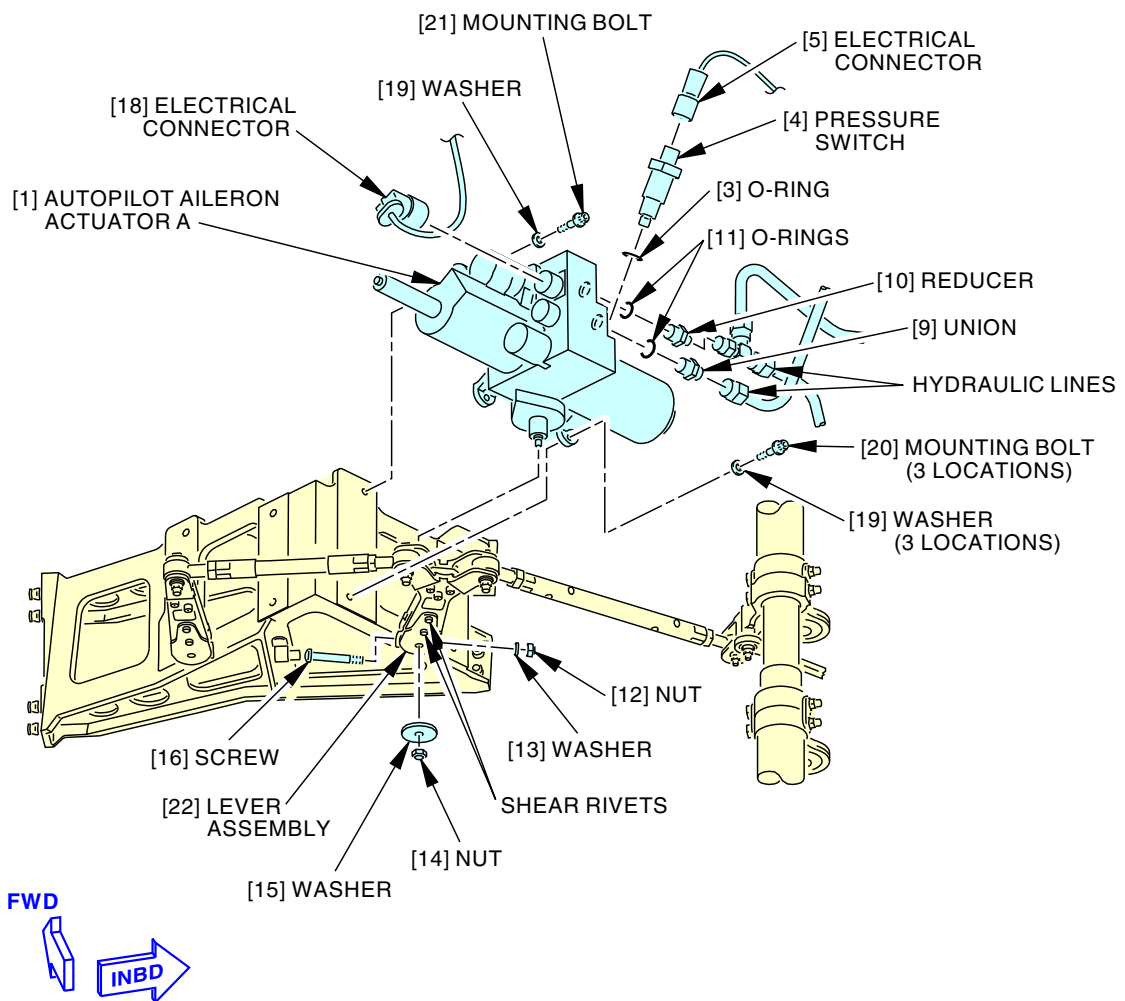
EFFECTIVITY
SIA 004-999

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AUTOPILOT AILERON ACTUATOR A

C

2411585 S00061528286_V2

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 4 of 6)

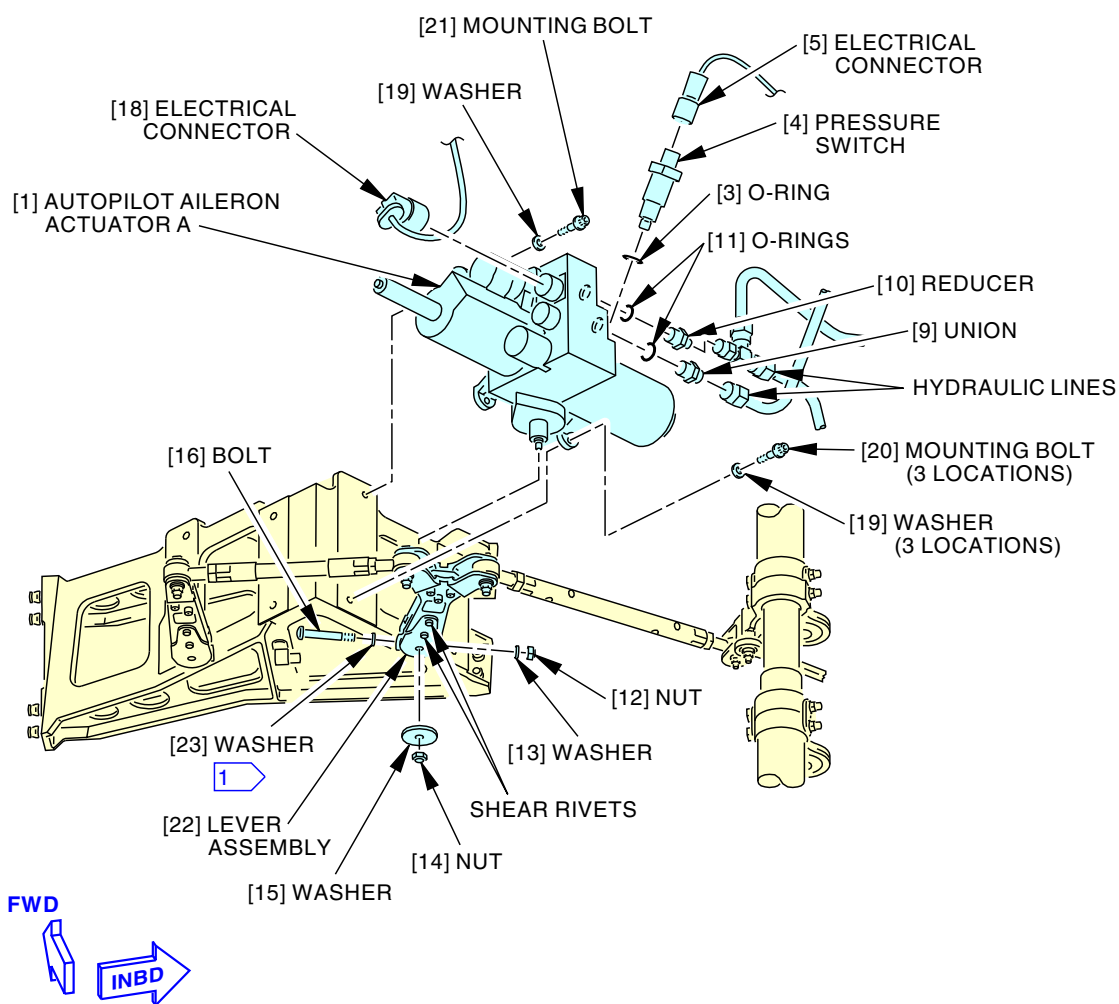
EFFECTIVITY
SIA 001-003

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AUTOPILOT AILERON ACTUATOR A

C

1 THIS WASHER SHOULD BE INSTALLED IF BOLT P/N BACB30NT3K23 IS USED.

3043947 S0000810539_V1

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 5 of 6)

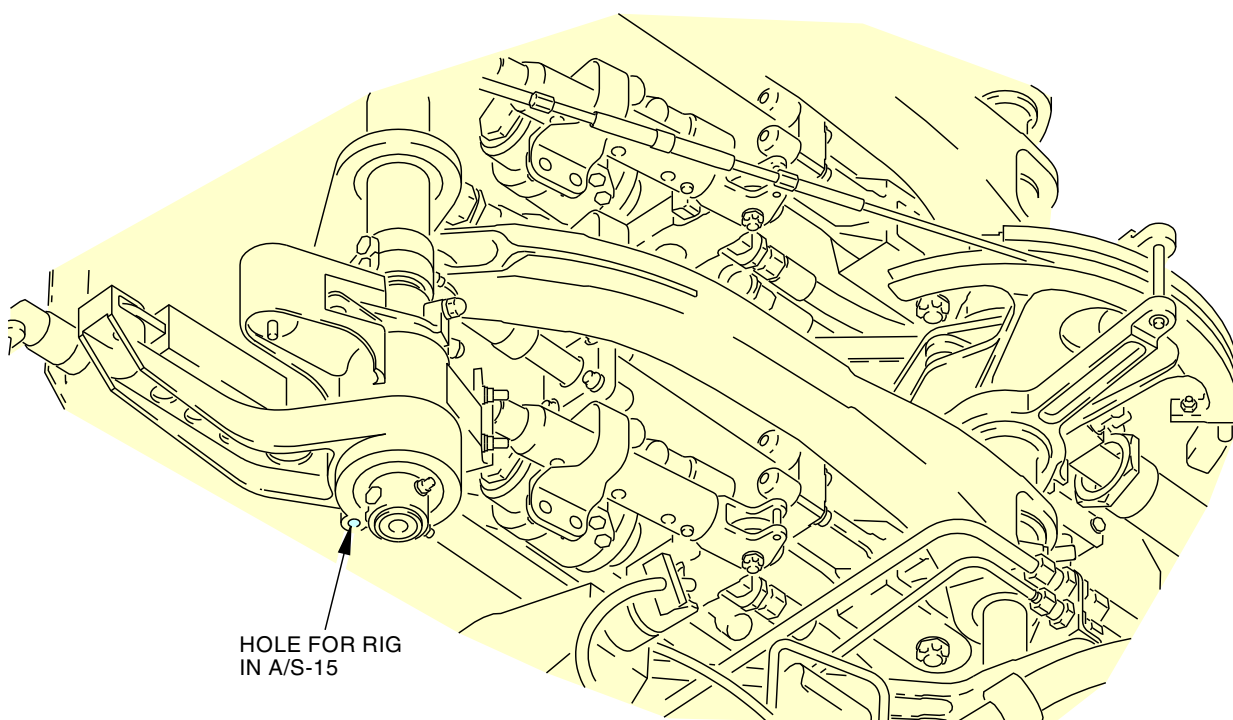
EFFECTIVITY
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HOLE FOR RIG
IN A/S-15



RIG PIN 15



2411586 S00061528287_V1

Autopilot Aileron Actuator Installation
Figure 401/22-11-25-990-806 (Sheet 6 of 6)

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TASK 22-11-25-400-801

3. **Autopilot Aileron Actuator Installation**

(Figure 401)

A. General

(1) This task is for the installation of the autopilot aileron actuator.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
22-11-25-710-801	Autopilot Aileron Actuator Test (P/B 501)
22-11-25-820-801	Autopilot Aileron Actuator Adjustment (P/B 501)
27-11-00-860-801	Pressure from the Aileron Hydraulic Systems A and B - Deactivation (P/B 201)
27-11-00-860-802	Pressure to the Aileron Hydraulic Systems A and B - Activation (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-1585	Kit - Rigging Pin Part #: F70207-151 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Autopilot aileron actuator B	22-11-25-01-180	SIA ALL
1	Autopilot aileron actuator A	22-11-25-01-260	SIA ALL
3	O-ring	22-11-40-01-015	SIA ALL
6	O-ring	22-11-25-01-235	SIA ALL
11	O-ring	22-11-25-01-250	SIA ALL
		22-11-25-01-300	SIA ALL

F. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

G. Autopilot Aileron Actuator Installation

SUBTASK 22-11-25-420-001

- (1) Do these steps to install the reducer [10] and union [9] as follows:
- (a) Lightly lubricate the new O-rings [11] on the reducer [10] and union [9] with hydraulic fluid, D00153.

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- (b) Install the reducer [10] and O-ring [11] in the pressure port on the autopilot aileron actuator A [1].
- (c) Tighten the reducer [10] to 170 ±5 in-lb (19.2 ±0.6 N·m).
- (d) Install the union [9] and O-ring [11] in the port on the autopilot aileron actuator A [1].
- (e) Tighten the union [9] to 170 ±5 in-lb (19.2 ±0.6 N·m).

SUBTASK 22-11-25-420-002

- (2) Do these steps to install the fitting [2], swivel nut [7], and union [8]:

NOTE: These items are only on the autopilot aileron actuator B.

- (a) Lightly lubricate the new O-ring [3] on the union [8] with hydraulic fluid, D00153.
- (b) Install the union [8] and O-ring [3] in the pressure port on the autopilot aileron actuator B [1].
- (c) Tighten the union [8] to 110 ±5 in-lb (12.4 ±0.6 N·m).
- (d) Install the fitting [2], new O-ring [6], and swivel nut [7].
- (e) Tighten the swivel nut [7] to 110 ±5 in-lb (12.4 ±0.6 N·m).

SUBTASK 22-11-25-420-003

- (3) Install the hydraulic pressure switch [4] on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1]:
 - (a) Remove the plug from the hydraulic port on the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].
 - (b) Install the hydraulic pressure switch [4] and O-ring [3].
 - (c) Tighten the hydraulic pressure switch [4] to 92.5 ±22.5 in-lb (10.45 ±2.54 N·m).
 - (d) Install the lockwire (TASK 20-10-44-400-801).

SUBTASK 22-11-25-800-001

- (4) Fill the autopilot aileron actuator A [1] with hydraulic fluid, D00153.
 - (a) Seal the reducer [10] and union [9] with plugs.

SUBTASK 22-11-25-420-004

- (5) Hold the autopilot aileron actuator A [1] or autopilot aileron actuator B [1] in its position for installation.
 - (a) Install the mounting bolts [20], mounting bolt [21], and washers [19].
 - 1) Make sure that the countersunk side of the washer [19] is against the head of the bolt.
- NOTE: The mounting bolt [21] shorter in length and it is only for autopilot aileron actuator A.

SUBTASK 22-11-25-200-004

- (6) Do these steps to examine the shear rivets on the lever assembly [17] or lever assembly [22]:
 - (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. (0.9525 mm) - 0.0395 in. (1.0033 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 [17] or lever assembly [22].
 - (d) If the pin does not move freely, replace the shear rivets.

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SUBTASK 22-11-25-420-005

- (7) Install the lever assembly [17] or lever assembly [22]:
- (a) Place the lever assembly [17] on the autopilot aileron actuator B [1] or lever assembly [22] 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.

SIA 001-003

- (c) Install the screw [16], washer [13], and nut [12] to attach the lever assembly [17] to autopilot aileron actuator B [1] or lever assembly [22] to autopilot aileron actuator A [1].

SIA 004-999

- (d) Install the bolt [16], washer [23], washer [13], and nut [12] to attach the lever assembly [17] to autopilot aileron actuator B [1] or lever assembly [22] to autopilot aileron actuator A [1].

SIA ALL

- (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 screw [16].

SUBTASK 22-11-25-420-006

- (8) Connect the hydraulic lines as follows:
- (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 22-11-25-420-007

- (9) Connect the electrical connector [18] for the autopilot aileron actuator A [1] or autopilot aileron actuator B [1].

SUBTASK 22-11-25-420-008

- (10) Connect the electrical connector [5] for the hydraulic pressure switch [4].

SUBTASK 22-11-25-860-043

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-25-860-044

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-25-790-001

- (13) Do a hydraulic leak check as follows:



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.

- (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] and autopilot aileron actuator B [1].
- (c) Make sure that there is no hydraulic leak.
- (d) Do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-25-860-014

- (14) Remove rig pin A/S 15 from rigging pin kit, SPL-1585.

SUBTASK 22-11-25-820-001

- (15) Do this task: Autopilot Aileron Actuator Adjustment, TASK 22-11-25-820-801.

H. Autopilot Aileron Actuator Installation Test

SUBTASK 22-11-25-740-001

- (1) Do this task: Autopilot Aileron Actuator Test, TASK 22-11-25-710-801.

————— **END OF TASK** —————

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AUTOPILOT AILERON ACTUATOR - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
- (1) Autopilot Aileron Actuator Adjustment.
 - (2) Autopilot Aileron Actuator Test.
- 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. **General**

- (1) This task is for the adjustment of the autopilot aileron actuator.
- (2) Two persons are necessary for this task.

B. **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)

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. **Prepare for the Adjustment**

SUBTASK 22-11-25-860-016

- (1) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-25-860-017

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

SUBTASK 22-11-25-860-018

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

SUBTASK 22-11-25-860-019

- (4) Set the aileron trim to 0 unit.

SUBTASK 22-11-25-860-020

- (5) Set the flaps to 1 degree.

SUBTASK 22-11-25-860-021

- (6) Set the speed brake handle to the down position.

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SUBTASK 22-11-25-420-010



WARNING

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

- (7) Make sure that the downlock pins are installed on the nose and main landing gear (TASK 32-00-01-480-801).

E. Autopilot Aileron Actuator Adjustment

SUBTASK 22-11-25-020-007

- (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 22-11-25-020-008

- (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 22-11-25-200-002

- (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.

SUBTASK 22-11-25-860-023



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.

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

SUBTASK 22-11-25-820-002

- (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 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

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- 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 ELEV RIG test, refer to "Do the Aileron Rigging Check" in (TASK 22-11-00-820-803).



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 22-11-25-820-003

- (6) Adjust the rod assembly [5] as follows:
- (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 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 22-11-25-820-004

- (7) Adjust the rod assembly [7] as follows:
- (a) Jiggle the captain's control wheel at the neutral position to make sure that the system is at center.
 - (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].

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- (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 [7] 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 of the rod assembly [7].
 - 1) Install lockwire (TASK 20-10-44-400-801).
- (e) Install the bolt [1], washer [2], washer [3], and nut [4] as follows:
 - 1) Make sure that the bolt 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 22-11-25-740-002

 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.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-25-860-024

- (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 22-11-25-860-025

- (2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-25-860-026

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-25-860-027

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

———— **END OF TASK** ————

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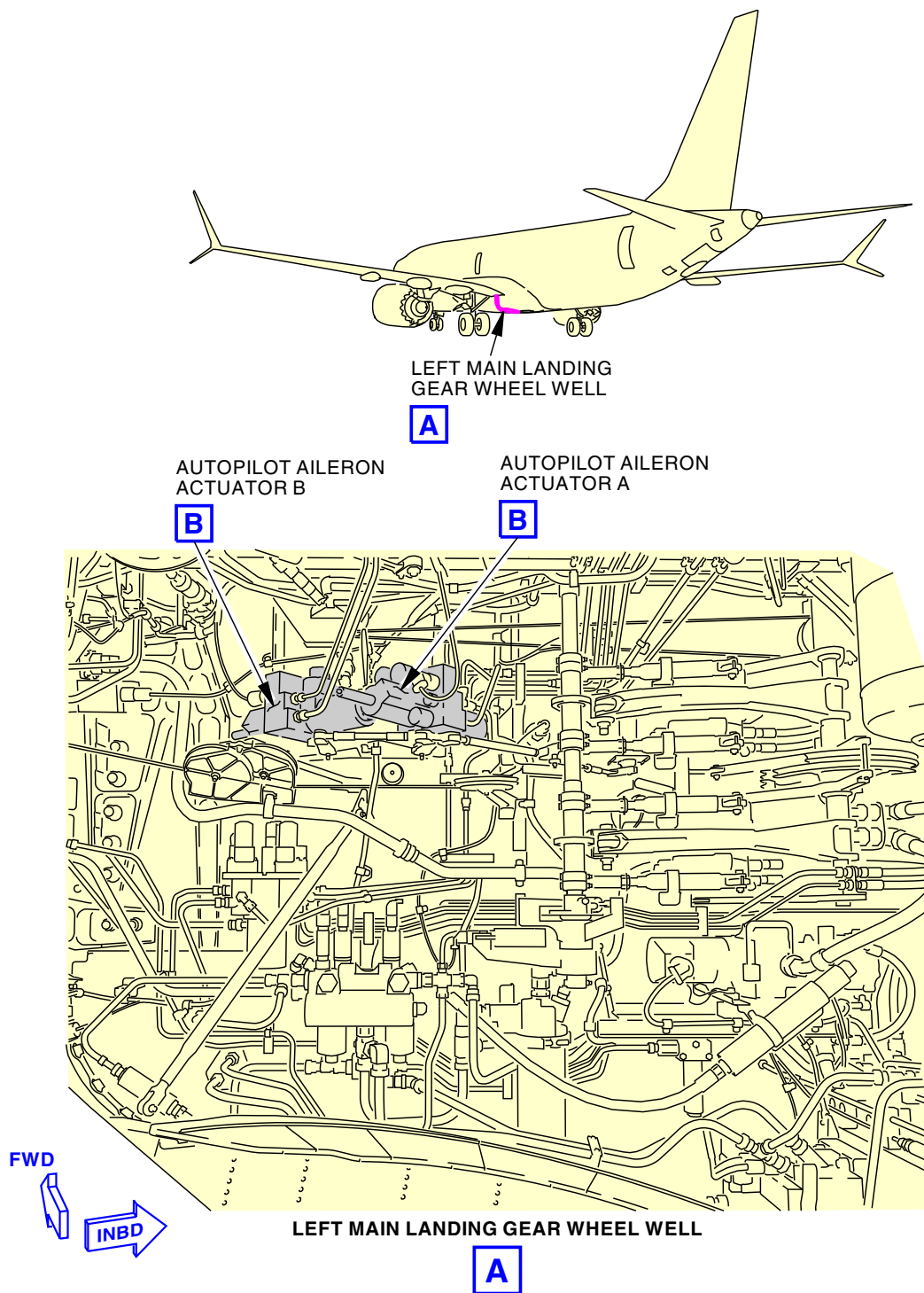
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Autopilot Aileron Actuator Adjustment
Figure 501/22-11-25-990-804 (Sheet 1 of 2)

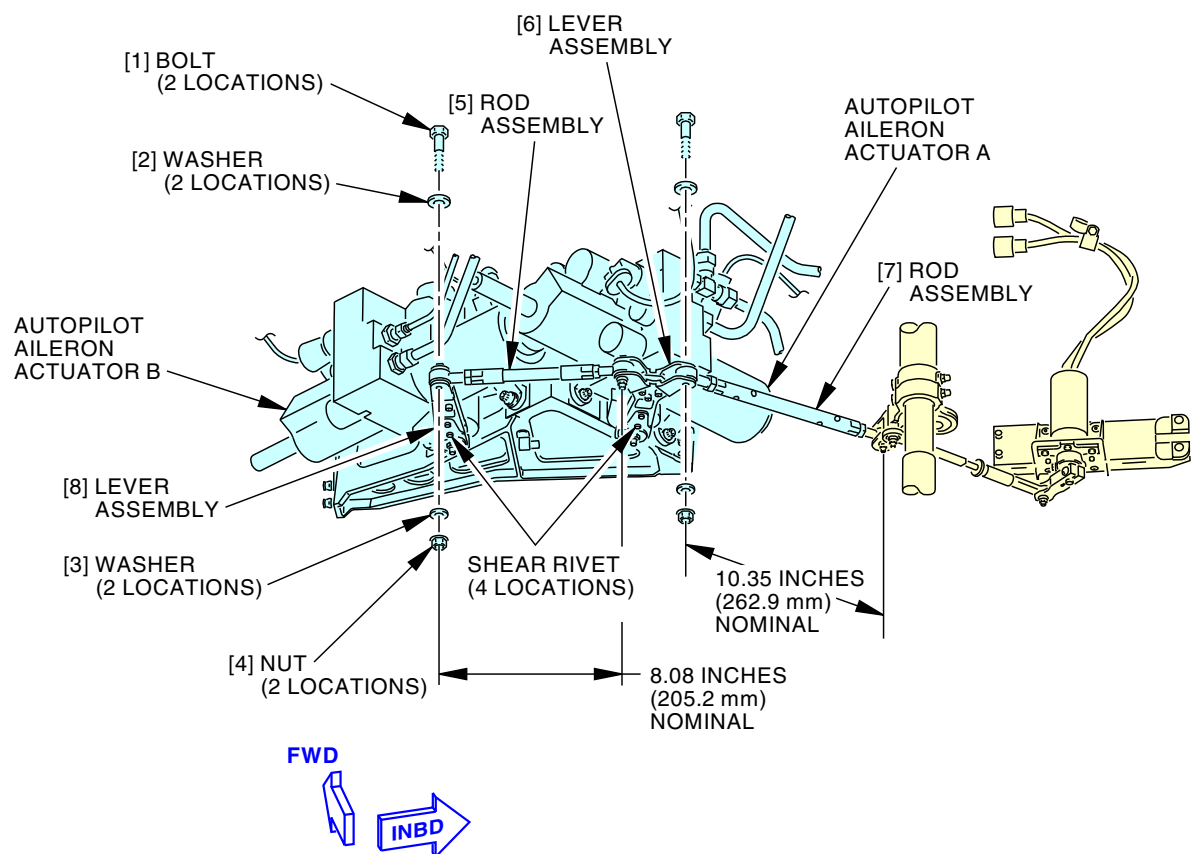
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AUTOPILOT AILERON ACTUATORS A AND B

B

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Autopilot Aileron Actuator Adjustment
Figure 501/22-11-25-990-804 (Sheet 2 of 2)

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TASK 22-11-25-710-801

3. Autopilot Aileron Actuator Test

A. General

- (1) This task is for the test of the autopilot aileron actuator.

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
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. Prepare for the Test

SUBTASK 22-11-25-860-030

- (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 22-11-25-860-031

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-25-860-032

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

SUBTASK 22-11-25-860-033

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

SUBTASK 22-11-25-860-034



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.

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

E. Autopilot Aileron Actuator Test

SUBTASK 22-11-25-740-003

- (1) Do this BITE test:
- (a) Push the INIT REF key on the Control Display Unit (CDU) keyboard.

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- (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: A/P aileron actuator A has interface with the Flight Control Computer A (Channel A). A/P aileron actuator B has interface with the Flight Control Computer 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 shown.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-25-860-035

- (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 22-11-25-860-036

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-25-860-037

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-25-860-038

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

———— **END OF TASK** ————

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AUTOPILOT AILERON ACTUATOR - INSPECTION/CHECK

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. Autopilot Aileron Actuator Linkage Inspection

SUBTASK 22-11-25-020-009

- (1) Remove the parts that are necessary for inspection.

SUBTASK 22-11-25-200-003

- (2) Examine the 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 shown in (Figure 601).
 - (c) Repair or replace the parts that are out of the tolerance.

SUBTASK 22-11-25-420-009

- (3) Install the parts.

———— **END OF TASK** ————

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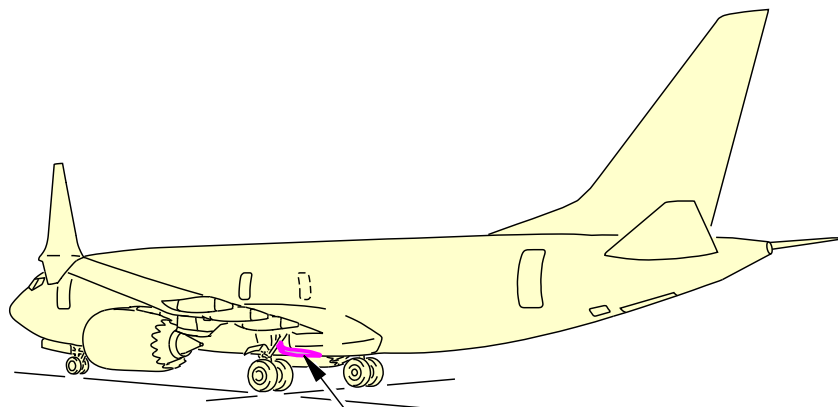
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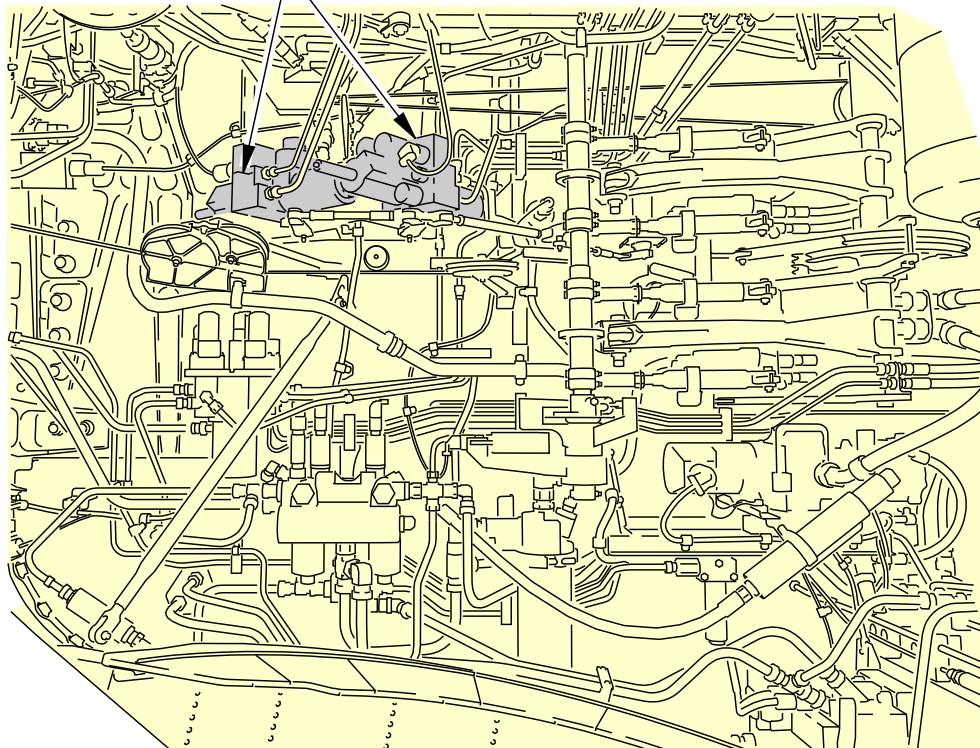
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LEFT MAIN LANDING
GEAR WELL WHEEL

A

B



FWD



LEFT MAIN LANDING GEAR WHEEL WELL

A

2411589 S00061528296_V1

Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 1 of 4)

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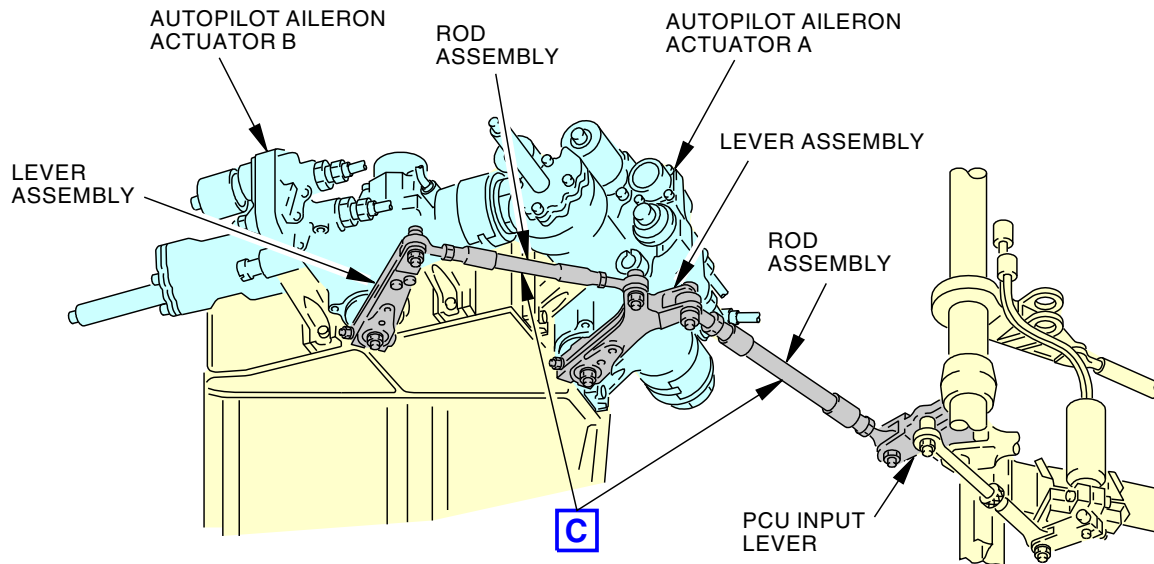
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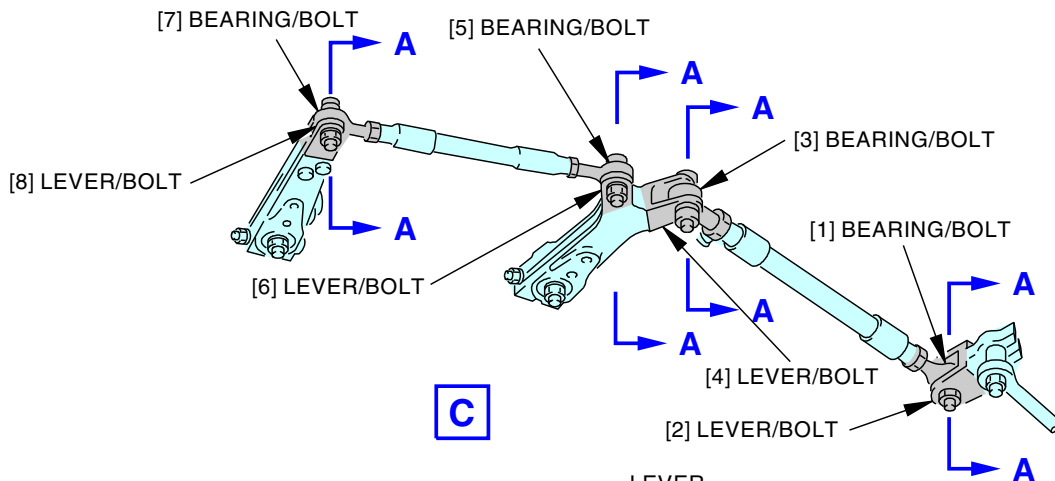
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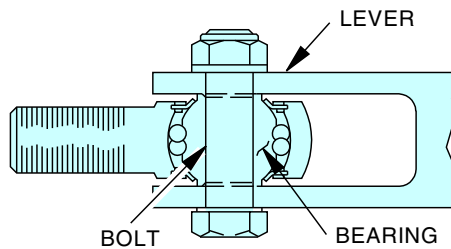


AUTOPILOT AILERON ACTUATORS A AND B

B



C



A-A

2411590 S00061528297_V1

Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 2 of 4)

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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)					
[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		

2411591 S00061528298_V1

**Autopilot Aileron Actuator Linkage Wear Limits
Figure 601/22-11-25-990-805 (Sheet 3 of 4)**

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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)**

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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 201 and Figure 202)

A. General

- (1) This task removes electrical power and hydraulic pressure from the autopilot elevator actuator.
- (2) The tryout in this task makes sure that the autopilot elevator actuator is in a zero energy state.

B. References

Reference	Title
27-31-00-800-802	Pressure from the Elevator Hydraulic Systems A and B 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. Autopilot Elevator Actuator - Deactivation

SUBTASK 22-11-26-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT
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

- (2) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal,
TASK 27-31-00-800-802

SUBTASK 22-11-26-860-002

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Autopilot Elevator Actuator - Tryout

SUBTASK 22-11-26-860-004

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-26-700-001

- (2) Use the FMC - CDU and do the test that follows (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 follows:
 - a) FCC-A SELF TEST FAIL

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- b) FCC-B SELF TEST FAIL
- c) 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** ————

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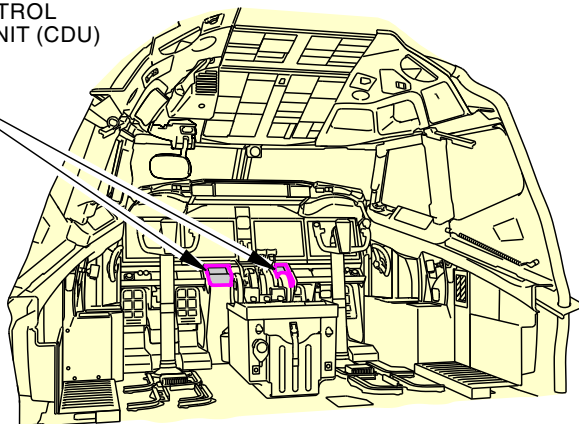
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



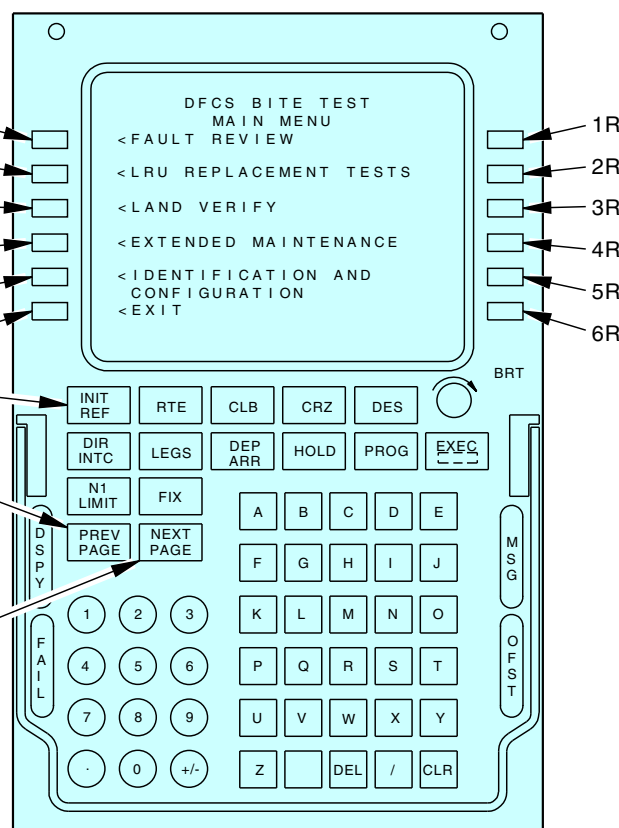
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

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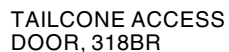
Flight Management Computer Control Display Unit
Figure 201/22-11-26-990-801

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A



TAILCONE ACCESS DOOR

A

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Autopilot Elevator Actuator Location
Figure 202/22-11-26-990-802

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TASK 22-11-26-440-801

3. Autopilot Elevator Actuator - Activation

(Figure 202)

A. General

(1) This task restores electrical 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 22-11-26-860-005

(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

SUBTASK 22-11-26-860-033

(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

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SUBTASK 22-11-26-410-001



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.

- (3) Do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

———— **END OF TASK** ————

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AUTOPILOT ELEVATOR ACTUATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of an autopilot elevator actuator [1].
 - (2) The installation of an autopilot elevator actuator [1].
- B. There are two autopilot elevator actuators [1]. 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. **General**

- (1) This task is for the removal of the autopilot elevator actuator.

B. **References**

Reference	Title
22-11-40-000-801	Hydraulic Pressure Switch Removal (P/B 401)
27-31-00-800-802	Pressure from the Elevator Hydraulic Systems A and B Removal (P/B 201)

C. **Location Zones**

Zone	Area
318	Tail Cone Compartment - Right
318	Tail Cone Compartment - Right

D. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

E. **Prepare for the Removal**

SUBTASK 22-11-26-860-006

- (1) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

SUBTASK 22-11-26-860-007

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-26-010-002

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

F. 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 washers [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].

SUBTASK 22-11-26-480-003

- (6) Install protective plugs on the hydraulic ports.

———— **END OF TASK** ————

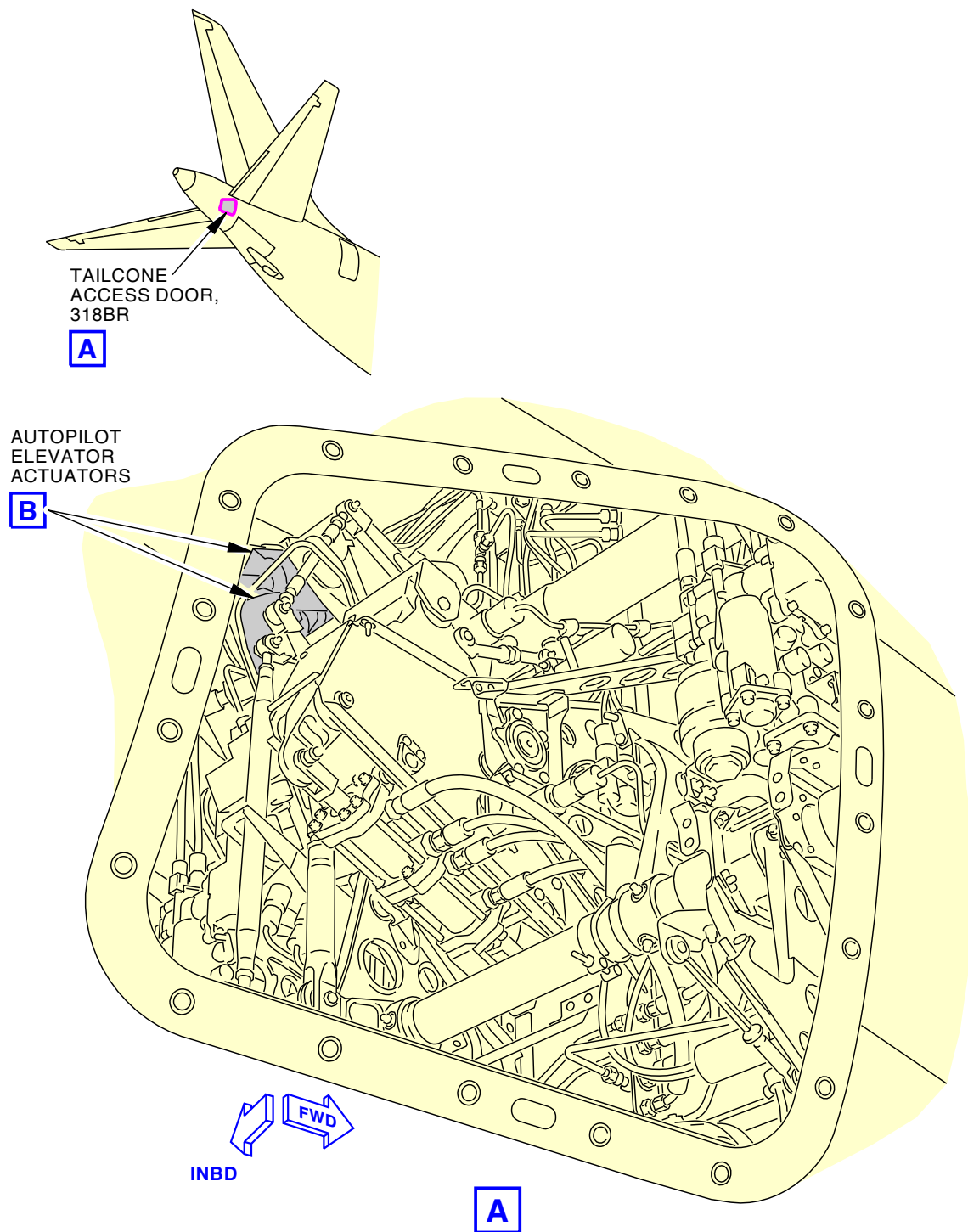
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Autopilot Elevator Actuator Installation
Figure 401/22-11-26-990-803 (Sheet 1 of 2)

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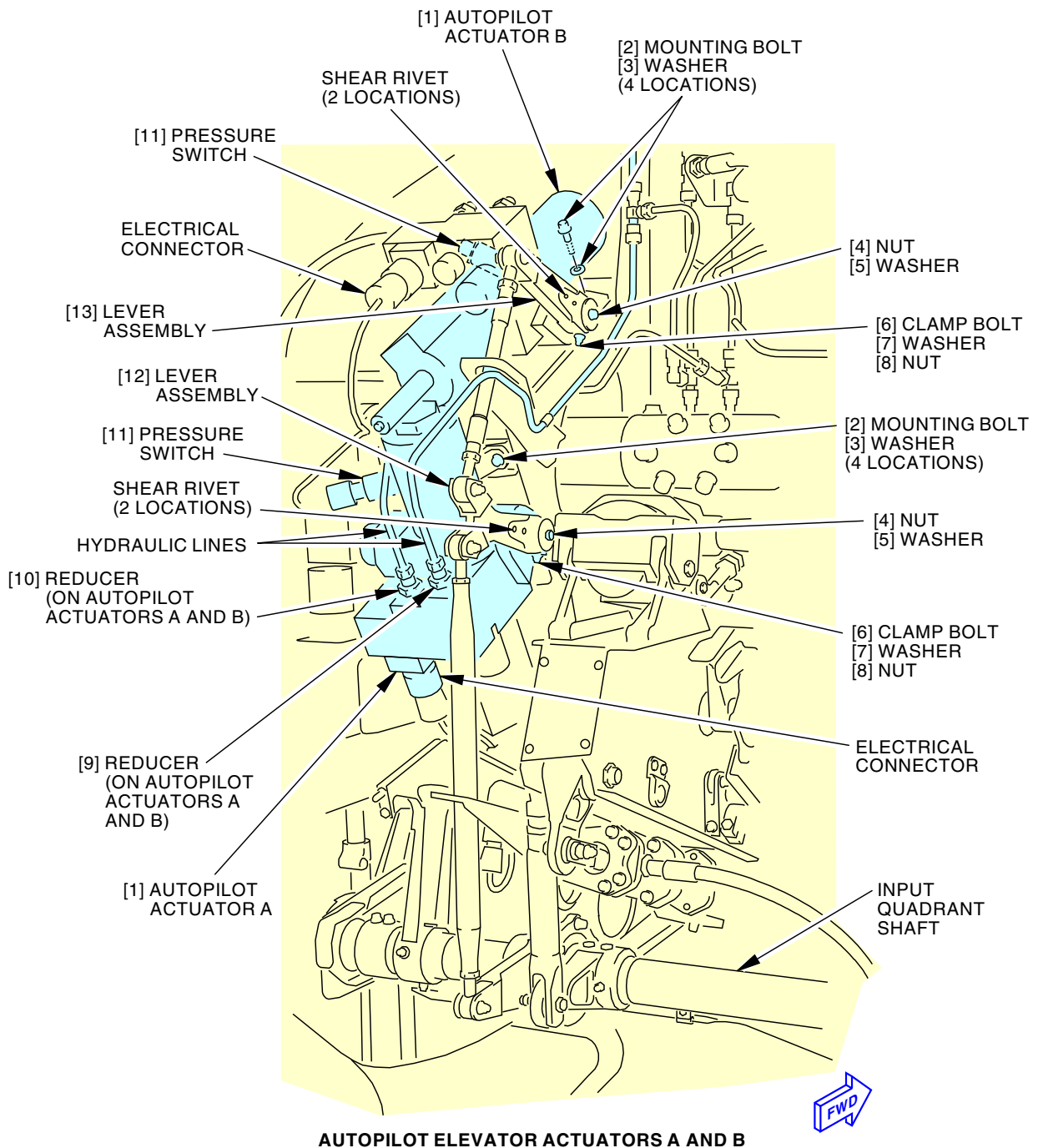
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AUTOPILOT ELEVATOR ACTUATORS A AND B

B

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Autopilot Elevator Actuator Installation
Figure 401/22-11-26-990-803 (Sheet 2 of 2)

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TASK 22-11-26-400-801

3. Autopilot Elevator Actuator - Installation

(Figure 401)

A. General

- (1) This task is for the installation of the autopilot elevator actuator.

B. 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	Pressure from the Elevator Hydraulic Systems A and B Removal (P/B 201)

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. 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. Autopilot Elevator Actuator Installation

SUBTASK 22-11-26-420-001

- (1) Lightly lubricate the new O-ring on the reducer [9] and reducer [10] with hydraulic fluid, D00153.

SUBTASK 22-11-26-080-001

- (2) Remove the protective plugs from the hydraulic ports.

SUBTASK 22-11-26-420-011

- (3) Install the reducer [9] and reducer [10] on the hydraulic ports on the autopilot elevator actuator [1].

SUBTASK 22-11-26-800-001

- (4) Fill the autopilot elevator actuator [1] with hydraulic fluid, D00153.

SUBTASK 22-11-26-480-004

- (5) Install protective plugs on the reducer [9] and reducer [10].

SUBTASK 22-11-26-420-002

- (6) Hold the autopilot elevator actuator [1] in its position for installation.

SUBTASK 22-11-26-420-012

- (7) Install the mounting bolts [2] and washers [3].
(a) Make sure that the countersunk side of the washers is against the head of the bolt.

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SUBTASK 22-11-26-200-001

- (8) 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:
 - 1) Insert a 0.0375 in. (0.9525 mm) - 0.0395 in. (1.0033 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

- (9) Install the lever assembly [13] or lever assembly [12] as follows:
- (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

- (10) Connect the hydraulic lines as follows:
- (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

- (11) Install the hydraulic pressure switch [11] (TASK 22-11-40-400-801).

SUBTASK 22-11-26-420-006

- (12) Connect the electrical connector for the autopilot elevator actuator [1].

SUBTASK 22-11-26-420-007

- (13) Connect the electrical connector for the hydraulic pressure switch [11].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-26-860-010

- (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

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(Continued)

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-26-860-034

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-26-790-001

- (3) Do a hydraulic leak check as follows:



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].
- (c) Make sure that there is no hydraulic leak.
- (d) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

SUBTASK 22-11-26-410-002

- (4) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

H. Autopilot Elevator Actuator Installation Test

SUBTASK 22-11-26-820-001

- (1) Do this task: Autopilot Elevator Actuator Adjustment and Test, TASK 22-11-26-820-801.

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SUBTASK 22-11-26-710-001

(2) Do this task: Autopilot Elevator Actuator Test, TASK 22-11-26-710-801.

———— **END OF TASK** ————

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AUTOPILOT ELEVATOR ACTUATOR - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
- (1) Autopilot Elevator Actuator Adjustment and Test.
 - (2) Autopilot Elevator Actuator Test.
- B. 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. General

- (1) This task is for the adjustment and test of the autopilot elevator actuator.
- (2) Two persons are necessary for this task.

B. 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)
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	Assembly - Trammel Bar, 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
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

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F. Prepare for the Adjustment

SUBTASK 22-11-26-860-012

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-010-003

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-26-010-004

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-26-980-001

- (4) Do these steps to set the dimension B of the stabilizer trim jackscrew setting:

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).



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 bar, SPL-1677, to measure the B dimension.

- 1) Make sure that the B dimension is 39.17 ± 0.01 in. (994.92 ± 0.26 mm).

SUBTASK 22-11-26-860-013

- (5) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-26-860-014

- (6) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-26-860-015

- (7) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

G. Autopilot Elevator Actuator Adjustment and Test

SUBTASK 22-11-26-010-005

- (1) Remove the bolt [2], washer [3], washer [4], and nut [5].

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SUBTASK 22-11-26-020-006

- (2) Disconnect the end of the rod assembly [8] which connects to the autopilot elevator actuator B lever assembly [1].

SUBTASK 22-11-26-010-006

- (3) Remove the bolt [2], washer [3], washer [4], and nut [5].

SUBTASK 22-11-26-020-007

- (4) Disconnect the end of the rod assembly [6] which connects to the autopilot elevator actuator A lever assembly [7].

SUBTASK 22-11-26-200-004

- (5) Do these steps to examine the shear rivets on the lever assembly [1] and lever assembly [7]:
 - (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. (0.9525 mm) - 0.0395 in. (1.0033 mm) diameter pin in the inspection hole in each rivet.
 - (c) Make sure 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.

SUBTASK 22-11-26-860-016



KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THEAILERONS, 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 (TASK 29-11-00-860-801).

SUBTASK 22-11-26-820-002

- (7) 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

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- 8) Do the instructions that show on the CDU display until test 51.06.

NOTE: Use the 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.



CAUTION

DO NOT PUSH THE LSK THAT IS ADJACENT TO THE ROD ADJUSTMENTS. IF YOU PUSH THE ROD ADJUSTMENTS, IT 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 DURING THE ADJUSTMENT. THE FLIGHT CONTROL MECHANISMS AND FLIGHT CONTROL SURFACES WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (8) 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] as follows:

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] as necessary.

NOTE: The nominal length of the rod assembly is 9.43 in. (239.52 mm).

- (b) Tighten the locknut on the rod end (TASK 20-10-44-400-801).
(c) Install the bolt [2], washer [4], washer [3], 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 DURING THE ADJUSTMENT. THE FLIGHT CONTROL MECHANISMS AND FLIGHT CONTROL SURFACES WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (9) Adjust the rod assembly [6] as follows:

- (a) Jiggle the aft quadrant.
- (b) Make sure that the trailing edge of the right elevator aligns with the index mark on the tail cone within ± 0.06 in. (1.52 mm).
- (c) 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.

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- (d) Make sure that the elevator A/P actuator LVDT voltage is -2.00 (± 0.05) VAC.
- (e) Make sure that you can see the threads of the rod end through the inspection hole at the end of the rod assembly [6].
- (f) Adjust the rod assembly if it is necessary.
NOTE: The nominal length of the rod assembly is 17.52 in. (445.01 mm).
- (g) Tighten the locknut on the rod end (TASK 20-10-44-400-801).
- (h) Install the bolt [2], washer [3], washer [4], and nut [5].

NOTE: The bolt must go smoothly through the rod end and the lever assembly.

SUBTASK 22-11-26-740-001



KEEP PERSONS AND EQUIPMENT AWAY FROM THE A/P ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES. THE PARTS CAN MOVE WHEN YOU PUSH THE LSK THAT IS ADJACENT TO THEM. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (10) Push the LSK that is adjacent to <CONTINUE (on the CDU display - Test 51.06) and do these steps:
 - (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.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-26-860-017

- (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 22-11-26-860-018

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-860-019

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-26-860-020

- (4) Remove hydraulic power from Hydraulic Systems A and B (TASK 29-11-00-860-805).

SUBTASK 22-11-26-410-003

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-26-410-004

- (6) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

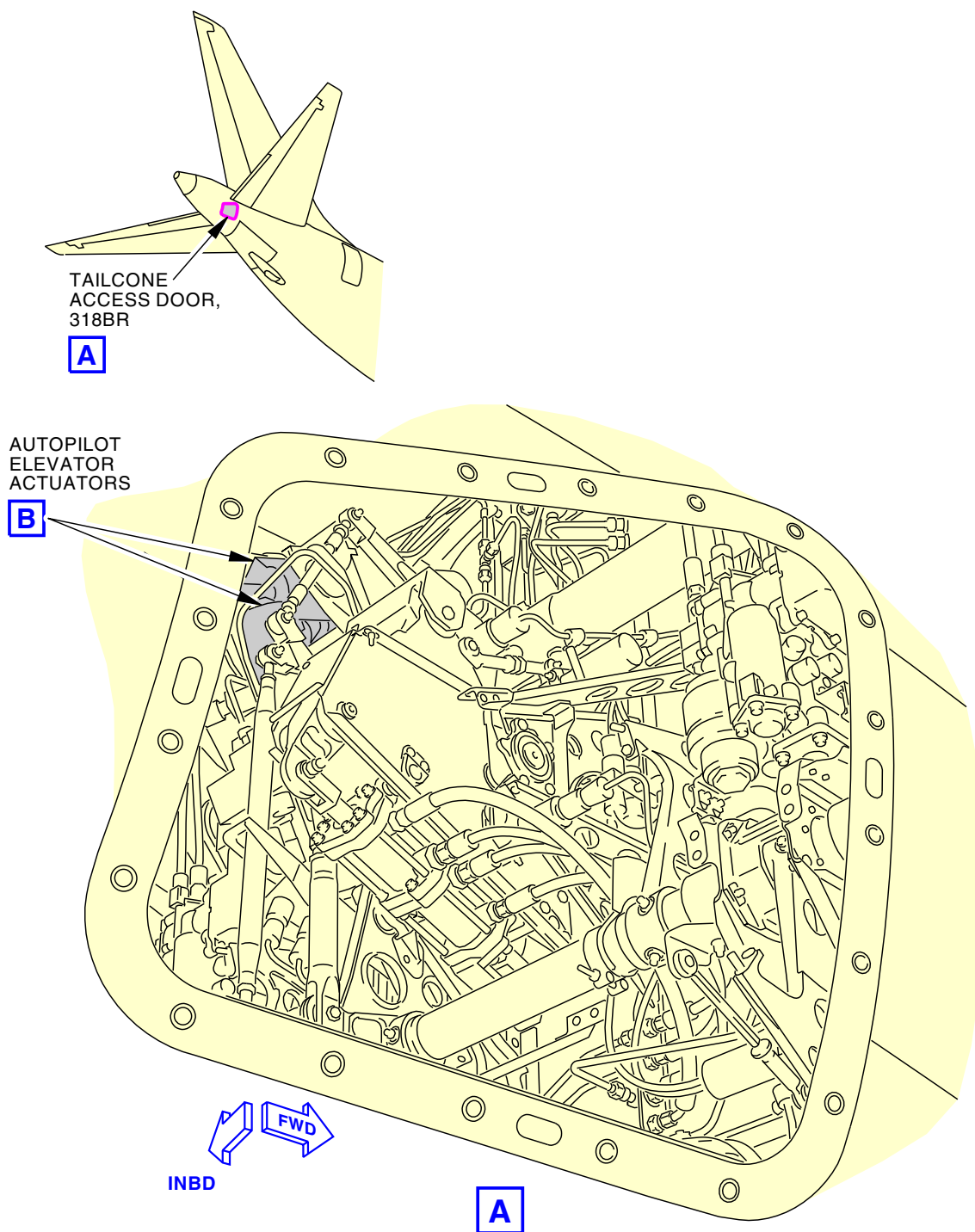
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Autopilot Elevator Actuator Adjustment
Figure 501/22-11-26-990-804 (Sheet 1 of 2)

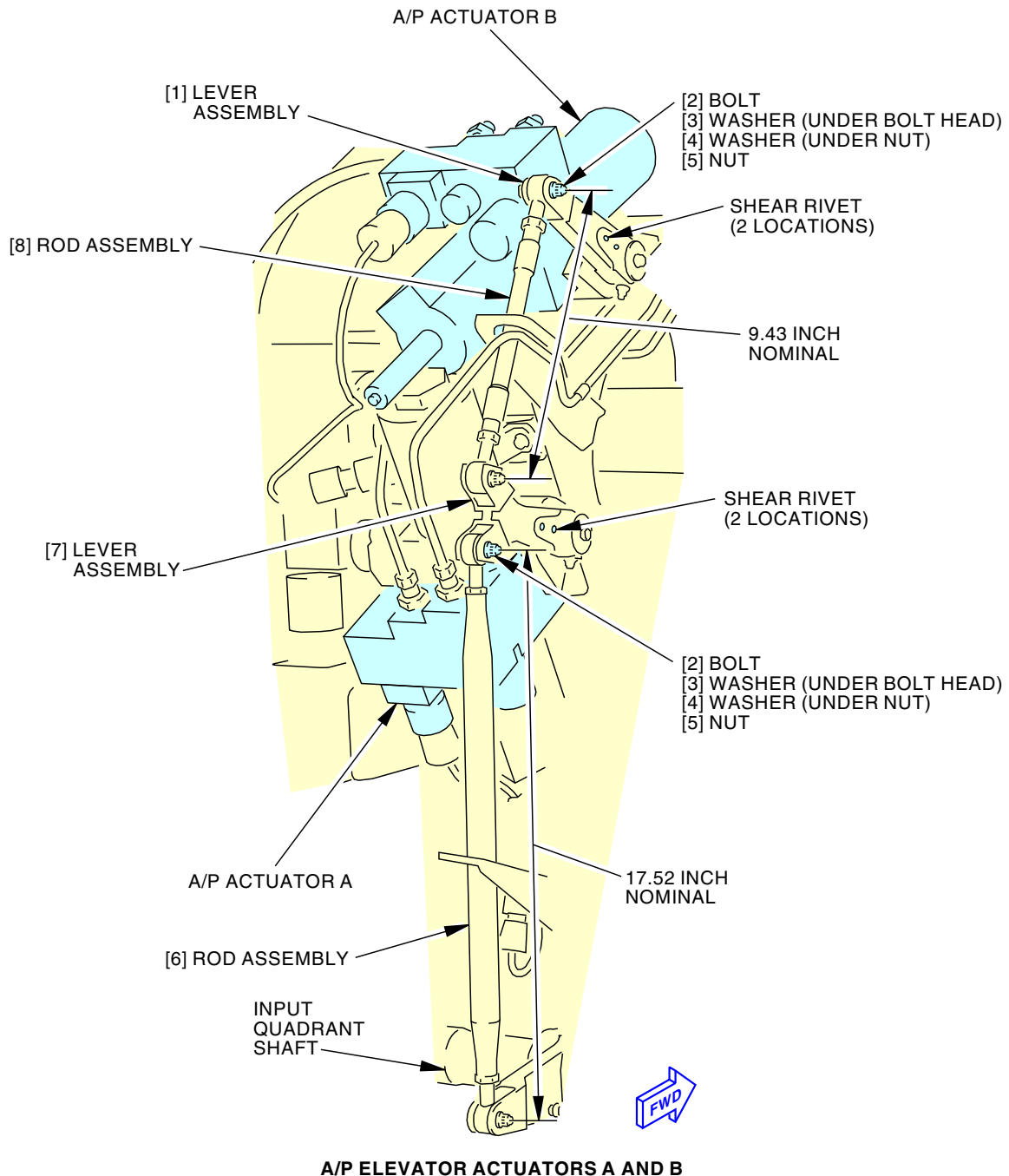
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A/P ELEVATOR ACTUATORS A AND B

B

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Autopilot Elevator Actuator Adjustment
Figure 501/22-11-26-990-804 (Sheet 2 of 2)

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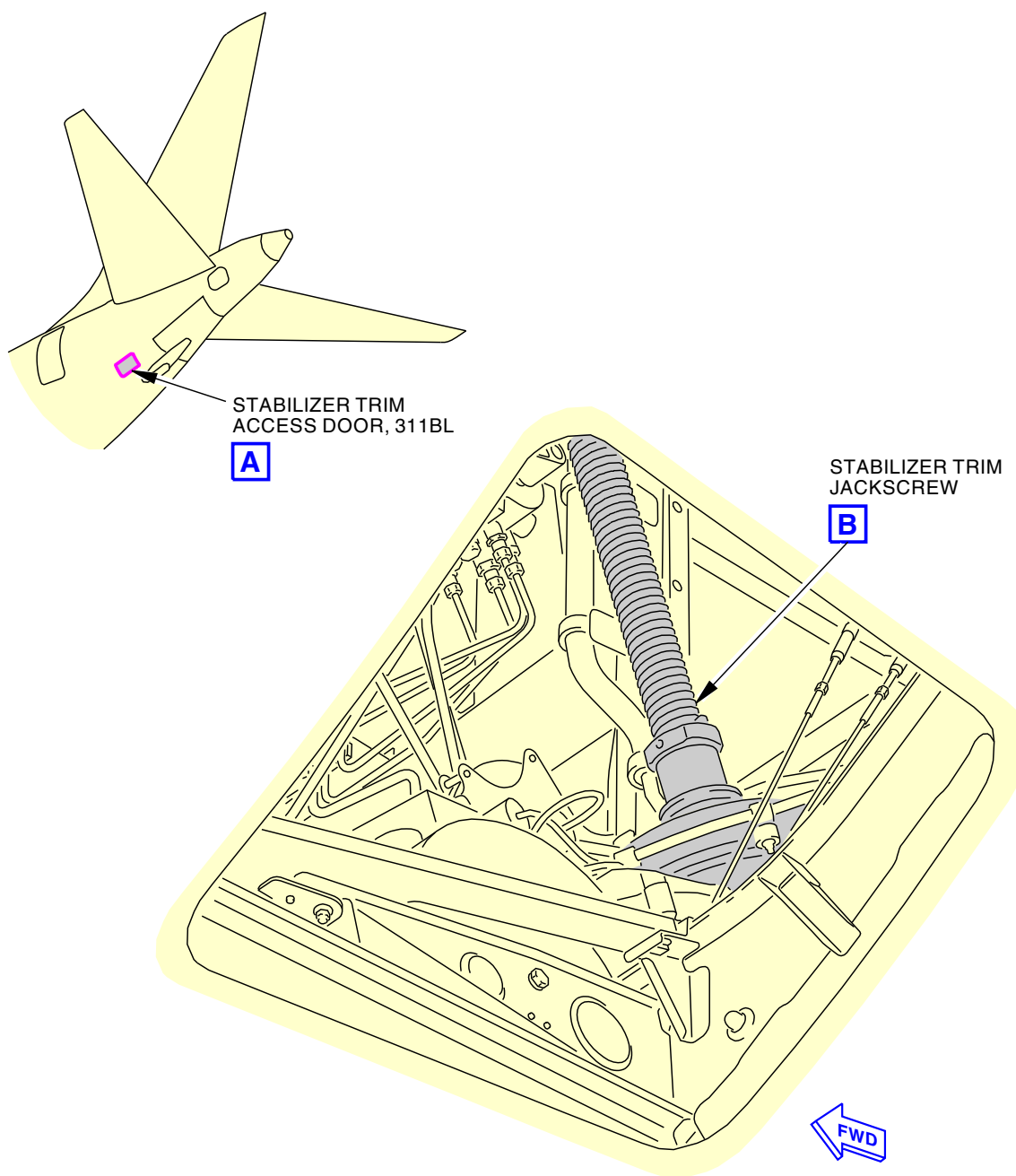
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VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER
TRIM ACCESS DOOR

A

2411598 S00061528314_V1

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-26-990-805 (Sheet 1 of 2)

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B

1 THE DIMENSION B IS MEASURED BETWEEN THE CENTER OF THE UPPER AND LOWER GIMBAL PINS.

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TASK 22-11-26-710-801

3. **Autopilot Elevator Actuator Test**

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the test of the autopilot elevator actuator.

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 22-11-26-860-023

- (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 22-11-26-860-024

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-26-860-025

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-26-860-026

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-26-860-027

 WARNING	KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THEAILERONS, 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 (TASK 29-11-00-860-801).

E. Autopilot Elevator Actuator Test

SUBTASK 22-11-26-740-002

- (1) Do this BITE test:
- (a) Push the INIT REF key on the CDU keyboard.

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- (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: 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 elevator actuator A has interface with the Flight Control Computer A (Channel A). A/P elevator actuator B has interface with the Flight Control Computer 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.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-26-860-028

- (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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-26-860-030

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-26-860-031

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

———— **END OF TASK** ————

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AUTOPILOT ELEVATOR ACTUATOR - INSPECTION/CHECK

TASK 22-11-26-200-801

1. Autopilot Elevator Actuator Linkage Inspection

(Figure 601)

A. General

- (1) This procedure is for an inspection of the worn areas of the autopilot elevator actuator linkage. To do this check, you must remove the autopilot elevator actuator linkage. Usually you use this procedure when you do the overhaul of the autopilot elevator actuator linkage. To get access to the components or to replace the components during the inspection, refer to (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. Procedure

SUBTASK 22-11-26-020-008

- (1) Remove the parts that are necessary for inspection.

SUBTASK 22-11-26-200-003

- (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 22-11-26-420-010

- (3) Install the parts.

———— **END OF TASK** ————

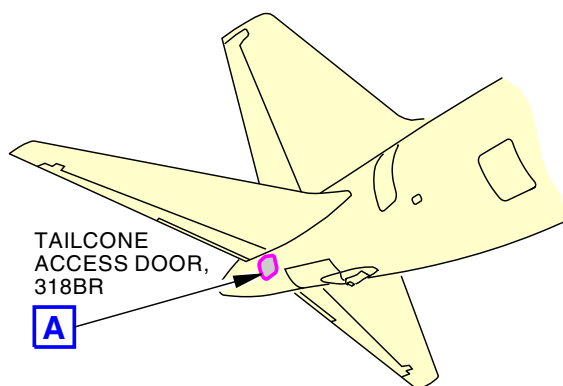
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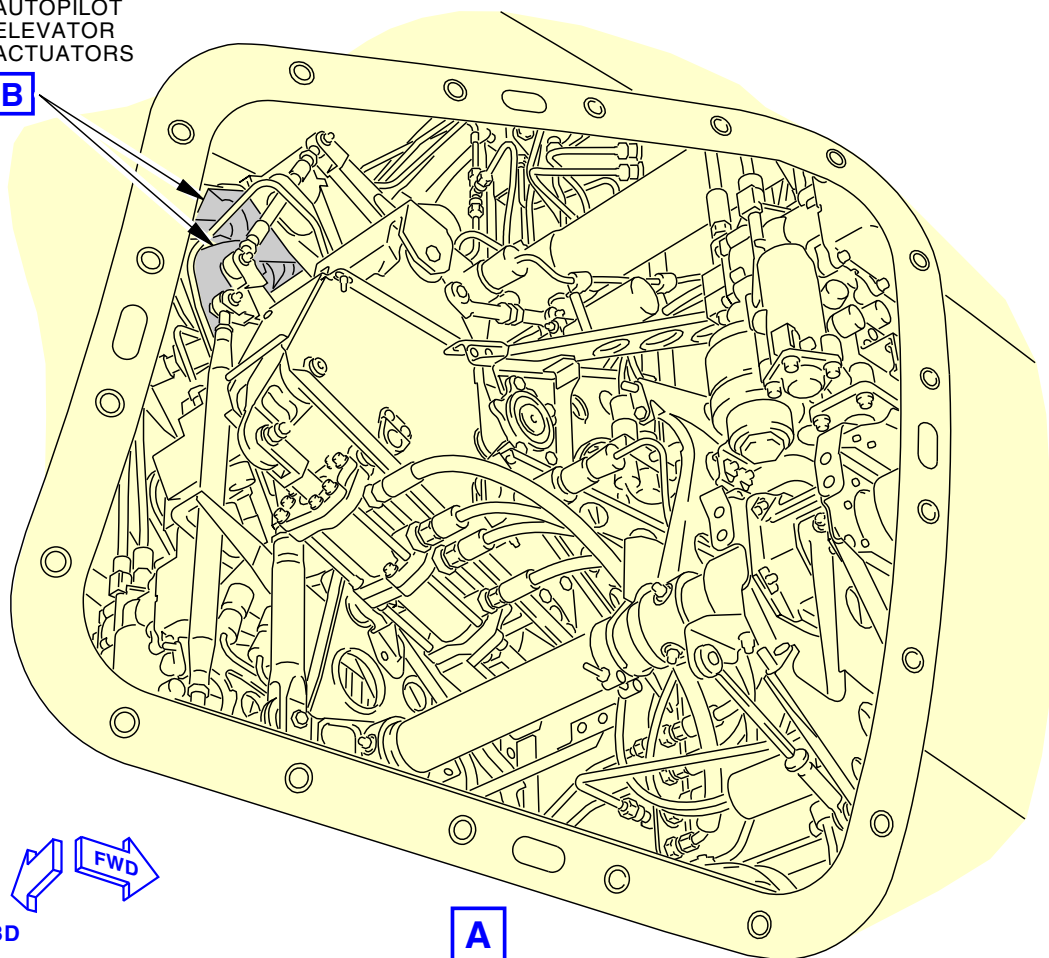
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AUTOPILOT
ELEVATOR
ACTUATORS

B



2411600 S00061528319_V1

Autopilot Elevator Actuator Linkage Wear Limits
Figure 601/22-11-26-990-806 (Sheet 1 of 5)

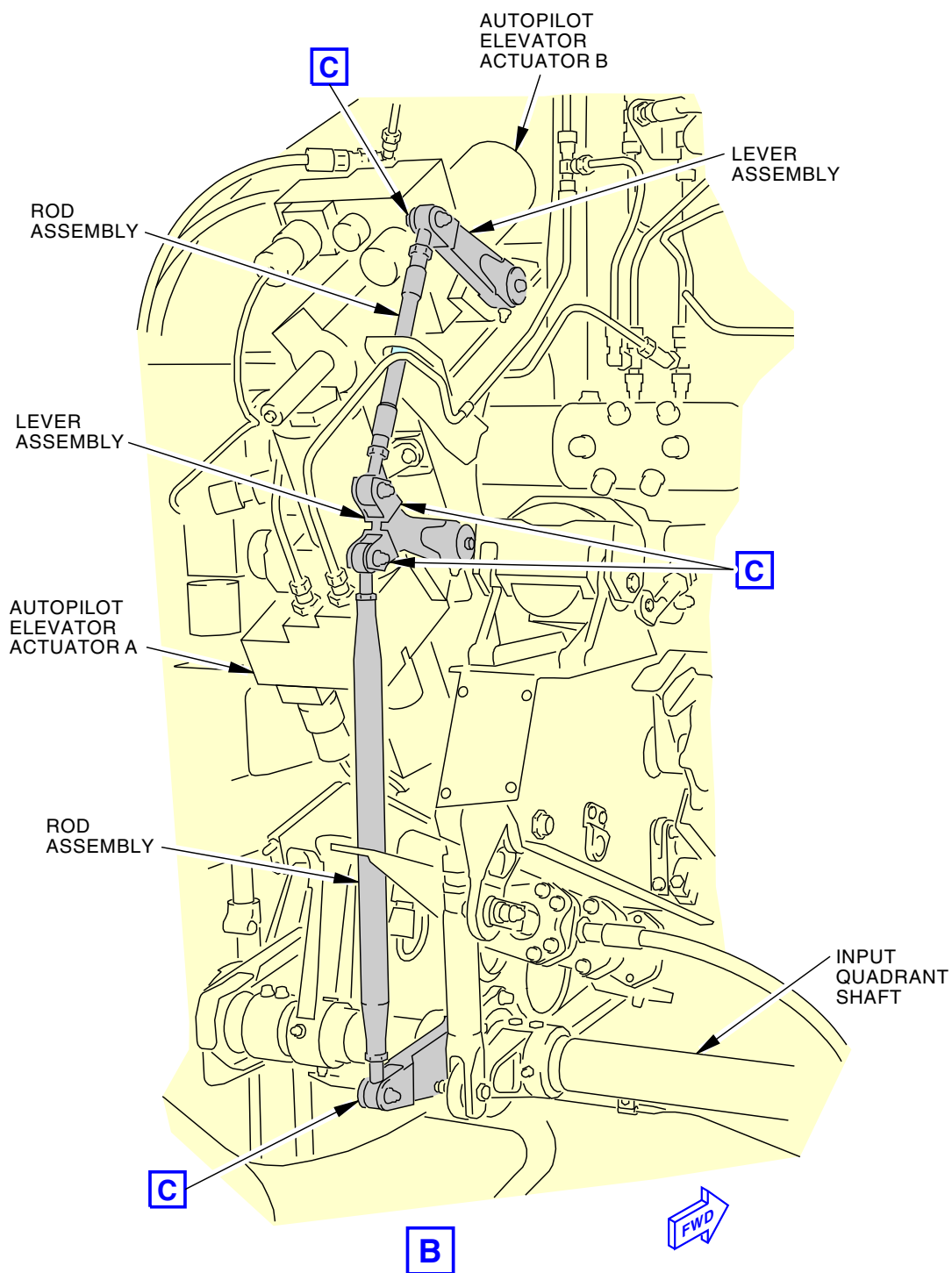
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Autopilot Elevator Actuator Linkage Wear Limits
Figure 601/22-11-26-990-806 (Sheet 2 of 5)

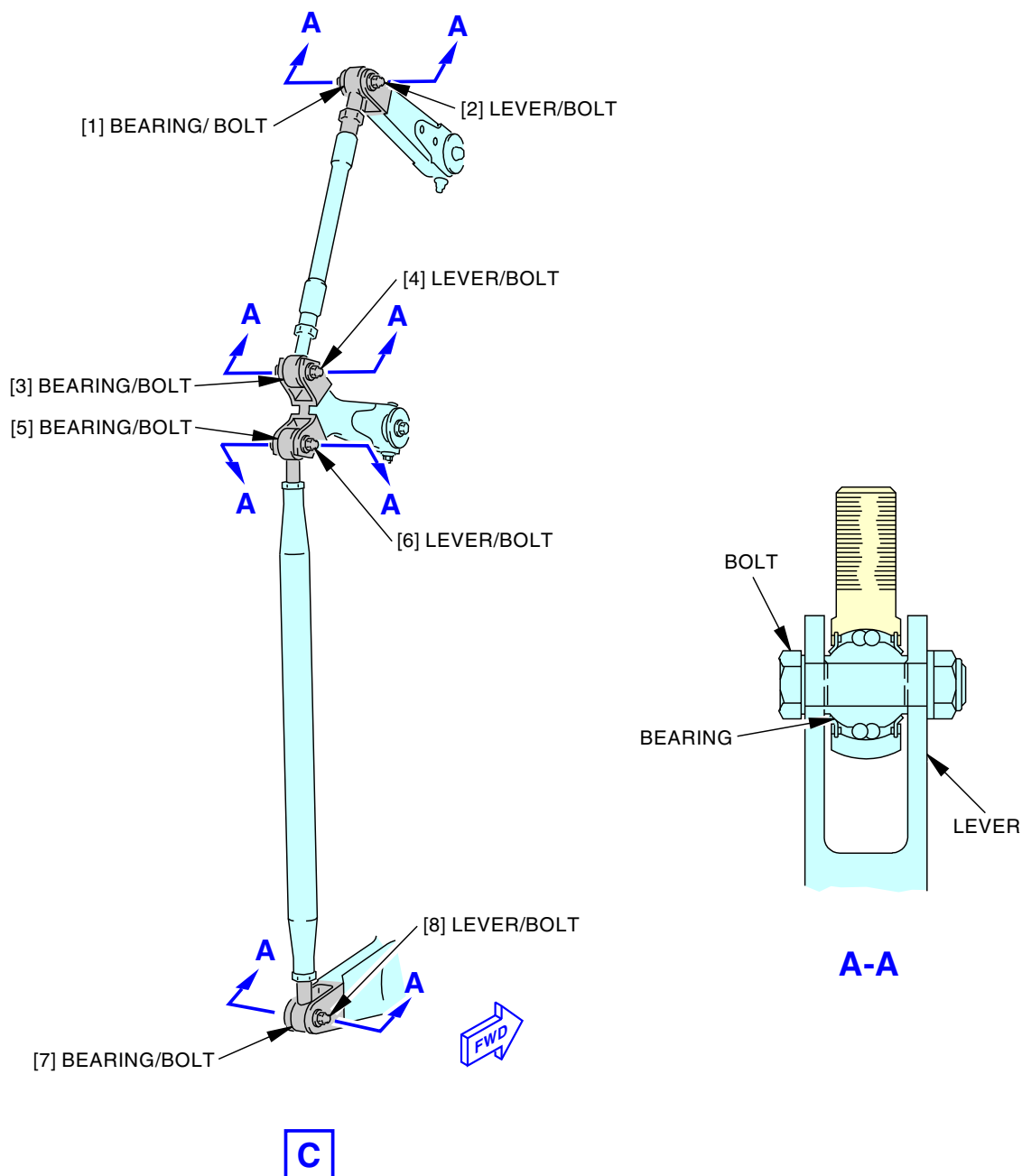
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Autopilot Elevator Actuator Linkage Wear Limits
Figure 601/22-11-26-990-806 (Sheet 3 of 5)

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INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PERMITTED WEAR DIMENSION INCH (mm)	MAXIMUM DIAMETER CLEARANCE INCH (mm)			
			MINIMUM INCH (mm)	MAXIMUM INCH (mm)					
[1]	BEARING	ID	0.2497 (6.34)	0.2500 (6.35)	0.2530 (6.43)	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)	0.0040 (0.10) 		X	
	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)	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)	0.0040 (0.10) 		X	
	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)	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)	0.0040 (0.10) 		X	
	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)	0.0035 (0.09) 	X		
	BOLT	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)		X		

2411603 S00061528322_V1

**Autopilot Elevator Actuator Linkage Wear Limits
Figure 601/22-11-26-990-806 (Sheet 4 of 5)**

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INDEX NO.	PART NAME	DIM.	DESIGN LIMITS		WEAR LIMITS		REPLACE WORN PART	REPAIR WORN PART	REPAIR INSTR
			DIAMETER		PERMITTED WEAR DIMENSION INCH (mm)	MAXIMUM DIAMETER CLEARANCE INCH (mm)			
			MINIMUM INCH (mm)	MAXIMUM INCH (mm)					
[8]	LEVER	ID	0.250 (6.35)	0.251 (6.38)	0.255 (6.48)	0.005 (0.13)		X	
	Bolt	OD	0.2485 (6.31)	0.2495 (6.34)	0.2481 (6.3)			X	

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.

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.

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).

2411604 S00061528323_V1

Autopilot Elevator Actuator Linkage Wear Limits
Figure 601/22-11-26-990-806 (Sheet 5 of 5)

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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 task removes electrical power and hydraulic pressure to Aileron Position Sensor.
- (2) The tryout in this task makes sure that the aileron position sensor is in a zero energy state.

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. **Aileron Position Sensor Deactivation**

SUBTASK 22-11-29-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-29-860-002



MAKE SURE THAT THE GROUND LOCKS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, 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 22-11-29-860-003

- (4) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Aileron Position Sensor Tryout

SUBTASK 22-11-29-860-005

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-29-700-001

- (2) Use the FMC - CDU and do the test that follows:
- (a) SELECT, INIT/REF on the keyboard.
 - (b) SELECT, "INDEX" (LSK 6L).
 - (c) SELECT, "MAINT" (LSK 6R).
 - (d) SELECT, "DFCS" (LSK 2L).

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- 1) DFCS will run the self test and display as follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** ————

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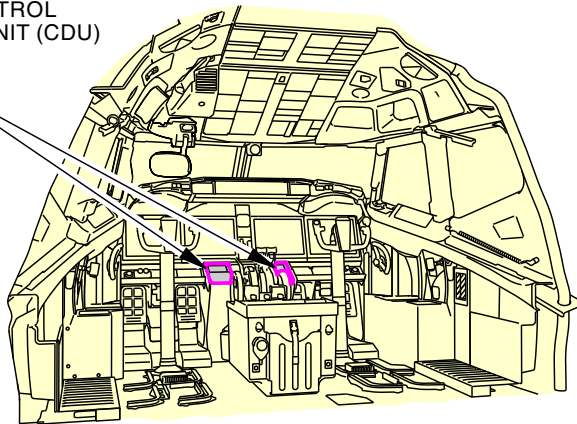
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



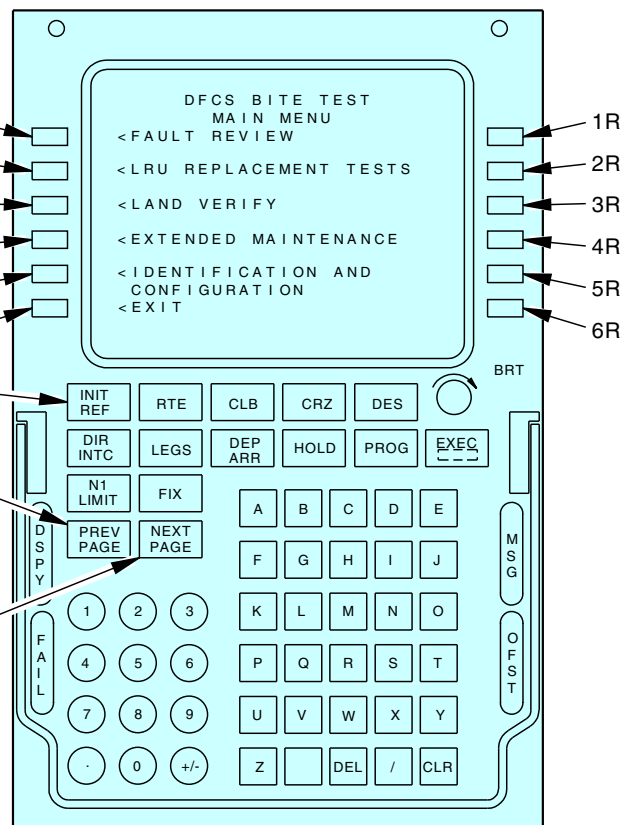
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

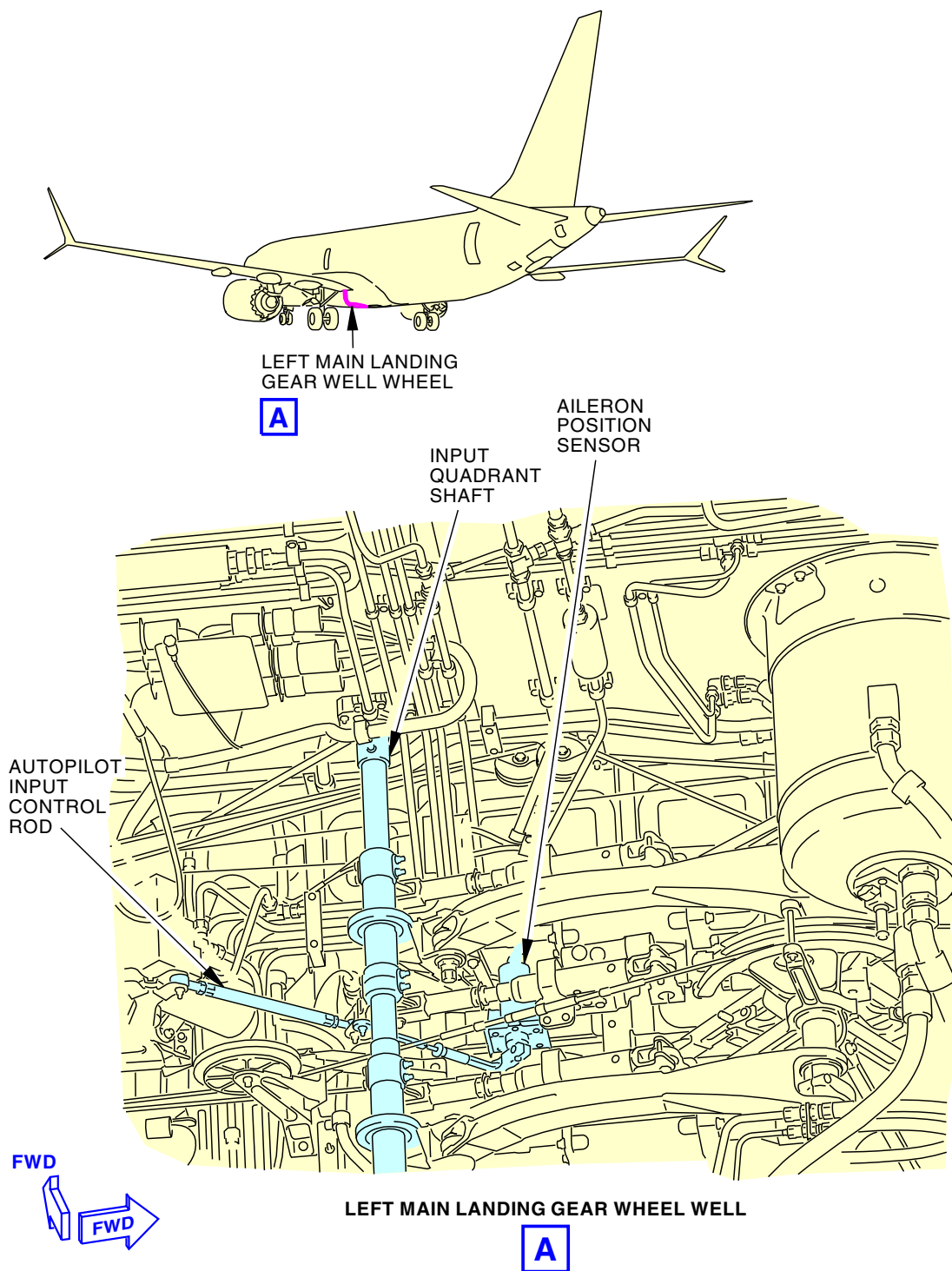
Flight Management Computer Control Display Unit
Figure 201/22-11-29-990-801

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Aileron Position Sensor
Figure 202/22-11-29-990-802

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TASK 22-11-29-440-801

3. **Aileron Position Sensor - Activation**

(Figure 202)

A. General

- (1) This task restores 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 22-11-29-860-006

- (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 22-11-29-860-039

- (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

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SUBTASK 22-11-29-410-001



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.

- (3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

———— **END OF TASK** ————

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AILERON POSITION SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of the aileron position sensor [11].
 - (2) The installation of the aileron position sensor [11].
- 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. General

- (1) This task is for the removal of the aileron position sensor.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

D. Prepare for the Removal

SUBTASK 22-11-29-860-007

- (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

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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.

- (2) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

E. Aileron Position Sensor Removal

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** ————

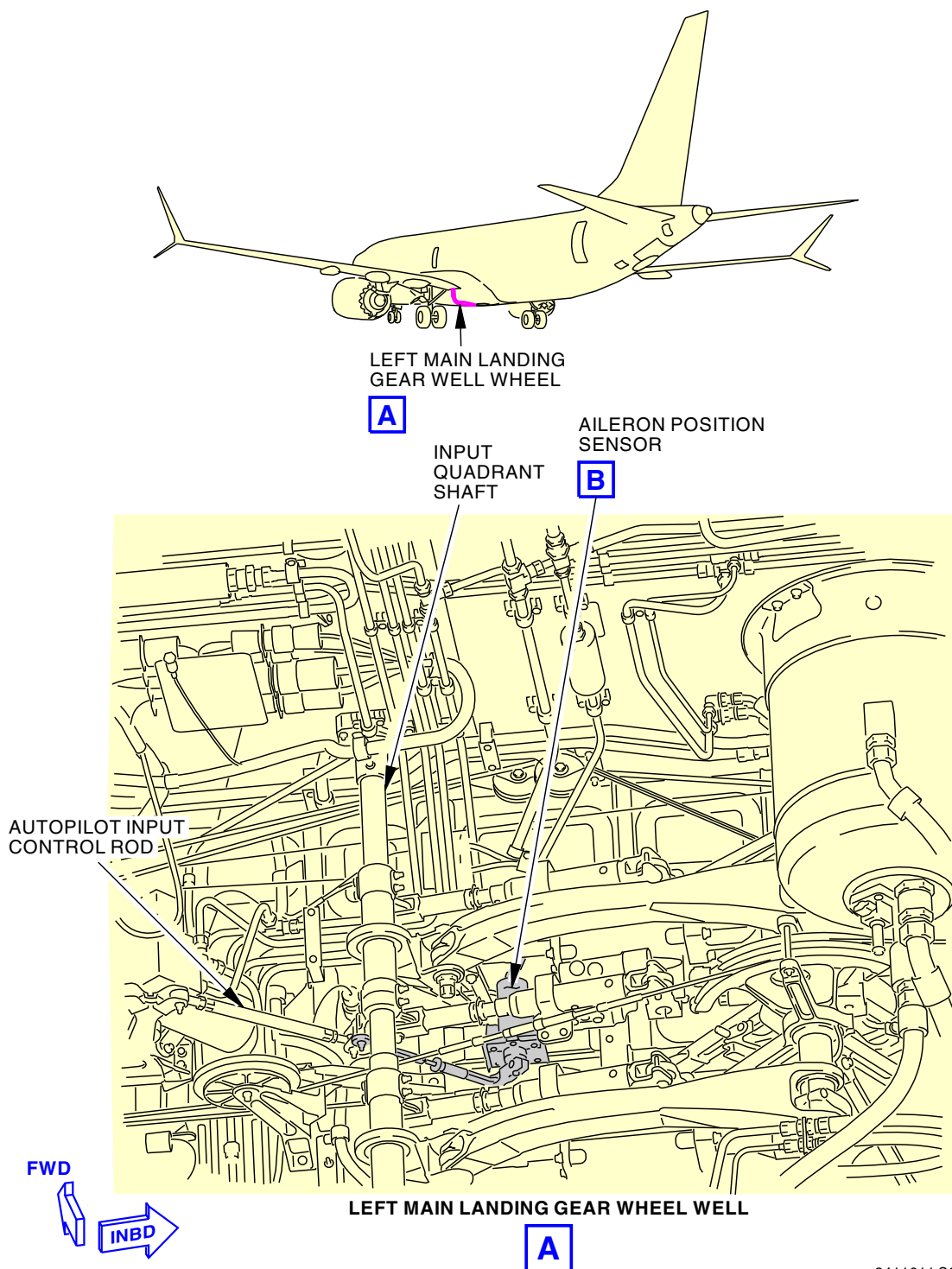
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2411611 S00061528346_V1

Aileron Position Sensor Installation
Figure 401/22-11-29-990-803 (Sheet 1 of 2)

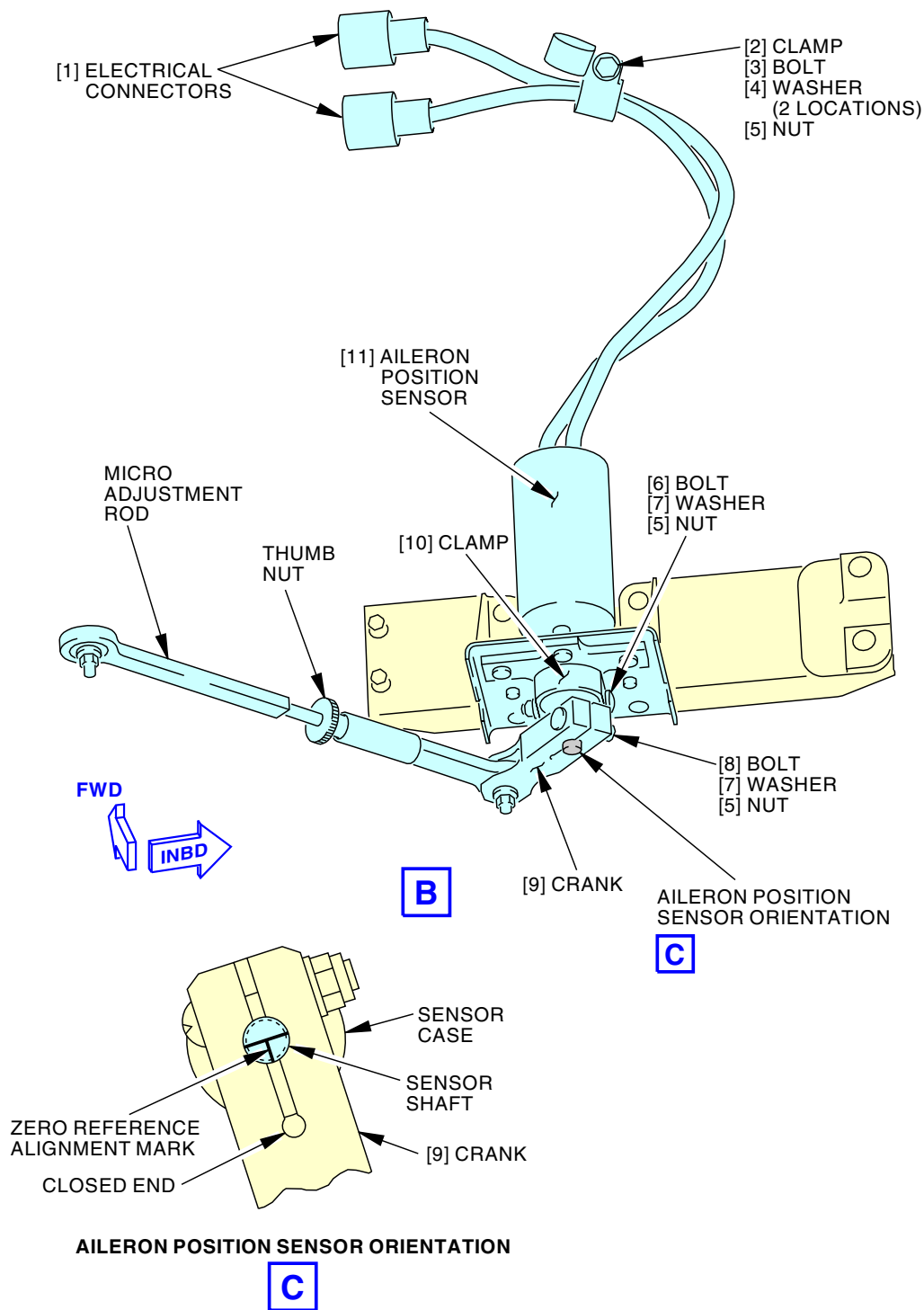
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Aileron Position Sensor Installation
Figure 401/22-11-29-990-803 (Sheet 2 of 2)

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TASK 22-11-29-400-801

3. **Aileron Position Sensor Installation**

(Figure 401)

A. General

- (1) This task is for the installation of the aileron position sensor.

B. 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)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
11	Aileron position sensor	22-11-29-01-155	SIA ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left

E. Aileron Position Sensor Installation

SUBTASK 22-11-29-820-004

- (1) Set the aileron trim to 0 unit.

SUBTASK 22-11-29-820-001

- (2) Align the reference mark on the sensor case with the reference mark on the sensor shaft.

SUBTASK 22-11-29-420-001

- (3) 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] as shown in 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

- (4) Install the clamp [2] with the bolt [3], washers [4], and nut [5].

SUBTASK 22-11-29-420-003

- (5) Connect the electrical connectors [1].

SUBTASK 22-11-29-820-002

- (6) Do this task: Aileron Position Sensor Adjustment, TASK 22-11-29-820-801.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-29-860-012

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-29-860-038

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

G. Aileron Position Sensor Installation Test

SUBTASK 22-11-29-740-001

- (1) Do this task: Aileron Position Sensor Test, TASK 22-11-29-710-801.

————— **END OF TASK** —————

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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. **General**

- (1) This task is for the adjustment of the aileron position sensor.
- (2) Two persons are necessary for this task.

B. **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)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. **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. **Prepare for the Adjustment**

SUBTASK 22-11-29-860-014

- (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 22-11-29-860-015

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOFF position.

SUBTASK 22-11-29-860-016

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-29-860-017

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

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SUBTASK 22-11-29-860-018



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.

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

SUBTASK 22-11-29-860-019

- (6) Set the aileron trim to 0 unit.

SUBTASK 22-11-29-860-020

- (7) Set the speed brake handle to the down position.

SUBTASK 22-11-29-860-021



MAKE SURE THAT YOU INSTALL THE DOWNLOCK PINS IN THE MAIN LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE MAIN LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Make sure that the landing gear downlock pins are installed.
- (a) If it is necessary, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

E. Aileron Position Sensor Adjustment

SUBTASK 22-11-29-820-003

- (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.

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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 as follows:
- 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].
 - Turn the aileron position sensor slowly in the clockwise and counter-clockwise directions until you get a value less than 0.06 VAC.
 - Tighten the bolt [1] on the clamp to 35 in-lb (4 N·m).
 - Remove the lockwire on the thumb nut on the micro-adjustment rod (TASK 20-10-44-000-801).
 - Turn the thumb nut on the micro-adjustment rod until you get a smallest value less than 0.03 VAC.
 - Install the lockwire on the thumb nut on the micro-adjustment rod (TASK 20-10-44-400-801).



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.

- Push the LSK that is adjacent to <CONTINUE on the CDU display - Test 52.01.
- Do the instructions that show on the CDU display to complete the AIL RIG test.
- Make sure that the values for the A side and B side are between the limits that show on the CDU display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-29-860-022

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

SUBTASK 22-11-29-860-023

- Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-024

- Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-29-860-025

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

————— **END OF TASK** —————

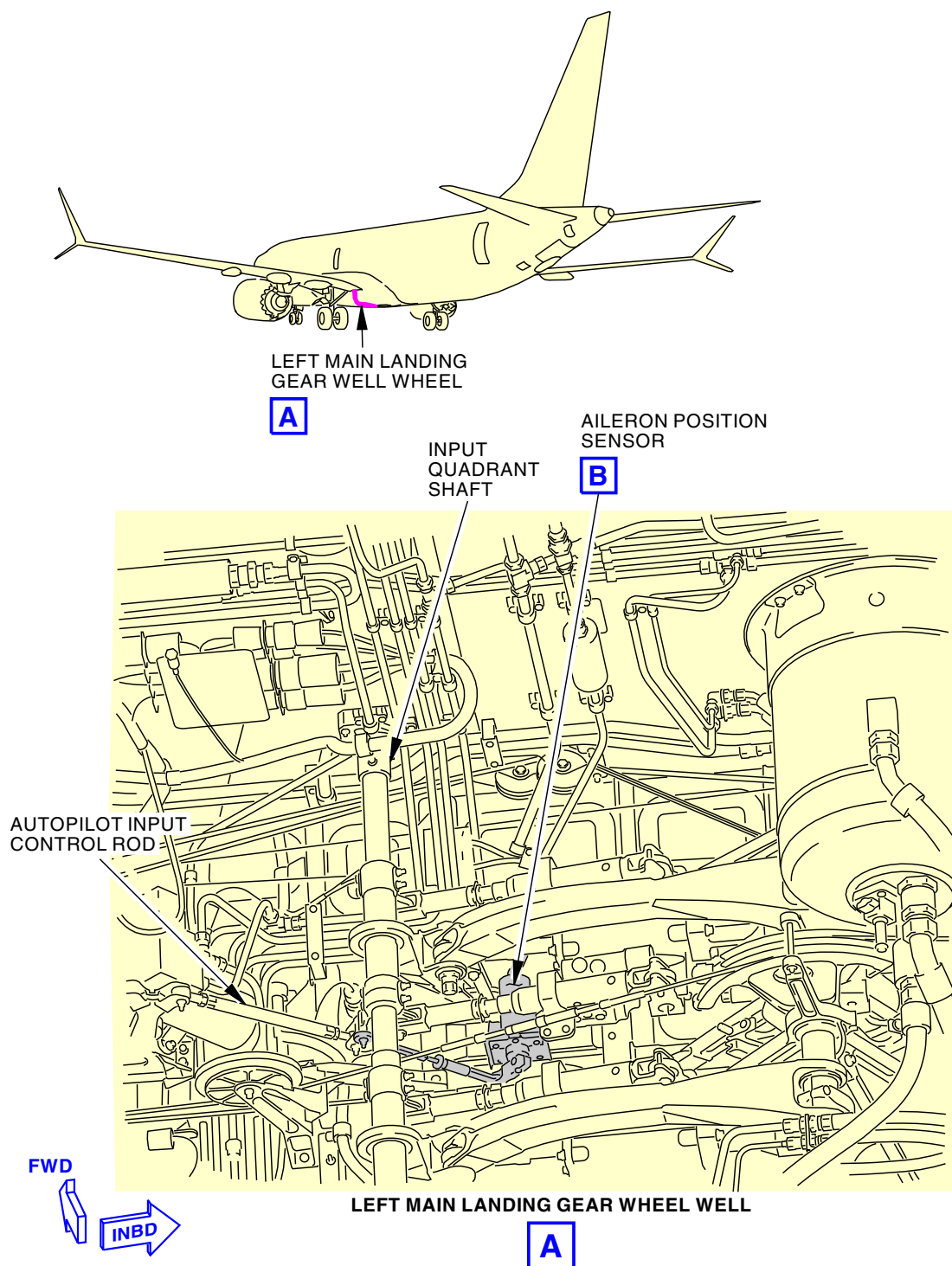
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2411613 S00061528351_V1

Aileron Position Sensor Adjustment
Figure 501/22-11-29-990-804 (Sheet 1 of 2)

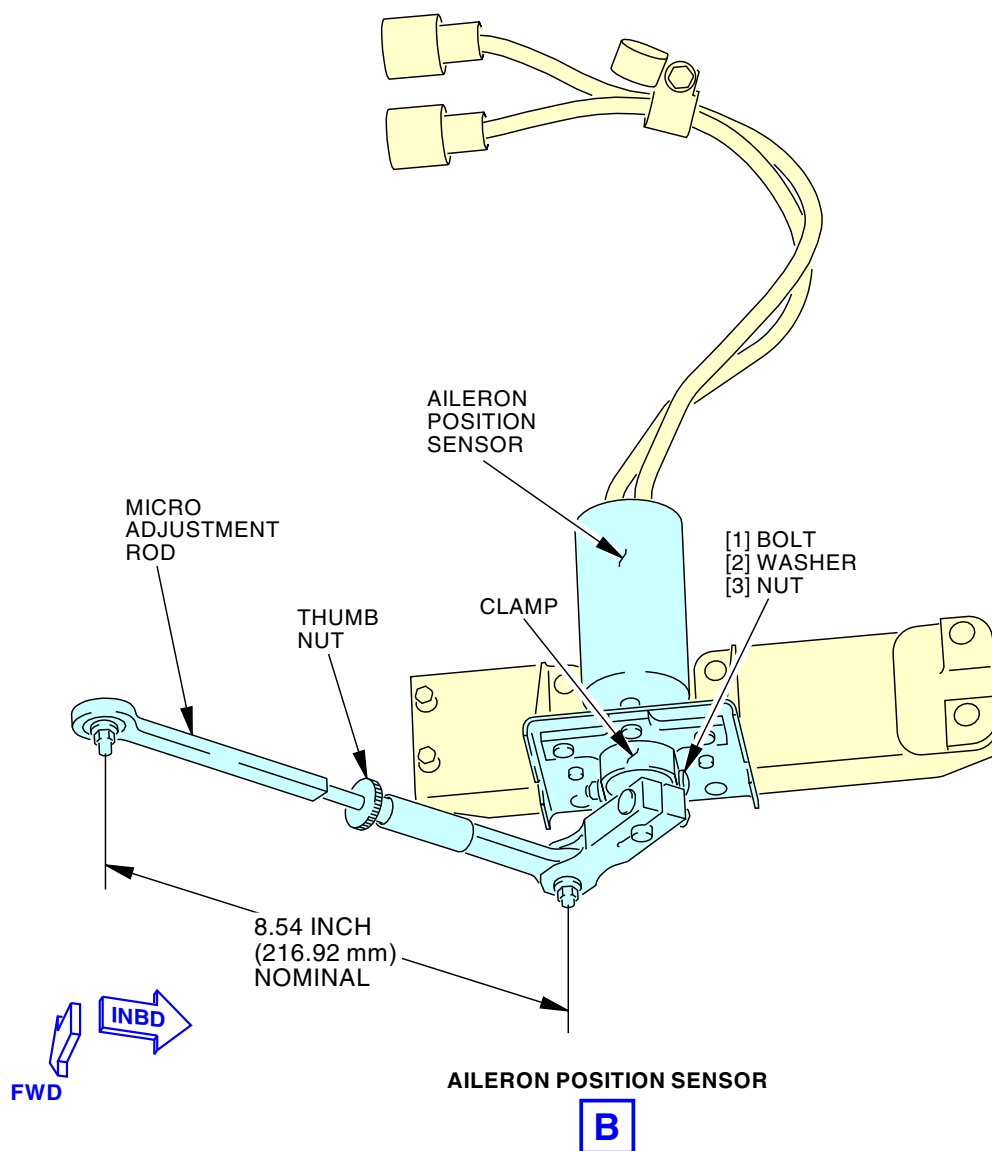
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2411614 S00061528352_V2

Aileron Position Sensor Adjustment
Figure 501/22-11-29-990-804 (Sheet 2 of 2)

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TASK 22-11-29-710-801

3. Aileron 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 22-11-29-860-028

- (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

SUBTASK 22-11-29-860-029

- (2) Set the autopilot Stab Trim Cutout Switch, on the control stand, to the CUTOUT position.

SUBTASK 22-11-29-860-030

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-29-860-031

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-29-860-032



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.

- (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 22-11-29-740-002

- (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

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- 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 22-11-29-860-033

- (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 22-11-29-860-034

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-29-860-035

- (3) Set the STAB TRIM PRI and B/U switches, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-29-860-036

- (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** ————

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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 201 and Figure 202)

A. **General**

- (1) This task removes electrical power and hydraulic pressure to the elevator position sensor.
- (2) The tryout in this task makes sure that the elevator position sensor is in a zero energy state.

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. **Elevator Position Sensor Deactivation**

SUBTASK 22-11-30-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-30-010-001

(2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-30-860-002

(3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Elevator Position Sensor Tryout

SUBTASK 22-11-30-860-004

(1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-30-700-001

(2) Use the FMC - CDU and do the test that follows:

- (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 follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL

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c) 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** ————

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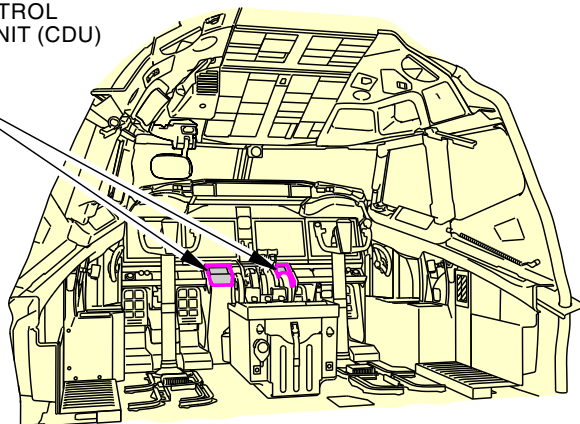
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



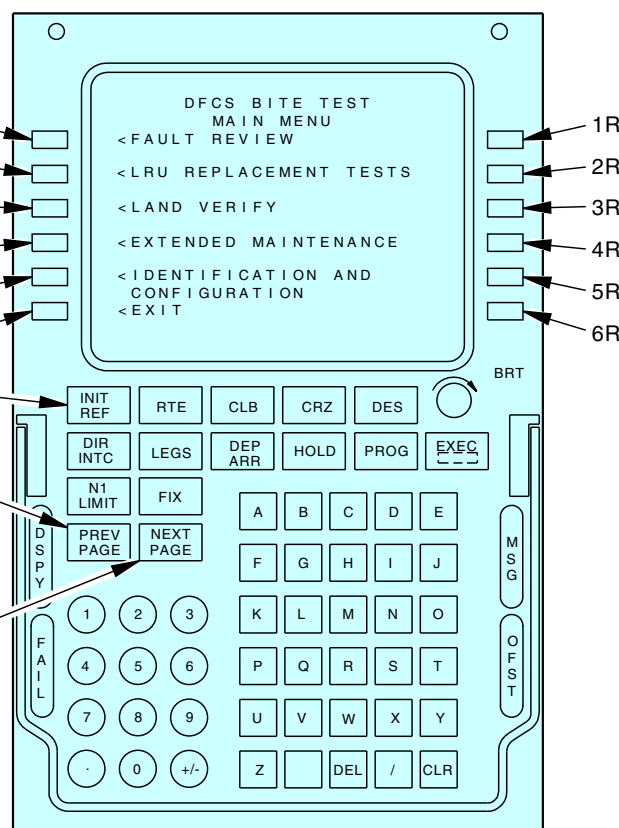
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-30-990-801

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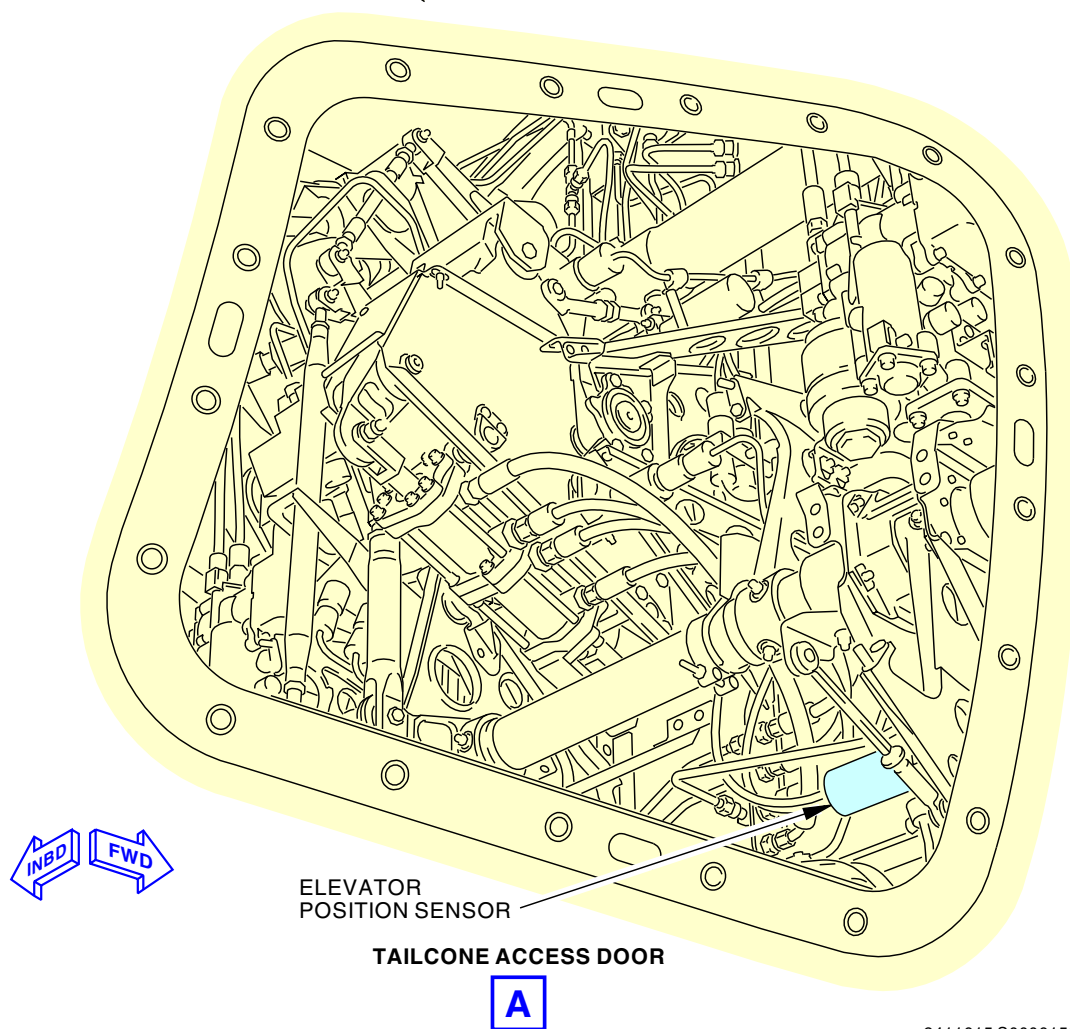
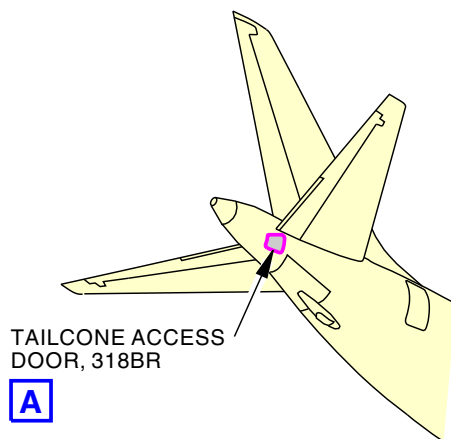
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Elevator Position Sensor
Figure 202/22-11-30-990-802

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TASK 22-11-30-440-801

3. Elevator Position Sensor - Activation

(Figure 202)

A. General

(1) This task restores 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 22-11-30-860-005

(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

SUBTASK 22-11-30-860-032

(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

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SUBTASK 22-11-30-410-001



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.

- (3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

———— **END OF TASK** ————

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ELEVATOR POSITION SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) The removal of the elevator position sensor [6].
- (2) The installation of the elevator position sensor [6].

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 and Figure 402)

A. General

- (1) This task is for the removal of the elevator position sensor.

B. Location Zones

Zone	Area
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 22-11-30-860-006

- (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

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

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SUBTASK 22-11-30-010-002

- (2) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

E. Elevator Position Sensor Removal

SUBTASK 22-11-30-020-001

- (1) Disconnect the electrical connectors [1].

SUBTASK 22-11-30-020-002

- (2) Do these steps to remove the elevator position sensor [6]:
- (a) Remove the bolt [7], washer [3], and nut [4] from the crank [5].
 - (b) Remove the bolt [2], washer [3], and nut [4] from the bracket.
 - (c) Remove the elevator position sensor [6].

———— **END OF TASK** ————

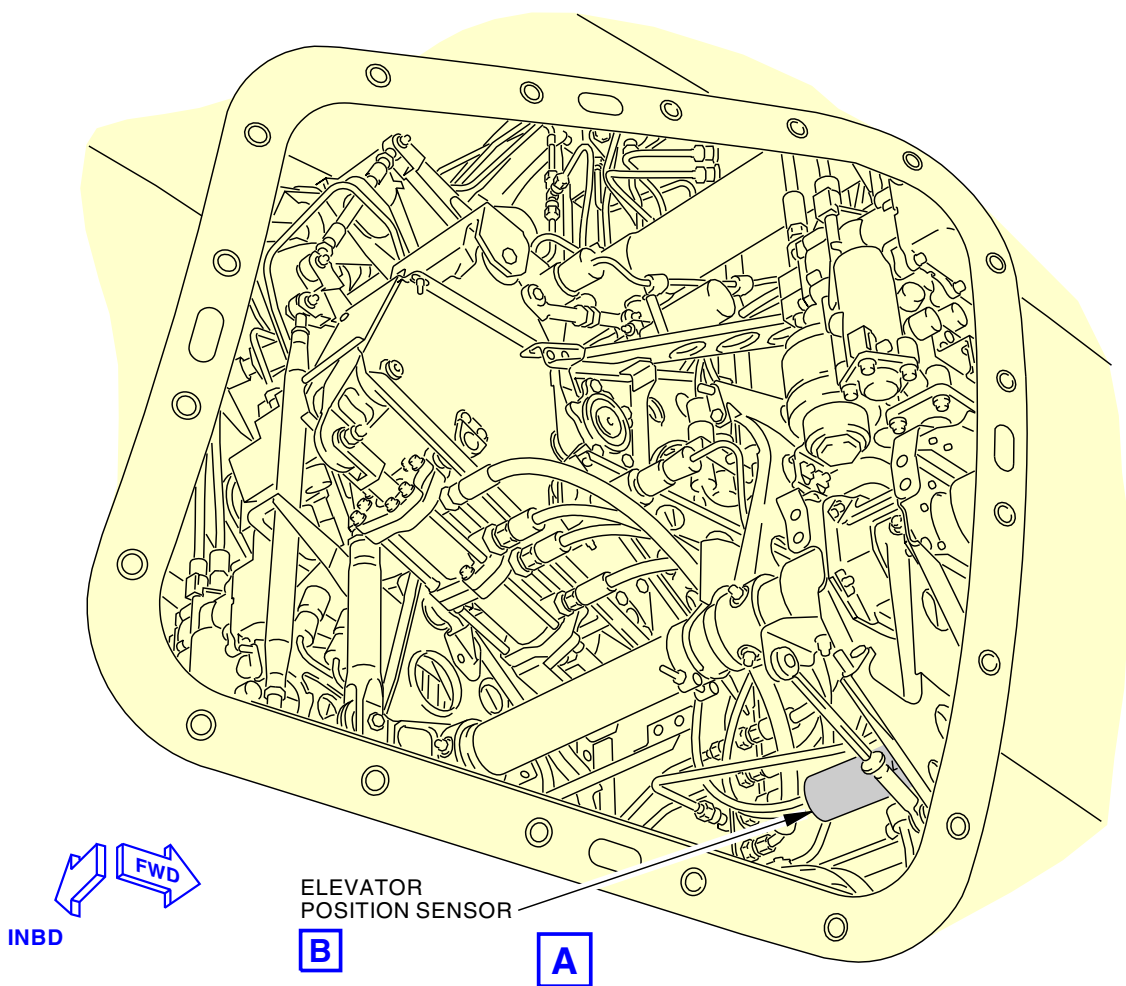
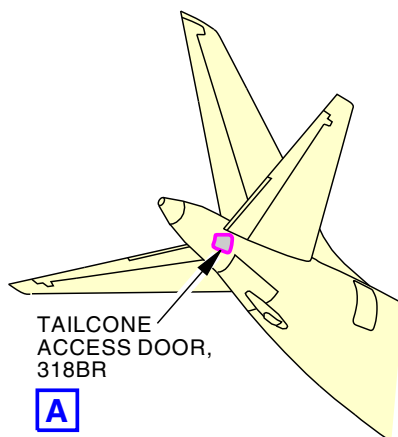
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2411616 S00061528361_V1

Elevator Position Sensor Installation
Figure 401/22-11-30-990-803 (Sheet 1 of 2)

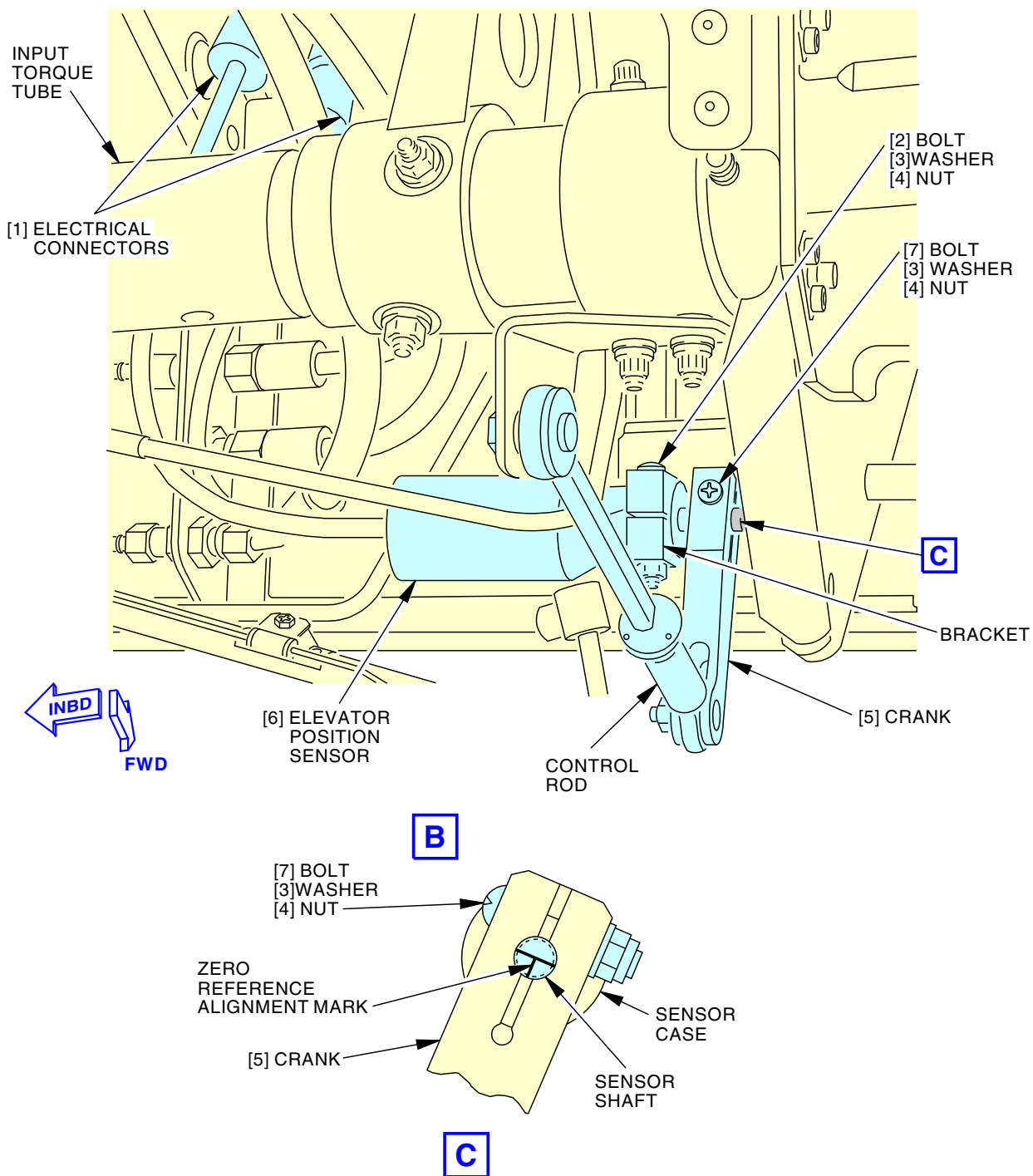
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2411617 S00061528362_V1

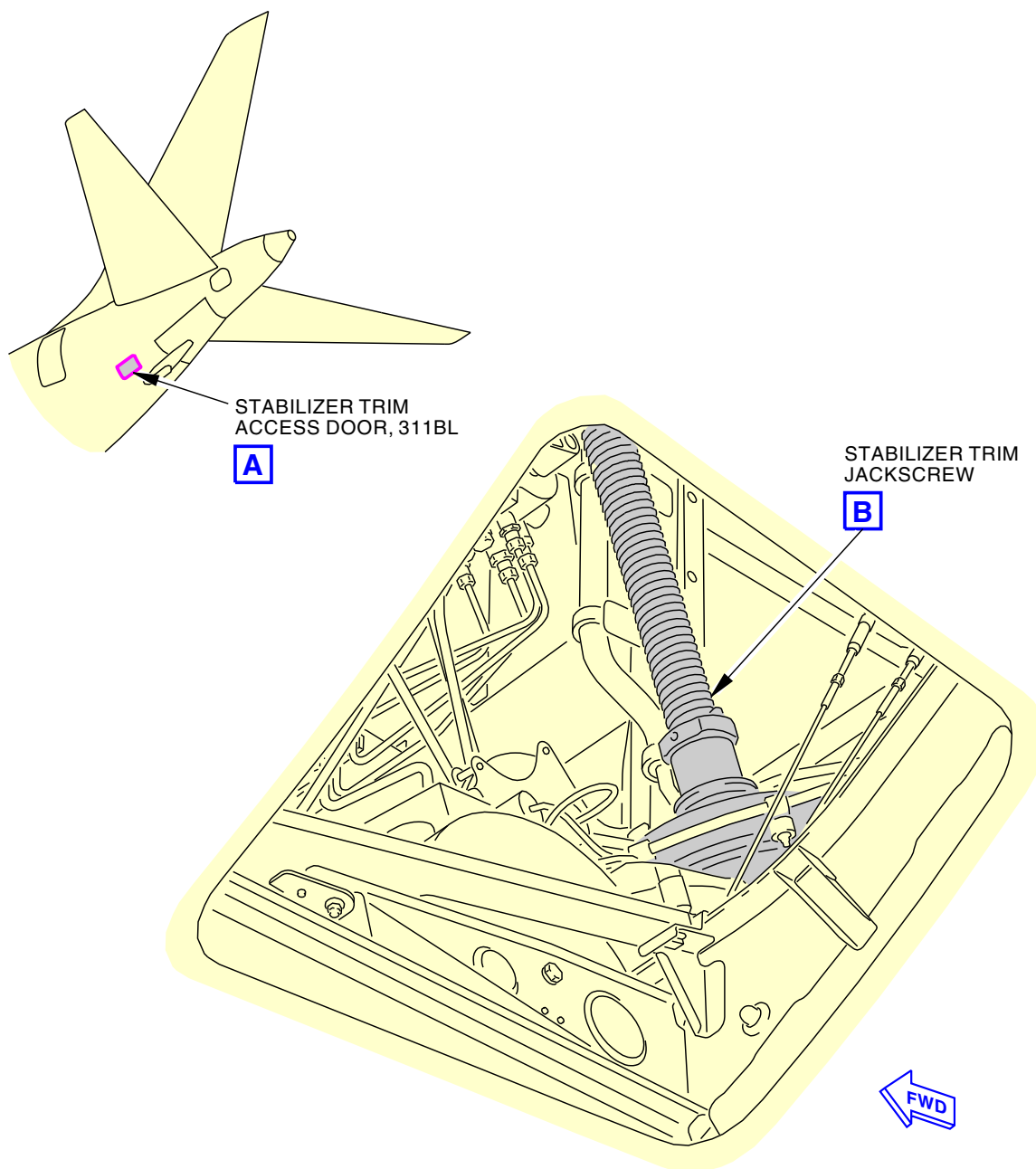
Elevator Position Sensor Installation
Figure 401/22-11-30-990-803 (Sheet 2 of 2)

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VIEW WHEN YOU LOOK UP THROUGH THE
STABILIZER TRIM ACCESS DOOR

A

2411618 S00061528363_V1

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-30-990-804 (Sheet 1 of 2)

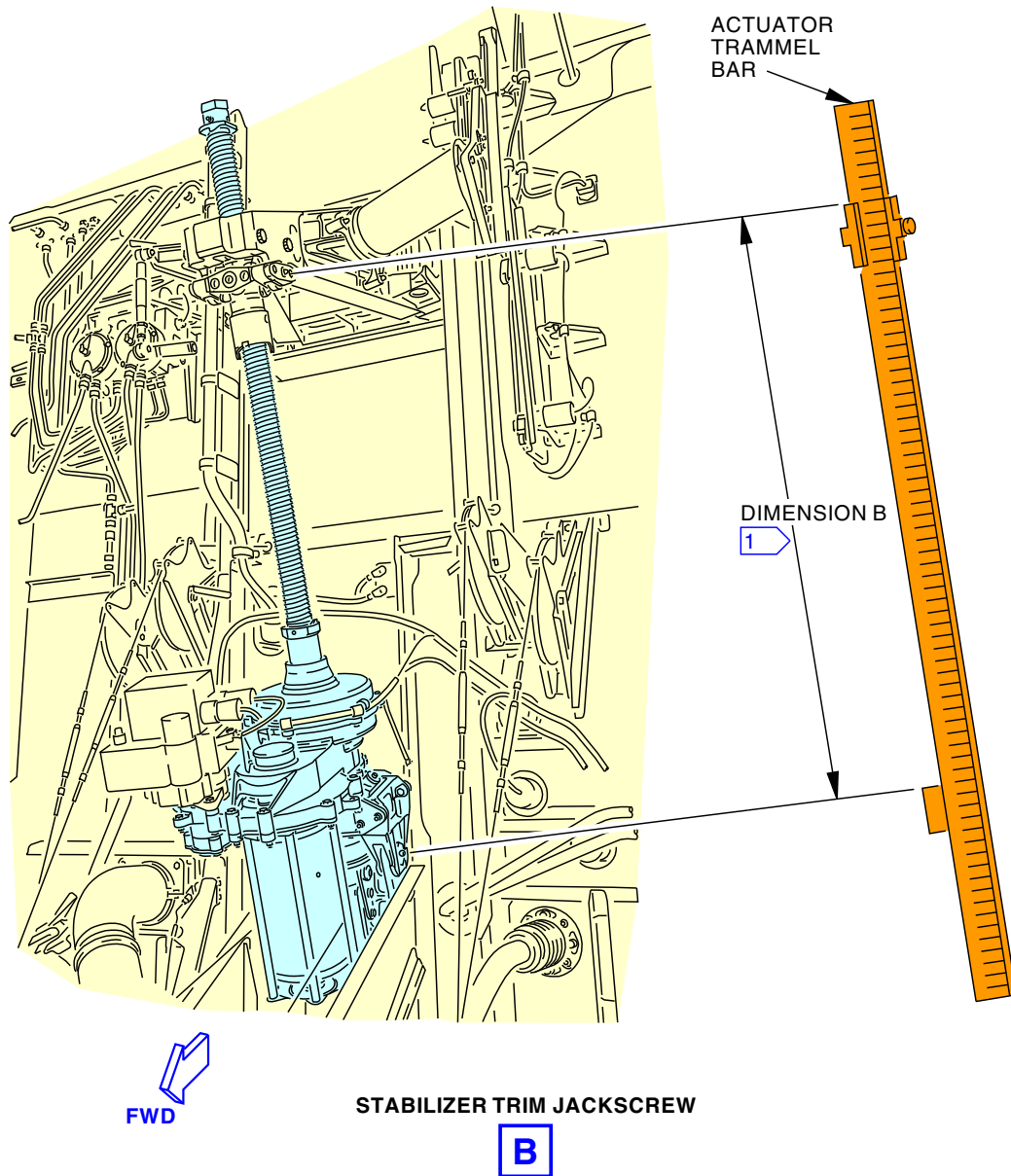
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NOTE:

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.

2411619 S00061528364_V1

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-30-990-804 (Sheet 2 of 2)

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TASK 22-11-30-400-801

3. **Elevator Position Sensor Installation**

(Figure 401, Figure 402)

A. **General**

(1) This task is for the installation of the elevator position sensor.

B. **References**

Reference	Title
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)

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	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Elevator position sensor	22-11-30-01-105	SIA 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. **Elevator Position Sensor Installation**

SUBTASK 22-11-30-980-001

(1) Do these steps to set the B dimension for the stabilizer trim jackscrew setting:

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 or 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.

(b) Use the trammel bar, SPL-1677, to measure the B dimension as follows:

1) Make sure that the B dimension is 39.17 ±0.01 in. (994.92 ±0.26 mm).

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SUBTASK 22-11-30-820-001

- (2) Align the reference mark on the sensor case with the reference mark on the sensor shaft.

SUBTASK 22-11-30-420-001

- (3) Install the elevator position sensor [6] as follows:
- (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] on 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] on the bracket.
 - 1) Tighten the bolt [2] to 35 in-lb (4 N·m).

SUBTASK 22-11-30-800-001

- (4) Do these steps to make sure that the mach trim actuator is at the null position:
- (a) Push the INIT REF key on the 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 acutator 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 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 bar, SPL-1677, to measure the B dimension.
- 3) Make sure that the B dimension is 39.17 ±0.01 in. (994.92 ±0.26 mm).

Table 402/22-11-30-993-802

TEST NUMBER	DFCS BIT TEST	UPPER AND LOWER LIMITS

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Table 402/22-11-30-993-802 (Continued)

51.02	MT ACT POS (VAC)	-6.10 to -8.43
	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)	-0.10 to 0.10
	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 22-11-30-420-002

- (5) Connect the two electrical connectors [1].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-30-860-008

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-30-860-033

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

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H. Elevator Position Sensor Installation Test

SUBTASK 22-11-30-820-002

(1) Do this task: Elevator Position Sensor Adjustment and Test, TASK 22-11-30-820-801.

SUBTASK 22-11-30-710-001

(2) Do this task: Elevator Position Sensor Test, TASK 22-11-30-710-801.

———— **END OF TASK** ————

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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 troque 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 and Figure 502)

A. General

- (1) This task is for the adjustment and test of the elevator position sensor.

B. 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)

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	Assembly - Trammel Bar, 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
318BR	Tailcone Access Door

F. Prepare for the Adjustment and Test

SUBTASK 22-11-30-010-005

- (1) Open this access door:

Number	Name/Location
318BR	Tailcone Access Door

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SUBTASK 22-11-30-010-006

- (2) Open this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-30-860-010

- (3) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-980-002

- (4) Do these steps to set the B dimension of the stabilizer trim jackscrew setting:

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 STAB TRIM PRI switch, S272, 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 39.17 ±0.01 in. (994.92 ±0.26 mm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim.



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 bar, SPL-1677, to measure the B dimension.

- 1) Make sure that the B dimension is 39.17 ±0.01 in. (994.92 ±0.26 mm).

SUBTASK 22-11-30-860-011

- (5) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-30-860-012

- (6) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-30-860-013

- (7) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

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SUBTASK 22-11-30-860-014



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.

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

G. Elevator Position Sensor Adjustment and Test

SUBTASK 22-11-30-820-003

- (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 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 22-11-30-210-001

- (3) Make sure that the CDU screen display 51.01.

SUBTASK 22-11-30-820-005

- (4) Make sure that the jackscrew B dimension equals 39.17 ± 0.01 in. (994.92 ± 0.26 mm).

NOTE: This is equal to the horizontal stabilizer set at 0 degrees or 4 units of trim.

SUBTASK 22-11-30-820-013

- (5) Make sure that the A and B values are within the limits shown on the CDU.

SUBTASK 22-11-30-740-001

- (6) Select CONTINUE to advance to test 51.02.

SUBTASK 22-11-30-820-006

- (7) Select CONTINUE to advance to test 51.03

SUBTASK 22-11-30-740-002

- (8) 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 22-11-30-820-007

- (9) Select CONTINUE on screen 51.03

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SUBTASK 22-11-30-860-015

- (10) Lightly jiggle the control column to center the system.

SUBTASK 22-11-30-740-003

- (11) Select CONTINUE twice to advance to test 51.05.

SUBTASK 22-11-30-820-008

- (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 22-11-30-820-009

- (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) - 35 in-lb (4 N·m).
 - (d) Do this step again and again until no more adjustment is necessary.

SUBTASK 22-11-30-820-010

- (14) Do these steps to fine adjust the elevator position sensor:
- (a) Do these steps to adjust the elevator position sensor:
 - 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 $\pm$ 0.03 VAC.
 - (b) Install the lockwire on the micro-adjustment nut (TASK 20-10-44-400-801).
NOTE: Make sure that the voltage for test 51.05 remains within -0.50 $\pm$ 0.03 VAC.

SUBTASK 22-11-30-820-011

- (15) Set the stabilizer to 11.6 units of trim.

SUBTASK 22-11-30-820-014

- (16) Make sure that the B dimension equals 28.28 $\pm$ 0.01 in. (718.31 $\pm$ 0.26 mm).

SUBTASK 22-11-30-820-015

- (17) Lightly jiggle the control column to center the system.

SUBTASK 22-11-30-820-016

- (18) Make sure that the voltage for the A and B value of screen 51.05 read 0.00 $\pm$ 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 adjustment rod length is 6.70 $\pm$ 0.02 in. (170.18 $\pm$ 0.51 mm) and installed correctly. Adjust the micro-adjustment rod 69-43490 using the knurled thumbnut to obtain a reading of 0.00 $\pm$.07 VAC.

SUBTASK 22-11-30-820-012

- (19) Continue to adjust as necessary to make sure of these voltage reading requirements after you lockwire the micro-adjustment rod thumbnut:
- (a) The voltage for the elevator position sensor is -0.50 $\pm$ 0.03 VAC.
 - (b) The voltage for the A and B value of screen 51.05 reads 0.00 $\pm$ 0.07 VAC.

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H. 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 22-11-30-860-017

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-860-018

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-30-860-019

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

SUBTASK 22-11-30-410-004

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-30-410-005

- (6) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

———— **END OF TASK** ————

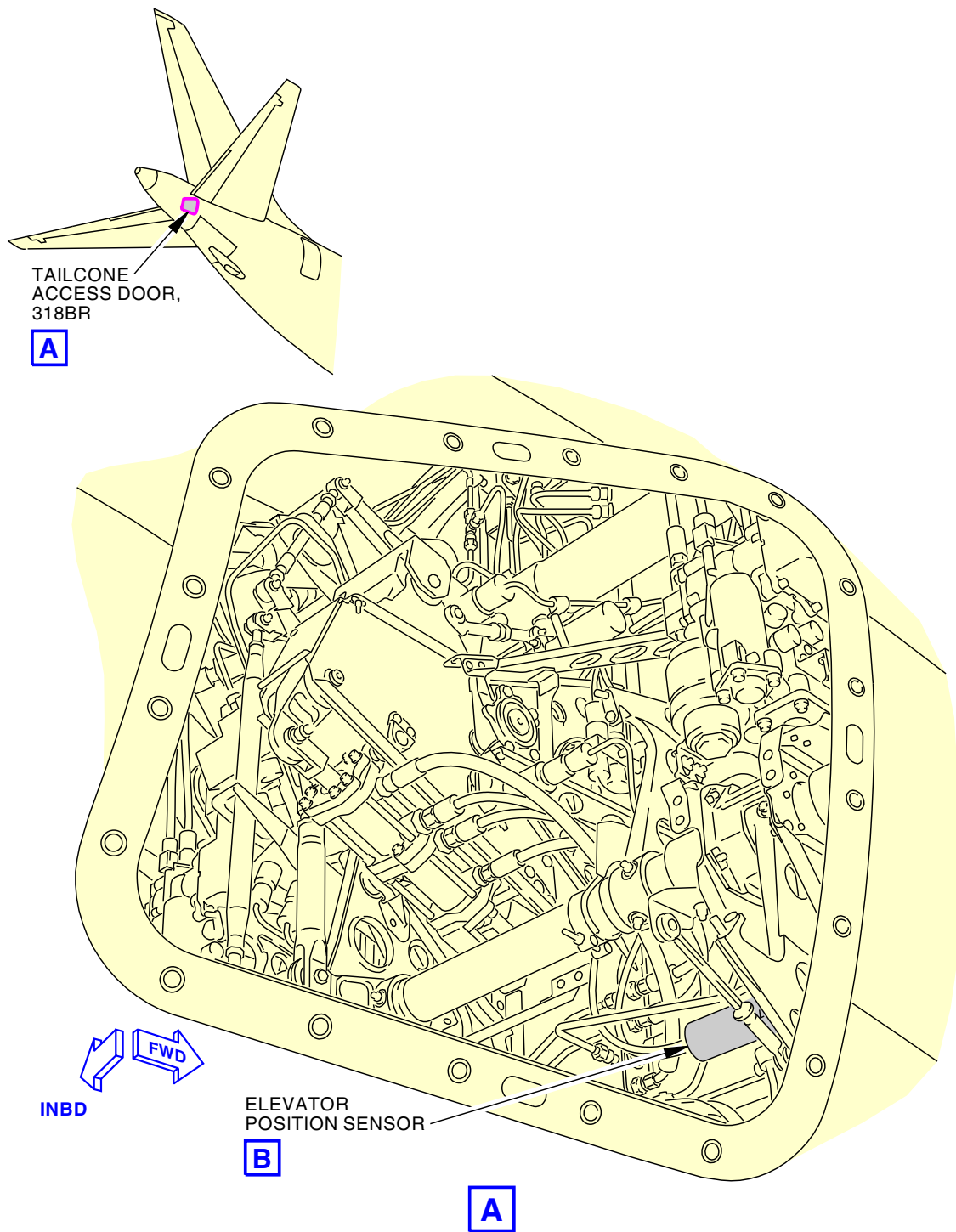
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2411620 S00061528368_V1

Elevator Position Sensor Adjustment
Figure 501/22-11-30-990-805 (Sheet 1 of 2)

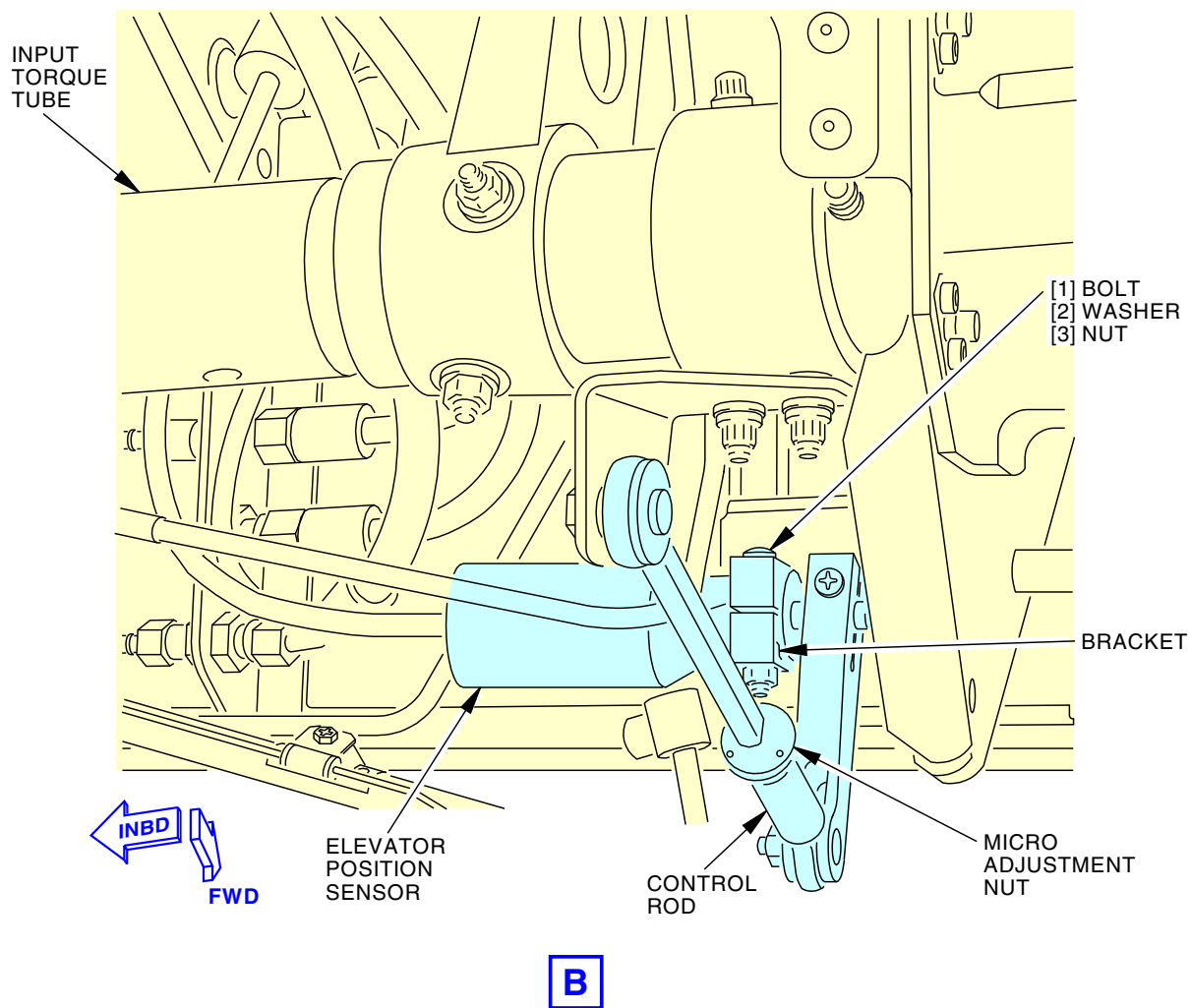
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2411621 S00061528369_V1

Elevator Position Sensor Adjustment
Figure 501/22-11-30-990-805 (Sheet 2 of 2)

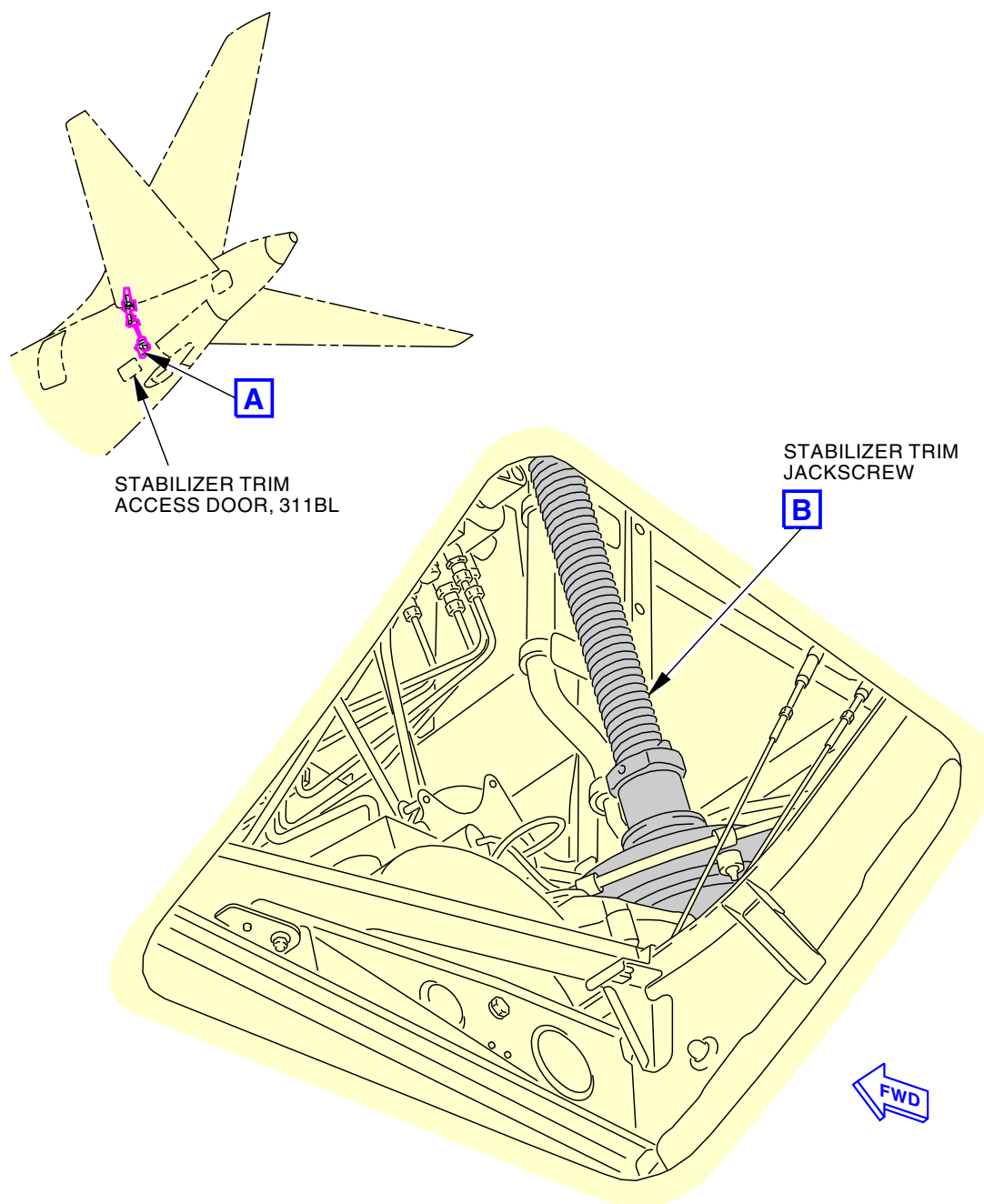
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VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER
TRIM ACCESS DOOR

A

2411622 S00061528370_V1

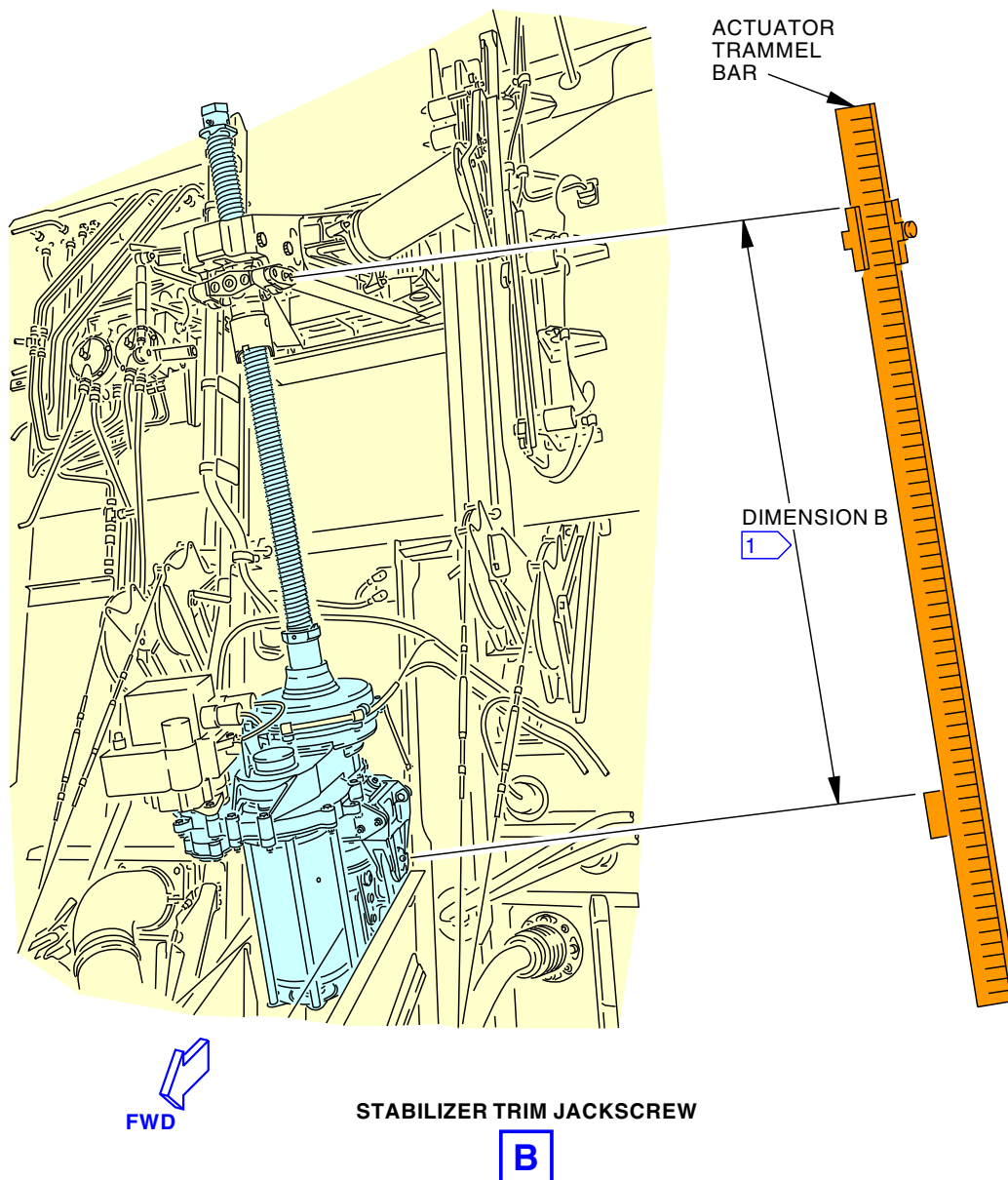
Stabilizer Trim Jackscrew Setting
Figure 502/22-11-30-990-806 (Sheet 1 of 2)

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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.

2411623 S00061528371_V1

Stabilizer Trim Jackscrew Setting
Figure 502/22-11-30-990-806 (Sheet 2 of 2)

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TASK 22-11-30-710-801

3. Elevator Position Sensor Test

A. General

- (1) This task is for the test of the elevator position sensor.

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 22-11-30-860-022

- (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 22-11-30-860-023

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-30-860-024

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-30-860-025

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-30-860-026



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.

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

NOTE: Hydraulic power is necessary for surface test.

E. Elevator Position Sensor Test

SUBTASK 22-11-30-740-004

- (1) Do this BITE test:
- (a) Push the INIT REF key on the CDU keyboard.

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- (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 complete with no failure and there is no "TEST FAILED" message.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-30-860-027

- (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 22-11-30-860-028

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-30-860-029

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-30-860-030

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

———— **END OF TASK** ————

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STABILIZER POSITION SENSOR - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Stabilizer Position Sensor Deactivation.
 - (2) Stabilizer Position Sensor Activation.

TASK 22-11-31-040-801

2. Stabilizer Position Sensor - Deactivation

(Figure 201 and Figure 202)

A. **General**

- (1) This task removes electrical power and hydraulic pressure to the stabilizer position sensor.
- (2) The tryout in this task makes sure the stabilizer position sensor is in a zero energy state.

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. **Stabilizer Position Sensor Deactivation**

SUBTASK 22-11-31-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-31-010-001

- (2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 22-11-31-860-002

- (3) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Stabilizer Position Sensor Tryout

SUBTASK 22-11-31-860-004

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-31-700-001

- (2) Use the FMC - CDU and do the test that follows:
- (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 follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL

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c) 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** —————

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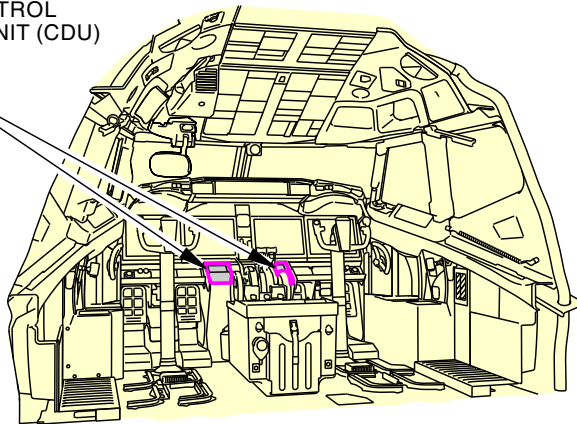
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



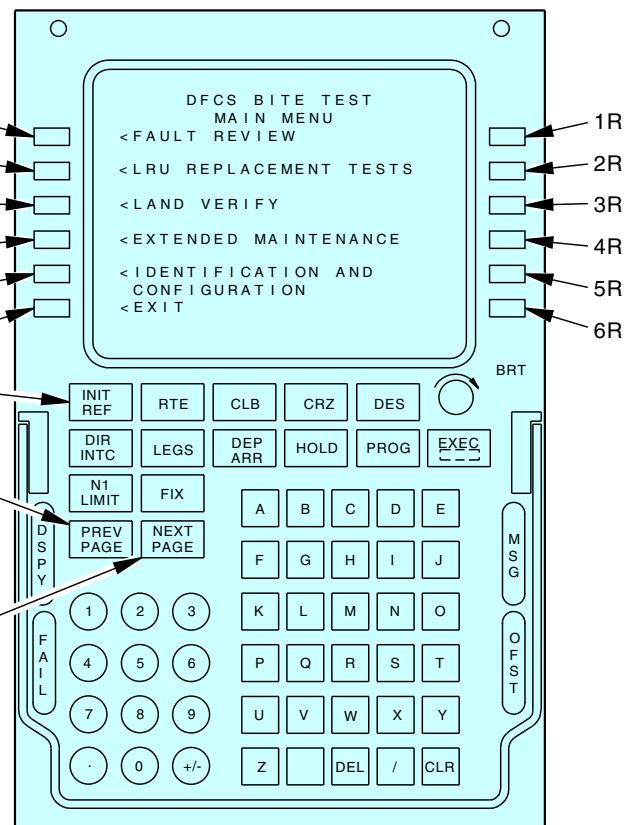
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-31-990-801

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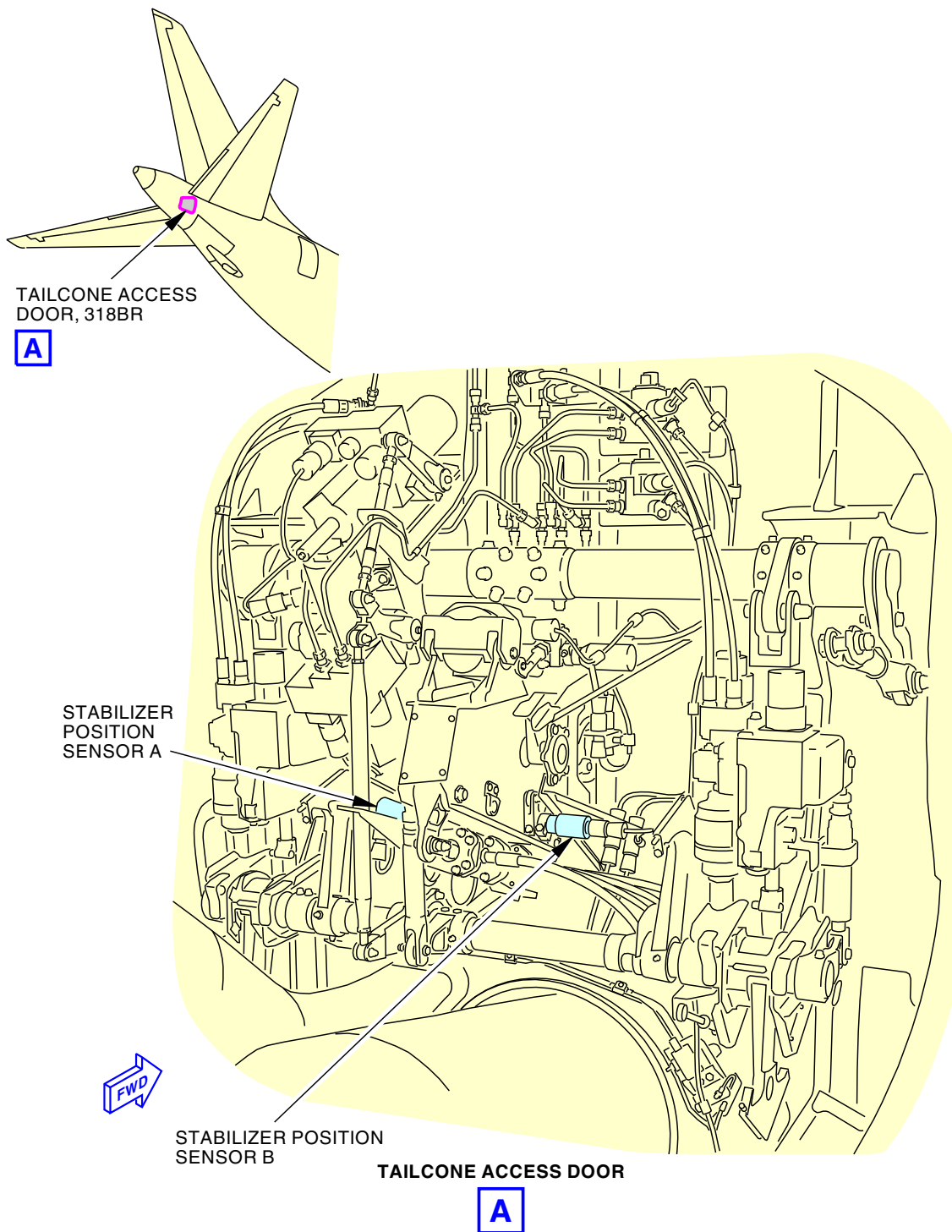
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2411624 S00061528376_V1

Stabilizer Position Sensor
Figure 202/22-11-31-990-802

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TASK 22-11-31-440-801

3. **Stabilizer Position Sensor - Activation**

(Figure 202)

A. General

(1) This task restores 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 22-11-31-860-005

(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

SUBTASK 22-11-31-860-032

(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

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SUBTASK 22-11-31-410-001



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.

- (3) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

———— **END OF TASK** ————

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STABILIZER POSITION SENSOR - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) The removal of the stabilizer position sensor A [6] or stabilizer position sensor B [4].
 - (2) The installation of the stabilizer position sensor A [6] or stabilizer position sensor B [4].
- B. There are two stabilizer position sensors. They are on the aft bulkhead station 1156.
- (1) The stabilizer position sensor A [6] (M1192) is a dual synchro position sensor and it has two connectors.
 - (2) The stabilizer position sensor B [4] (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 [6] and stabilizer position sensor B [4].
- (1) The stabilizer position sensor A [6] is on the left side of the elevator feel and centering unit.
 - (2) The stabilizer position sensor B [4] is on the right side of the elevator feel and centering unit.

TASK 22-11-31-000-801

2. **Stabilizer Position Sensor Removal**

(Figure 401 or Figure 402 and Figure 22-11-31-990-806)

A. **General**

- (1) This task is for the removal of a stabilizer position sensor.

B. **References**

Reference	Title
22-11-31-990-806	Figure: Stabilizer Trim Jackscrew Setting (P/B 501)

C. **Location Zones**

Zone	Area
315	APU Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

E. **Prepare for the Removal**

SUBTASK 22-11-31-860-006

- (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

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CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01044	AFCS MCP DC 1

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-31-010-002

- (2) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

F. Stabilizer Position Sensor Removal

SUBTASK 22-11-31-020-001

- (1) Disconnect the stabilizer position sensor electrical connector(s).

SUBTASK 22-11-31-020-002

- (2) Do these steps to remove the stabilizer position sensor B [4] or stabilizer position sensor A [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 B [4] or stabilizer position sensor A [6].

————— **END OF TASK** —————

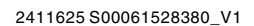
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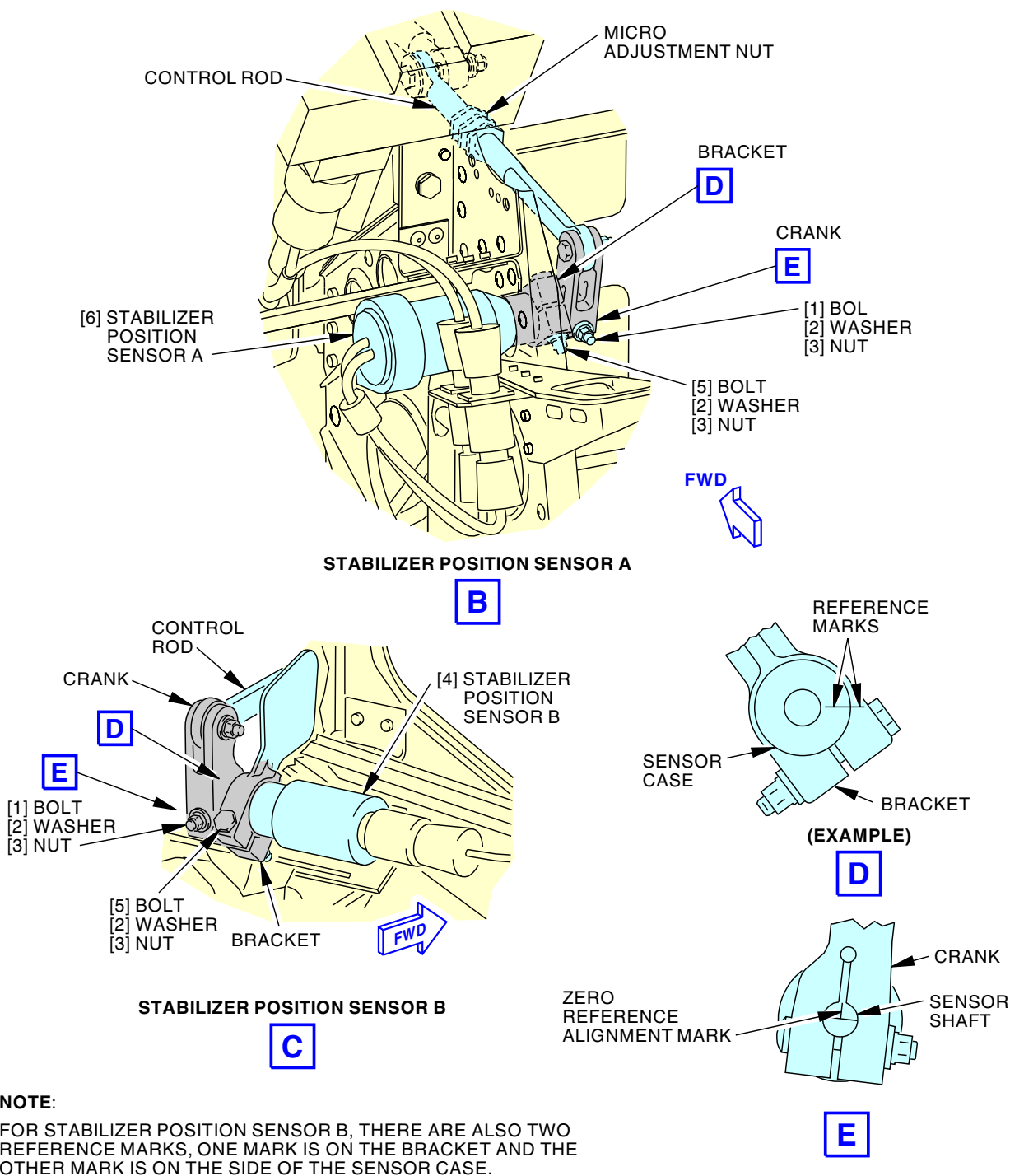


Stabilizer Position Sensors Installation

Figure 401/22-11-31-990-803 (Sheet 1 of 2)

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2411626 S00061528381_V1

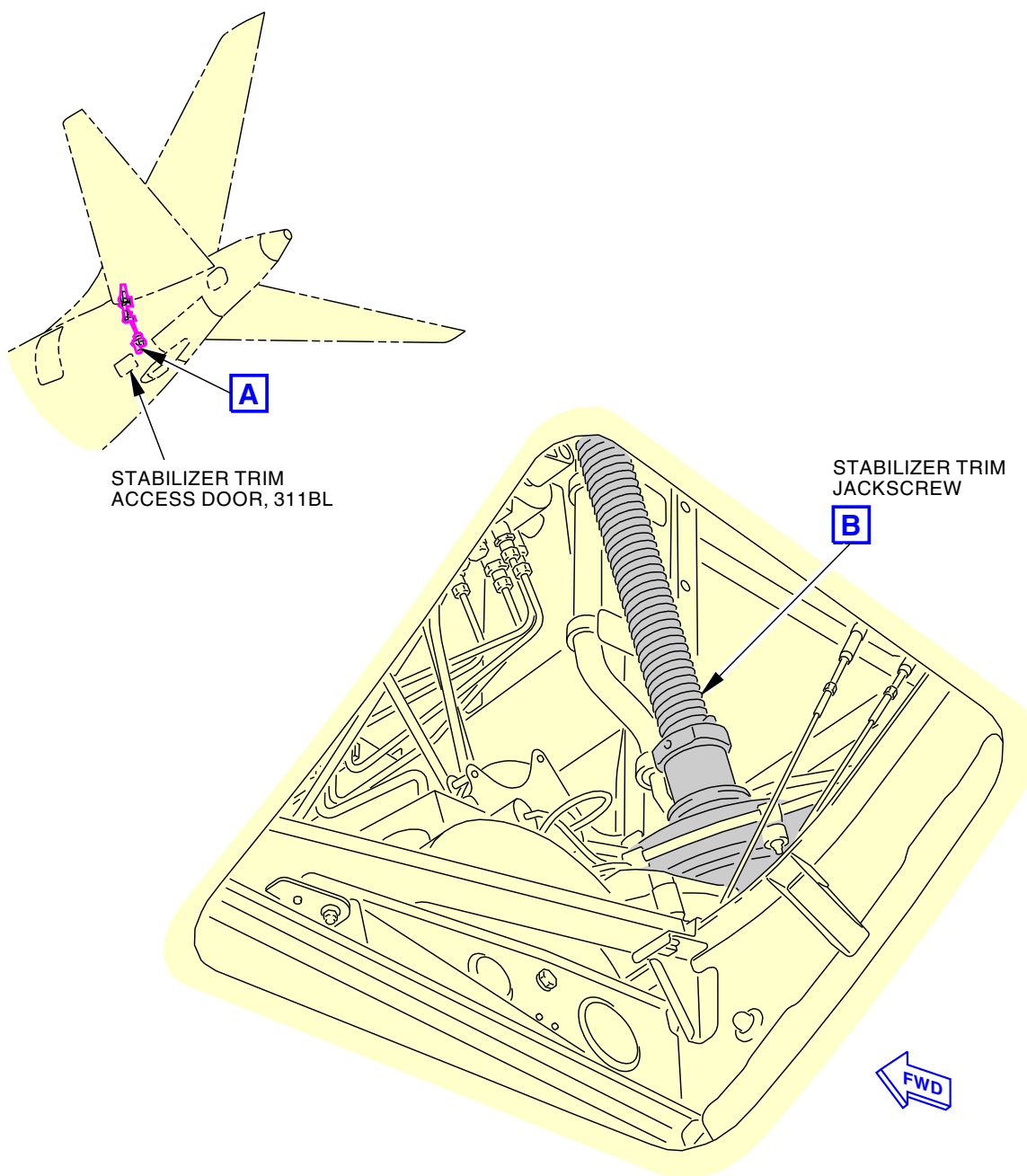
Stabilizer Position Sensors Installation
Figure 401/22-11-31-990-803 (Sheet 2 of 2)

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VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER
TRIM ACCESS DOOR

A

2411627 S00061528382_V1

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-31-990-804 (Sheet 1 of 2)

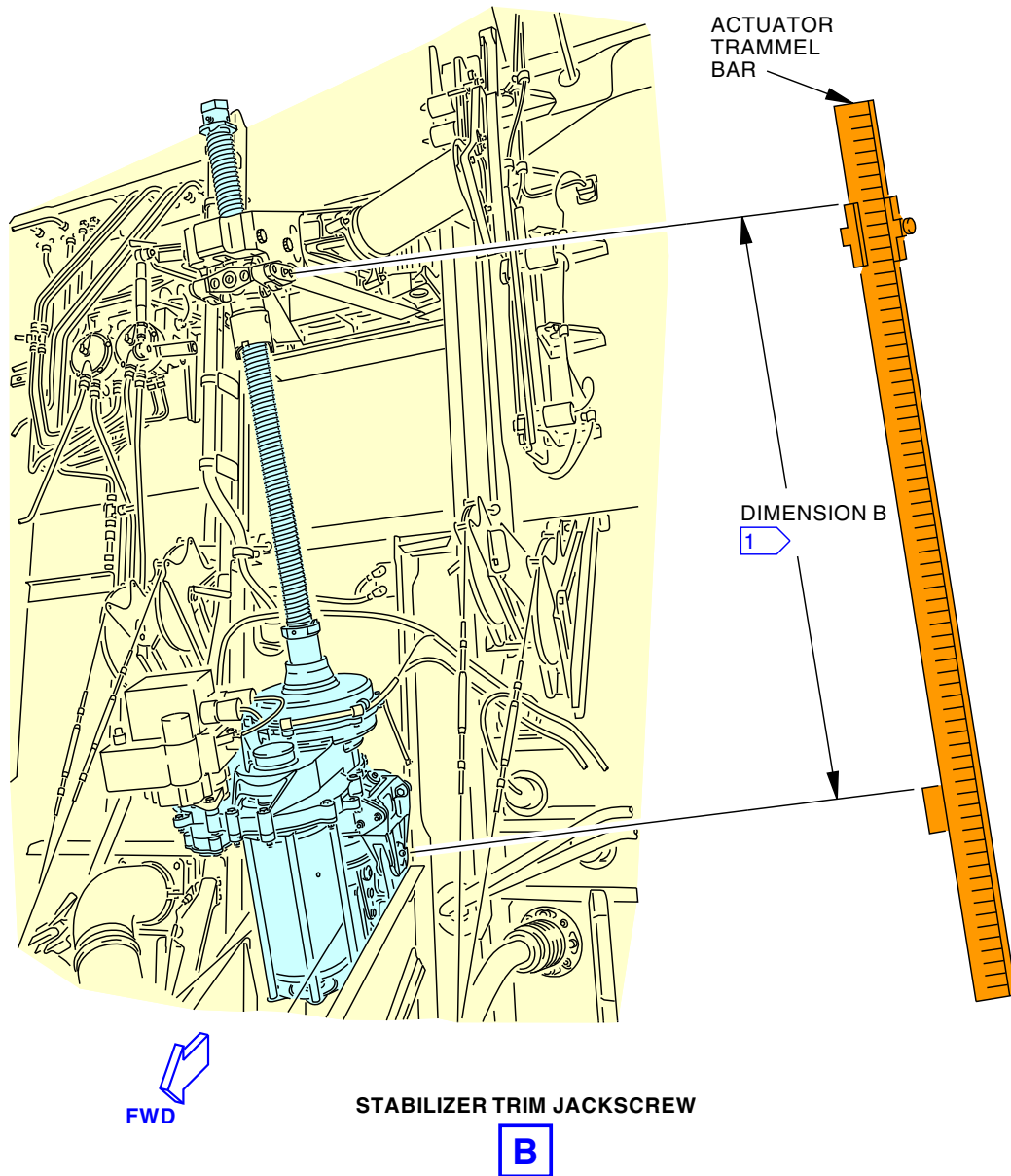
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NOTE:

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.

2411628 S00061528383_V1

Stabilizer Trim Jackscrew Setting
Figure 402/22-11-31-990-804 (Sheet 2 of 2)

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TASK 22-11-31-400-801

3. **Stabilizer Position Sensor Installation**

(Figure 401 or Figure 402 and Figure 22-11-31-990-806)

A. **General**

(1) This task is for the installation of the stabilizer position sensor.

B. **References**

Reference	Title
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)
22-11-31-990-806	Figure: Stabilizer Trim Jackscrew Setting (P/B 501)

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-1793	Multimeter - Digital/Analog (or equivalent meter meets task requirements) Part #: 117 Supplier: 89536 Part #: 260-8XPI Supplier: 55026 Part #: 287 Supplier: 89536 Part #: 289 Supplier: 89536 Part #: 87V Supplier: 89536 Part #: FLUKE 27 II Supplier: 89536 Part #: FLUKE-77-4 Supplier: 89536 Opt Part #: 187 Supplier: 89536 Opt Part #: 189 Supplier: 89536 Opt Part #: 21 Supplier: 89536 Opt Part #: 27 Supplier: 89536 Opt Part #: 77 SERIES III Supplier: 89536 Opt Part #: 87 Supplier: 89536 Opt Part #: FLUKE 27 Supplier: 89536 Opt Part #: MODEL 27 Supplier: 89536
SPL-1677	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

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
117A	Electronic Equipment Access Door
311BL	Stabilizer Trim Access Door

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F. Stabilizer Position Sensor Installation

SUBTASK 22-11-31-010-007

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

SUBTASK 22-11-31-980-001

- (2) Do these steps to set the B dimension of the stabilizer trim jackscrew setting:

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 or zero degree.



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 bar, SPL-1677, to measure the B dimension.
- 1) Make sure that the B dimension is 39.17 ± 0.01 in. (994.92 ± 0.26 mm).

SUBTASK 22-11-31-860-031

- (3) Do these steps to make sure that the Mach trim actuator is in the null position:

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
D	3	C01048	AFCS SYS A ENGAGE INTLK
D	4	C00457	AFCS SYS A MACH TRIM DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

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- (c) Open this access door:

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

117A	Electronic Equipment Access Door

- (d) Get access to the Flight Control Computer (FCC) A on the E1 electronic equipment rack, shelf No. 1 (E1-1) or flight control computer B on the E1 electronic equipment rack, shelf No. 4 (E1-4).
- (e) Use the digital/analog multimeter, COM-1793, to measure pin J3-1 and pin J3-37 of the FCC-A or FCC-B front test connector.
- (f) Make sure that the voltage is less than 50 mvdc.
- (g) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00456	AFCS SYS A MACH TRIM AC
C	5	C01041	AFCS SYS A SNSR EXC AC
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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

SUBTASK 22-11-31-820-001

- (4) Align the reference mark on the sensor case with the reference mark on the bracket.

SUBTASK 22-11-31-420-001

- (5) Install the stabilizer position sensor B [4] or stabilizer position sensor A [6].
- (a) Put the stabilizer position sensor B [4] or stabilizer position sensor A [6] into the bracket and the crank.
- (b) Make sure that the zero reference alignment mark on the sensor shaft aligns with the slot in the crank.
- (c) Tighten the bolt [1] in the crank to 35 in-lb (4 N·m).
- (d) Tighten the bolt [5] in the bracket to 35 in-lb (4 N·m).

SUBTASK 22-11-31-420-002

- (6) Connect the stabilizer position sensor electrical connector(s).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-31-860-008

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00456	AFCS SYS A MACH TRIM AC

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CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-31-860-033

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-31-420-003

- (3) Close this access door:

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

H. Stabilizer Position Sensor Installation Test

SUBTASK 22-11-31-820-002

- (1) Do this task: Stabilizer Position Sensor Adjustment and Test, TASK 22-11-31-820-801.

SUBTASK 22-11-31-710-001

- (2) Do this task: Stabilizer Position Sensor Test, TASK 22-11-31-710-801.

————— **END OF TASK** —————

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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.

TASK 22-11-31-820-801

2. **Stabilizer Position Sensor Adjustment and Test**

(Figure 501)

A. **General**

- (1) This task is for the adjustment and test of the stabilizer position sensor.
- (2) Two persons are necessary for this task.

B. **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)
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)
31-65-00-970-801	System Maintenance Data Pages Function (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	Assembly - Trammel Bar, 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
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. **Access Panels**

Number	Name/Location
311BL	Stabilizer Trim Access Door

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(Continued)

Number	Name/Location
318BR	Tailcone Access Door

F. Prepare for the Adjustment

SUBTASK 22-11-31-860-010

- (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 22-11-31-010-005

- (2) Remove this access door:

Number	Name/Location
318BR	Tailcone Access Door

SUBTASK 22-11-31-010-006

- (3) 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:

NOTE: The B dimension is measured between the center of the upper and lower gimbal pins on the stabilizer trim jackscrow. 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).

- 1) On the Flight Controls Page (TASK 31-65-00-970-801), make sure that the STABILIZER shows 0.0.



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 bar, SPL-1677, to measure the B dimension.

- 1) Make sure that the B dimension is 39.17 ± 0.01 in. (994.92 ± 0.26 mm).

SUBTASK 22-11-31-860-011

- (5) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-31-860-012

- (6) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-31-860-013

- (7) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

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SUBTASK 22-11-31-860-014



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.

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

G. Stabilizer Position Sensor Adjustment and Test

SUBTASK 22-11-31-820-003

- (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
 - a) Do the instructions that show on the CDU.
- 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 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 "Do the Stabilizer Rigging Test" in (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 Captain Control Column for 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.



DO NOT SELECT CONTINUE ON TEST 54.01 WHEN YOU ADJUST THE STABILIZER POSITION SENSOR. IF YOU DO, THE ACTUATORS, ROD ASSEMBLIES AND FLIGHT CONTROL SURFACES CAN MOVE. INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- 8) Adjust the washer [2]:
- 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].

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- 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).



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.

- 9) Adjust the nut [3] as follows:
- 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).



KEEP PERSONS AWAY FROM THE AILERON/STABILIZER POSITION SENSORS 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.

- (c) Verify that the CDU display shows Test 54.01.
- 1) Do the instructions that show on the CDU display to complete the ELEV 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.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-31-860-015

- (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 22-11-31-860-016

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

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SUBTASK 22-11-31-860-017

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-31-860-018

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

SUBTASK 22-11-31-410-004

- (5) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-31-410-005

- (6) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Stabilizer Trim Access Door

———— **END OF TASK** ————

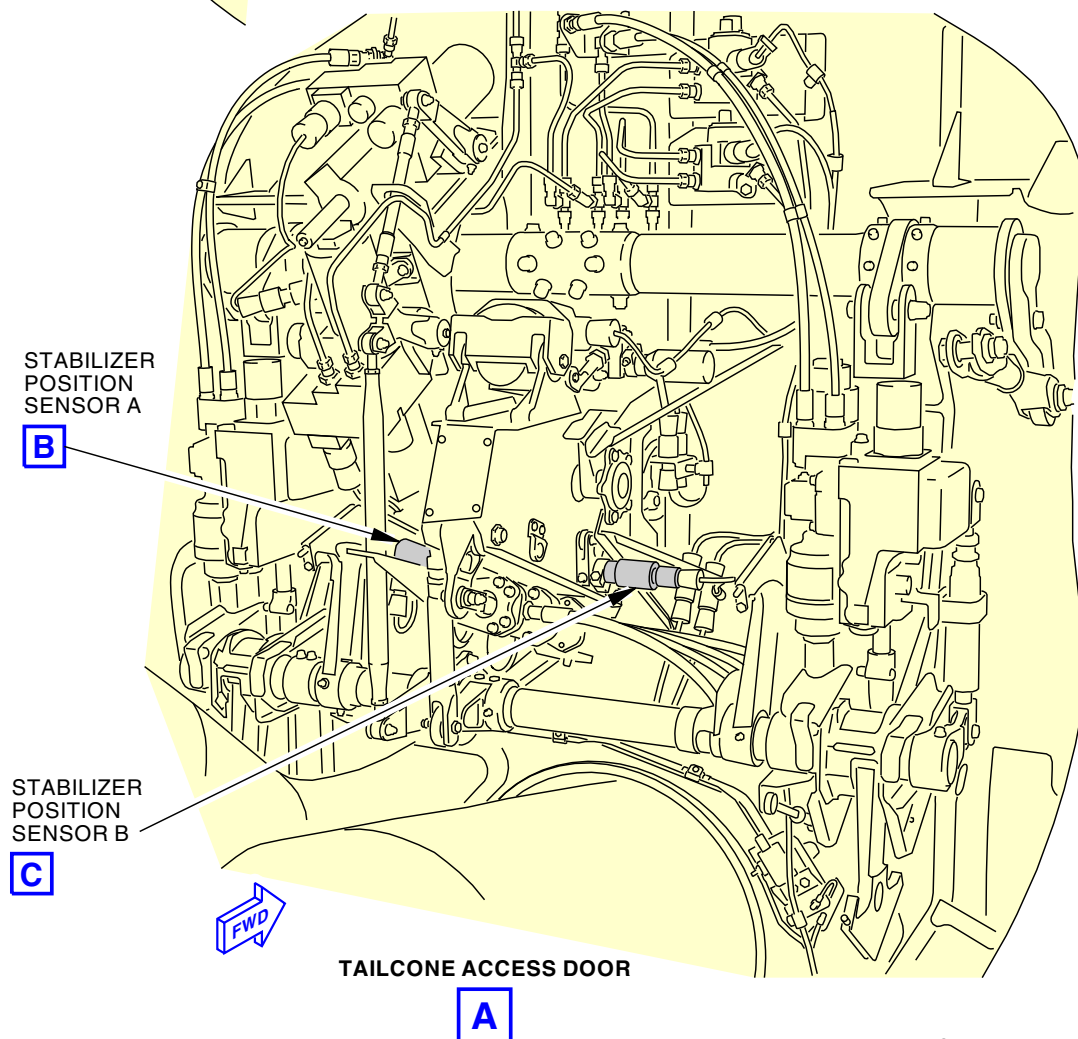
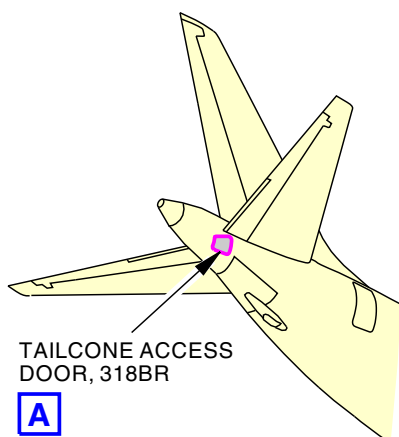
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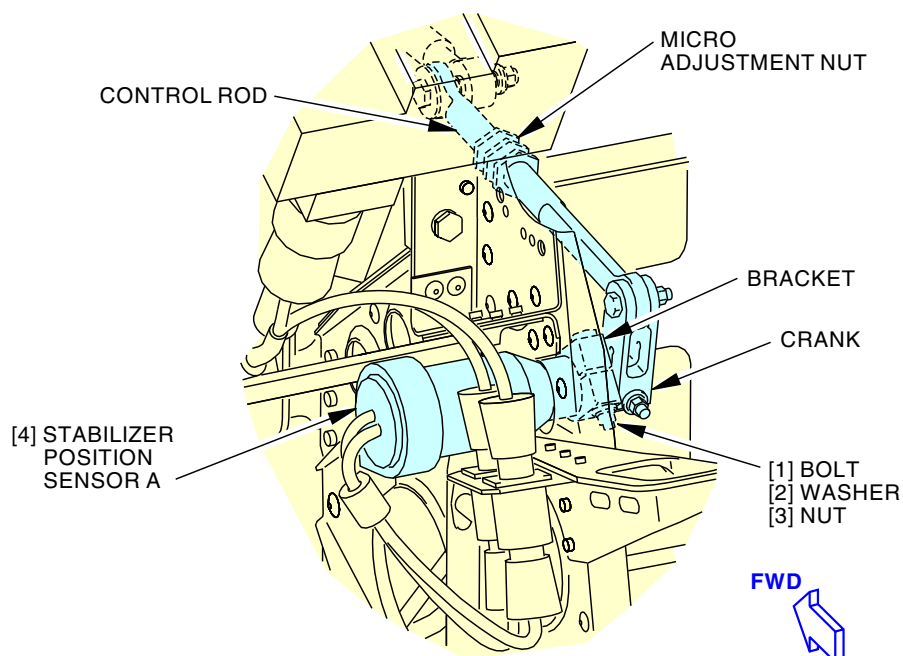
Stabilizer Position Sensors Adjustment
Figure 501/22-11-31-990-805 (Sheet 1 of 2)

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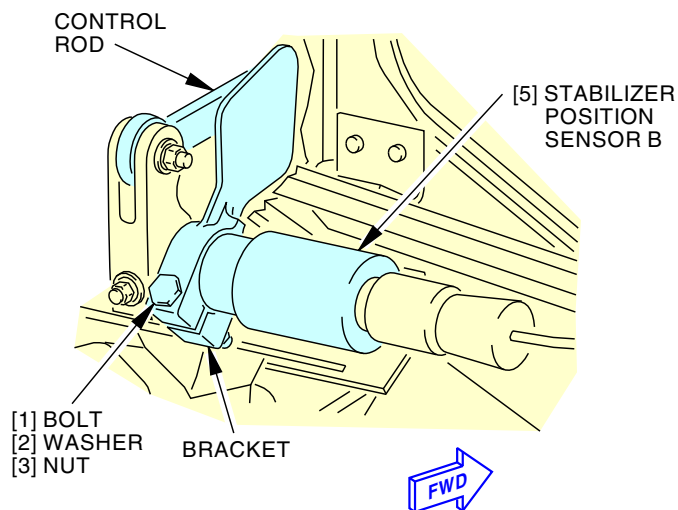
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STABILIZER POSITION SENSOR A

B



STABILIZER POSITION SENSOR B

C

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Stabilizer Position Sensors Adjustment
Figure 501/22-11-31-990-805 (Sheet 2 of 2)

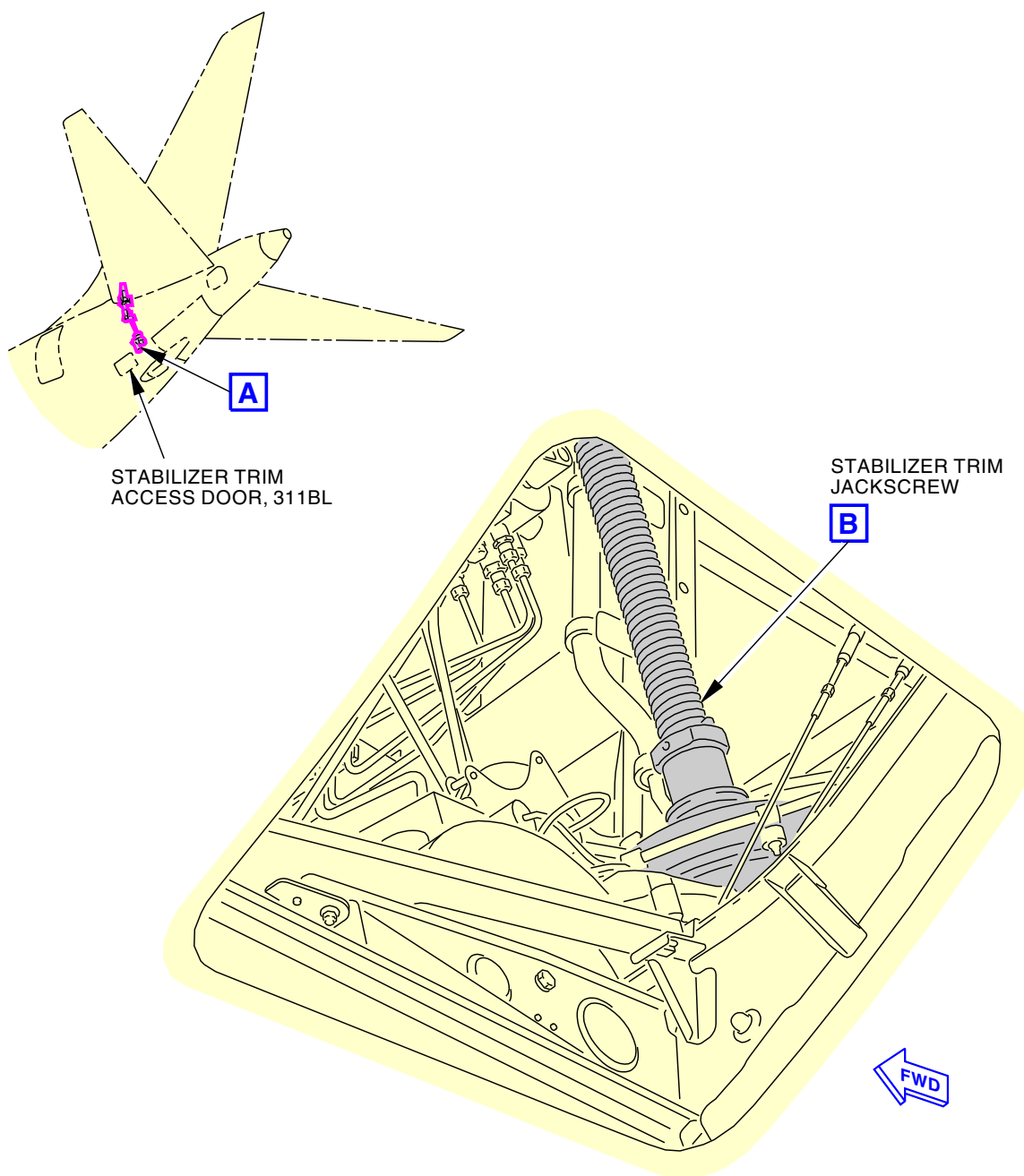
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VIEW WHEN YOU LOOK UP THROUGH THE STABILIZER
TRIM ACCESS DOOR

A

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Stabilizer Trim Jackscrew Setting
Figure 502/22-11-31-990-806 (Sheet 1 of 2)

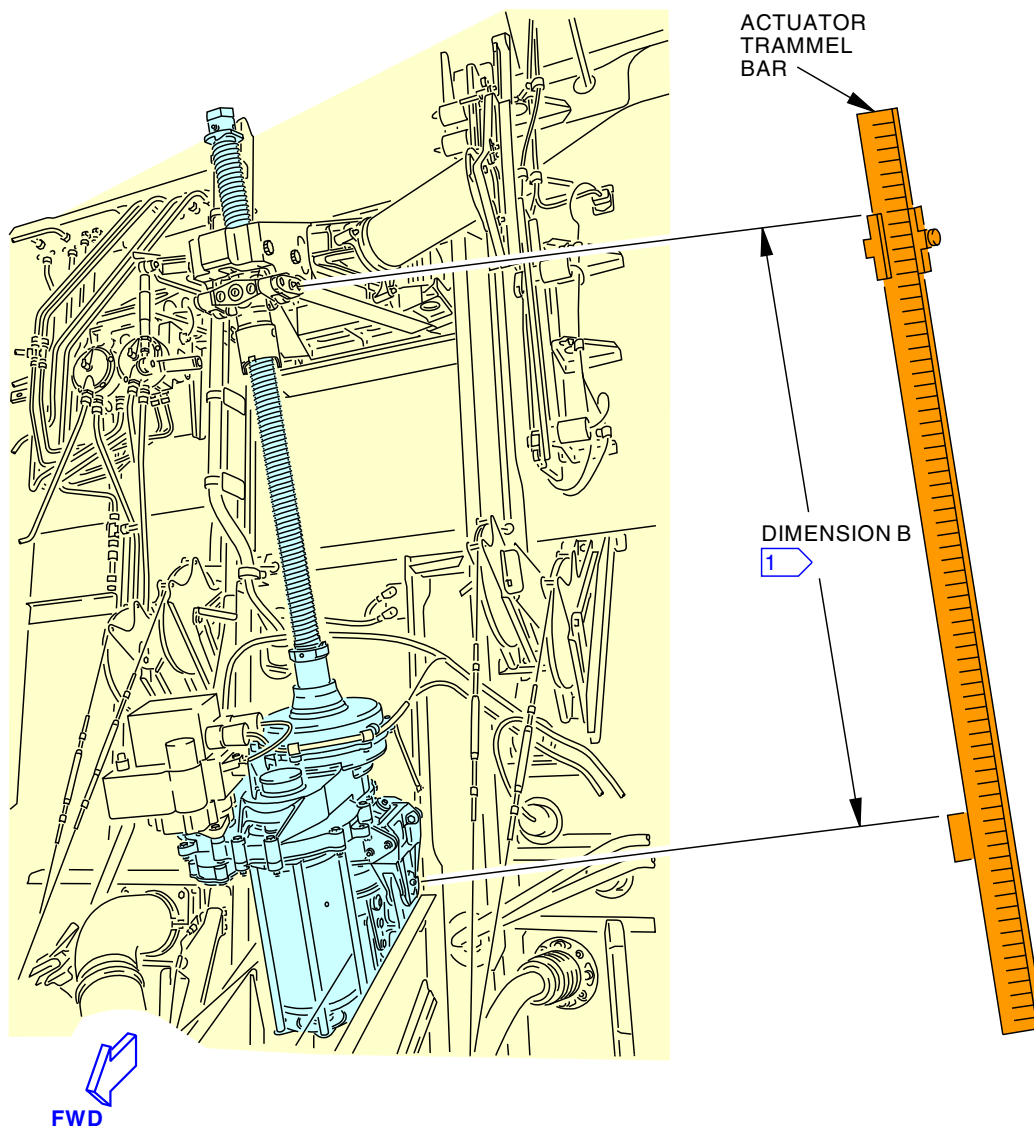
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STABILIZER TRIM JACKSCREW

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.

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Stabilizer Trim Jackscrew Setting
Figure 502/22-11-31-990-806 (Sheet 2 of 2)

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TASK 22-11-31-710-801

3. **Stabilizer Position Sensor Test**

A. **General**

- (1) This task is for the test of the stabilizer position sensor.

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 22-11-31-860-021

- (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 22-11-31-860-022

- (2) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the CUTOUT position.

SUBTASK 22-11-31-860-023

- (3) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-31-860-024

- (4) Set the left and right IRS select switches, on the P5 Aft Overhead Panel, to the ALIGN or NAV position.

SUBTASK 22-11-31-860-025



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.

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

NOTE: Hydraulic power is necessary for surface test.

E. **Stabilizer Position Sensor Test**

SUBTASK 22-11-31-740-001

- (1) Do this BITE test:
- (a) Push the INIT REF key on the CDU keyboard.

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- (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 shown.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-31-860-026

- (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 22-11-31-860-027

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-31-860-028

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand to the NORMAL position.

SUBTASK 22-11-31-860-029

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

————— **END OF TASK** —————

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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 task removes electrical power to the autoflight status annunciator.
- (2) The tryout in this task makes sure that the autoflight status annunciator is in a zero energy state.

B. Location Zones

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

C. Autoflight Status Annunciator Deactivation

SUBTASK 22-11-32-860-001

- (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

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

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D. Autoflight Status Annunciator Tryout

SUBTASK 22-11-32-700-001

- (1) Do the following steps to make sure that there is no electrical to the autoflight status annunciator [1]:
 - (a) Hold the annunciator TEST switch [5] in the position 1.
 - (b) Make sure that no warning light annunciators [6] come on.
 - (c) Hold the annunciator TEST switch [5] in the position 2.
 - (d) Make sure that no warning light annunciators [6] come on.

———— **END OF TASK** ————

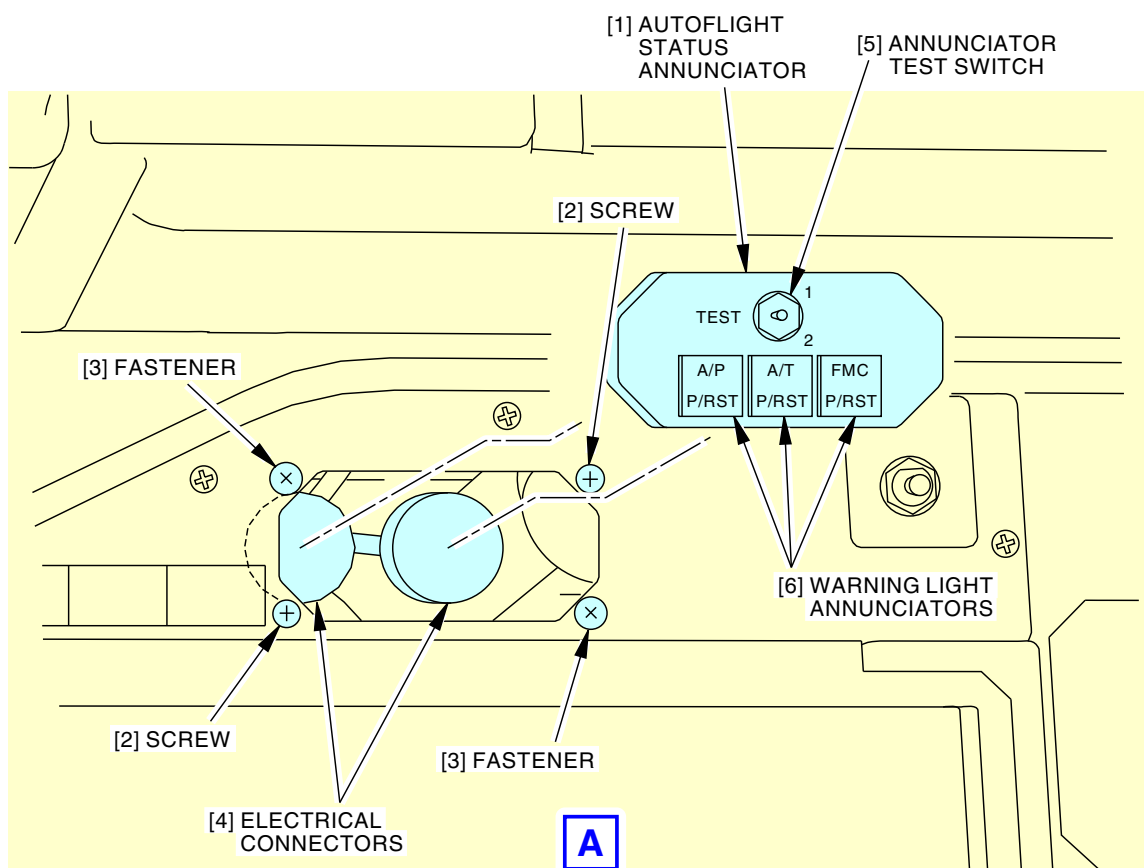
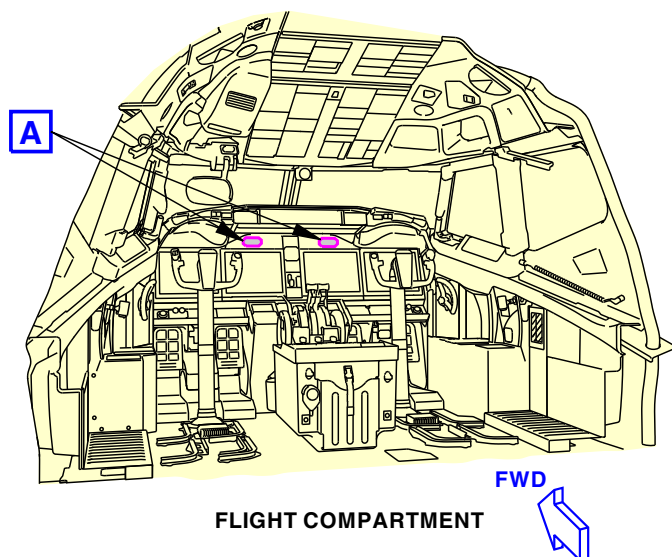
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Autoflight Status Annunciator Deactivation
Figure 201/22-11-32-990-801

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TASK 22-11-32-440-801

3. **Autoflight Status Annunciator - Activation**

(Figure 201)

A. General

- (1) This task restores electrical power to the autoflight status annunciator.

B. Location Zones

Zone	Area

211	Flight Compartment - Left
212	Flight Compartment - Right

C. Autoflight Status Annunciator Activation

SUBTASK 22-11-32-860-004

- (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 22-11-32-860-013

- (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

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SUBTASK 22-11-32-700-002

- (3) Do the following steps to make sure that there is power to the autoflight status annunciator [1]:
- (a) Hold the annunciator TEST switch [5] in the position 1.
 - (b) Make sure that all three amber warning light annunciators [6] come on.
NOTE: The A/P and A/T warning lights come on before the FMC warning light comes on.
 - (c) Release the annunciator TEST switch [5].
 - (d) Make sure that all the warning light annunciators [6] go off.
 - (e) Hold the annunciator TEST switch [5] in the position 2.
 - (f) Make sure that the red A/P and A/T warning lights come on and then the amber FMC warning light comes on.
 - (g) Release the annunciator TEST switch [5].
 - (h) Make sure that all warning light annunciators [6] go off.

———— **END OF TASK** ————

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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 [1]. The second task is for the installation of the autoflight status annunciator [1].
- B. The autoflight status annunciator [1] is also known as the Flight Management System (FMS) warning annunciator. There are two autoflight status annunciators [1] installed in the airplane. One on captain's instrument panel and one on the flight operator's instrument panel.
- C. Each autoflight status annunciator [1] attaches to the instrument panel with a clamp. There are two electrical connectors that connect to the autoflight status annunciators [1].

TASK 22-11-32-000-801

2. Autoflight Status Annunciator Removal

(Figure 401)

A. General

- (1) This task is for the removal of the autoflight status annunciator.

B. Location Zones

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

C. Prepare for the Removal

SUBTASK 22-11-32-860-007

- (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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	3	C01047	AFCS MCP DC 2

D. Autoflight Status Annunciator Removal

SUBTASK 22-11-32-020-002

(1) Do these steps to remove the autoflight status annunciator [1]:

- (a) Loosen the two fasteners [3] on the clamp that holds the autoflight status annunciator [1] in the panel.

NOTE: There are two fasteners [3] and two countersunk screws [2] on the autoflight status annunciator [1] panel. To remove the autoflight status annunciator [1] panel, loosen the top left and lower right fasteners [3]. Do not loosen the top right and lower left countersunk screws [2].

- (b) Carefully pull the autoflight status annunciator [1] out of the instrument panel.
- (c) Disconnect the two electrical connectors [4].
- (d) Install dust caps on the electrical connectors [4].

————— **END OF TASK** —————

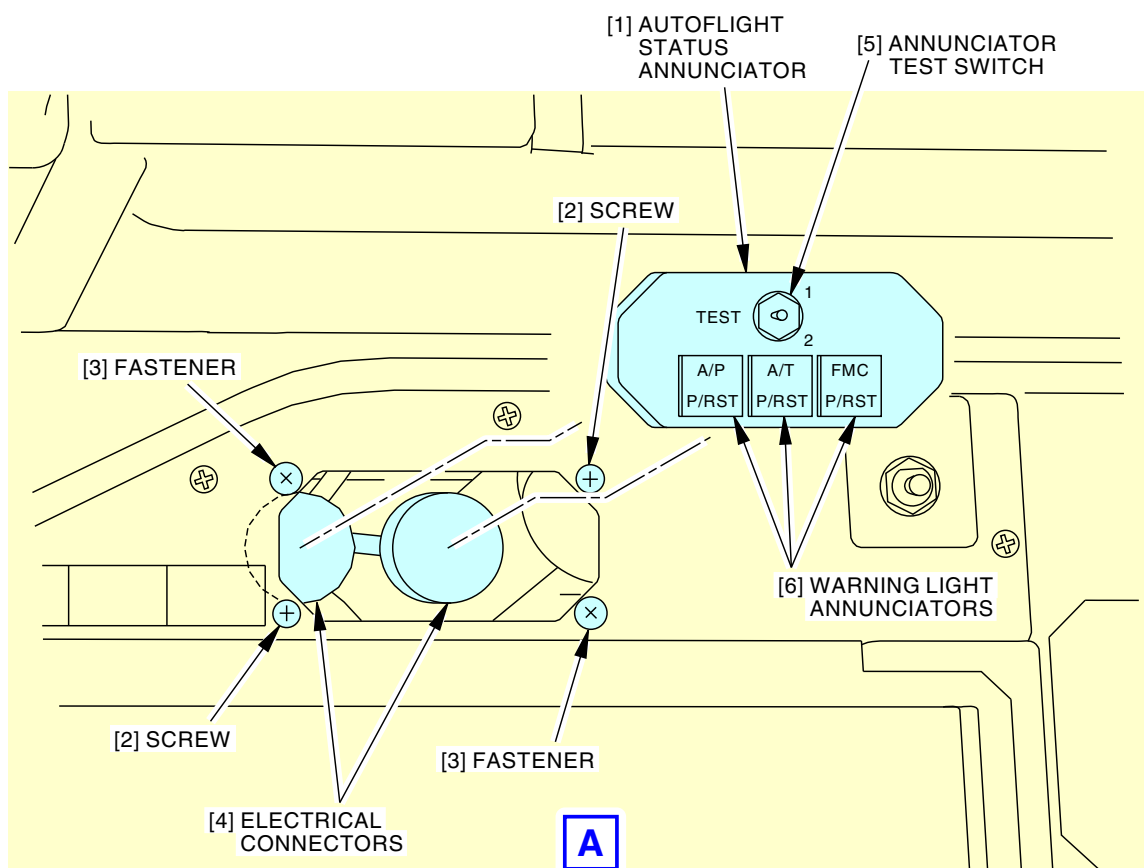
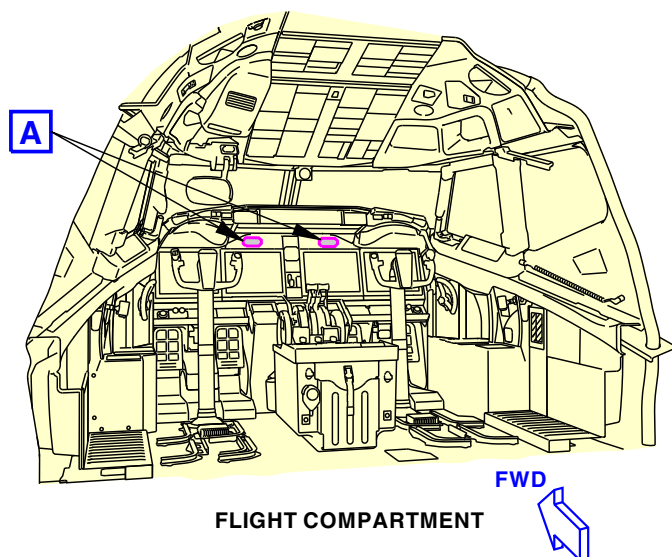
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Autoflight Status Annunciator Installation
Figure 401/22-11-32-990-803

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TASK 22-11-32-400-801

3. **Autoflight Status Annunciator Installation**

(Figure 401)

A. General

- (1) This task is for the installation of the autoflight status annunciator.

B. References

Reference	Title
22-11-32-720-801	Autoflight Status Annunciator Warning Lights Test (P/B 501)

C. Location Zones

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

D. Autoflight Status Annunciator Installation

SUBTASK 22-11-32-420-002

- (1) Do these steps to install the autoflight status annunciator [1]:
- (a) Remove the dust caps from the two electrical connectors [4].
 - (b) Connect the two electrical connectors [4] to the autoflight status annunciator [1].
 - (c) Align the autoflight status annunciator [1] in the correct position on the instrument panel.
 - (d) Tighten the two fasteners [3] to secure the autoflight status annunciator [1] to the instrument panel.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-32-840-003

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	2	C01042	AFCS SYS B SNSR EXC AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-32-860-014

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

F. Autoflight Status Annunciator Installation Test

SUBTASK 22-11-32-860-009

- (1) Do this task: Autoflight Status Annunciator Warning Lights Test, TASK 22-11-32-720-801.

————— **END OF TASK** —————

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AUTOFLIGHT STATUS ANNUNCIATOR - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) Autoflight status annunciator warning lights test.

TASK 22-11-32-720-801

2. Autoflight Status Annunciator Warning Lights Test

(Figure 501)

A. General

- (1) This task is for the test of the autoflight status annunciator warning lights.

B. Location Zones

Zone	Area

211	Flight Compartment - Left

212	Flight Compartment - Right

C. Autoflight Status Annunciator Warning Lights Test

SUBTASK 22-11-32-860-010

- (1) 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
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

- (a) If the circuit breakers are not closed, close these circuit breakers last:

CAPT Electrical System Panel, P18-1

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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-32-710-001

- (2) On the autoflight status annunciator [1], hold the annunciator test switch [5] in position 1.

SUBTASK 22-11-32-710-002

- (3) Make sure that the amber A/P P/RST and A/T P/RST warning light annunciators [6] come on first, then the amber FMC P/RST warning light annunciator comes on.

SUBTASK 22-11-32-860-011

- (4) Release the annunciator test switch [5].

SUBTASK 22-11-32-210-005

- (5) Make sure that the three warning light annunciators [6] go off.

SUBTASK 22-11-32-710-003

- (6) On the autoflight status annunciator, hold the annunciator test switch [5] in position 2.

SUBTASK 22-11-32-710-004

- (7) Make sure that the red A/P P/RST and A/T P/RST warning light annunciators [6] come on first, then the amber FMC P/RST warning light annunciators [6] comes on.

NOTE: The FMC P/RST warning light annunciator [6] contains only two amber lamps behind the amber filter.

SUBTASK 22-11-32-860-012

- (8) Release the annunciator test switch [5].

SUBTASK 22-11-32-210-006

- (9) Make sure that the three warning light annunciators [6] go off.

————— **END OF TASK** —————

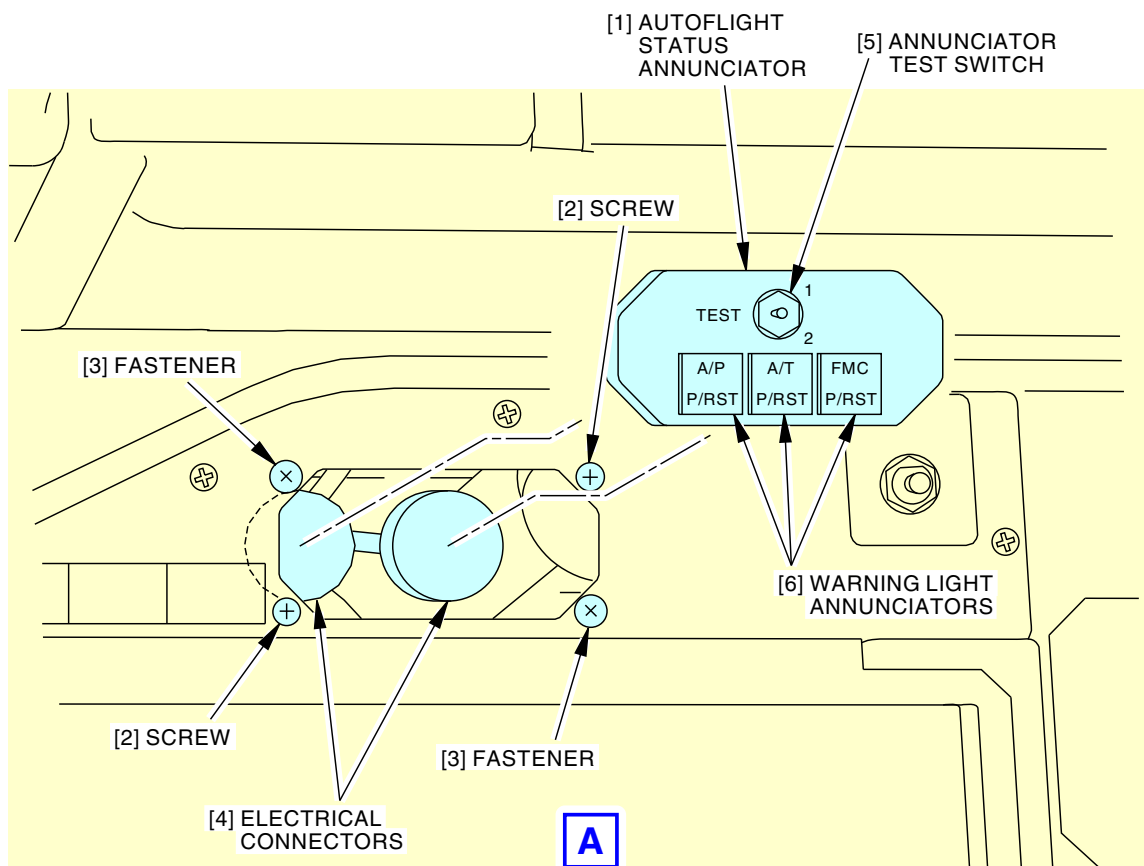
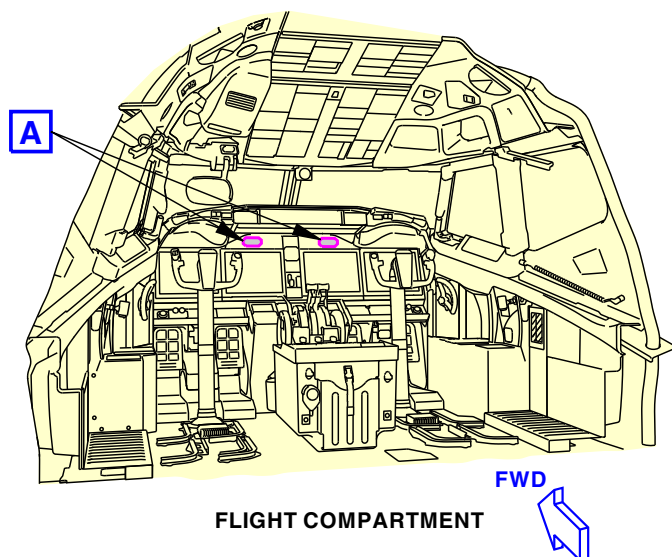
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Autoflight Status Annunciator Test
Figure 501/22-11-32-990-805

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FLIGHT CONTROL COMPUTER - MAINTENANCE PRACTICES

1. General

- A. This procedure contains these tasks:
- (1) Flight Control Computer (FCC) deactivation.
 - (2) FCC Activation.
 - (3) FCC hardware and Operational Program Software (OPS) verification.
 - (4) FCC OPS installation using the Onboard Network System (ONS).
 - (5) An installation of the FCC OPS from one FCC to the other FCC, using the FCC cross-load function.
- B. The Data Loader Control Panel (DLCP) is installed on the P61 panel in the flight compartment. The DLCP has two switches and two data transfer unit ports (ONS and PDL port)

TASK 22-11-33-040-801

2. Flight Control Computer - Deactivation

(Figure 201 and Figure 22-11-33-990-802)

A. General

- (1) This task removes electrical power to the flight control computer.
- (2) The tryout in this task makes sure that the flight control computer is in a zero energy state.

B. References

Reference	Title
22-11-33-990-802	Figure: Flight Control Computer Installation (P/B 401)

C. Location Zones

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

D. Flight Control Computer Deactivation

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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

E. Flight Control Computer Tryout

SUBTASK 22-11-33-860-003

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-33-860-004

- (2) At the FMC - CDU make sure that the keyboard and display panel are not functioning.

———— **END OF TASK** ————

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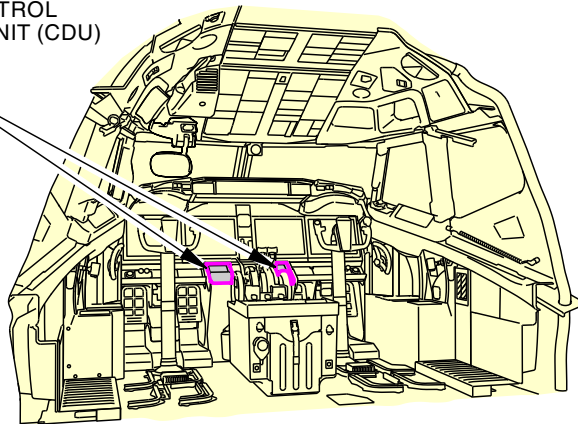
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



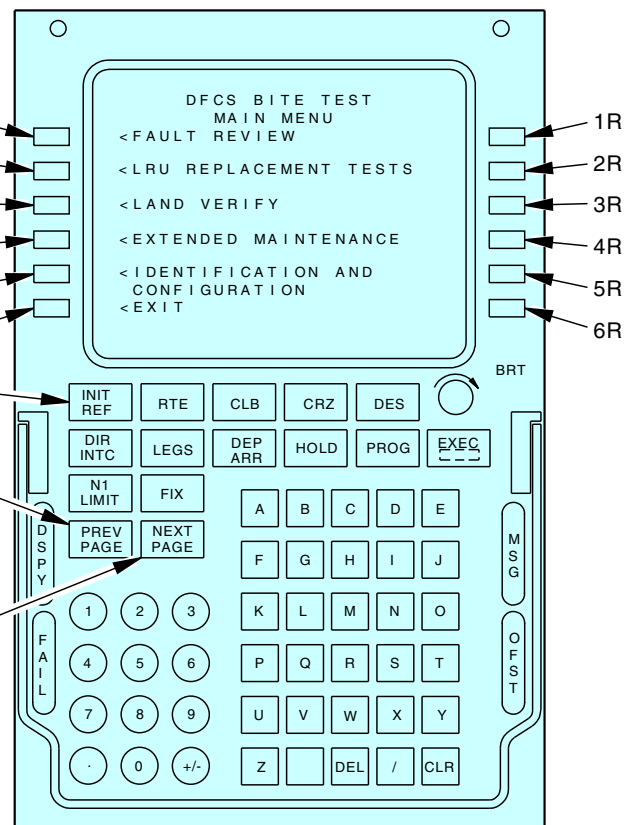
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

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Flight Management Computer Control Display Unit
Figure 201/22-11-33-990-801

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TASK 22-11-33-440-801

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 22-11-33-860-005

- (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 22-11-33-860-046

- (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 —————

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TASK 22-11-33-470-801

4. FCC Hardware and Software Verification

(Figure 202)

A. General

- (1) This task gives the instructions on how to make sure that the correct Flight Control Computer (FCC) and FCC Operational Program Software (OPS) is installed.
- (2) The airplane must be on the ground with the engines shutdown to do this task.

B. References

Reference	Title
22-11-33 P/B 401	FLIGHT CONTROL COMPUTER - REMOVAL/INSTALLATION

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FCC	22-11-33-03-010	SIA ALL
2	FCC OPS	22-11-33-10-020	SIA ALL

D. Location Zones

Zone	Area
212	Flight Compartment - Right

E. FCC Software Verification

SUBTASK 22-11-33-860-043

- (1) Make sure that the airplane parking brake is on.

SUBTASK 22-11-33-860-007

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1
D	15	C01401	LANDING GEAR AIR/GND RELAY

- (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

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1
A	7	C01018	FMCS CDU 1
D	1	C04030	DSP CAPT EFIS CONT PNL
D	2	C04003	MULTI FUNCTION PANEL
D	3	C04026	DISPLAY LEFT INBOARD
D	4	C04027	DISPLAY LEFT OUTBOARD
D	5	C04023	DISPLAY DPC 1 PRI

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F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	9	C04024	DISPLAY DPC 2 HOLDUP
D	10	C04022	DISPLAY DPC 1 HOLDUP
D	11	C04025	DISPLAY DPC 2 PRI
D	15	C01050	FMCS CDU 2
D	16	C01262	FMCS CMPTR 2
E	10	C04029	DISPLAY RIGHT OUTBOARD
E	11	C04028	DISPLAY RIGHT INBOARD
E	12	C04002	MAINT/BITE PANEL
E	13	C04031	DSP F/O EFIS CONT PNL
E	15	C01263	FMCS XFR

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C01958	NETWORK FILE SERVER
C	10	C04032	SPOILER CONTROL ELEC PWR A
C	12	C04033	SPOILER CONTROL ELEC PWR B

SUBTASK 22-11-33-860-008

- (4) Set the SYSTEM SELECT Switch on the Data Loader Control Panel, P61 to NORMAL.
- (5) Make sure that the FMC Switch on the overhead panel, P5 is set to NORMAL.

SUBTASK 22-11-33-860-044

- (6) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is not engaged.

SUBTASK 22-11-33-860-009

- (7) Make sure that the correct FCC and FCC OPS is installed as follows:

NOTE: For the FCC to be an approved installation, the correct FCC and FCC OPS must be installed. Refer to the Expendables/Parts table for FCC [1] and FCC OPS [2].

NOTE: The prompts on the Control Display Unit (CDU) screen can be selected if you push the adjacent Line Select Key (LSK).

- (a) Push the INIT REF key on the CDU keyboard.
- (b) Select INDEX.
- (c) Select MAINT.
- (d) Select DFCS and wait for DFCS BITE TEST MAIN MENU to appear.
 - 1) If the message FCC INCOMPATIBILITY is displayed, do the software installation to both FCC-A and FCC-B.

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- 2) If the DFCS SELF TEST fails with the message CROSS CHANNEL TEST FAIL, select CONTINUE.
 - 3) Follow the CDU prompts on the screen..
- (e) Select IDENTIFICATION AND CONFIGURATION.
 - (f) Select CHANNEL A.
 - (g) Make sure that the HARDWARE PART NUMBER and the FCC OPS for channel A is correct.
NOTE: Refer to the Expendables/Parts table for FCC [1] and FCC OPS [2].
 - (h) Select PREV MENU.
 - (i) Select CHANNEL B.
 - (j) Make sure that the HARDWARE PART NUMBER and the FCC OPS for channel B is correct.
NOTE: Refer to the Expendables/Parts table for FCC [1] and FCC OPS [2].
 - (k) If a HARDWARE PART NUMBER is not correct, install the correct FCC (PAGEBLOCK 22-11-33/401).
 - (l) If an FCC OPS part number is not correct, install the correct software (TASK 22-11-33-470-802)

———— **END OF TASK** ————

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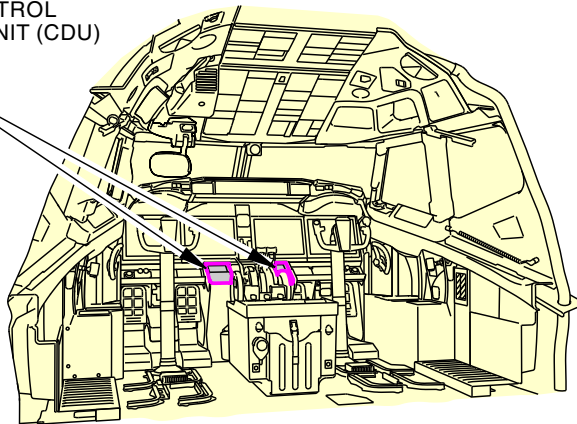
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



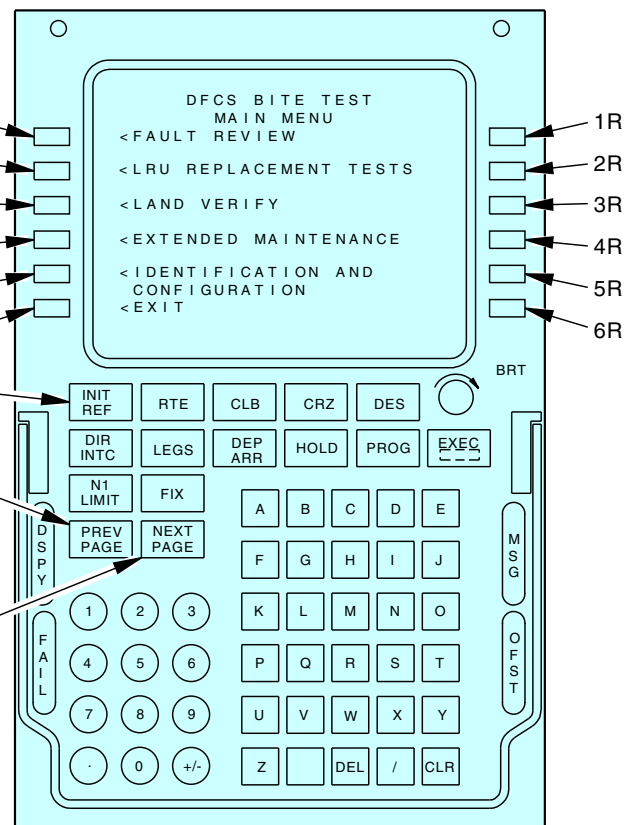
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 202/22-11-33-990-804

EFFECTIVITY
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TASK 22-11-33-470-802

5. FCC Software Installation from the Onboard Network System

A. General

- (1) This task gives the instructions on how to install Operational Program Software (OPS) in the Flight Control Computer (FCC) maintenance laptop to access the Onboard Network System (ONS) data load function.
- (2) The airplane must be on the ground with the engines shutdown before you can install software.

B. References

Reference	Title
20-15-11-470-801	On-Airplane Software Installation (P/B 201)
46-13-00-470-801	LRU Software Parts Installation (P/B 201)
46-13-00-480-801	Maintenance Laptop Connection (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	FCC OPS	22-11-33-10-020	SIA ALL

D. Location Zones

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

E. FCC Software Installation from the Onboard Network System

SUBTASK 22-11-33-470-003

- (1) Do this task: On-Airplane Software Installation, TASK 20-15-11-470-801.

SUBTASK 22-11-33-860-012

- (2) Make sure that the DFCS is not engaged.

SUBTASK 22-11-33-860-013

- (3) Do this task: Maintenance Laptop Connection, TASK 46-13-00-480-801.
- (4) Set the SYSTEM SELECT Switch on the Data Loader Control Panel, P61 to FCC.
- (5) Set the DATA SELECTOR Switch on the Data Loader Control Panel, P61 to L CAPT UPR if loading FCC A and R F/O LWR if loading FCC B.
- (6) Install the software to the FCC (TASK 46-13-00-470-801)

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 [2].

SUBTASK 22-11-33-470-006

- (7) If the other FCC software needs to be loaded, do this task: FCC Software Installation Using the Cross-load Function, TASK 22-11-33-470-803.

SUBTASK 22-11-33-860-014

- (8) Set the SYSTEM SELECT Switch on the Data Loader Control Panel, P61 to NORMAL.

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F. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-470-005

- (1) Do these steps to test the software installation:

NOTE: The prompts on the Control Display Unit (CDU) screen can be selected if you push the adjacent Line Select Key (LSK).

- (a) Make sure that the FCC hardware and software is correct (TASK 22-11-33-470-801).
- (b) Go to the DFCS BIT TEST MAIN MENU screen:
 - 1) Push the INIT REF function key.
 - 2) Select INDEX.
 - 3) Select MAINT.
 - 4) Select DFCS.
 - a) Follow the CDU prompts on the screen.
- (c) Select FAULT REVIEW.
- (d) Select ERASE FAULT HISTORY.
- (e) Select CHANNEL A AND B.
- (f) Select YES.
- (g) Select EXIT until you are out of the DFCS BITE.

————— **END OF TASK** —————

TASK 22-11-33-470-803

6. FCC Software Installation Using the Cross-load Function

(Figure 203)

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.
- (3) To read about software installation times,

B. References

Reference	Title
20-15-11-470-801	On-Airplane Software Installation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	FCC OPS	22-11-33-10-020	SIA ALL

D. Location Zones

Zone	Area
212	Flight Compartment - Right

E. FCC Software Installation Using the Cross-load Function

SUBTASK 22-11-33-470-004

- (1) Do this task: On-Airplane Software Installation, TASK 20-15-11-470-801.

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SUBTASK 22-11-33-860-016

- (2) Make sure that the Digital Flight Control System (DFCS) is not engaged.

SUBTASK 22-11-33-860-017

- (3) 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 [2].

SUBTASK 22-11-33-860-018

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-33-860-019

- (5) Do these steps to install the software into an FCC:

NOTE: The prompts on the Control Display Unit (CDU) screen can be selected if you push the adjacent Line Select Key (LSK).

- (a) Set the SYSTEM SELECT Switch on the Data Loader Control Panel, P61 to NORMAL.
- (b) Set the DATA LOAD SELECTOR Switch on the Data Loader Control Panel, P61 to C SINGLE SYS.
- (c) Go to the DFCS BIT TEST MAIN MENU screen:
 - 1) Push the INIT REF function key.
 - 2) Select INDEX.
 - 3) Select MAINT.
 - 4) Select DFCS.
 - a) Follow the CDU prompts on the screen.
- (d) Select IDENTIFICATION AND CONFIGURATION.
- (e) Select CROSSLOAD.

NOTE: The CROSSLOAD prompt only appears if the FCC have different OPS part numbers installed. The OPS and OPC software part numbers will be displayed for both FCC-A and FCC-B.

- (f) To load software from FCC-A to FCC-B, select A TO B.
- (g) To load software from FCC-B to FCC-A, select B TO A.
- (h) To start the software cross-load, select YES.
- (i) If the software cross-load is successful, these messages will be on the BITE screen:

NOTE: The software cross-load may take between 6 and 8 minutes. During this time the message IN PROGRESS will be displayed.

- 1) DFCS BITE TEST
- 2) CROSSLOAD FROM FCC-A (or B)
- 3) CROSSLOAD COMPLETE

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- 4) INITIALIZATION OF FCC
- 5) IN PROGRESS. THIS MAY REQUIRE 30 SECONDS.

SUBTASK 22-11-33-860-020

- (6) After two minutes, do the software installation test below.

NOTE: If cross-loading is successful, the CDU will display the DFCS BITE TEST MAIN MENU.

F. Software Installation Test from the FMCS CDU

SUBTASK 22-11-33-420-001

- (1) Do these steps to test the software installation:

NOTE: The prompts on the CDU screen can be selected if you push the adjacent LSK.

- (a) Make sure that the FCC hardware and software is correct (TASK 22-11-33-470-801).
- (b) Go to the DFCS BIT TEST MAIN MENU screen:
 - 1) Push the INIT REF function key.
 - 2) Select INDEX.
 - 3) Select MAINT.
 - 4) Select DFCS.
 - a) Follow the CDU prompts on the screen.
- (c) Select FAULT REVIEW.
- (d) Select ERASE FAULT HISTORY.
- (e) Select CHANNEL A AND B.
- (f) Select YES.
- (g) Select EXIT until you are out of the DFCS BITE.

————— **END OF TASK** —————

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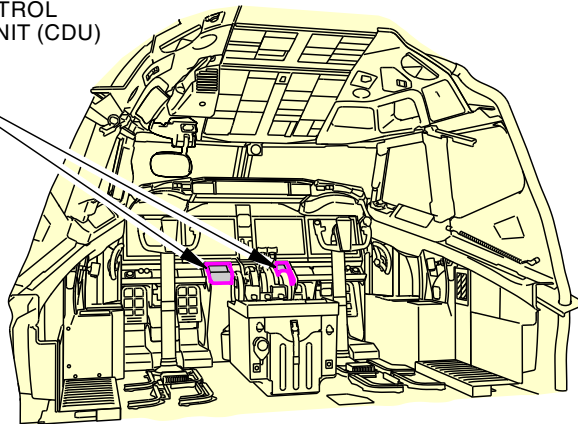
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



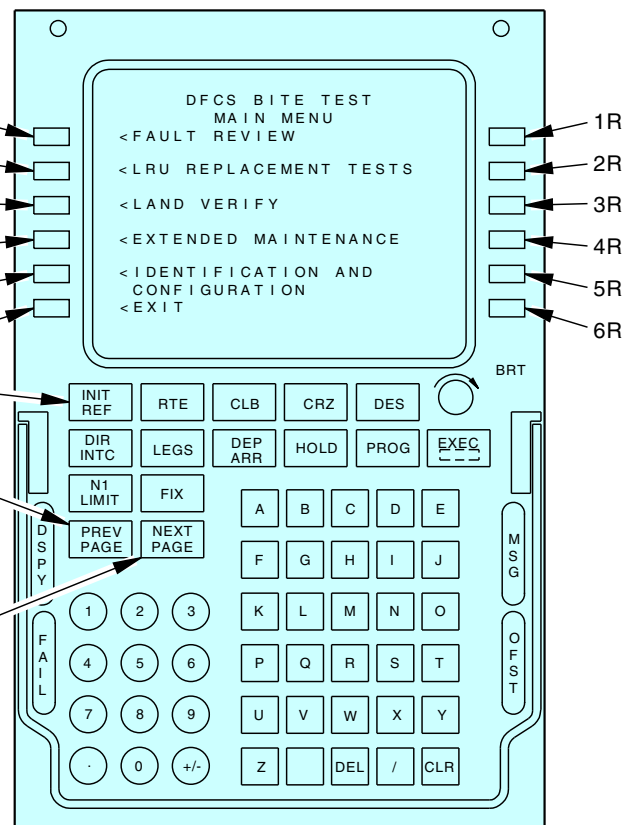
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 203/22-11-33-990-803

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FLIGHT CONTROL COMPUTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of a Flight Control Computer (FCC) [1].
 - (2) The installation of a Flight Control Computer (FCC) [1].
- B. There are two Flight Control Computer (FCC)s [1]. 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. General

- (1) This task is for the removal of the flight control computer.

B. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)

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. Prepare for the Removal

SUBTASK 22-11-33-860-022

- (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
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)

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-33-010-001

- (2) Open this access door.

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

F. Flight Control Computer Removal

SUBTASK 22-11-33-020-001

 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.

- (1) Remove the Flight Control Computer (FCC) [1] (TASK 20-10-07-000-801).

———— **END OF TASK** ————

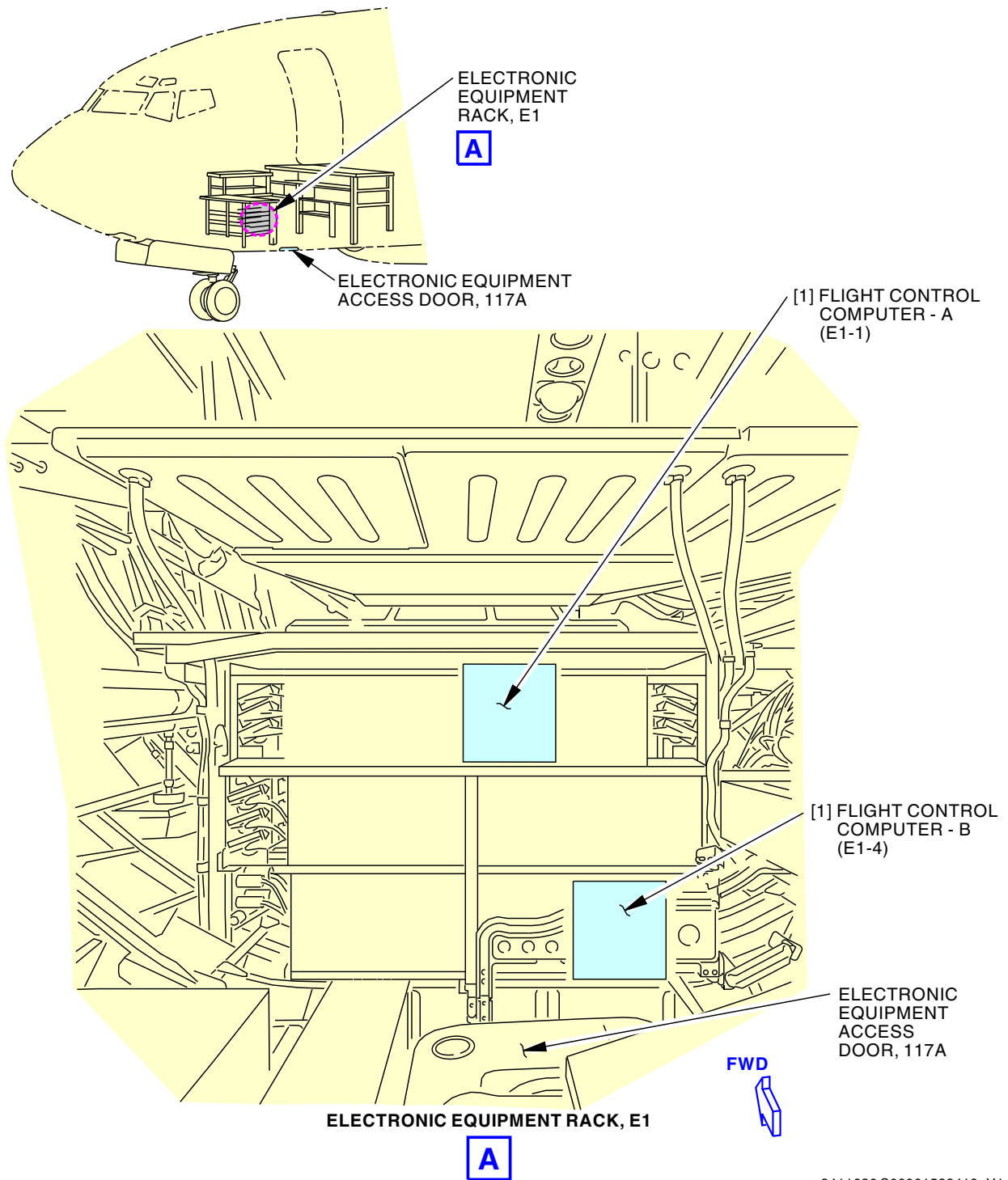
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2411636 S00061528419_V1

**Flight Control Computer Installation
Figure 401/22-11-33-990-802**

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TASK 22-11-33-400-801

3. Flight Control Computer Installation

(Figure 401)

A. General

(1) This task is for the installation of the Flight Control Computer (FCC).

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
22-11-33-470-801	FCC Hardware and Software Verification (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Flight Control Computer (FCC)	22-11-33-03-010	SIA ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Flight Control Computer Installation

SUBTASK 22-11-33-010-002

(1) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-11-33-860-048

(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
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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-33-420-002



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.

- (3) Install the Flight Control Computer (FCC) [1] (TASK 20-10-07-400-801).

SUBTASK 22-11-33-410-002

- (4) Close this access door:

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

SUBTASK 22-11-33-860-050

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-33-860-051

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

G. Prepare for the Test

SUBTASK 22-11-33-860-052

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-33-860-028

- (2) Set the STAB TRIM PRI switch, S272, on the control stand, to the CUTOUT position.

SUBTASK 22-11-33-860-029

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

SUBTASK 22-11-33-860-030

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

H. Erase Fault History from the Installed Flight Control Computer

SUBTASK 22-11-33-740-003

- (1) Do this Built-In-Test Equipment (BITE) procedure to erase the fault history data from the installed 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
- 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.

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I. Flight Control Computer Installation Test

SUBTASK 22-11-33-740-001

- (1) Do this DFCS BITE test:

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 DFCS 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.

NOTE: The prompts on the CDU screen can be selected if you push the adjacent LSK.

- (a) Push the INIT REF key on the CDU keyboard.
- (b) Select INDEX.
- (c) Select MAINT.

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.

- (d) Select DFCS.
- (e) Select LRU REPLACEMENT TESTS.
- (f) Select the applicable channel:

NOTE: Channel A is for FCC-A and channel B is for FCC-B.

- 1) CHANNEL A
- 2) CHANNEL B
- 3) CHANNEL A AND B.

- (g) Select DFCS/AT or FCC.

NOTE: If CHANNEL A or CHANNEL A AND B was selected, DFCS/AT will show on the BITE display.

If CHANNEL B was selected, FCC will show on the BITE display.

- (h) Do the instructions that show on the CDU display to complete the test.
- (i) Select CONTINUE.
- (j) Make sure that the test is completed with no failure.
 - 1) Make sure that the TEST FAILED message does not show.

SUBTASK 22-11-33-740-002



MAKE SURE THAT YOU HAVE THE CORRECT FCC SOFTWARE ON EACH FLIGHT CONTROL COMPUTER. IF THE CORRECT SOFTWARE IS NOT INSTALLED, THE AUTOPILOT CAN POSSIBLY NOT OPERATE CORRECTLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do this task: FCC Hardware and Software Verification, TASK 22-11-33-470-801.

NOTE: If the same incorrect software is installed on the two Flight Control Computers, no indication, flight deck effect, or maintenance message will show that the incorrect software is installed.



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J. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-33-860-047

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

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-33-860-045

- (2) Set the STAB TRIM PRI switch, S272, on the control stand, to the NORMAL position.

————— END OF TASK —————

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DFCS MODE CONTROL PANEL - MAINTENANCE PRACTICES

1. **General**

A. This procedure has these tasks:

- (1) Digital Flight Control System (DFCS) Mode Control Panel Deactivation.
- (2) DFCS Mode Control Panel Activation.

TASK 22-11-34-040-801

2. **DFCS Mode Control Panel - Deactivation**

(Figure 202)

A. **General**

- (1) This procedure removes electrical power from the Digital Flight Control System (DFCS) Mode Control Panel.
- (2) The tryout in this task makes sure that the DFCS Mode Control Panel is in a zero energy state.

B. **Location Zones**

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

C. **DFCS Mode Control Panel Deactivation**

SUBTASK 22-11-34-860-001

- (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**

SUBTASK 22-11-34-700-001

- (1) Use the FMC - CDU and do the test that follows:
 - (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 these messages:

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- a) FCC-A SELF TEST FAIL
- b) FCC-B SELF TEST FAIL
- c) 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** ————

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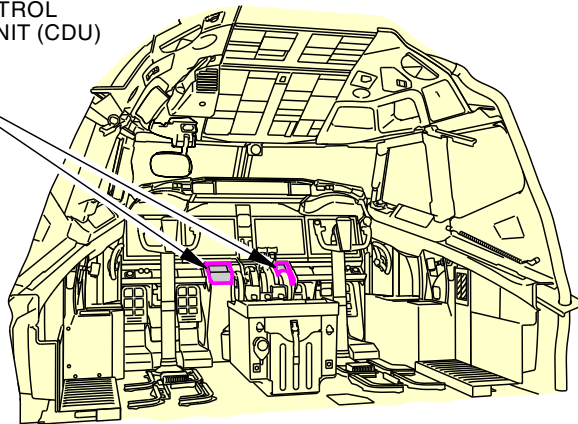
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



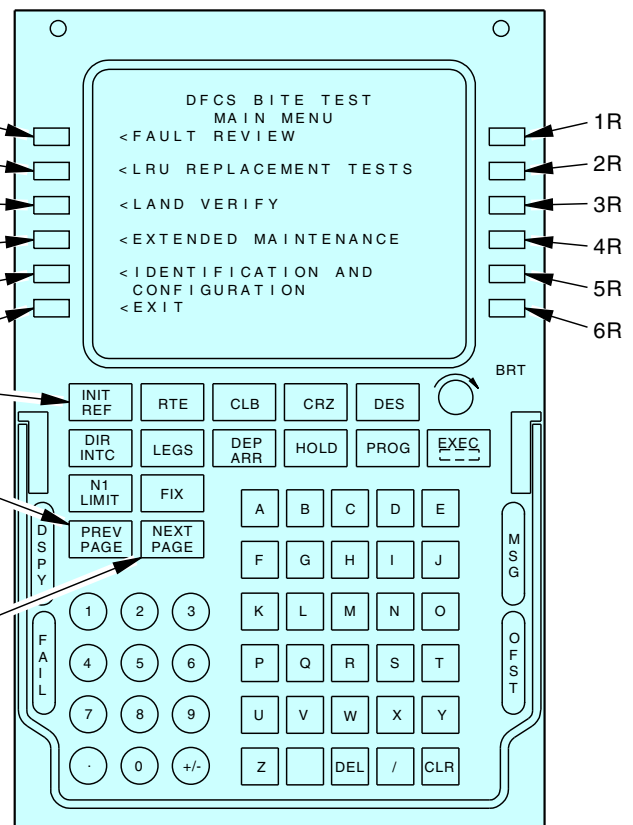
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-34-990-802

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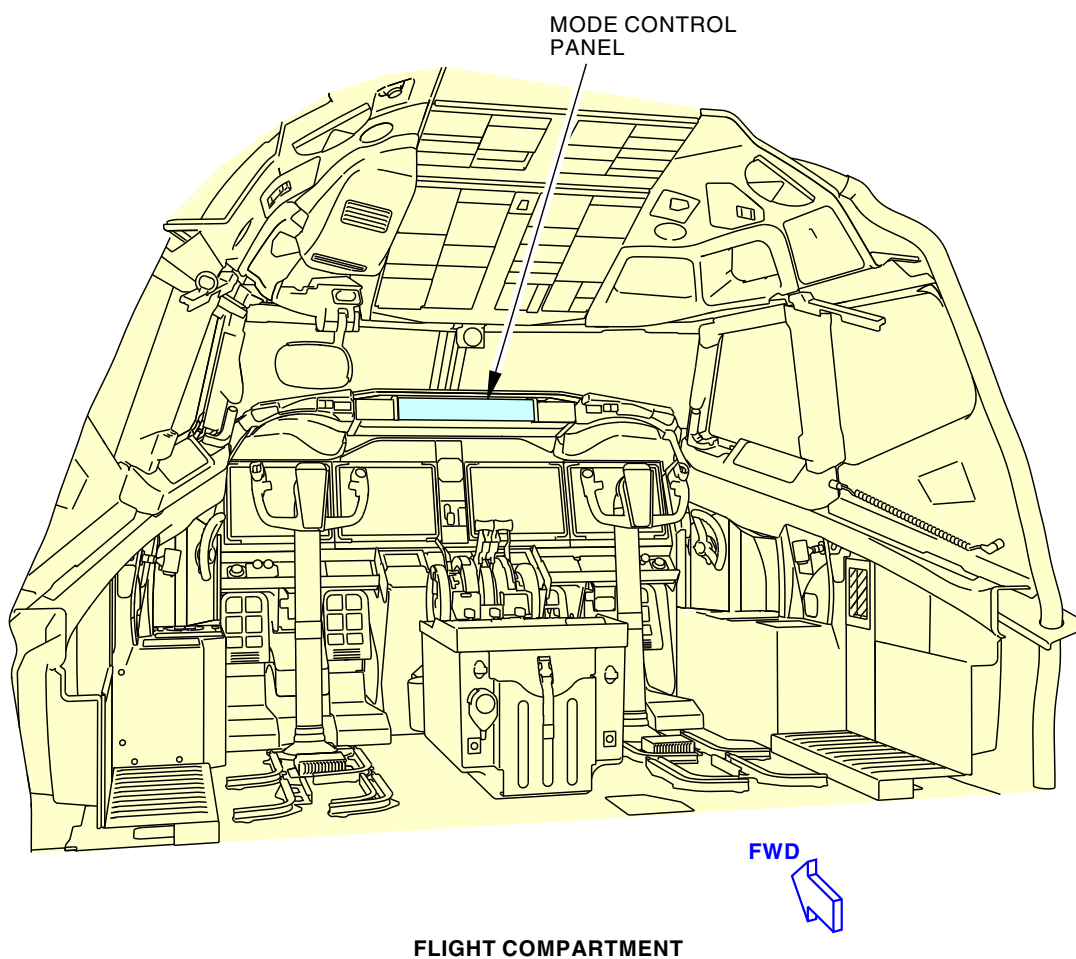
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2411638 S00061528432_V1

DFCS Mode Control Panel
Figure 202/22-11-34-990-803

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TASK 22-11-34-440-801

3. DFCS Mode Control Panel - Activation

(Figure 202)

A. General

- (1) This task restores electrical power to the Digital Flight Control System (DFCS) mode control panel.

B. Location Zones

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

C. DFCS Mode Control Panel Activation

SUBTASK 22-11-34-860-004

- (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 22-11-34-860-013

- (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 —————

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.

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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) To replace the left course indicator control knob [1], do these steps:
- (a) Loosen the setscrews [2] on the left course indicator control knob [1].
 - (b) Remove the left course indicator control knob [1].
 - (c) Install the new left course indicator control knob [1] onto shaft.
 - (d) Make sure that there is clearance of 0.03 ± 0.01 in. (0.76 ± 0.25 mm) between the left course indicator control knob [1] and top face of the mode control panel.
 - (e) Install the setscrews [2] in the left course indicator control knob [1].
 - 1) Tighten the setscrews [2] to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-002

- (2) To replace the speed indicator control knob [3], do these steps:
- (a) Loosen the setscrews [4] on the speed indicator control knob [3].
 - (b) Remove the speed indicator control knob [3].
 - (c) Install the new speed indicator control knob [3] onto shaft.
 - (d) Make sure that there is clearance of 0.03 ± 0.01 in. (0.76 ± 0.25 mm) between the speed indicator control knob [3] and top face of the mode control panel.
 - (e) Install the setscrews [4] in the speed indicator control knob [3].
 - 1) Tighten the setscrews [4] to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-003

- (3) To replace the heading indicator control knob [5], do these steps:
- (a) Loosen the setscrews [6] on the heading indicator control knob [5].
 - (b) Remove the heading indicator control knob [5].
 - (c) Install the new heading indicator control knob [5] onto shaft.
 - (d) Make sure that there is clearance of 0.03 ± 0.01 in. (0.76 ± 0.25 mm) between the heading indicator control knob [5] and top face of the bank limit knob.
 - (e) Install the setscrews [6] in the heading indicator control knob [5].
 - 1) Tighten the setscrews [6] to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-004

- (4) To replace the altitude indicator control knob [7], do these steps:
- (a) Loosen the setscrews [8] on the altitude indicator control knob [7].
 - (b) Remove the altitude indicator control knob [7].
 - (c) Install the new altitude indicator control knob [7] onto shaft.

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- (d) Make sure that there is clearance of 0.03 ± 0.01 in. (0.76 ± 0.25 mm) between the altitude indicator control knob [7] and top face of the mode control panel.
- (e) Install the setscrews [8] in the altitude indicator control knob [7].
 - 1) Tighten the setscrews [8] to 3.5 in-lb (0.4 N·m) - 4.25 in-lb (0.48 N·m).

SUBTASK 22-11-34-960-005

- (5) To replace the right course indicator control knob [9], do these steps:
 - (a) Loosen the setscrews [10] on the right course indicator control knob [9].
 - (b) Remove the right course indicator control knob [9].
 - (c) Install the new right course indicator control knob [9] onto shaft.
 - (d) Make sure that there is clearance of 0.03 ± 0.01 in. (0.76 ± 0.25 mm) between the right course indicator control knob [9] and top face of the mode control panel.
 - (e) Install the setscrews [10] in the right course indicator control knob [9].
 - 1) Tighten the setscrews [10] 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 22-11-34-710-002

- (2) Make sure the indicator control knobs work correctly.
 - (a) Rotate the knobs back and forth.
 - (b) Make sure that the indicator window changes.

———— **END OF TASK** ————

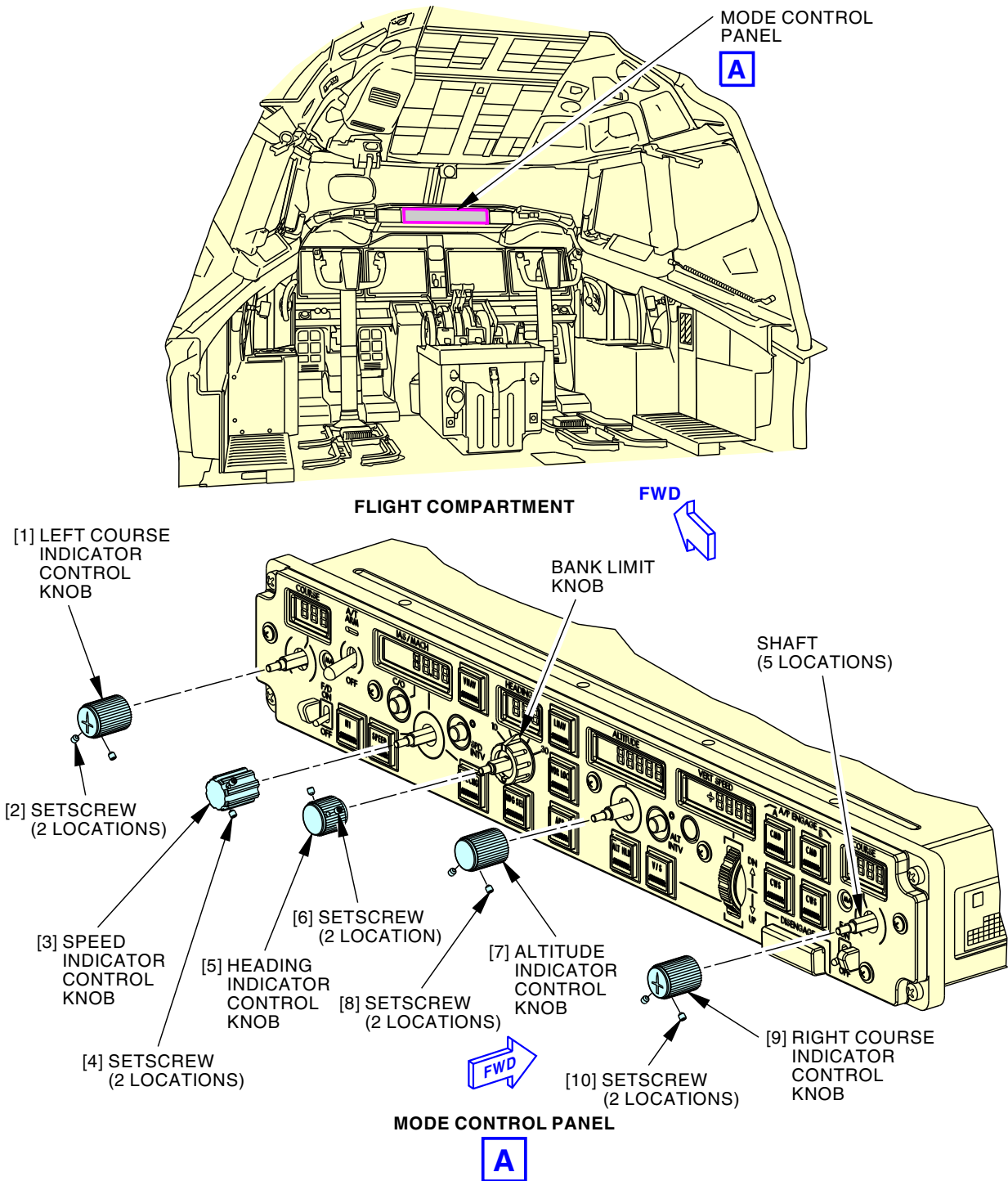
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2886562 S0000686050_V1

DFCS Mode Control Panel Knobs Installation
Figure 203/22-11-34-990-804

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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. General

- (1) This task is for the removal of the DFCS mode control panel

B. References

Reference	Title
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. Location Zones

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

D. Prepare for the Removal

SUBTASK 22-11-34-860-005

- (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

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E. DFCS Mode Control Panel Removal

SUBTASK 22-11-34-860-006

- (1) Turn the PANEL BRIGHT knob on captain's light control module (P1) to OFF.

NOTE: The MCP [3] 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.

SUBTASK 22-11-34-020-001

- (2) Before you touch the MCP [3], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 22-11-34-020-003



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) Remove the MCP [3] as follows:

- (a) Remove the four screws [2] on the front of the MCP [3].
- (b) Remove the two screws [4] on the bottom of the MCP [3].



BE CAREFUL WHEN YOU REMOVE THE MCP FROM ITS SUPPORTS IN THE GLARESHIELD. IF YOU ARE NOT CAREFUL WHEN YOU MOVE THE MCP, YOU CAN PUT TOO MUCH FORCE ON THE ELECTRICAL CABLES. DAMAGE TO ELECTRICAL CABLES COULD OCCUR.

- (c) Move the MCP [3] out from its supports in the glare shield until you can get access to the three electrical connectors [1] at the rear of the MCP unit.
- (d) Disconnect the three electrical connectors [1] from the MCP [3].
- (e) Remove the MCP [3] from its supports in the glare shield.
- (f) Put protective covers on the electrical connectors [1].

————— **END OF TASK** —————

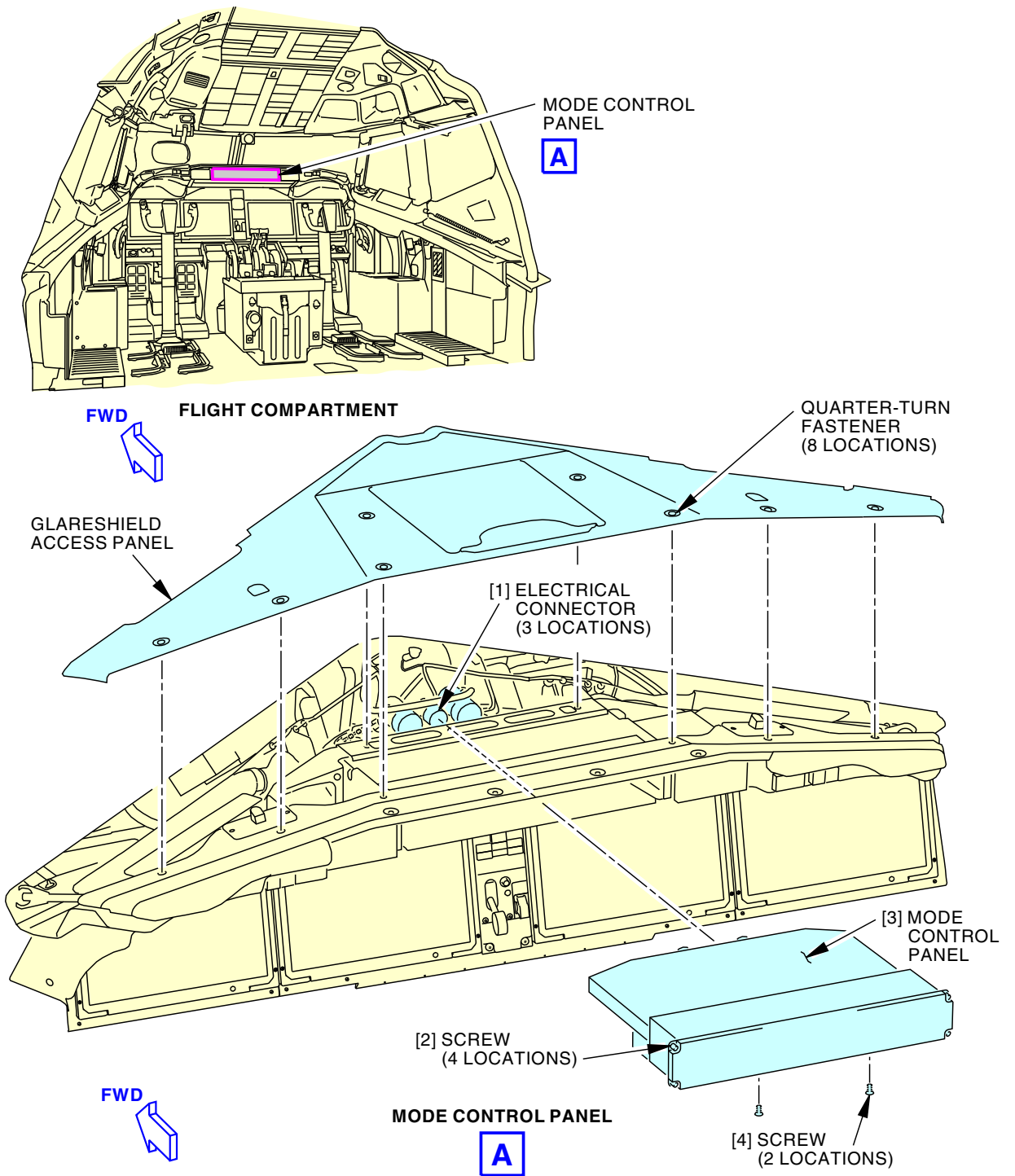
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Mode Control Panel Installation
Figure 401/22-11-34-990-801

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TASK 22-11-34-400-801

3. **DFCS Mode Control Panel Installation**

(Figure 401)

A. General

- (1) This task is for the installation of the DFCS mode control panel.

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. Location Zones

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

D. DFCS Mode Control Panel Installation

SUBTASK 22-11-34-420-001

- (1) Make sure that you have the correct MCP [3] part number for installation.

NOTE: For the MCP [3] to be an approved installation, refer to the Expendable/Parts table.

- (2) Before you touch the MCP [3], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 22-11-34-020-002



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 MCP [3] as follows:

- Remove the protective covers from the three electrical connectors [1].
- Examine the electrical connectors [1] for bent or broken pins, dirt, and damage.
- Move the MCP [3] onto its supports in the glare shield until the electrical connectors [1] can connect to the rear of the MCP.
- Connect the three electrical connectors [1] to the MCP [3].
- Move the MCP [3] into position.
- Install the four screws [2] on the front of the MCP [3].
- Install the two screws [4] on the bottom of the MCP [3].

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-34-860-008

- (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

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(Continued)

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-34-860-009

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

F. DFCS Mode Control Panel Installation Test

SUBTASK 22-11-34-710-001

- (1) Do this task: Mode Control Panel Installation Test, TASK 22-11-34-740-801.

————— **END OF TASK** —————

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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 Digital Flight Control System (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) built-in test equipment (BITE) is used to do the operational test after the installation of the DFCS 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
32-09-00-860-802	Return the Airplane to the Ground Mode (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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)

C. **Location Zones**

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

D. **Mode Control Panel Installation Test**

SUBTASK 22-11-34-860-011

- (1) On the P1 captain's instrument panel, turn the control knob of the AFDS FLOOD lights approximately to the middle position.

SUBTASK 22-11-34-840-001

- (2) Prepare for the LRU replacement test as follows:
 - (a) Make sure that the BAT switch, on the P5 Forward Overhead Panel, is in the ON position.
 - (b) Set the STANDBY POWER switch, on the P5 Forward Overhead Panel, to the AUTO position.
 - (c) Align the Air Data Inertial Reference System (ADIRS) (TASK 34-21-00-820-802 or TASK 34-21-00-820-801 or TASK 34-21-00-820-803).
 - (d) Make sure that all the instrument switches, on the P5 Forward Overhead Panel, are in the NORMAL position.
 - (e) Make sure that the airplane is in the ground mode (TASK 32-09-00-860-802).
 - (f) Push the captain's or first officer's autopilot disengage switch, on the control wheel, to make sure that the autopilot is disengaged.

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- (g) Make sure that the IRS or Flight Management Computer (FMC) ground speed is less than 20 knots.

SUBTASK 22-11-34-740-001

- (3) Do the LRU replacement test for the Digital Flight Control System (DFCS) Mode Control Panel (MCP) as follows:

- (a) Push the INIT REF key on the FMCS CDU.
- (b) Push the line select key (LSK) adjacent to <INDEX.
- (c) Push the LSK adjacent to MAINT>.
- (d) Push the LSK adjacent to <DFCS.

NOTE: The DFCS self-test will start and will run for a few seconds.

- (e) Push the LSK adjacent to <LRU REPLACEMENT TESTS.
- (f) Push the LSK adjacent to <CHANNEL A AND B.
- (g) Push the LSK adjacent to <MCP.
- (h) Do the preparation steps as shown on the CDU display.
- (i) Push the LSK adjacent to <CONTINUE.
- (j) 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.

- (k) 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 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.
- (l) Make sure that the CDU display shows TEST PASSED.

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

- (4) Continue the instructions on the CDU display:

- (a) Push the LSK adjacent to <EXIT.
- (b) Do the instructions on the CDU display.
- (c) Push the LSK adjacent to <EXIT.

———— **END OF TASK** ————

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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 be cleaned with approved liquids.

B. **Tools/Equipment**

Reference	Description
STD-4406	Brush - Bristle, Soft, Natural

C. **Consumable Materials**

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

D. **Location Zones**

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

E. **DFCS Mode Control Panel Cleaning**

SUBTASK 22-11-34-420-002

- (1) Clean the surface of the Mode Control Panel (MCP) as follows:



CAUTION

USE AN AIR IONIZING GUN ATTACHMENT OR IONIZING NOZZLE FOR THE COMPRESSED AIR OUTLET. IF YOU DO NOT, DAMAGE TO THE MCP CAN OCCUR.

- (a) Use compressed air or a brush, STD-4406 to remove light dirt and dust from the surface of the MCP.



CAUTION

DO NOT USE TOO MUCH ISOPROPYL ALCOHOL TO CLEAN THE MCP. IF YOU DO, THE ALCOHOL CAN GET INSIDE MCP. DAMAGE CAN OCCUR.

- (b) Use a cotton swab to remove heavy oil and grease from the surface of the MCP.

NOTE: Put a small quantity of alcohol, B00130 to clean the surface of the MCP



CAUTION

DO NOT USE LIQUID AGENTS TO CLEAN THE LIQUID CRYSTAL DISPLAY. THE LIQUID AGENTS CAN CAUSE MOISTURE CONTAMINATION. DAMAGE IN THE LCD MODULES CAN OCCUR.

- (c) Use a lens tissue to clean the LCD displays and edge light panel.

NOTE: Use the lens tissue to remove dust, dirt, oil and grease.

———— **END OF TASK** ————

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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 Integrated Flight System Accessory Unit (IFSAU).

B. **References**

Reference	Title
24-22-00-860-801	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 22-11-37-860-001

- (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

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 22-11-37-860-002



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 24-22-00-860-801.

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SUBTASK 22-11-37-860-003

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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
E	4	C01629	AFCS SYS A RUDDER DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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
D	3	C01630	AFCS SYS B RUDDER DC

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:
 - 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)"

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- (k) SELECT, INIT/REF on the keyboard, to exit of BITE.
- (l) End of test.

———— **END OF TASK** ————

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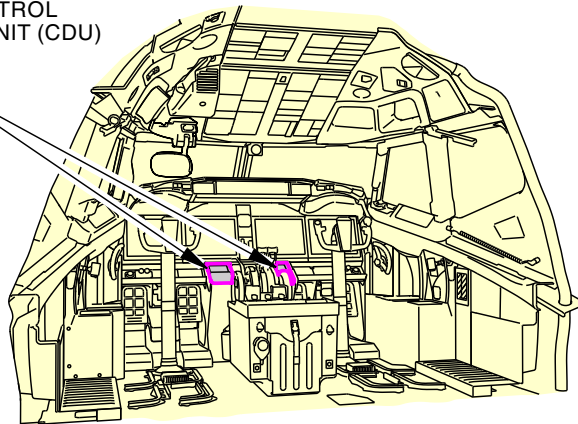
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



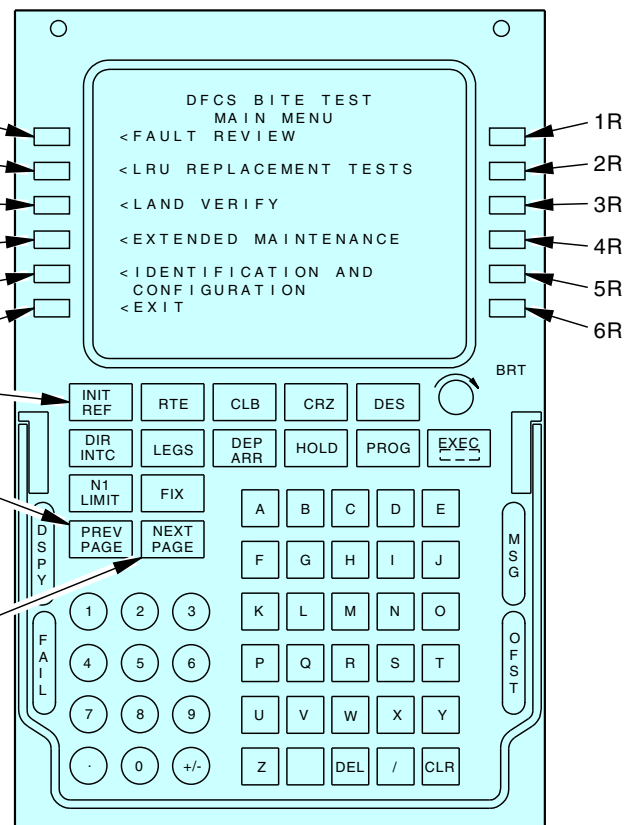
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

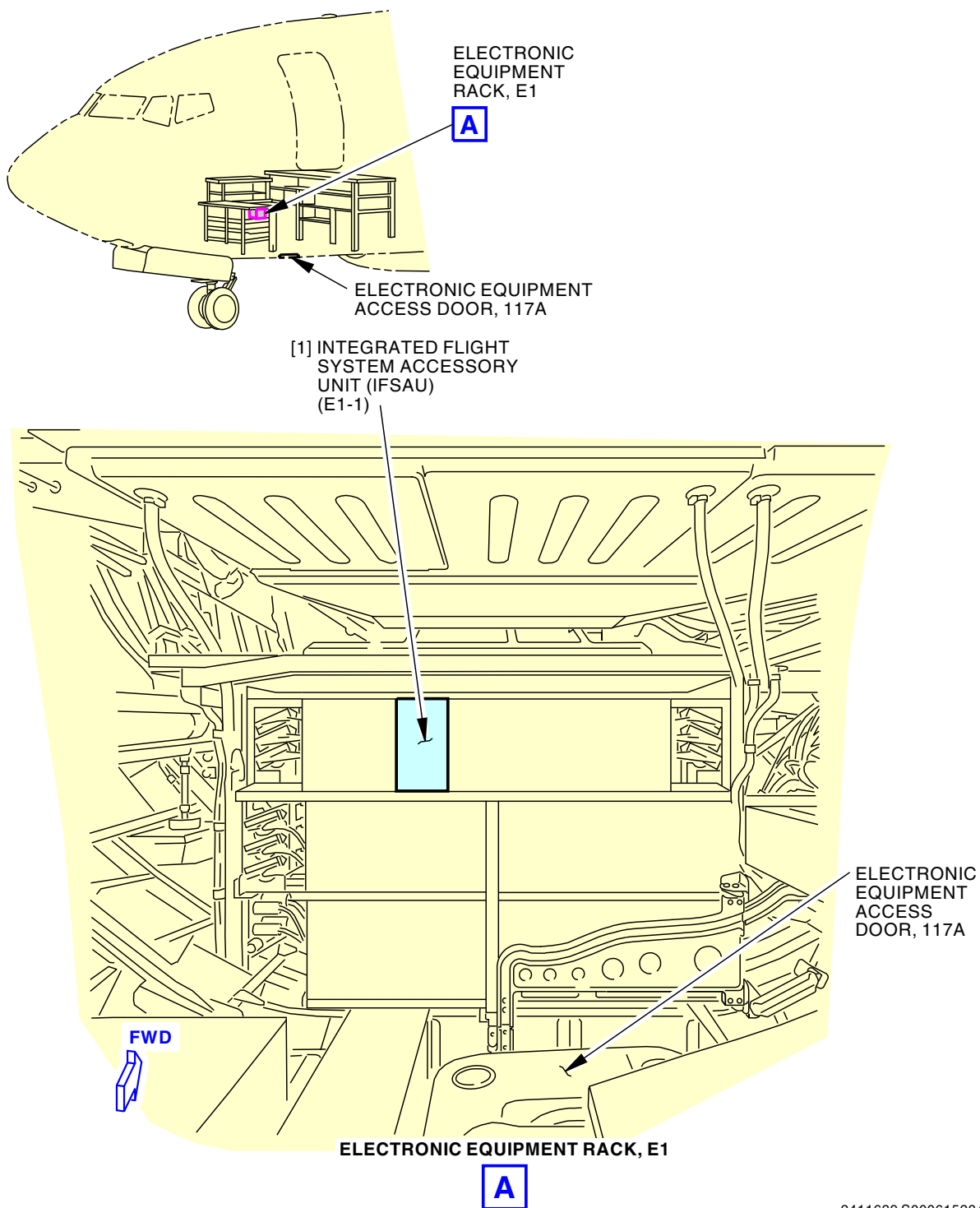
**Flight Management Computer
Figure 201/22-11-37-990-801**

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2411639 S00061528437_V1

Integrated Flight System Accessory Unit
Figure 202/22-11-37-990-802

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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 Integrated Flight System Accessory Unit (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 22-11-37-860-004



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 22-11-37-860-005

- (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

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
B	10	C00207	FLIGHT CONTROL STAB TRIM CONT

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C01037	AFCS SYS B MACH TRIM AC
C	3	C01047	AFCS MCP DC 2

SUBTASK 22-11-37-860-019

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

————— **END OF TASK** —————

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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 (M1474) 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 Removal

(Figure 401)

A. General

- (1) This task is for the removal of the Integrated Flight System Accessory Unit (IFSAU).

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)
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit 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

E. Prepare for the Removal

SUBTASK 22-11-37-860-006

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-37-730-001

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C00412	INSTR XFR
E	8	C00425	ADIRU LEFT EXC

SUBTASK 22-11-37-000-001

- (3) Find the 117A electronic equipment access door (TASK 06-41-00-800-801).

SUBTASK 22-11-37-010-001

- (4) Open this access door:

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

F. Integrated Flight System Accessory Unit Removal

SUBTASK 22-11-37-020-001



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.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 22-11-37-020-002

- (2) Remove the IFSAU (TASK 20-10-07-000-801).

————— **END OF TASK** —————

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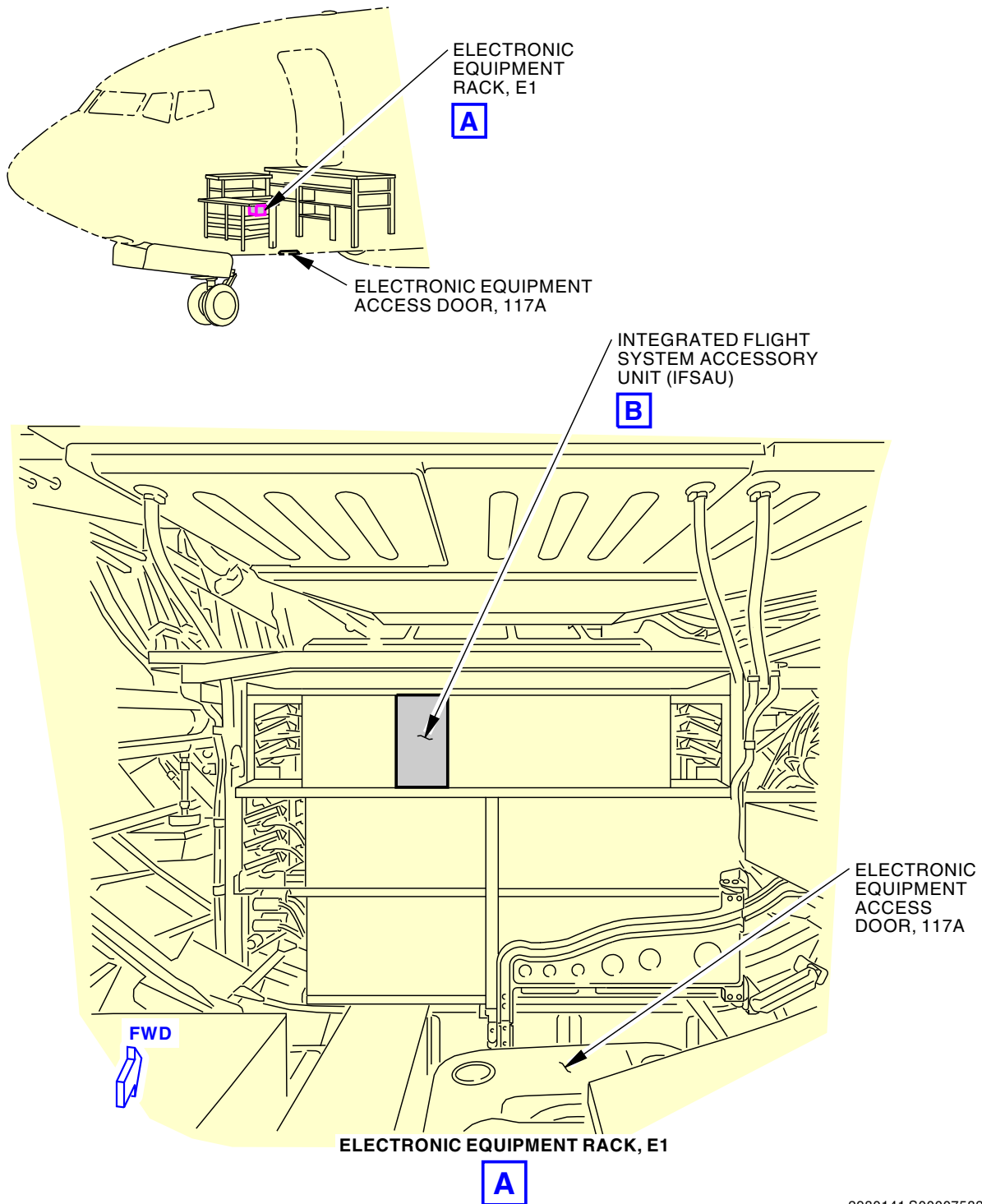
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**Integrated Flight System Accessory Unit (IFSAU) Installation
Figure 401/22-11-37-990-804 (Sheet 1 of 2)**

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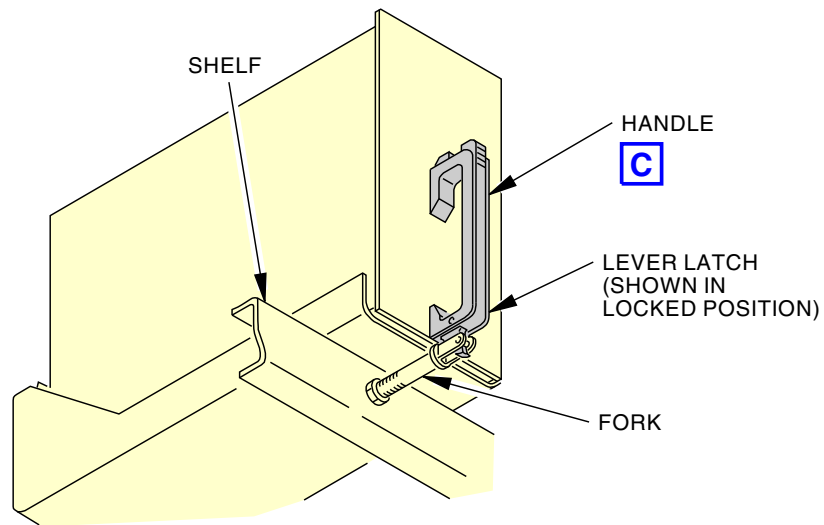
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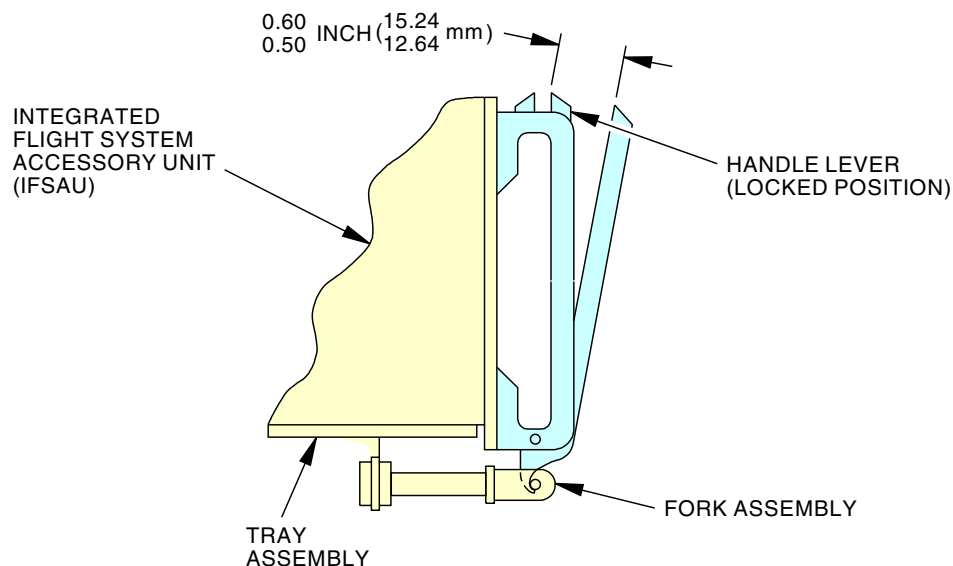
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B



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.

2980142 S0000758340_V1

Integrated Flight System Accessory Unit (IFSAU) Installation
Figure 401/22-11-37-990-804 (Sheet 2 of 2)

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TASK 22-11-37-400-801

3. Integrated Flight System Accessory Unit Installation

(Figure 401)

A. General

- (1) The test at the end of this procedure makes sure that the installation of the Integrated Flight System Accessory Unit (IFSAU) is correct.

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
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 22-11-37-020-003



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.

- (1) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 22-11-37-420-001

- (2) Install the IFSAU (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 the 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.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-37-860-008

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

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C00412	INSTR XFR
E	8	C00425	ADIRU LEFT EXC

SUBTASK 22-11-37-860-018

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-37-410-001

- (4) Close this access door:

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

SUBTASK 22-11-37-860-013

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

H. Integrated Flight System Accessory Unit Installation Test

SUBTASK 22-11-37-860-010

- (1) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-37-860-011

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

SUBTASK 22-11-37-860-012

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

SUBTASK 22-11-37-740-001

- (4) 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

- (5) Follow the instructions on the CDU to fully exit the DFCS BITE mode:
- (a) Push the LSK adjacent to EXIT.
 - (b) Follow the instructions on the CDU display.

SUBTASK 22-11-37-860-015

- (6) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

————— END OF TASK —————

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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. **References**

Reference	Title
24-22-00-860-801	Supply Electrical Power (P/B 201)

C. **Location Zones**

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

D. **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

E. **Takeoff/Go-Around Switch - Tryout**

NOTE: This tryout is to make sure the Takeoff/Go-Around Switch is in a zero energy state.

SUBTASK 22-11-39-860-002

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-801

SUBTASK 22-11-39-860-003

- (2) 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)

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(Continued)

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC
E	1	C00721	AUTOTHROTTLE DC 1

F/O Electrical System Panel, P6-2

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

SUBTASK 22-11-39-700-001

(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:
 - 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** ————

EFFECTIVITY
SIA ALL

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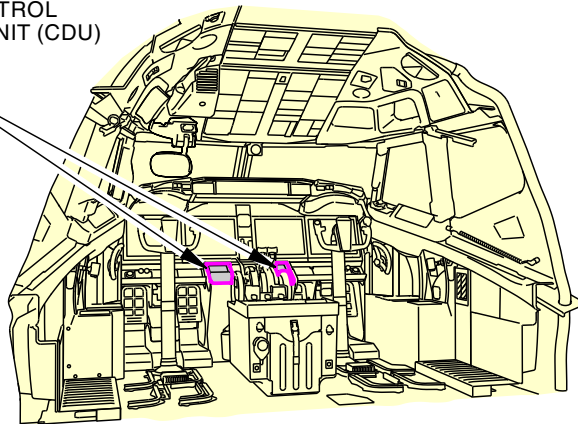
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



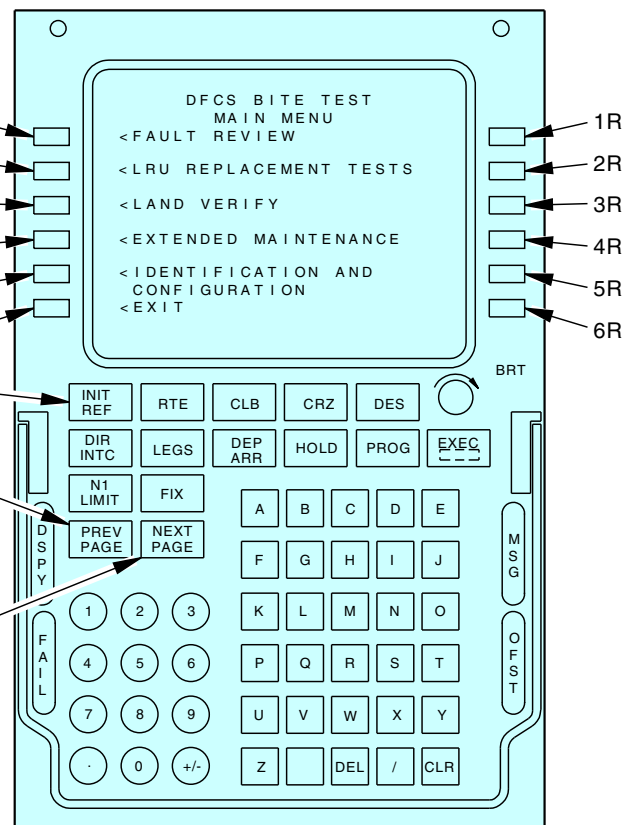
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

2411549 S00061528183_V2

Flight Management Computer Control Display Unit
Figure 201/22-11-39-990-801

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TASK 22-11-39-440-801

3. Takeoff/Go-Around Switch - Activation

(Figure 201)

A. General

- (1) This task restores the 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 22-11-39-860-004

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)

SUBTASK 22-11-39-860-016

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

————— END OF TASK —————

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TAKEOFF/GO-AROUND SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) The first task is the removal of the Takeoff/Go-Around (TOGA) switch [5].
 - (2) The second task is the installation of the Takeoff/Go-Around (TOGA) switch [5].
- B. There are two TOGA switches [5] installed on the left/right thrust levers. Switch S786 is inboard and S787 is outboard. The TOGA switches are installed on the top of the aft edge of each thrust lever.
- C. The removal and installation of the left/right TOGA switches are equivalent.

TASK 22-11-39-000-801

2. Takeoff/Go-Around Switch Removal

(Figure 401)

A. **General**

- (1) This task gives the instructions for the takeoff/go-around switch removal.

B. **Tools/Equipment**

Reference	Description
STD-3905	Gun - Soldering

C. **Consumable Materials**

Reference	Description	Specification
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	

D. **Location Zones**

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

E. **Prepare for Removal**

SUBTASK 22-11-39-860-005

- (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

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SUBTASK 22-11-39-860-014

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

CAPT Electrical System Panel, P18-2

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

F/O Electrical System Panel, P6-2

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

F. Takeoff/Go-Around Switch Removal

SUBTASK 22-11-39-860-007

- (1) Put the thrust lever [9] in a position to get access to the switch [5].

SUBTASK 22-11-39-010-001

- (2) Remove the four screws [7] that attach the cover [4] to the thrust lever [9].

SUBTASK 22-11-39-020-001

- (3) Do these steps to remove the switch [5]:
- (a) Remove the lacing tape that attaches the switch [5] to the wire bundle.
 - (b) Remove the two screws [8] that attach the switch bracket [3] to the thrust lever [9].
 - (c) Remove the hex nut [1] and lockwasher [2] from the switch [5].
 - (d) Remove the switch [5] from the switch bracket [3].
 - (e) Remove the heat shrinkable RT-876 sleeve, G01148 from the switch wire terminals [6].
 - (f) Use a soldering gun, STD-3905 to melt the solder on the wire terminals [6] to release the wires from the switch [5].
 - 1) Record the locations and positions of the switch wire terminals [6]
 - (g) Remove the wire terminal [6].

————— **END OF TASK** —————

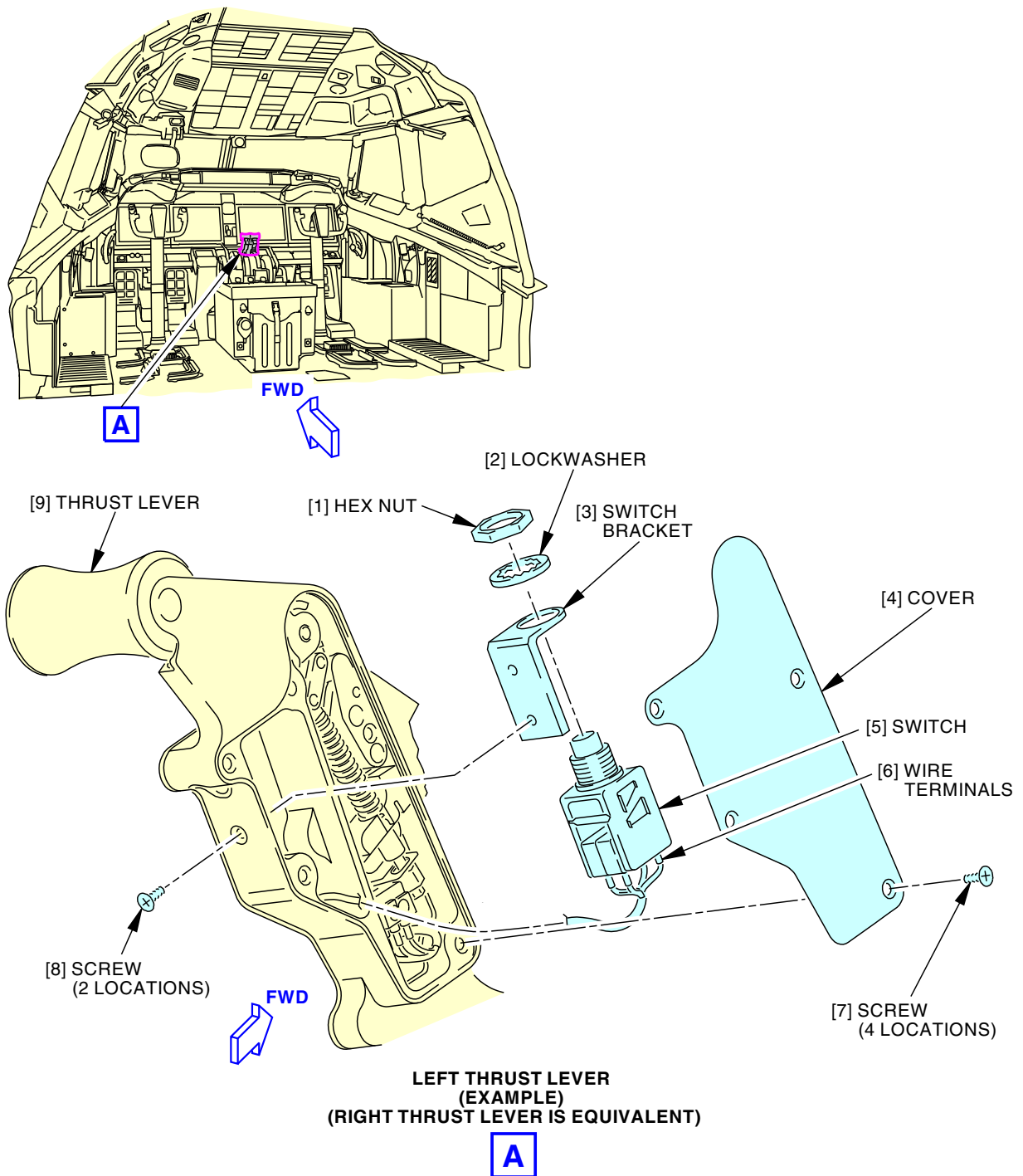
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2411640 S00061528448_V3

Takeoff/Go-Around Switch Installation
Figure 401/22-11-39-990-802

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TASK 22-11-39-400-801

3. Takeoff/Go-Around Switch Installation

(Figure 401)

A. General

- (1) This task gives the instructions for the installation of the takeoff/go-around switch.

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
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
C50169	Coating - Chemical And Solvent Resistant Finish - (BAC 705 Gray Color)	BMS10-11 Type II
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	
G50262	Wiper - Cleaning	BMS15-5

D. Location Zones

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

E. Takeoff/Go-Around Switch Installation

SUBTASK 22-11-39-420-001

- (1) Do these steps to install the switch [5]:
- Put each wire terminal [6] of the switch [5] through a heat shrinkable RT-876 sleeve, G01148.
 - Use a soldering gun, STD-3905, to bond the wires to the terminals of the new switch [5].
 - Push the heat shrinkable RT-876 sleeve, G01148, on the terminals on the switch [5].
 - Use a 180 deg. F (82 deg. C) maximum output temperature heat gun, STD-442, to blow hot air on the heat shrinkable RT-876 sleeve, G01148, to make it smaller and tighter.
 - Put the switch [5] in the switch bracket [3].
 - Install the lockwasher [2] and hex nut [1] on the switch [5].
 - Install the screws [8] that attach the switch [5] to the thrust lever [9].
 - Use lacing tape to attach the switch [5] to the wire bundle.
 - Install the screws [7] that attach the cover [4] to the thrust lever [9].
 - Make sure that the wires do not touch when the cover is installed.
 - Clean the surface of the screws [7] and screws [8] heads with a clean wiper, G50262.

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CLEANING AND CONVERSION-COATING-SOLUTIONS CONTAIN DANGEROUS AND FLAMMABLE MATERIALS. THESE SOLUTIONS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (k) Apply one layer of primer, C00259, and coating, C50169, to the screws [7] and screws [8] heads.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-39-860-010

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C00374	AFCS SYS B WARN LIGHT (BAT)
C	2	C01042	AFCS SYS B SNSR EXC AC

SUBTASK 22-11-39-860-015

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-39-860-013

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

CAPT Electrical System Panel, P18-2

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

F/O Electrical System Panel, P6-2

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

G. Takeoff/Go-Around Switch Installation Test

SUBTASK 22-11-39-740-001

- (1) Do the BITE test as follows:
- (a) Push the INIT REF key on the CDU keyboard.
 - (b) Push each line-select key (LSK) that is adjacent to: INDEX, MAINT, A/T, INTERACTIVE, and INPUT DISCRETES.
 - 1) If CONTINUE displays during the test do the instructions on the CDU display.

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- a) Do not push the LSK that is adjacent to CONTINUE.
- b) Use the NEXT PAGE or PREV PAGE to change the page.
- (c) Find the CDU display that shows the input discrete for the TOGA switch.
 - 1) Make sure that the CDU display shows TOGA NOT PRESSED.
 - 2) Push and hold the TOGA switch on the thrust lever.
 - a) Examine one thrust lever at a time.
 - 3) Make sure that the CDU display shows TOGA PRESSED.
 - 4) Release the TOGA switch.
 - 5) Make sure that the CDU display shows TOGA NOT PRESSED.
 - 6) Push the INIT REF key on the CDU keyboard to stop the test.

———— **END OF TASK** ————

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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 task removes electrical power to the hydraulic pressure switch and the capability to pressurize the elevator and aileron systems.
- (2) The tryout in this task makes sure that the hydraulic pressure switch is in a zero energy state.

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	Pressure from the Elevator Hydraulic Systems A and B 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
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. **Hydraulic Pressure Switch Deactivation**

SUBTASK 22-11-40-860-001

- (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
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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-40-480-001



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

- (2) Make sure that you install the landing gear downlock pins (TASK 32-00-01-480-801).

SUBTASK 22-11-40-010-001

- (3) For the A/P aileron actuators, do this task: Pressure from the Aileron Hydraulic Systems A and B - Deactivation, TASK 27-11-00-860-801.

SUBTASK 22-11-40-010-002

- (4) For the A/P elevator actuators, do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.

SUBTASK 22-11-40-860-002

- (5) Attach DO NOT OPERATE tag, STD-858 to the captain's and first officer's control columns.

F. Hydraulic Pressure Switch Tryout

SUBTASK 22-11-40-860-004

- (1) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	10	C00840	FLIGHT CONTROL STAB TRIM ACTUATOR

SUBTASK 22-11-40-700-001

- (2) Use the FMC - CDU and do the test that follows:
- (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:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** ————

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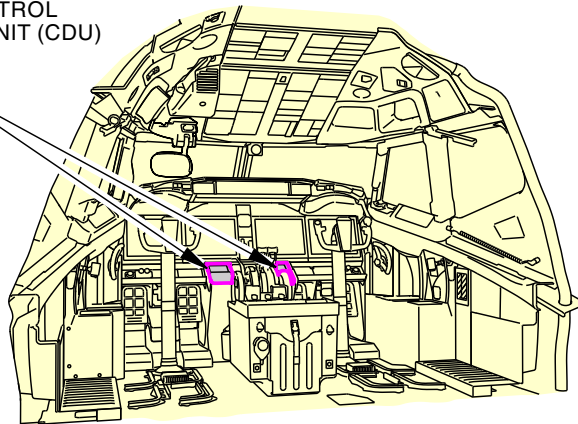
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



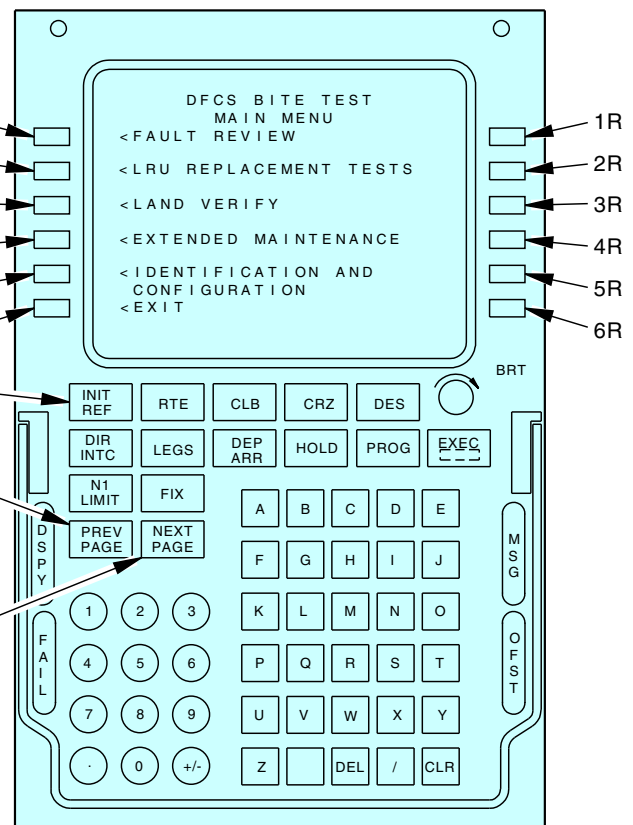
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

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Flight Management Computer Control Display Unit
Figure 201/22-11-40-990-801

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TASK 22-11-40-440-801

3. **Hydraulic Pressure Switch - Activation**

(Figure 201)

A. General

- (1) This task includes the steps to restore electrical power to the hydraulic pressure switch and pressurize the elevator and aileron hydraulic systems.

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 22-11-40-860-005

- (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 22-11-40-860-025

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-40-410-001

- (3) For the A/P aileron actuators, do this task: Pressure to the Aileron Hydraulic Systems A and B - Activation, TASK 27-11-00-860-802.

SUBTASK 22-11-40-410-002

- (4) For the A/P elevator actuators, do this task: Elevator Hydraulic System A and B - Pressurization, TASK 27-31-00-800-801.

————— **END OF TASK** —————

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HYDRAULIC PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of a hydraulic pressure switch [1].
 - (2) The installation of a hydraulic pressure switch [1].
- B. There is one hydraulic pressure switch [1] 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. **General**

- (1) This task is for the removal of 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	Pressure from the Elevator Hydraulic Systems A and B Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. **Location Zones**

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

E. **Prepare for the Removal**

SUBTASK 22-11-40-860-006

- (1) 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 YOU INSTALL THE DOWNLOCK PINS IN THE MAIN LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE MAIN LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure that the landing gear downlock pins are installed.

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- 1) If it is necessary, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 22-11-40-010-003

- (2) For the A/P elevator actuators, do these steps:
- (a) Do this task: Pressure from the Elevator Hydraulic Systems A and B Removal, TASK 27-31-00-800-802.
 - (b) Open this access door.

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 22-11-40-860-007

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

F. 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 lockwire from the hydraulic pressure switch [1].
 - (c) Remove the hydraulic pressure switch [1].
 - (d) Remove the packing [2] and discard it.
 - (e) Install a cover on the open hydraulic port.

————— **END OF TASK** —————

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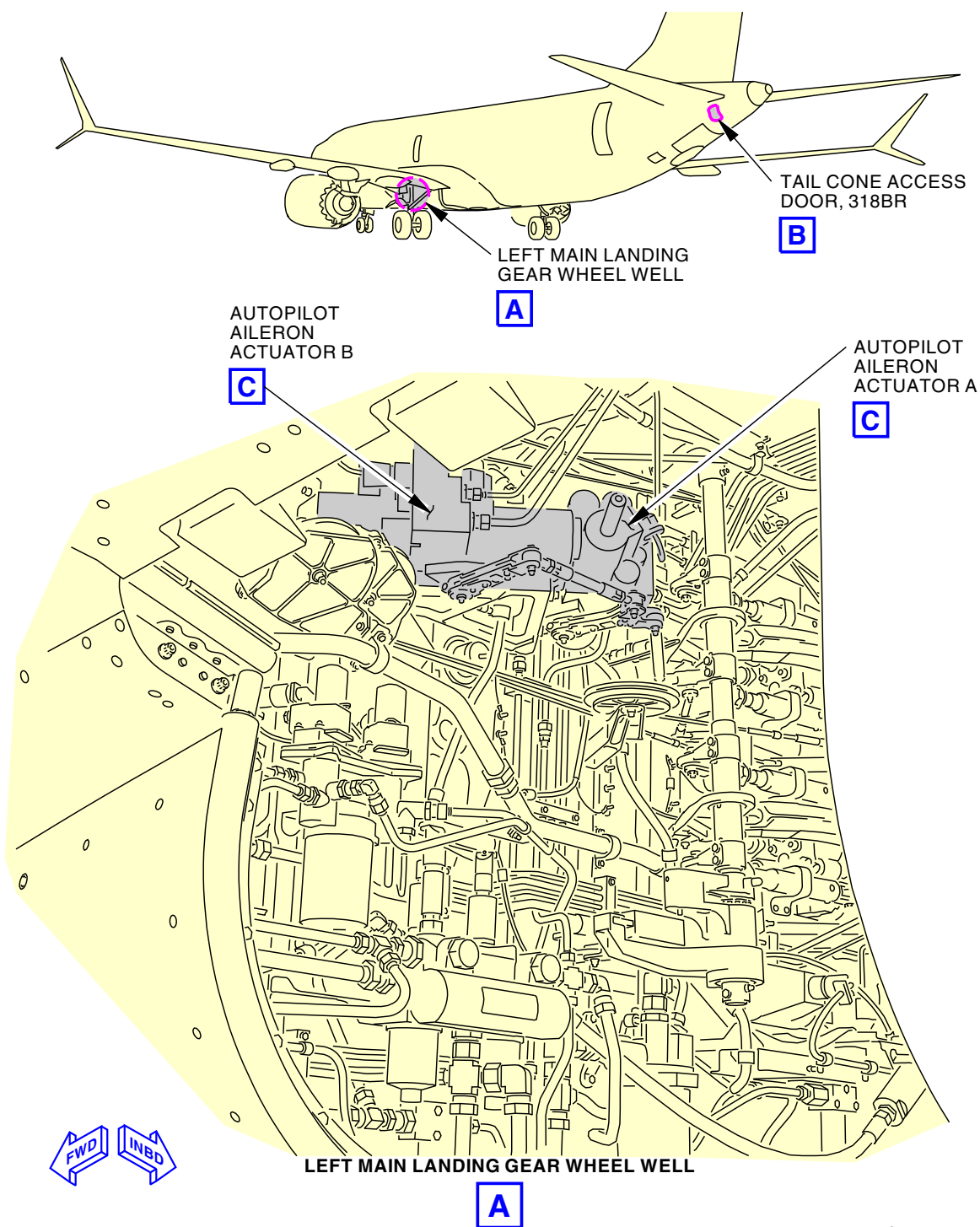
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Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 1 of 3)

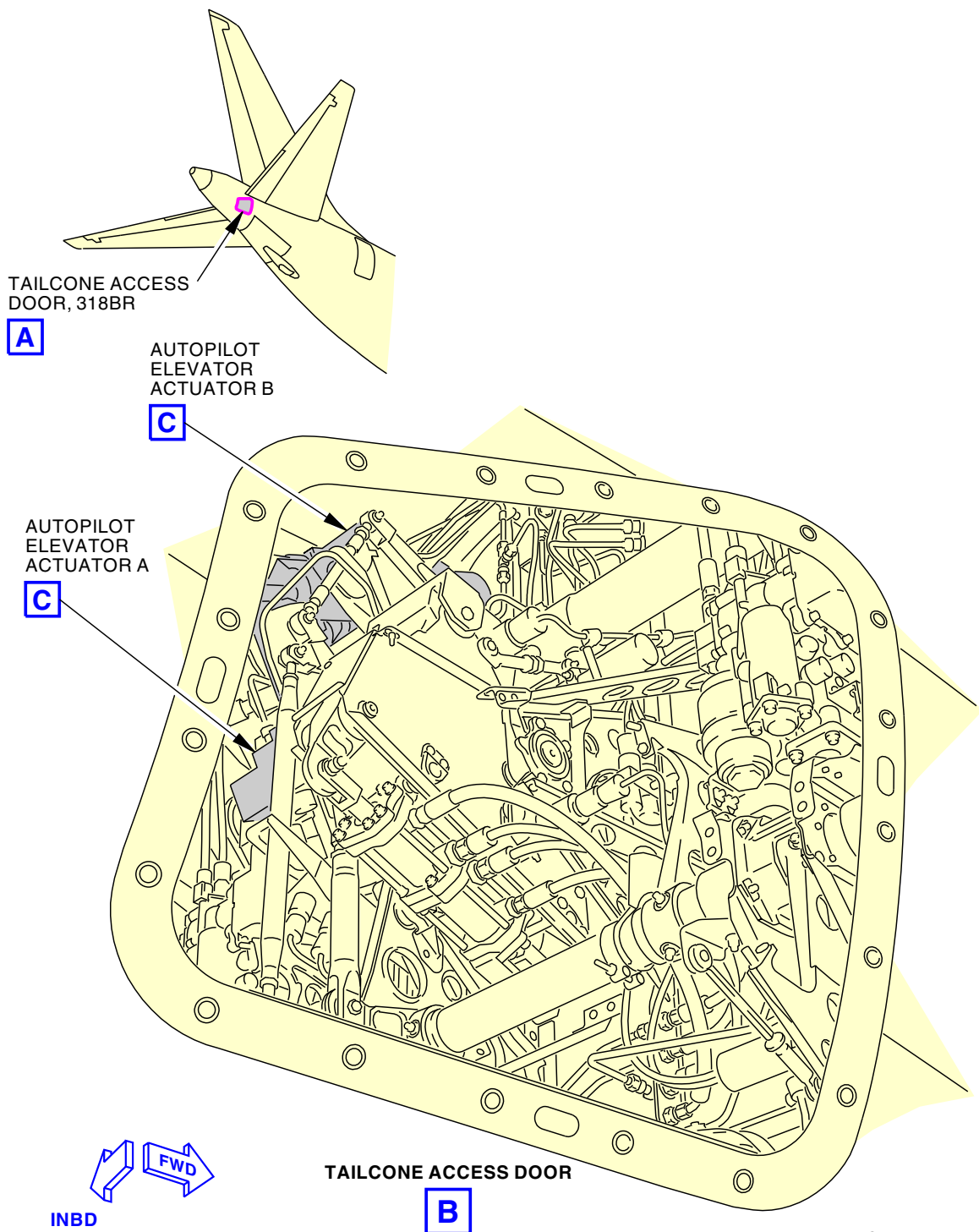
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Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 2 of 3)

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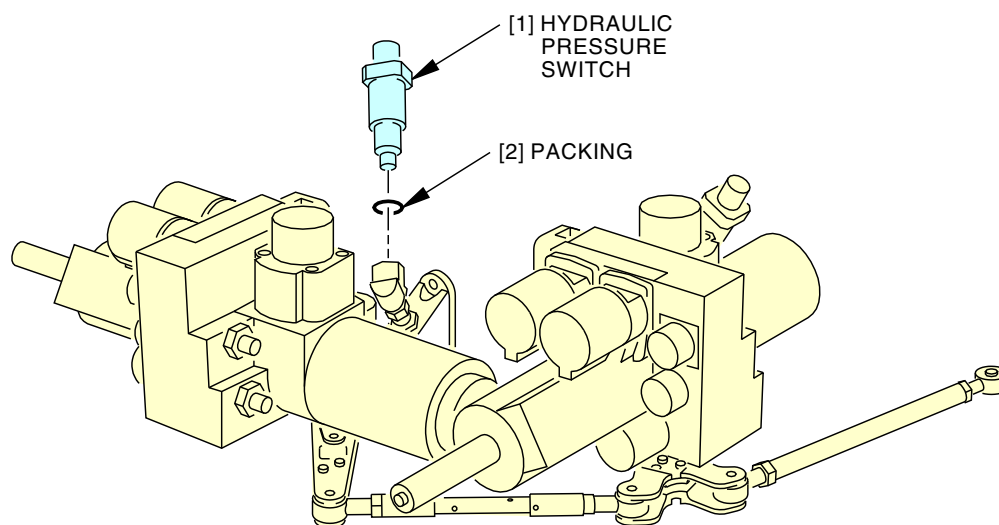
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A/P ACTUATORS
(EXAMPLE)

C

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Hydraulic Pressure Switch Installation
Figure 401/22-11-40-990-802 (Sheet 3 of 3)

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TASK 22-11-40-400-801

3. Hydraulic Pressure Switch Installation

(Figure 401)

A. General

(1) This task is for the installation of the hydraulic pressure switch.

B. References

Reference	Title
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)

C. 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Hydraulic pressure switch	22-11-40-02-010	SIA ALL
2	Packing	22-11-40-02-005	SIA ALL

E. 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

F. Access Panels

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]:

- Apply a layer of MCS 352B fluid, D00054, or hydraulic fluid, D00153, to the packing [2].
- Apply a layer of MCS 352B fluid, D00054, or hydraulic fluid, D00153, to the threads of the hydraulic pressure switch [1].
- Install the packing [2] on the hydraulic pressure switch [1].
- Install the hydraulic pressure switch [1].
- Tighten the hydraulic pressure switch [1] to 70 in-lb (8 N·m) - 120 in-lb (14 N·m).

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- (f) Install lockwire on the hydraulic pressure switch [1] (TASK 20-10-44-400-801).
- (g) Connect the electrical connector to the hydraulic pressure switch [1].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-40-860-021

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-40-860-024

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

SUBTASK 22-11-40-410-003

- (3) Close this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

I. Hydraulic Pressure Switch Installation Test

SUBTASK 22-11-40-860-022

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

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SUBTASK 22-11-40-860-023

- (2) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	18	C00451	LANDING GEAR AURAL WARN

SUBTASK 22-11-40-860-012

- (3) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-40-860-013

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

SUBTASK 22-11-40-860-014

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

SUBTASK 22-11-40-860-015



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 (TASK 29-11-00-860-801).

SUBTASK 22-11-40-740-001

- (7) 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) BITE LIBRARY TEST.

- (c) Make a selection for the applicable channel:

NOTE: The A/P aileron actuator A and the A/P elevator actuator A have interfaces with the Flight Control Computer A (Channel A). The A/P aileron actuator B and the A/P elevator actuator B have interfaces with the Flight Control Computer B (Channel B).

- 1) CHANNEL A
- 2) CHANNEL B
- 3) CHANNEL A AND B
- 4) RUN SELECT LIBRARY TESTS

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- 5) 30 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.

- 6) EXECUTE.

(d) Do the instructions that show on the CDU to complete the test.

(e) Make sure that the test is completed with no failure or the "TEST FAILED" message does not show.

SUBTASK 22-11-40-210-001

- (8) Visually examine the hydraulic pressure switch [1] as follows:

(a) Make sure that there is no hydraulic leak.

SUBTASK 22-11-40-860-018

- (9) Set the STAB TRIM PRI switch, S272, on the aft area of the control stand, to the NORMAL position.

SUBTASK 22-11-40-860-019

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

———— **END OF TASK** ————

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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. **References**

Reference	Title
24-22-00-860-801	Supply Electrical Power (P/B 201)

C. **Location Zones**

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

D. **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
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

E. **Autopilot Disengage Switch - Tryout**

NOTE: This tryout is to make sure the Autopilot Disengage Switch is in a zero energy state.

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SUBTASK 22-11-41-860-002

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-801

SUBTASK 22-11-41-860-003

- (2) Make sure that these circuit breakers are open and have safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

- (3) 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 —————

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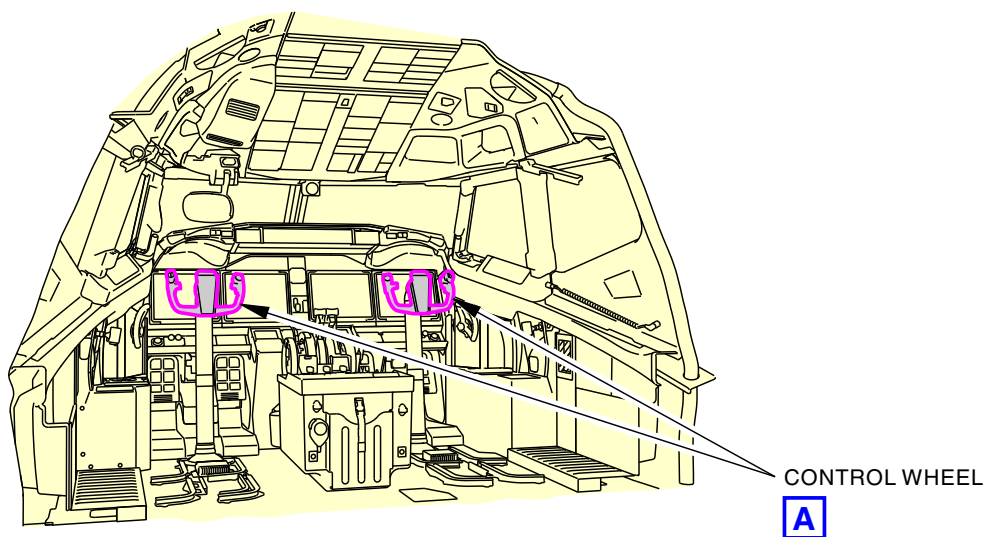
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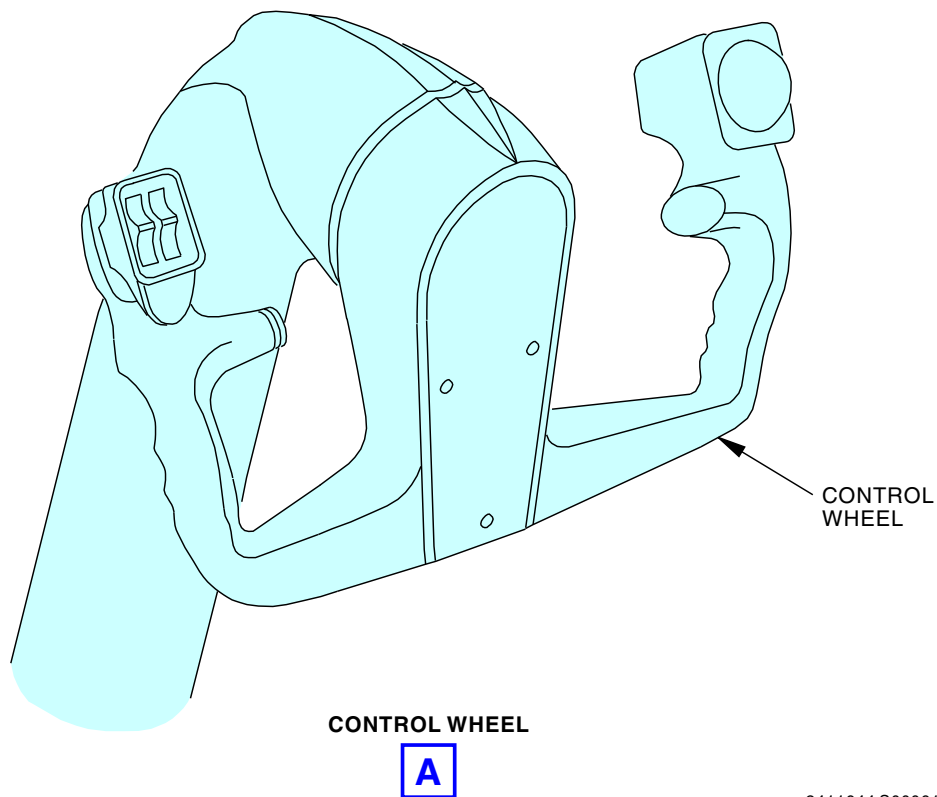
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FLIGHT COMPARTMENT



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Autopilot Disengage Switch
Figure 201/22-11-41-990-801

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TASK 22-11-41-440-801

3. **Autopilot Disengage Switch - Activation**

(Figure 201)

A. General

- (1) This task restores 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 22-11-41-860-004

- (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

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 —————

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AUTOPILOT DISENGAGE SWITCH - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) The removal of an autopilot disengage switch [1].
 - (2) The installation of an autopilot disengage switch [1].
- B. You can find the two autopilot disengage switches [1] (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 [1].

TASK 22-11-41-000-801

2. **Autopilot Disengage Switch Removal**

(Figure 401)

A. **General**

- (1) This task is for the removal of the autopilot disengage switch.

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: 11139
	Opt Part #: MS3447-20 Supplier: 58960

C. **Location Zones**

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

D. **Prepare for the Removal**

SUBTASK 22-11-41-860-005

- (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

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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

E. Autopilot Disengage Switch Removal

SUBTASK 22-11-41-020-001

(1) Do these steps to remove the autopilot disengage 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.

- (b) Remove the medallion and approach plate [5].

- (c) Use the insertion/extraction tool, COM-3934, to disconnect the eight wires on the autopilot disengage switch.

NOTE: The wires are on the autopilot disengage switch side of the wire connectors in the center of the control wheel.

- (d) Attach one end of the threading wire around the eight wires that connect to the autopilot disengage switch [1].

NOTE: For the threading wire, you can use a 30 in. (76 cm) length of standard wire (No. 18 to 20 gage, without insulation).

- (e) Remove the screw [3] on the outboard horn of the control wheel.

- (f) Remove the switch plate [2].

- (g) Pull the autopilot disengage switch [1] and its eight wires through the control wheel horn slowly until the threading wire shows.

NOTE: Pull until approximately 3 in. (76 mm) 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.

- (h) Remove the eight wires from the threading wire.

———— **END OF TASK** ————

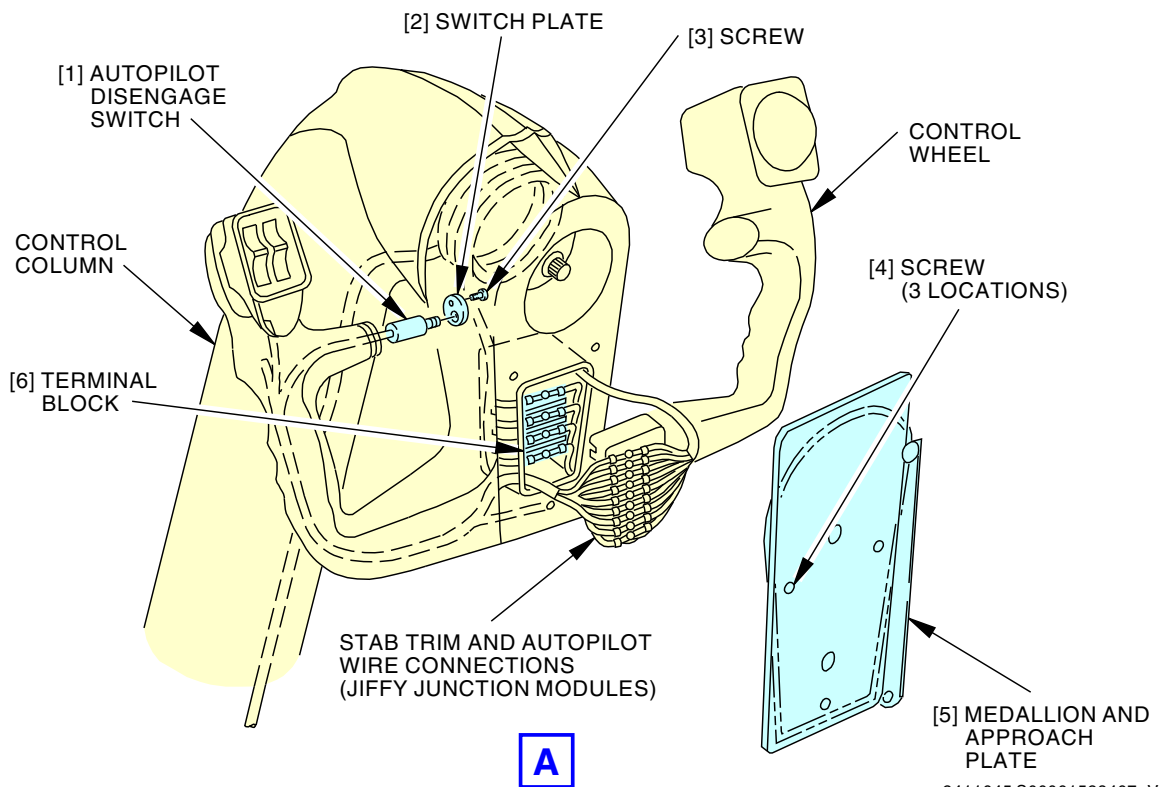
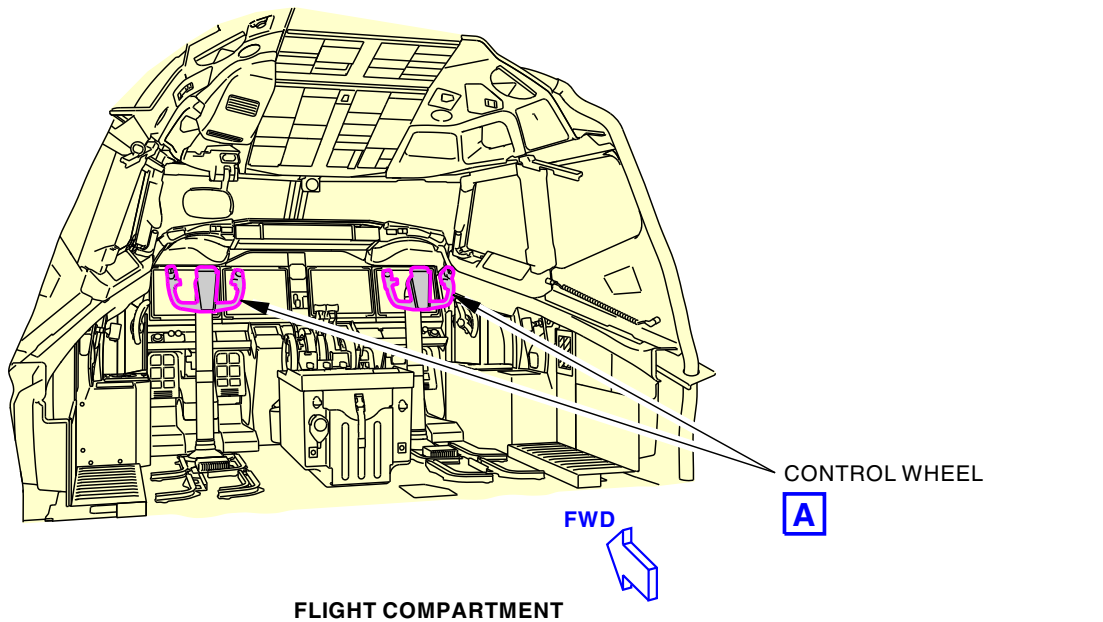
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Autopilot Disengage switch Installation
Figure 401/22-11-41-990-802

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TASK 22-11-41-400-801

3. Autopilot Disengage Switch Installation

(Figure 401)

A. General

- (1) This task is for the installation of the autopilot disengage switch.

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-3934	Tool - Electrical Contact Insertion/Extraction, 20 Gauge Part #: M15570-20 Supplier: 00779 Part #: M81969/1-02 Supplier: 11851 Part #: M81969/14-11 Supplier: 11139 Opt Part #: MS3447-20 Supplier: 58960

D. Consumable Materials

Reference	Description	Specification
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Autopilot disengage switch	27-11-41-01-155	SIA ALL

F. Location Zones

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

G. Autopilot Disengage Switch Installation

SUBTASK 22-11-41-420-001

- (1) Do these steps to install the autopilot disengage switch [1]:
- Install the switch plate [2] on the autopilot disengage switch [1] with primer, C00259.
 - Apply primer, C00259, on the threads only.
 - Make sure that the threading wire is in the control wheel horn and the two ends of the threading wire show.
 - Attach the end of the threading wire that comes out of the control wheel horn around the eight wires of the autopilot disengage switch [1].
 - Pull the eight wires down through the control wheel horn with the opposite end of the threading wire.
 - Put the autopilot disengage switch [1] in its position for installation.
 - Install the switch plate [2] to the control wheel horn with the screw [3].

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- (g) Remove the threading wire from the eight wires.
- (h) Use 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 have 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.

- (i) Use Table 401 for switch part number 721101-A1 or Table 402 for switch part number SW43896.

Table 401/22-11-41-993-801 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)
BJA	BLACK/GRAY
BLU	BLUE

Table 402/22-11-41-993-802 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

- (j) Put the wire connectors on top of the terminal block [6].
- (k) Install the medallion and approach plate [5] with the screws [4].

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-41-860-007

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-41-860-015

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C01046	AFCS SYS B FCC DC

I. Autopilot Disengage Switch Installation Test

SUBTASK 22-11-41-860-009

- (1) Make sure that the STAB TRIM PRI switch, S272, on the aft area of the control stand is in the NORMAL position.

SUBTASK 22-11-41-860-010

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

SUBTASK 22-11-41-860-011

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

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SUBTASK 22-11-41-860-012



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 (TASK 29-11-00-860-801).

SUBTASK 22-11-41-740-001

- (5) Do this manual test:
- (a) Push the CMD A or CMD B autopilot engage switch on the mode control panel to engage the autopilot.
 - (b) Make sure that the CMD A or CMD B autopilot engage switch light comes on.
 - (c) Push the captain or first officer autopilot disengage switch on the control wheel to disengage the autopilot.
 - (d) Make sure that the A/P warning lights flash.
 - (e) Make sure that the A/P disengage warning sound comes on.
 - (f) Push the captain or first officer autopilot disengage switch again.
 - (g) Make sure that the A/P warning lights go off.
 - (h) Make sure that there is no A/P disengage warning sound.

SUBTASK 22-11-41-860-013

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

———— **END OF TASK** ————

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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. **General**

- (1) This task is for the test of the stabilizer trim motor.

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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)

C. **Location Zones**

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

D. **Stabilizer Trim Motor Autopilot Test**

SUBTASK 22-11-81-860-002

- (1) Make sure that the STAB TRIM PRI switch, S272, on the aft area of the control stand is in the NORMAL position.

SUBTASK 22-11-81-860-003

- (2) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-81-860-004

- (3) 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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803.

SUBTASK 22-11-81-860-005



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.

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

SUBTASK 22-11-81-980-001

- (5) Set the stabilizer to 5 units of trim.

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SUBTASK 22-11-81-860-006

- (6) Make sure that the trailing edge flaps are in the UP position.

SUBTASK 22-11-81-980-002

- (7) Engage the autopilot A in the CWS mode.

SUBTASK 22-11-81-980-003

- (8) Pull the control column aft approximately 2 in. (51 mm) and release it.

NOTE: To prevent a cam-out of the control column, keep the force on the control column below 15 lb (7 kg).

NOTE: These conditions can cause the STAB OUT OF TRIM light to come on during the test:

- Cam-out of the control column.
- STAB NOSE UP or STAB NOSE DOWN limit switches are engaged.
- The stab trim motor is bad and did not operate at the correct rate.

SUBTASK 22-11-81-210-001

- (9) Make sure that these conditions 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

- (10) Disengage the autopilot A.

SUBTASK 22-11-81-980-005

- (11) Set the stabilizer to 5 units of trim.

SUBTASK 22-11-81-980-006

- (12) Extend the flaps to 5 degrees.

SUBTASK 22-11-81-980-007

- (13) Engage the autopilot B in the CWS mode.

SUBTASK 22-11-81-980-008

- (14) Push the control column forward approximately 2 in. (51 mm) and release it.

NOTE: To prevent a cam-out of the control column, keep the force on the control column below 15 lb (7 kg).

NOTE: These conditions can cause the STAB OUT OF TRIM light to come on during the test:

- Cam-out of the control column.
- STAB NOSE UP or STAB NOSE DOWN limit switches are engaged.
- The stab trim motor is bad and did not operate at the correct rate.

SUBTASK 22-11-81-210-002

- (15) Make sure that these conditions 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

- (16) Disengage the autopilot B.

SUBTASK 22-11-81-860-007

- (17) Set the mode select switches on the Inertial Reference System (IRS) and Mode Select Unit (MSU) to the OFF position.

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SUBTASK 22-11-81-980-010

(18) Set the flaps in the UP position.

SUBTASK 22-11-81-860-008

(19) Remove hydraulic power from Hydraulic Systems A and B (TASK 29-11-00-860-805).

———— **END OF TASK** ————

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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 task removes electrical power to the pitch control wheel steering force transducer.
- (2) The tryout in this task makes sure that the pitch control wheel steering force transducer is in a zero energy state.

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. Pitch Control Wheel Steering Force Transducer Deactivation

SUBTASK 22-11-92-860-001

- (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
B	3	C01046	AFCS SYS B FCC DC
B	4	C00716	AFCS SYS B ENGAGE INTLK

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(Continued)

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-92-010-001

- (2) If it is necessary, do this task: Hydraulic System A or B Power Removal,
TASK 29-11-00-860-805

SUBTASK 22-11-92-860-002

- (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

SUBTASK 22-11-92-700-001

- (1) Use the FMC - CDU and do the test that follows:
- (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 follows:
 - a) FCC-A SELF TEST FAIL
 - b) FCC-B SELF TEST FAIL
 - c) 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** —————

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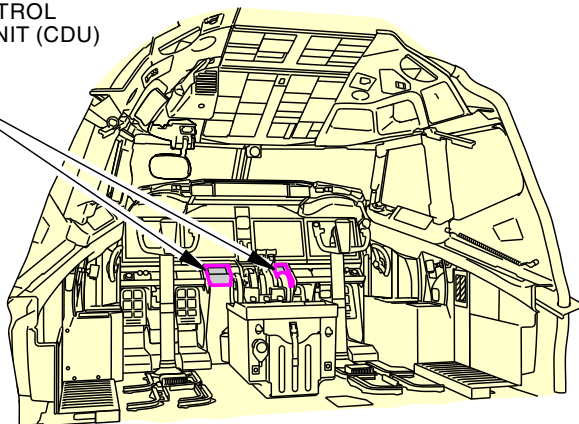
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FMCS CONTROL
DISPLAY UNIT (CDU)

A



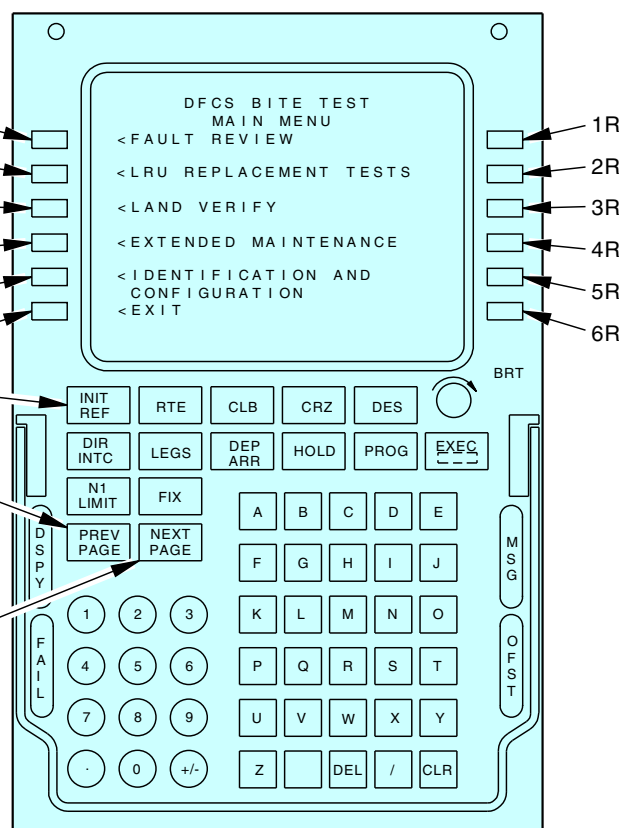
FLIGHT COMPARTMENT

LINE SELECT KEY (LSK)
(12 LOCATIONS)

INIT REF
FUNCTION KEY

PREVIOUS
PAGE KEY

NEXT PAGE KEY



FMCS CONTROL DISPLAY UNIT (CDU)

A

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**Flight Management Computer Control Display Unit
Figure 201/22-11-92-990-801**

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TASK 22-11-92-440-801

3. Pitch Control Wheel Steering Force Transducer - Activation

(Figure 201)

A. General

- (1) This task restores electrical power to the pitch control wheel steering force transducer.

B. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Pitch Control Wheel Steering Force Transducer Activation

SUBTASK 22-11-92-860-005

- (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

————— END OF TASK —————

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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. General

- (1) This task is for the removal of the pitch force transducer.

B. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

C. Access Panels

Number	Name/Location
112A	Forward Access Door

D. Prepare for the Removal

SUBTASK 22-11-92-860-006

- (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

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

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SUBTASK 22-11-92-940-001

- (2) Do these steps to prepare for the removal:
- (a) Open this access door:

<u>Number</u>	<u>Name/Location</u>
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.

E. Pitch Force Transducer Removal

SUBTASK 22-11-92-020-001

- (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 the 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 the quadrant assembly.
 - (f) Remove the pitch force transducer [1].

———— **END OF TASK** ————

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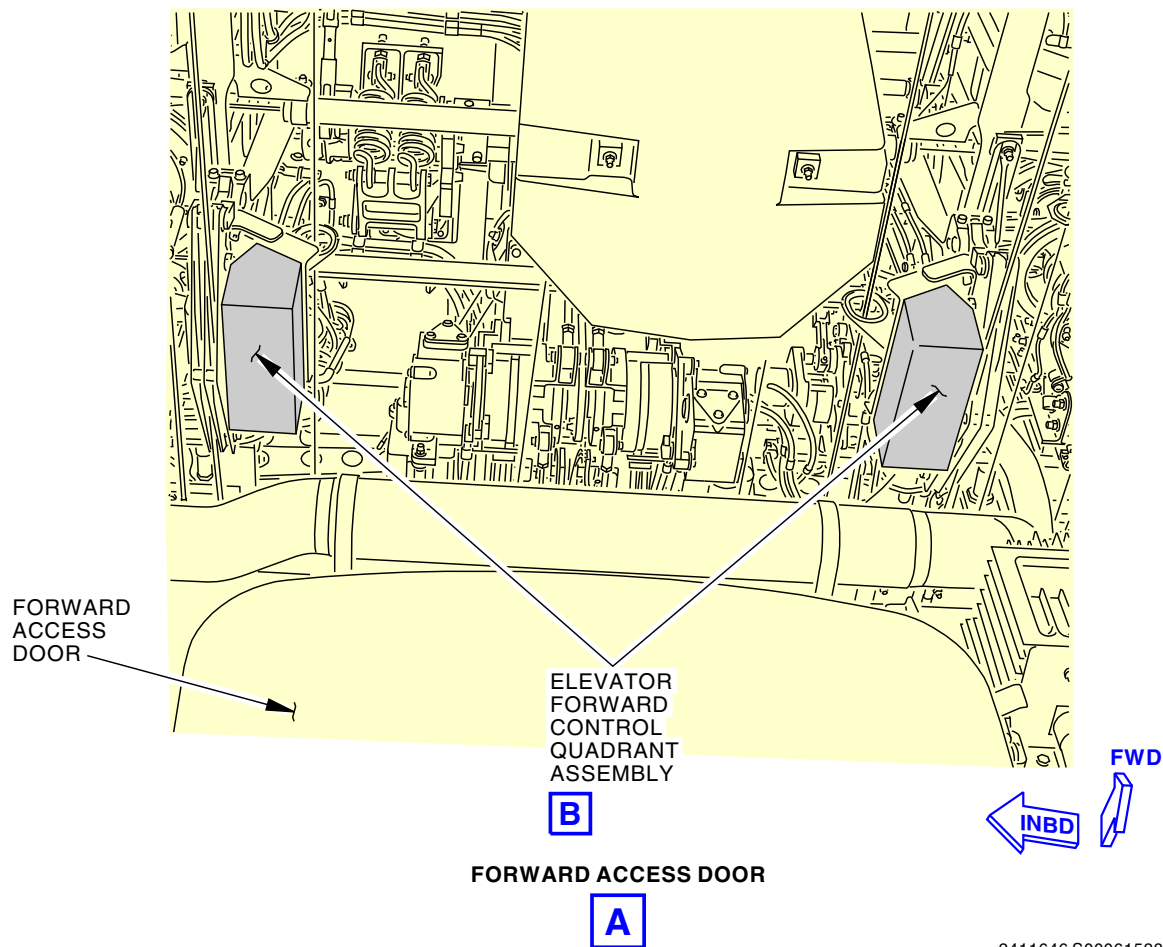
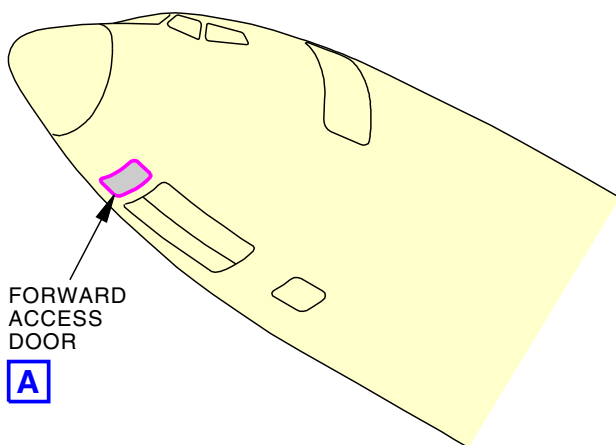
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Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-802 (Sheet 1 of 3)

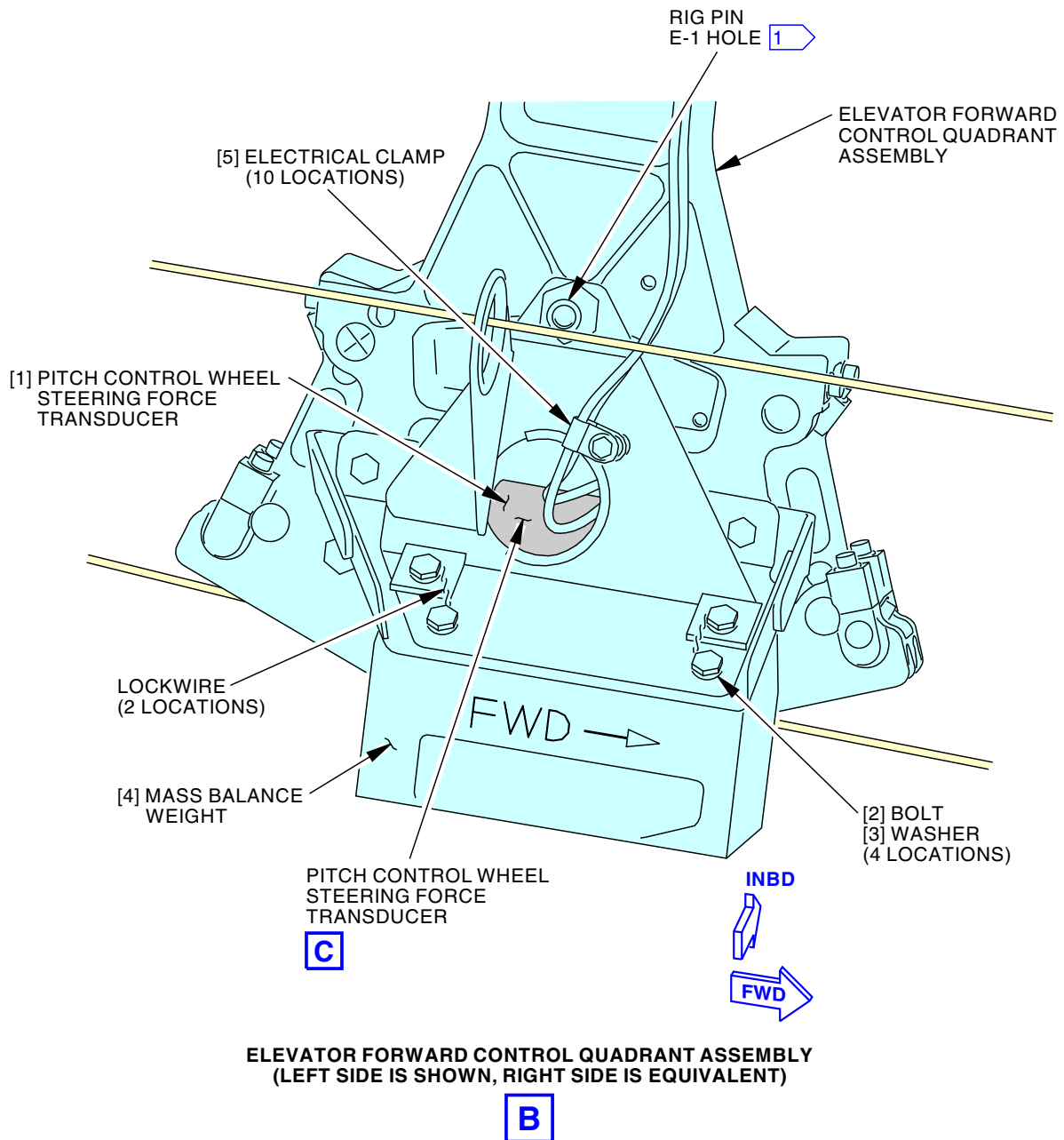
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[1] LEFT SIDE OF FORWARD
QUADRANT ASSEMBLY ONLY

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Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-802 (Sheet 2 of 3)

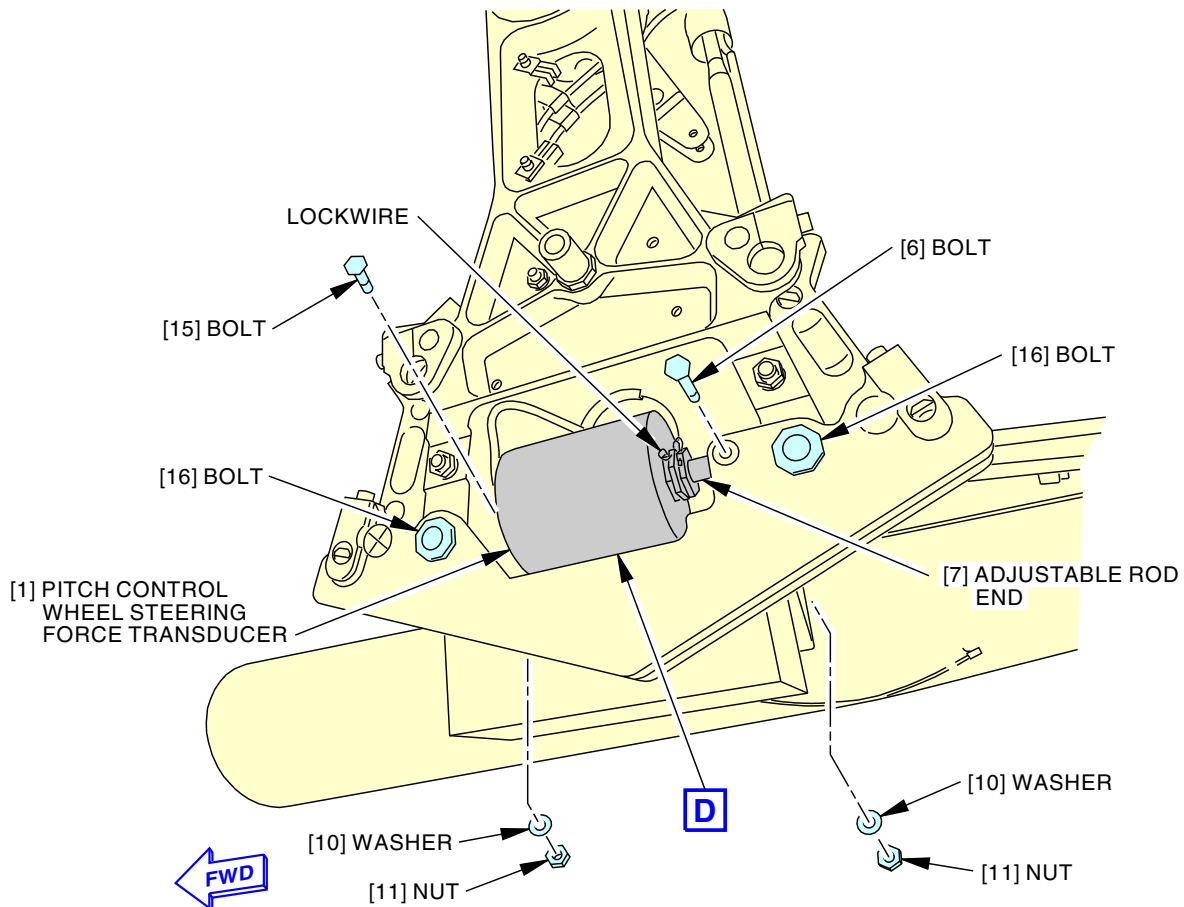
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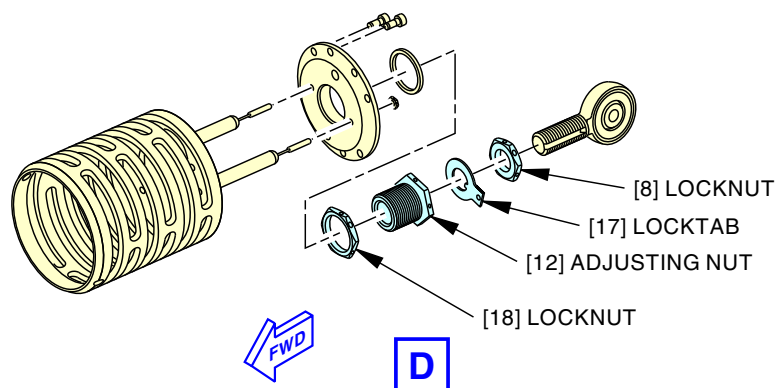
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**PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)**



2411648 S00061528480_V3

**Pitch Control Wheel Steering Force Transducer Installation
Figure 401/22-11-92-990-802 (Sheet 3 of 3)**

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TASK 22-11-92-400-801

3. Pitch Force Transducer Installation

(Figure 401)

A. General

- (1) This task is for the installation of the pitch force transducer.

B. 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)

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 22-11-92-860-007

- (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 22-11-92-420-001

- (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 22-11-92-020-010

- (3) Make sure that the bolts [16] are loose.

SUBTASK 22-11-92-420-011

- (4) Install the pitch force transducer [1] to the quadrant assembly with the bolt [15], washer [10], and nut [11].

SUBTASK 22-11-92-420-002

- (5) Attach the electrical cables to the electrical clamps [5].

NOTE: Do not pull the electrical cables tightly.

SUBTASK 22-11-92-420-003

- (6) Connect the pitch force transducer [1].

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.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-92-410-002

- (1) Close this access door

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 22-11-92-860-008

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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 22-11-92-860-020

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C01045	AFCS SYS A FCC DC

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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** —————

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PITCH CONTROL WHEEL STEERING FORCE TRANSDUCER - ADJUSTMENT/TEST

1. **General**

- A. This procedure contains these tasks:
- (1) The first task uses the Digital Flight Control System (DFCS) Built-In-Test Equipment (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 and Figure 503)

A. **General**

- (1) This task gives the instructions for the adjustment of the pitch force transducer.

B. **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)
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)

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-1585	Kit - Rigging Pin Part #: F70207-151 Supplier: 81205
SPL-1677	Assembly - Trammel Bar, Stabilizer Trim Actuator Part #: F80055-36 Supplier: 81205 Opt Part #: F80055-1 Supplier: 81205

D. **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

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E. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

G. Prepare for the Pitch Force Transducers Adjustment

SUBTASK 22-11-92-800-001

- (1) Make sure that the tension adjustment is correct for the elevator control cables (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 22-11-92-730-001

- (2) Do this task: Null Procedure - Mach Trim Actuator, TASK 27-31-00-700-801.

SUBTASK 22-11-92-010-002

- (3) Open these access doors:

Number	Name/Location
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

H. Pitch Force Transducer Adjustment

SUBTASK 22-11-92-860-010

- (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 LSK adjacent to <PITCH CWS.

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- (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:

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 STAB TRIM PRI switch, S272, on the aft area of 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 39.17 ±0.01 in. (994.92 ±0.26 mm).

NOTE: This B dimension is equivalent to the horizontal stabilizer at 4 units of trim or 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 bar, SPL-1677, to measure the B dimension.

- 1) Make sure that the B dimension is 39.17 ±0.01 in. (994.92 ±0.26 mm).

SUBTASK 22-11-92-740-002

- (4) Push the Line Select Key (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 22-11-92-020-004

- (6) If the mass balance weight [4] is installed, do these steps:

- (a) Remove lockwire from the mass balance weight [4] (TASK 20-10-44-000-801).
(b) Remove the bolt [2], washers [3], and mass balance weight [4] from the elevator forward quadrant assembly.

SUBTASK 22-11-92-020-011

- (7) Make sure that the bolt [16] near the side of adjustable rod end [7] is loose.

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SUBTASK 22-11-92-020-002

- (8) Remove the bolt [6], washer [10], and nut [11] from the adjustable rod end [7] of the applicable pitch force transducer [1].

SUBTASK 22-11-92-020-006

- (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.
 - (a) 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 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 you can install the adjustable rod end [7].

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 22-11-92-020-003

- (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 22-11-92-420-004

- (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], and 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.

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SUBTASK 22-11-92-420-009

- (21) Install the bolt [16], washer [14], and nut [13].

SUBTASK 22-11-92-420-012

- (22) Tighten the bolts [16].

SUBTASK 22-11-92-420-010

- (23) Install the mass balance weight [4] with bolts [2] and washers [3].
- (a) Install the mass balance weight [4] with bolts [2] and washers [3].
 - (b) Tighten the bolts [2].
 - (c) Install 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.
 - (d) If the voltage is larger than 0.20 VAC, do a check on the control quadrant and bearings of the structure.
 - (e) If they are satisfactory, then do a check of the tension for elevator control cables EA and EB (TASK 27-31-00-820-801).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 22-11-92-410-005

- (1) Close these access doors:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door
311BL	Stabilizer Trim Access Door
318BR	Tailcone Access Door

————— END OF TASK —————

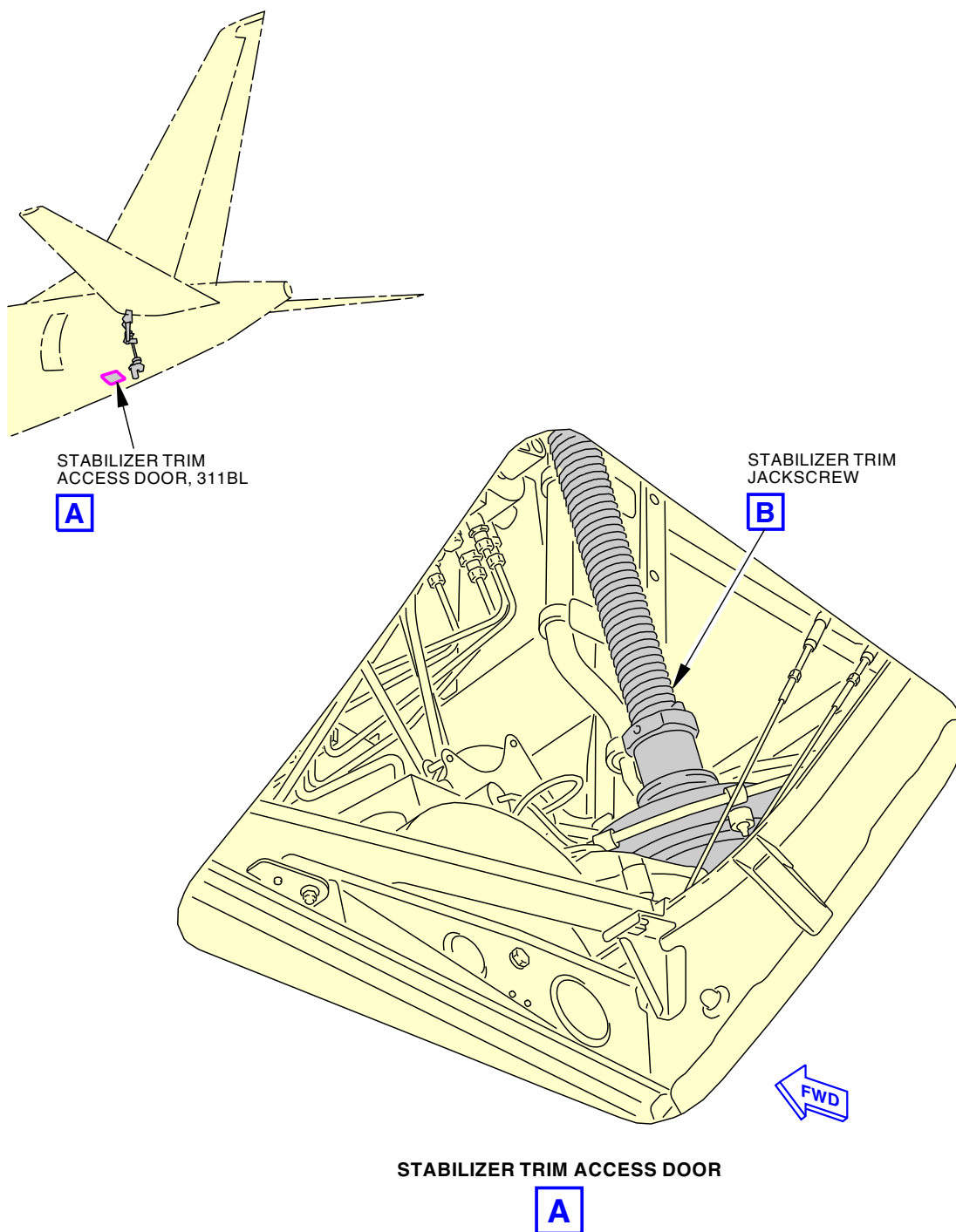
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Stabilizer Trim Jackscrew Setting
Figure 501/22-11-92-990-803 (Sheet 1 of 2)

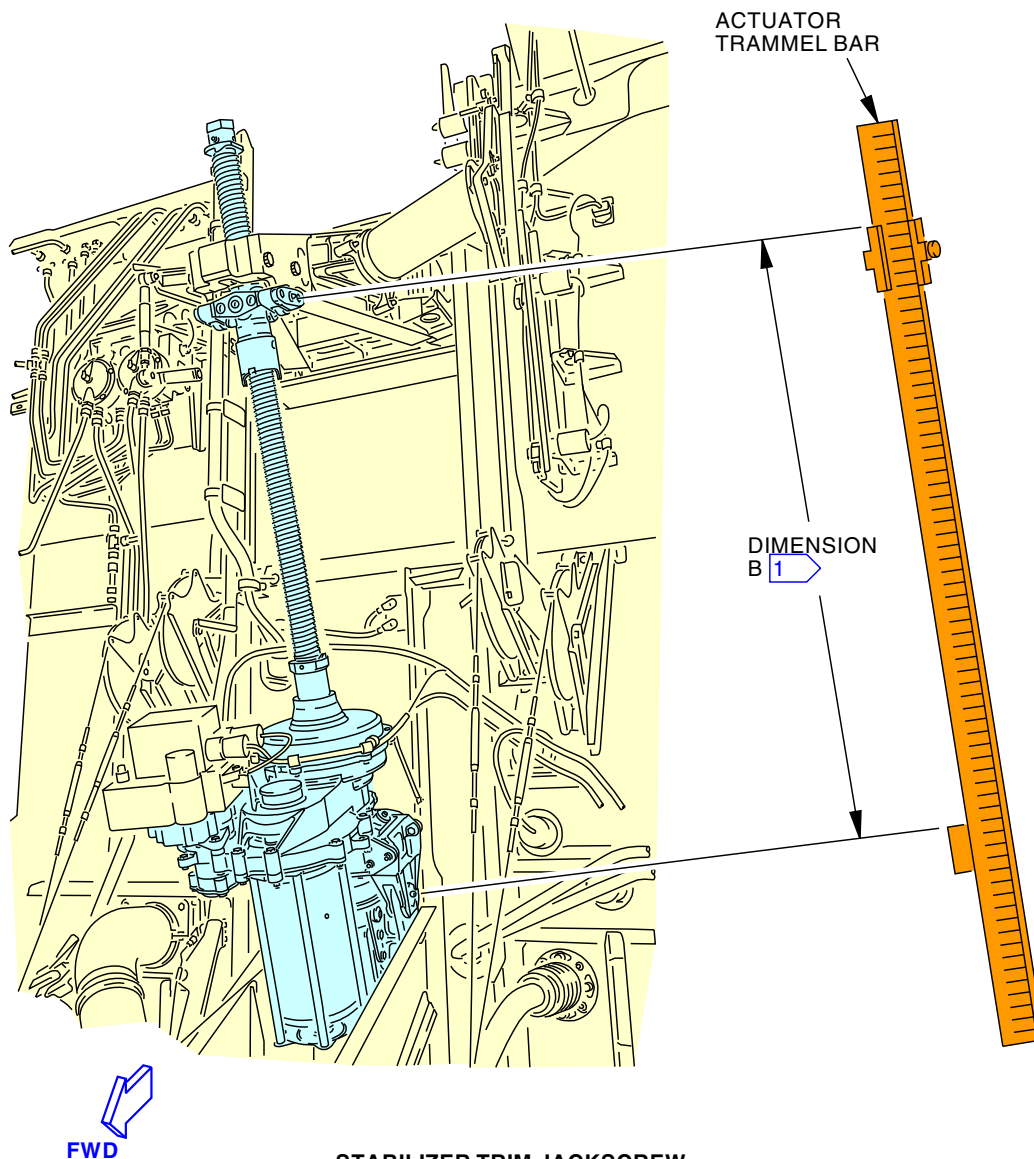
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STABILIZER TRIM JACKSCREW

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.

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Stabilizer Trim Jackscrew Setting
Figure 501/22-11-92-990-803 (Sheet 2 of 2)

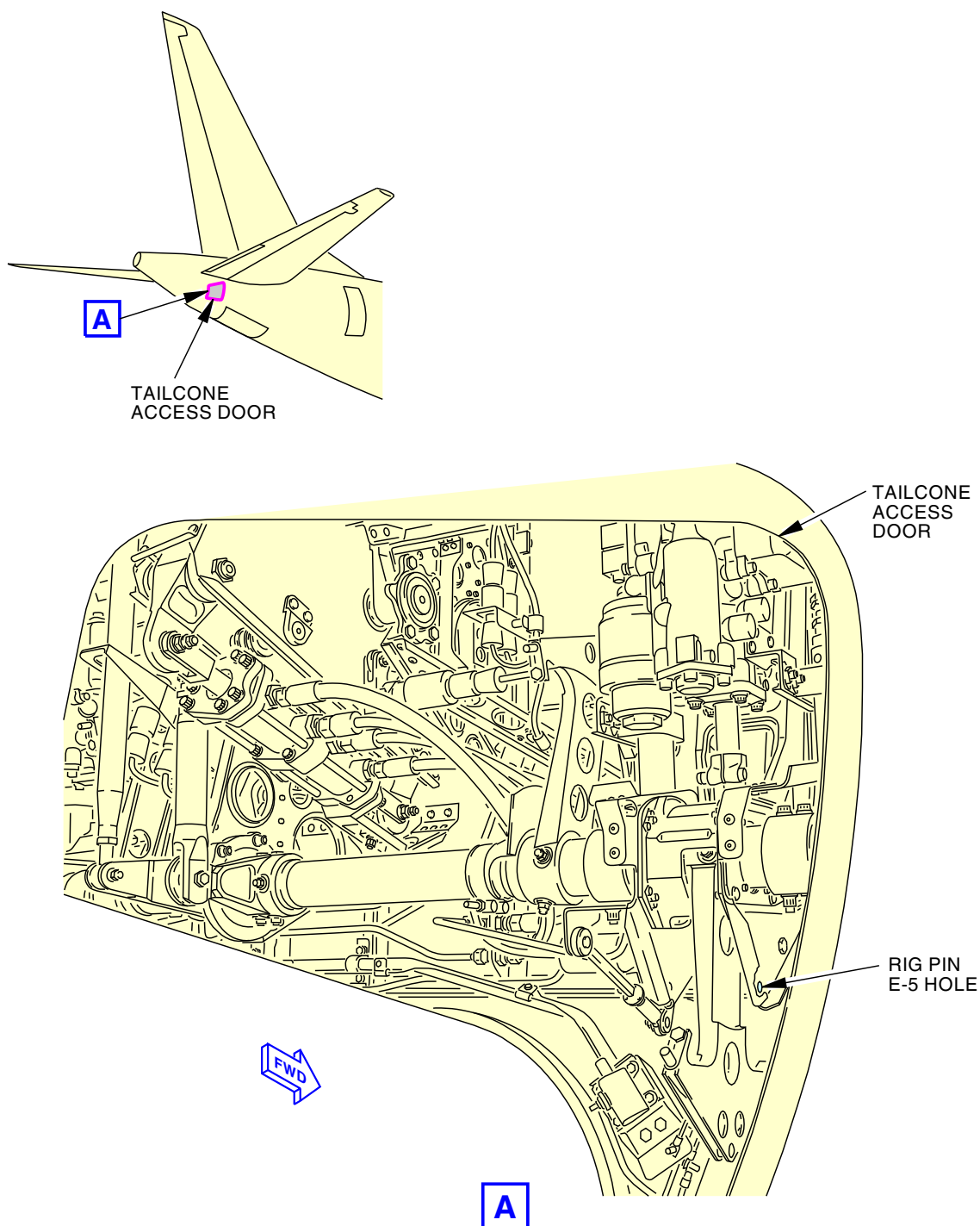
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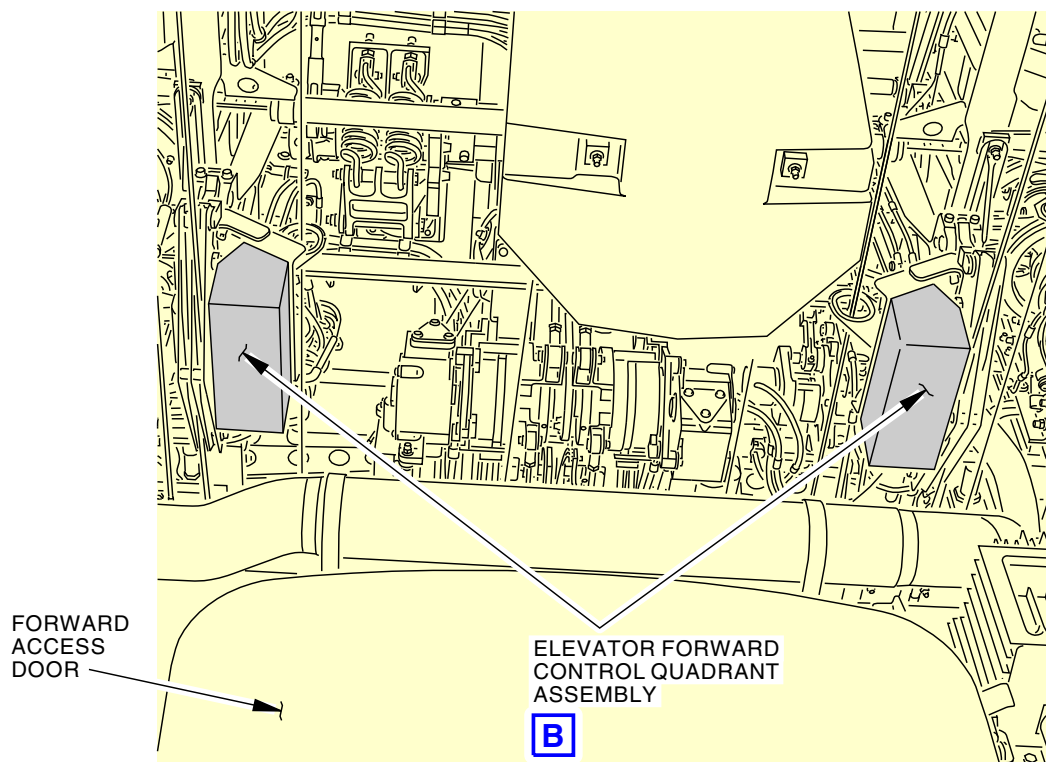
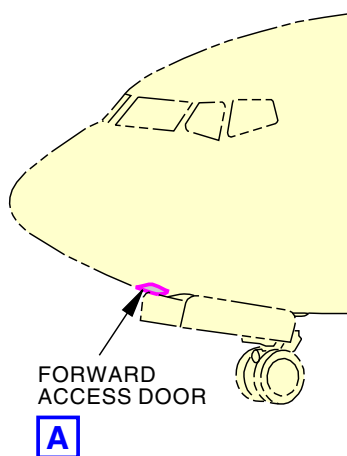
Elevator Rig Pin Installation
Figure 502/22-11-92-990-804

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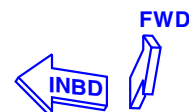
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FORWARD ACCESS DOOR

FORWARD ACCESS DOOR

A



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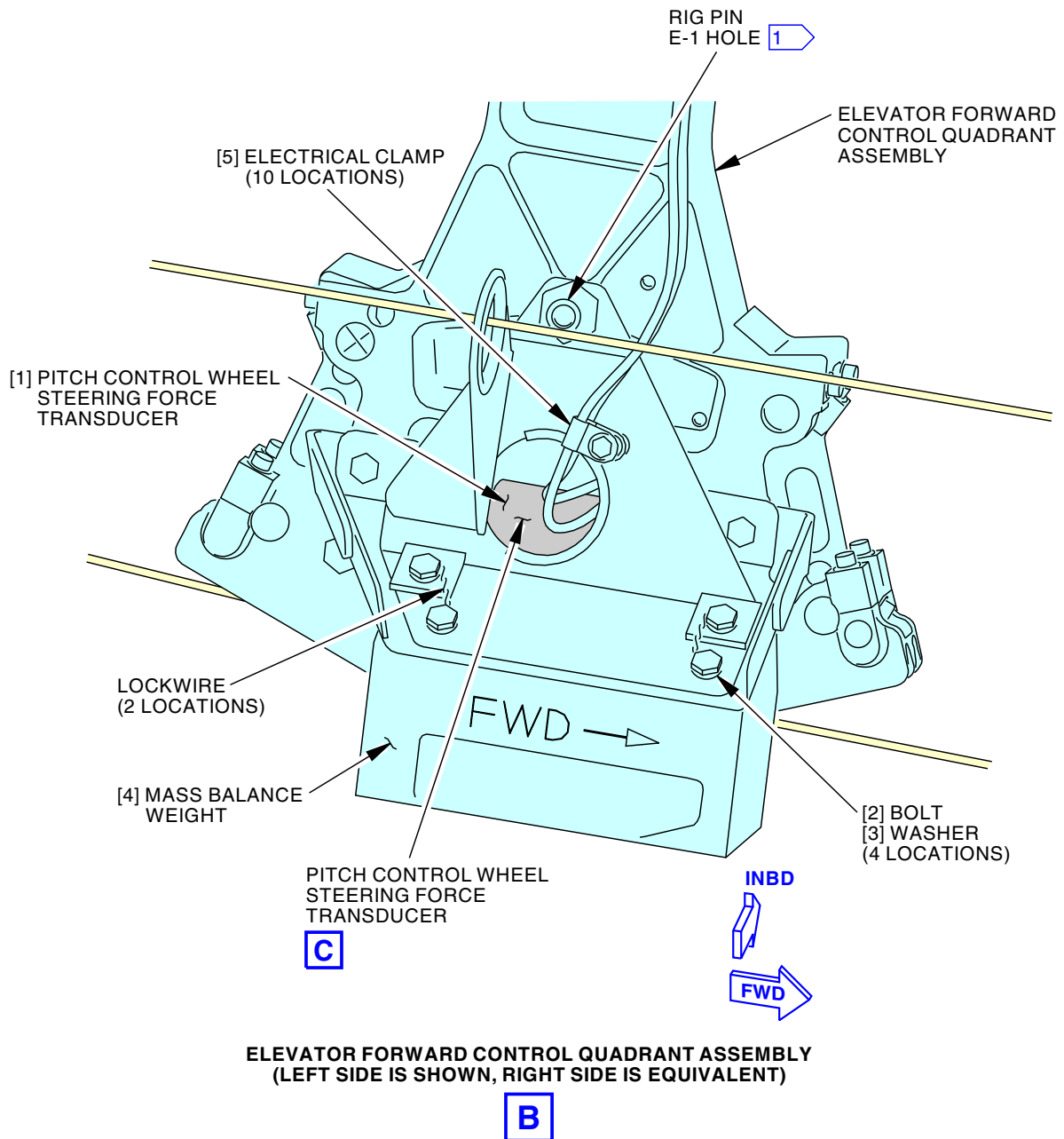
Pitch Control Wheel Steering Force Transducer Installation
Figure 503/22-11-92-990-805 (Sheet 1 of 3)

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[1] LEFT SIDE OF FORWARD QUADRANT ASSEMBLY ONLY

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Pitch Control Wheel Steering Force Transducer Installation
Figure 503/22-11-92-990-805 (Sheet 2 of 3)

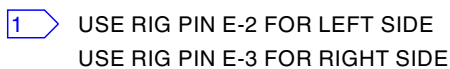
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Pitch Control Wheel Steering Force Transducer Installation

Figure 503/22-11-92-990-805 (Sheet 3 of 3)

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TASK 22-11-92-730-801

3. Pitch Force Transducer Test

A. General

(1) This task is for the pitch force transducer test.

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-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

D. Prepare for the Test

SUBTASK 22-11-92-860-011



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.

(1) Supply hydraulic power to Hydraulic Systems A and B (TASK 29-11-00-860-801).

E. Pitch Force Transducer Test - DFCS BITE

SUBTASK 22-11-92-980-002

(1) 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 22-11-92-860-012

(2) Attach the DO-NOT-OPERATE tags to the control columns.

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SUBTASK 22-11-92-860-013

- (3) Set the aileron trim to 0.0 unit.

SUBTASK 22-11-92-860-014

- (4) Set the STAB TRIM PRI and B/U switches, S272, on the aft area of the control stand, to the CUTOUT position.

SUBTASK 22-11-92-860-015

- (5) Make sure that the VHF NAV and IRS switches, on the P5 Forward Overhead Panel, are in the NORMAL positions.

SUBTASK 22-11-92-860-016

- (6) 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

- (7) 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

F. 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.

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.

G. 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
 - (c) MAINT>
 - (d) <DFCS
 - (e) <LRU REPLACEMENT TESTS
 - (f) <CHANNEL A AND B

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- (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.

H. Put the Airplanes Back to Its Initial Condition

SUBTASK 22-11-92-860-017

- (1) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

———— **END OF TASK** ————

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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 test.

TASK 22-23-00-710-801

2. Yaw Damper System Operational Test

A. General

- (1) This task is for the operational test of the yaw damper system computers.

B. References

Reference	Title
34-61-00-860-801	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. Prepare for the Test

SUBTASK 22-23-00-010-001

- (1) Open this access door:

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

F. Yaw Damper System Operational Test

SUBTASK 22-23-00-860-002

- (1) Enter the value "94" for lb option or "43" for kg option in line select key (LSK) 3L for the Zero Fuel Weight (TASK 34-61-00-860-801).

NOTE: After Zero Fuel Weight is entered in LSK 3L, the calculated gross weight will show at LSK 1L.

SUBTASK 22-23-00-860-003

- (2) 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 22-23-00-740-001

- (3) Do the stall management yaw damper computer 1 self-test as follows:

- (a) Make sure that the display shows EXISTING FAULTS?.
- (b) Push and release the down arrow key until the display shows GROUND TESTS?.

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- (c) Push the YES key on the keypad.
- (d) Make sure that the display shows SELF TEST?.
- (e) Make sure that the display shows TEST IN PROGRESS.
- (f) When the self-test is complete, make sure that the display shows SMYD LRU OK.

SUBTASK 22-23-00-740-002

- (4) Do the stall Management yaw Damper computer 2 self-test as follows:
 - (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.
 - (d) Make sure that the display shows SELF TEST?.
 - (e) Push the YES key on the keypad.
 - (f) Make sure that the display shows TEST IN PROGRESS.
 - (g) When the self-test is completed, make sure that the display shows SMYD LRU OK.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-00-010-002

- (1) Close this access door:

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

————— END OF TASK —————

TASK 22-23-00-710-802

3. Yaw Damper System Test

A. General

- (1) This task does a test of these interfaces:
 - (a) Interface between SMYD 1 and the main rudder power control unit.
 - (b) Interface between SMYD 2 and the standby rudder power control unit.
- (2) This task also does an interlock and light test.

B. References

<u>Reference</u>	<u>Title</u>
27-21-00-800-801	Rudder Hydraulic System A, B, or Standby 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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
34-61-00-860-801	Setting Zero Fuel Weight (P/B 201)

C. Location Zones

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

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(Continued)

Zone	Area

212	Flight Compartment - Right

D. Access Panels

Number	Name/Location

117A	Electronic Equipment Access Door

E. Prepare for the Test

SUBTASK 22-23-00-860-006



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.

- (1) Make sure that the rudder hydraulic system is pressurized, do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-00-010-003

- (2) Open this access door:

Number	Name/Location

117A	Electronic Equipment Access Door

SUBTASK 22-23-00-860-007

- (3) 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

- (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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803.

SUBTASK 22-23-00-860-008

- (5) Enter the zero fuel weight, do this task: Setting Zero Fuel Weight, TASK 34-61-00-860-801.

F. Stall Management Yaw Damper Computer Servo Test

SUBTASK 22-23-00-730-001



KEEP PERSONNEL, AND EQUIPMENT AWAY FROM THE RUDDER. KEEP YOUR HANDS WHERE THE RUDDER CANNOT CATCH THEM. THE RUDDER WILL MOVE AUTOMATICALLY DURING THIS TEST. THE RUDDER CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do the stall management yaw damper computer 1 servo test as follows:
 - (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?.

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- (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) Push the YES key on the keypad.
- (i) Make sure that the display shows SYS B HYD ON?.
- (j) Make sure that HYD PUMPS B switch on the P5 panel is ON.
- (k) Push the YES key on the keypad.
- (l) Make sure that the display shows FLT CTRL B ON?.
- (m) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to ON.
- (n) Push the YES key on the keypad.
- (o) Make sure that the display shows YAW DMPR ENGAGED?.
- (p) Set the yaw damper engage switch on the P5 overhead panel to ON.
- (q) Push the YES key on the keypad.
- (r) Make sure that the display shows ZERO COMMAND?.
- (s) Push the YES key on the keypad.
- (t) Make sure that the display shows RUDDER MOVING.
- (u) After approximately ten seconds, make sure that the display shows these indications:
 - 1) YD cmd 0.0 $\pm$ 0.2
 - 2) LVDT 0.0 $\pm$ 0.2
 - 3) END ZERO COMMAND?
- (v) Push the YES key on the keypad.
- (w) 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?.

- (x) Push the down arrow key on the keypad.
- (y) Make sure that the display shows SWEEP TEST?.
 - 1) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 2.
 - 2) Push the down arrow key on the SMYD 2 keypad.



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- 3) Make sure that the display shows OTHER FUNCTNS?.
- 4) Push the YES key on the SMYD 2 keypad.
- 5) Push the down arrow key on the SMYD 2 keypad.
- 6) Make sure that the display shows I/O MONITOR.
- 7) Push the YES key on the SMYD 2 keypad.
- 8) Push the down arrow key on the SMYD 2 keypad.
- 9) Make sure that the display shows OTHER DATA.
- 10) Push the YES key on the SMYD 2 keypad.
- 11) Push the down arrow key on the SMYD 2 keypad.
- 12) Make sure that the display shows WORD 151.
- 13) Push the YES key on the SMYD 2 keypad.
- 14) Make sure that the display shows XXXXX degree.

NOTE: The Xs will show as numbers. You can ignore the value of the number.

- (z) Push the YES key on the SMYD 1 keypad.
- (aa) After approximately two seconds, make sure that the display shows RUD CMD LEFT.
- (ab) After approximately ten seconds, make sure that the display shows YD LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ac) After approximately two seconds, make sure that the display shows RUD CMD RIGHT.
- (ad) After approximately ten seconds, make sure that the display shows YD LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ae) After approximately two seconds, make sure that the display shows RUD CMD ZERO.
- (af) After approximately ten seconds, make sure that the display shows these indications in sequence:

- 1) YD LVDT XXXXX

NOTE: The Xs will show as numbers. You can ignore the value of the number.

- 2) TEST PASSED

- (ag) Set the FLT CONTROL B switch on the P5 overhead panel to OFF.
- (ah) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.
- (ai) Make sure that the YAW DAMPER light on the P5 overhead panel comes on.
- (aj) Set the FLT CONTROL B switch on the P5 overhead panel to ON.
- (ak) Set the yaw damper engage switch on the P5 overhead panel to ON.
- (al) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	7	C00286	YAW DAMPER 1 DC

- 1) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

- (am) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 1.
- (an) Make sure that the display shows TURN OFF DISPLAY?.
- (ao) Push the YES key on the keypad.

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C01354	YAW DAMPER 2 DC

SUBTASK 22-23-00-730-002

 WARNING	KEEP PERSONNEL, AND EQUIPMENT AWAY FROM THE RUDDER. KEEP YOUR HANDS WHERE THE RUDDER CANNOT CATCH THEM. THE RUDDER WILL MOVE AUTOMATICALLY DURING THIS TEST. THE RUDDER CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) Do the stall management yaw damper computer 2 servo test as follows:
- (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) Push the YES key on the keypad.
 - (i) Make sure that the display shows FLT CTRL A STBY?.
 - (j) Make sure that the FLT CONTROL A switch on the P5 overhead panel is set to STBY RUD.
 - (k) Push the YES key on the keypad.
 - (l) Make sure that the display shows FLT CTRL B STBY?.
 - (m) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to STBY RUD.
 - (n) Push the YES key on the keypad.
 - (o) Make sure that the display shows YAW DMPR ENGAGED?.
 - (p) Set the yaw damper engage switch on the P5 overhead panel to ON.
 - (q) Push the YES key on the keypad.
 - (r) Make sure that the display shows ZERO COMMAND?.
 - (s) Push the YES key on the keypad.
 - (t) Make sure that the display shows RUDDER MOVING.

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- (u) After approximately ten seconds, make sure that the display shows these indications:
 - 1) YD cmd 0.0 $\pm$ 0.2
 - 2) YD LVDT 0.0 $\pm$ 0.2
 - 3) END ZERO COMMAND?
- (v) Push the YES key on the keypad.
- (w) 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?.
- (x) Push the down arrow key on the keypad.
- (y) Make sure that the display shows SWEEP TEST?.
 - 1) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 1.
 - 2) Push the down arrow key on the SMYD 1 keypad.
 - 3) Make sure that the display shows OTHER FUNCTNS?.
 - 4) Push the YES key on the SMYD 1 keypad.
 - 5) Push the down arrow key on the SMYD 1 keypad.
 - 6) Make sure that the display shows I/O MONITOR.
 - 7) Push the YES key on the SMYD 1 keypad.
 - 8) Push the down arrow key on the SMYD 1 keypad.
 - 9) Make sure that the display shows OTHER DATA.
 - 10) Push the YES key on the SMYD 1 keypad.
 - 11) Push the down arrow key on the SMYD 1 keypad.
 - 12) Make sure that the display shows WORD 151.
 - 13) Push the YES key on the SMYD 1 keypad.
 - 14) Make sure that the display shows XXXXX degree.

NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (z) Push the YES key on the SMYD 2 keypad.
- (aa) After approximately two seconds, make sure that the display shows this indication:
 - 1) RUD CMD LEFT
- (ab) After approximately ten seconds, make sure that the display shows YD LVDT XXXXX.

NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ac) After approximately two seconds, make sure that the display shows RUD CMD RIGHT.
- (ad) After approximately ten seconds, make sure that the display shows YD LVDT XXXXX.

NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ae) After approximately two seconds, make sure that the display shows RUD CMD ZERO.
- (af) After approximately ten seconds, make sure that the display shows these indications in sequence:



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1) YD LVDT XXXXX

NOTE: The Xs will show as numbers. You can ignore the value of the number.

2) TEST PASSED

(ag) Set the FLT CONTROL A switch on the P5 overhead panel to ON.

(ah) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

(ai) Make sure that the YAW DAMPER light on the P5 overhead panel comes on.

(aj) Set the FLT CONTROL A switch on the P5 overhead panel to STBY RUD.

(ak) Set the yaw damper engage switch on the P5 overhead panel to ON.

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C01354	YAW DAMPER 2 DC

(am) Make sure that the yaw damper engage switch on the P5 overhead panel disengages.

(an) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 2.

(ao) Make sure that the display shows TURN OFF DISPLAY?.

(ap) Push the YES key on the keypad.

(aq) Set the FLT CONTROL A and the FLT CONTROL B switches on the P5 overhead panel to ON.

G. Interlock and Light Test

SUBTASK 22-23-00-860-011

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

SUBTASK 22-23-00-730-003

(2) Do the interlock and light test as follows:

(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.

(d) Make sure that the YAW DAMPER disengage light comes on.

(e) Release the YAW DAMPER disengage light.

(f) Make sure that the YAW DAMPER disengage light goes out.

(g) 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.

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- (h) Set the yaw damper engage switch on the P5 overhead panel to OFF.
- (i) 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:

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

SUBTASK 22-23-00-730-004

- (2) Set the two mode select switches on the IRS MSU to the OFF position.

———— **END OF TASK** ————

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**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. General

- (1) This task is for the removal of the standby rudder solenoid and electrohydraulic servo valves.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

D. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

E. Prepare for the Removal

SUBTASK 22-23-11-860-001

- (1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-11-860-002

- (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 22-23-11-010-001

- (3) Open 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

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access to the standby rudder Power Control Unit (PCU).

F. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves Removal

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** ————

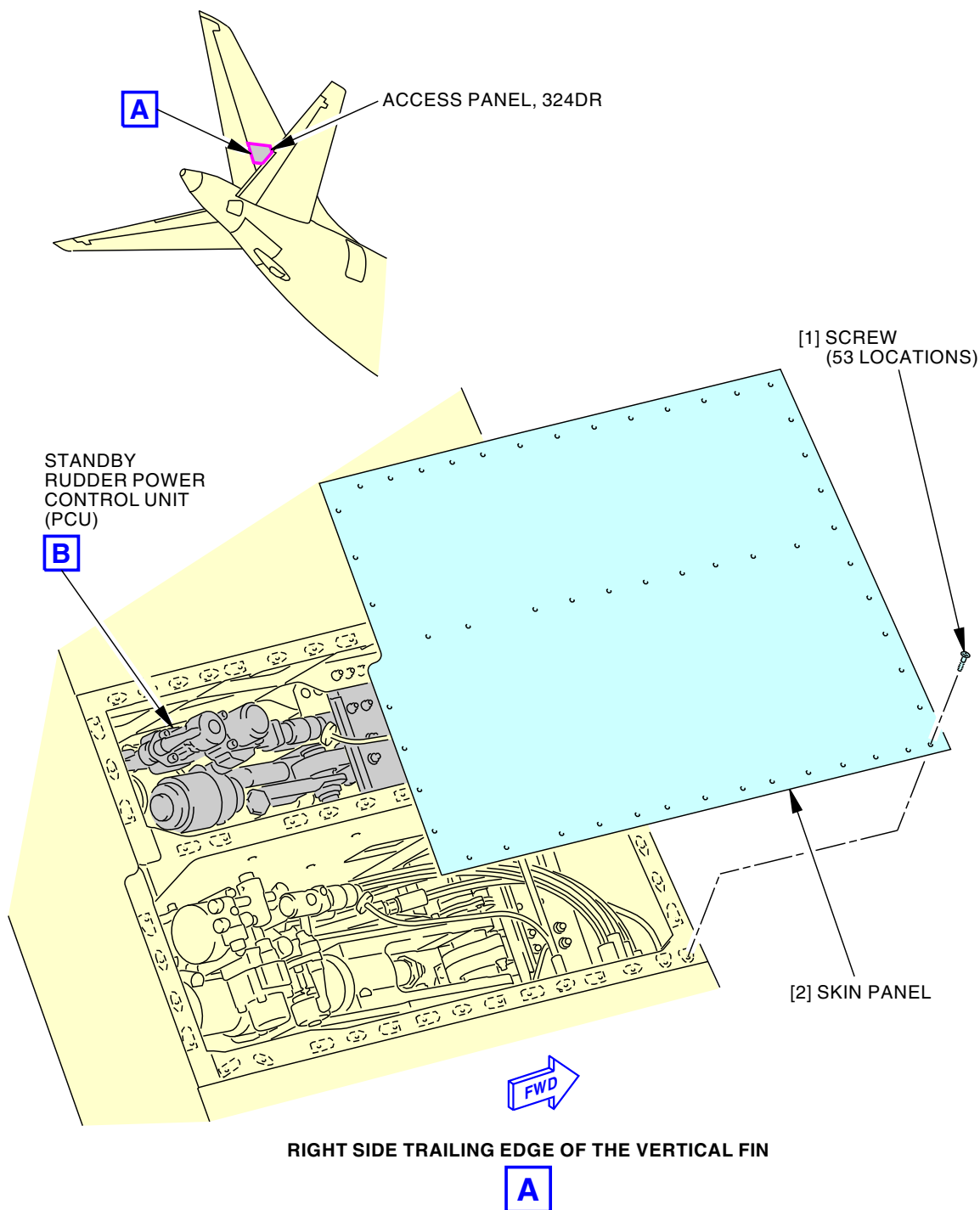
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2411657 S00061528506_V1

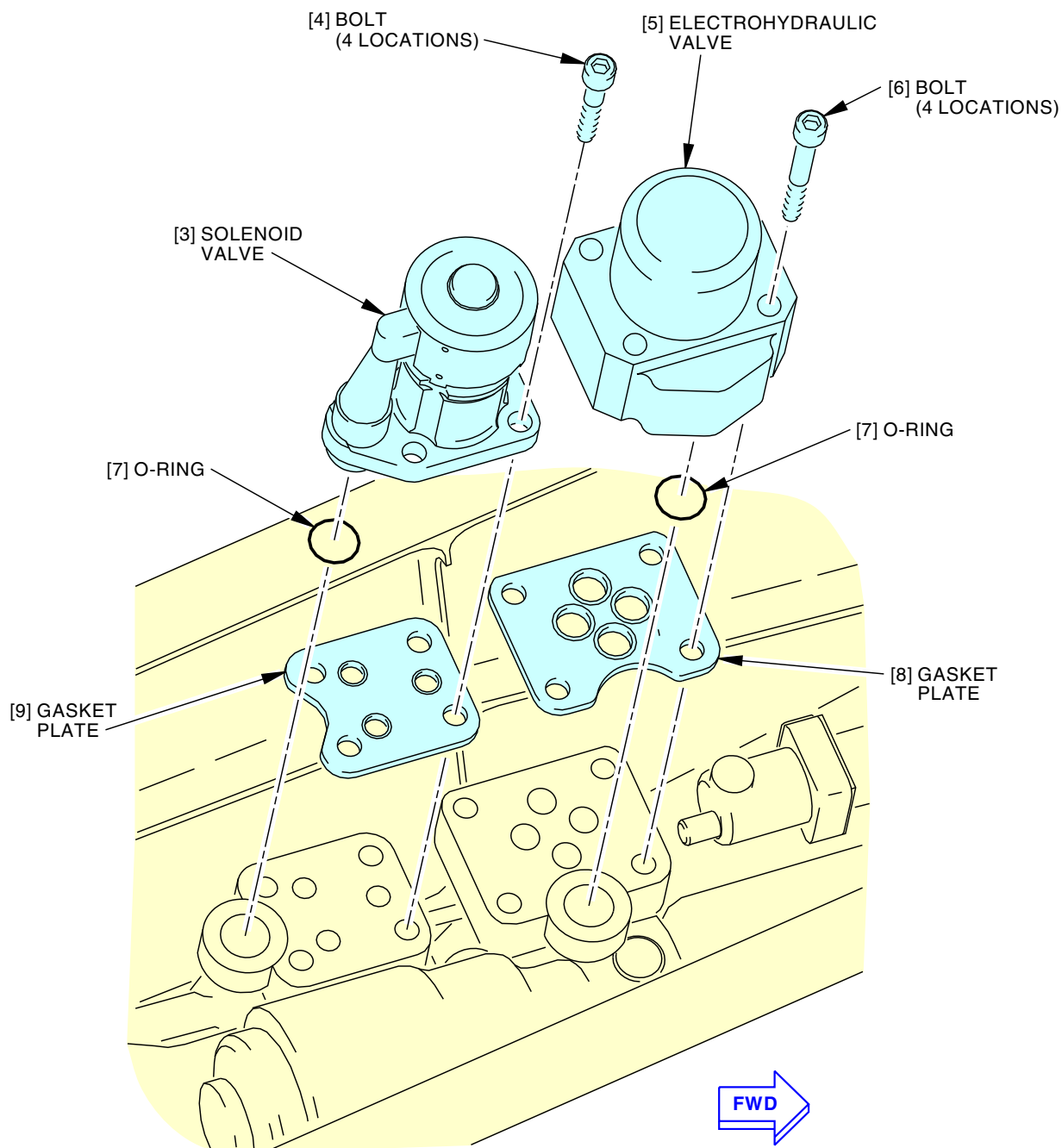
Standby Rudder PCU Solenoid and Electrohydraulic Valves Installation
Figure 401/22-23-11-990-801 (Sheet 1 of 2)

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STANDBY RUDDER POWER CONTROL UNIT (PCU)



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Standby Rudder PCU Solenoid and Electrohydraulic Valves Installation
Figure 401/22-23-11-990-801 (Sheet 2 of 2)

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TASK 22-23-11-400-801

3. **Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation**

(Figure 401)

A. General

- (1) This task is for the installation of the standby rudder solenoid and electrohydraulic servo valves.

B. References

Reference	Title
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. 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Solenoid valve	27-21-24-01-266	SIA ALL
		27-21-24-01-405	SIA ALL
5	Electrohydraulic servo valve	27-21-24-01-130	SIA ALL
		27-21-24-01-200	SIA ALL
		27-21-24-01-250	SIA ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	O-ring	27-21-24-01-260 27-21-24-01-280	SIA ALL SIA ALL
8	Gasket plate	27-21-24-01-255	SIA ALL
9	Gasket plate	27-21-24-01-275	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
324DR	Vertical Fin, Trailing Edge Access

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 Power Control Unit (PCU) ports.
- (b) Lubricate the new o-ring [7] with hydraulic fluid, D00153.
- (c) Install the 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 54 in-lb (6.1 N·m) - 72 in-lb (8.1 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.
 - 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 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]:

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- (a) Remove the plugs on the standby rudder PCU ports.
- (b) Lubricate the new o-ring [7] with hydraulic fluid, D00153.
- (c) Install the 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 54 in-lb (6.1 N·m) - 72 in-lb (8.1 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 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.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-11-010-003

- (1) Install the screws [1] and skin panel [2] to close access to the standby rudder PCU:
 - (a) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
324DR	Vertical Fin, Trailing Edge Access

SUBTASK 22-23-11-860-011

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

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I. Standby Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation Test

SUBTASK 22-23-11-860-012



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.

- (1) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-11-010-006

- (2) Open this access door:

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

SUBTASK 22-23-11-720-001

- (3) 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 Built-In-Test Equipment (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.

- (j) Make sure that the display shows FLT CTRL A STBY?.

- (k) Make sure that the FLT CONTROL A switch, on the P5 overhead panel, is set to the STBY RUD position.

- (l) Push the YES key on the keypad.

- (m) Make sure that the display shows FLT CTRL B STBY?.

- (n) Make sure that the FLT CONTROL B switch, on the P5 overhead panel, is set to the STBY RUD position.

- (o) Push the YES key on the keypad.

- (p) Make sure that the display shows YAW DMPR ENGAGED?.

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KEEP PERSONNEL, AND EQUIPMENT AWAY FROM THE RUDDER. KEEP YOUR HANDS WHERE THE RUDDER CANNOT CATCH THEM. THE RUDDER WILL MOVE AUTOMATICALLY DURING THIS TEST. THE RUDDER CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (q) Set the yaw damper engage switch, on the P5 overhead panel, to the ON position.
- (r) Push the YES key on the keypad.
- (s) Make sure that the display shows ZERO COMMAND?.
- (t) Push the YES key on the keypad.
- (u) Make sure that the display shows RUDDER MOVING.
- (v) After approximately ten seconds, make sure that the display shows these indications:
 - 1) YD 0.0 $\pm$ 0.2
 - 2) LVDT 0.0 $\pm$ 0.2
 - 3) END ZERO COMMAND?.
- (w) Push the YES key on the keypad.
- (x) Make sure that the display shows these indications:
 - 1) RUDDER MOVING
 - 2) TEST EXITING
 - 3) ZERO COMMAND?.
- (y) Push and release the down arrow key until the display shows SWEEP TEST?.
- (z) Push the YES key on the keypad.
- (aa) After approximately two seconds, make sure that the display shows RUDDER CMD LEFT.
- (ab) After approximately ten seconds, make sure that the display shows YD LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ac) After approximately two seconds, make sure that the display shows RUDDER CMD RIGHT.
- (ad) After approximately ten seconds, make sure that the display shows this indication LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ae) After approximately two seconds, make sure that the display shows RUDDER CMD ZERO.
- (af) After approximately ten seconds, make sure that the display shows these indications in sequence:
 - 1) LVDT XXXXX
NOTE: The Xs will show as numbers. You can ignore the value of the number.
 - 2) TEST PASSED
 - 3) TEST EXITING
 - 4) ZERO COMMAND?.
- (ag) Push the ON/OFF switch on the SMYD Computer 2.
 - 1) Make sure that the display shows TURN OFF DISPLAY?.

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- (ah) Push the YES key on the keypad.
- (ai) Set the FLT CONTROL A and the FLT CONTROL B switches, on the P5 overhead panel, to the ON position.

SUBTASK 22-23-11-860-013

- (4) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-11-410-001

- (5) Close this access panel:

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

————— **END OF TASK** —————

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**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
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 22-23-11-860-007



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.

- (1) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-11-010-004

- (2) Open this access door:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 22-23-11-860-008

- (3) Do the Stall Management Yaw Damper Computer 2 servo test:

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- (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

KEEP PERSONNEL, AND EQUIPMENT AWAY FROM THE RUDDER. KEEP YOUR HANDS WHERE THE RUDDER CANNOT CATCH THEM. THE RUDDER WILL MOVE AUTOMATICALLY DURING THIS TEST. THE RUDDER CAN CAUSE INJURIES TO PERSONNEL, 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 $\pm$ 0.2
 - 2) LVDT 0.0 $\pm$ 0.2
 - 3) END ZERO COMMAND?
- (q) Push the YES key on the keypad.



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- (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 represents 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 represents 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 represents 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.

SUBTASK 22-23-11-860-009



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.

- (4) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

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SUBTASK 22-23-11-010-005

(5) Close this access panel:

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

————— END OF TASK —————

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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. General

- (1) This task is for the removal of the main rudder Power Control Unit (PCU) solenoid and electrohydraulic servo valves.

B. References

Reference	Title
27-21-00-800-802	Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

D. Access Panels

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

E. Prepare for the Removal

SUBTASK 22-23-21-860-001

- (1) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-21-860-002

- (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 22-23-21-010-001

- (3) Open this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

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NOTE: 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.

F. Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Removal

SUBTASK 22-23-21-020-001

- (1) Do these steps to remove the solenoid valve [4]:
- (a) Remove the lockwire.
 - (b) Remove the bolts [5] that attach the solenoid valve [4] to the main rudder PCU.
 - (c) Remove the solenoid valve [4].
 - (d) Remove the gasket plate [3].
 - 1) If the seals on the gasket plate [3] are in bad condition, discard the gasket plate [3].
 - (e) Remove and discard the o-ring [8].
 - (f) 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 lockwire.
 - (b) Remove the bolts [7] that attach the electrohydraulic servo valve [6] to the main rudder PCU.
 - (c) Remove the electrohydraulic servo valve [6].
 - (d) Remove the gasket plate [9].
 - 1) If the seals on the gasket plate [9] are in bad condition, discard the gasket plate [9].
 - (e) Remove and discard the o-ring [8].
 - (f) Put plugs on the main rudder PCU ports to avoid hydraulic fluid contamination.

———— **END OF TASK** ————

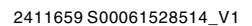
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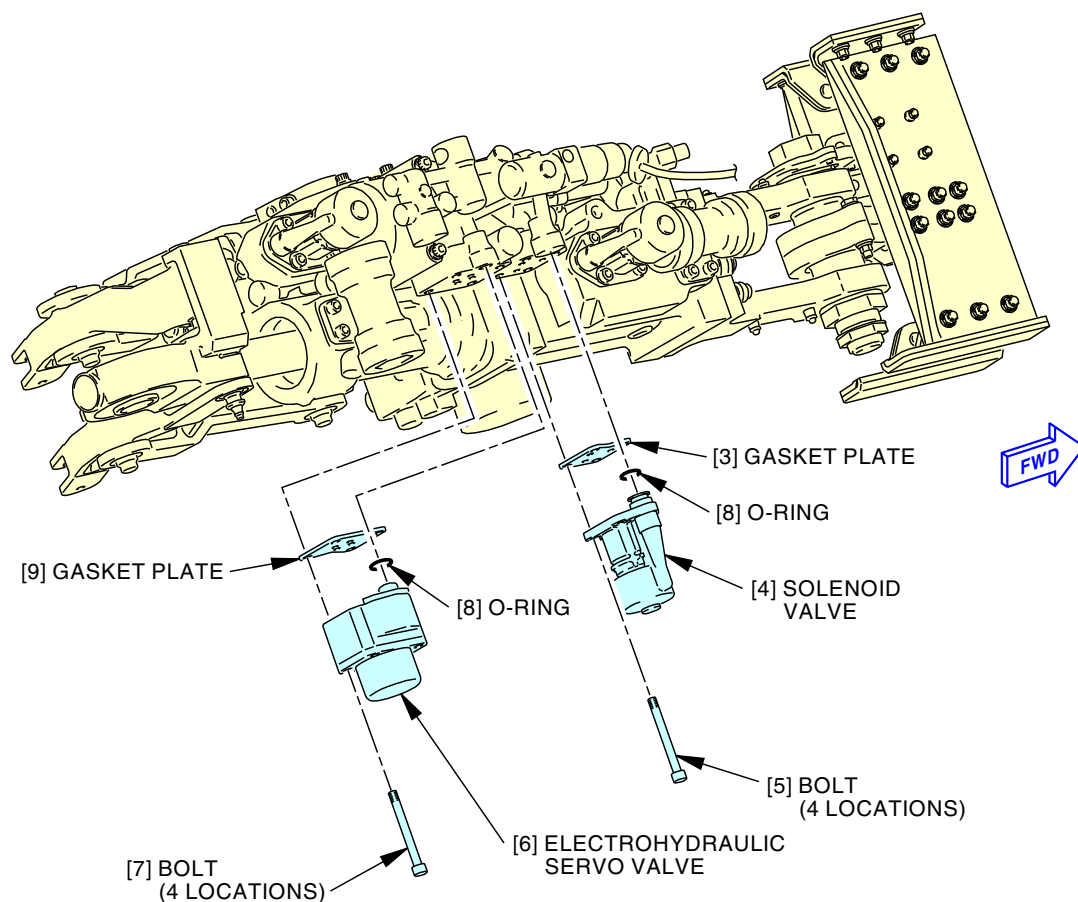


Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation

Figure 401/22-23-21-990-801 (Sheet 1 of 2)

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MAIN RUDDER POWER CONTROL UNIT (PCU)

B

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Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation
Figure 401/22-23-21-990-801 (Sheet 2 of 2)

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TASK 22-23-21-400-801

3. Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation

(Figure 401)

A. General

- (1) This task is for the installation of the main rudder Power Control Unit (PCU) solenoid and electrohydraulic servo valves.

B. References

Reference	Title
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)
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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
34-61-00-860-801	Setting Zero Fuel Weight (P/B 201)

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
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Gasket plate	27-21-91-02-228	SIA ALL
		27-21-91-02-329	SIA ALL
4	Solenoid valve	27-21-91-02-232	SIA ALL
		27-21-91-02-278	SIA ALL
		27-21-91-02-279	SIA ALL
		27-21-91-02-332	SIA ALL
		27-21-91-02-380	SIA ALL
		27-21-91-02-385	SIA ALL
6	Electrohydraulic servo valve	27-21-91-02-300	SIA ALL
		27-21-91-02-302	SIA ALL
		27-21-91-02-303	SIA ALL
8	O-ring	27-21-91-02-226	SIA ALL
		27-21-91-02-296	SIA ALL
		27-21-91-02-328	SIA ALL
9	Gasket plate	27-21-91-02-298	SIA ALL

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E. Location Zones

Zone	Area
211	Flight Compartment - Left
324	Vertical Fin - Rear Spar To Trailing Edge

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
324DR	Vertical Fin, Trailing Edge Access

G. Main Rudder PCU Solenoid and Electrohydraulic Servo Valves Installation

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) Torque 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 the 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) Torque 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. Put the Airplane Back to Its Usual Condition

SUBTASK 22-23-21-410-001

- (1) Close this access panel:

Number	Name/Location
324DR	Vertical Fin, Trailing Edge Access

SUBTASK 22-23-21-860-012

- (2) 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

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CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	7	C00286	YAW DAMPER 1 DC

I. Solenoid and Electrohydraulic Valves Installation Test

SUBTASK 22-23-21-710-001



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.

- (1) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

SUBTASK 22-23-21-860-013

- (2) Open this access door:

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

SUBTASK 22-23-21-010-006

- (3) 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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803.

SUBTASK 22-23-21-470-001

- (4) Enter the zero fuel weight (TASK 34-61-00-860-801).

SUBTASK 22-23-21-720-001

- (5) Do the Stall Management Yaw Damper (SMYD) computer 1 servo test as follows:

- (a) Push the ON/OFF key on SMYD Computer 1 (E3-2).

NOTE: SMYD Built-In-Test Equipment (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.

- (j) Make sure that the display shows SYS B HYD ON?.

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- (k) Make sure that HYD PUMPS B switch on the P5 panel is ON.
- (l) Push the YES key on the keypad.
- (m) Make sure that the display shows FLT CONT B ON?.
- (n) Make sure that the FLT CONTROL B switch on the P5 overhead panel is set to ON.
- (o) Push the YES key on the keypad.
- (p) Make sure that the display shows YAW DMPR ENGAGED?.



WARNING

KEEP PERSONNEL, AND EQUIPMENT AWAY FROM THE RUDDER. KEEP YOUR HANDS WHERE THE RUDDER CANNOT CATCH THEM. THE RUDDER WILL MOVE AUTOMATICALLY DURING THIS TEST. THE RUDDER CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (q) Set the yaw damper engage switch on the P5 overhead panel to ON.
- (r) Push the YES key on the keypad.
- (s) Make sure that the display shows ZERO COMMAND?.
- (t) Push the YES key on the keypad.
- (u) Make sure that the display shows RUDDER MOVING.
- (v) After approximately ten seconds, make sure that the display shows these indications:
 - 1) YD 0.0 $\pm$ 0.2
 - 2) LVDT 0.0 $\pm$ 0.2
 - 3) END ZERO COMMAND?
- (w) Push the YES key on the keypad.
- (x) Make sure that the display shows RUDDER MOVING.
- (y) Push and release the down arrow key until the display shows SWEEP TEST?.
- (z) Push the YES key on the keypad.
- (aa) After approximately two seconds, make sure that the display shows RUDDER CMD LEFT.
- (ab) After approximately ten seconds, make sure that the display shows LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ac) After approximately two seconds, make sure that the display shows RUDDER CMD RIGHT.
- (ad) After approximately ten seconds, make sure that the display shows LVDT XXXXX.
NOTE: The Xs will show as numbers. You can ignore the value of the number.
- (ae) After approximately two seconds, make sure that the display shows RUDDER CMD ZERO.
 - 1)
- (af) After approximately ten seconds, make sure that the display shows these indications in sequence:
 - 1) LVDT XXXXX
NOTE: The Xs will show as numbers. You can ignore the value of the number.
 - 2) TEST PASSED



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- (ag) Push the ON/OFF switch on the SMYD Computer 1.
- (ah) Make sure that the display shows TURN OFF DISPLAY?.
- (ai) Push the YES key on the keypad.

SUBTASK 22-23-21-860-014

- (6) Do this task: Pressure from the Rudder Hydraulic Systems A, B, and Standby - Deactivation, TASK 27-21-00-800-802.

SUBTASK 22-23-21-410-002

- (7) Close this access door:

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

———— **END OF TASK** ————

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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
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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)
34-61-00-860-801	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 22-23-21-860-007



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.

- (1) Do this task: Rudder Hydraulic System A, B, or Standby Pressurization, TASK 27-21-00-800-801.

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SUBTASK 22-23-21-860-008

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
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) Open this access door:

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

SUBTASK 22-23-21-820-001

- (4) Align Air Data Inertial Reference System (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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803.

SUBTASK 22-23-21-860-009

- (5) Do this task to enter the zero fuel weight: Setting Zero Fuel Weight, TASK 34-61-00-860-801.

SUBTASK 22-23-21-740-001

- (6) 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?

- 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.

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- 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 $\pm$ 0.2
- 2) LVDT 0.0 $\pm$ 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.
- (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
- (aa) Push the ON/OFF switch on the Stall Management Yaw Damper (SMYD) Computer 1.
- 1) Make sure that the display shows TURN OFF DISPLAY?



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(ab) Push the YES key on the keypad.

SUBTASK 22-23-21-860-010



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.

- (7) 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 22-23-21-010-005

- (8) Close this access door:

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

————— END OF TASK —————

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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 task removes electrical power to the autothrottle system.
- (2) The tryout this task makes sure that the autothrottle system is in a zero energy state.

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 22-31-00-860-001

- (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 22-31-00-860-002

- (2) Make sure that the engine start levers are in the cutoff position and attach DO NOT OPERATE tag, STD-858.

E. **Autothrottle System Tryout**

SUBTASK 22-31-00-860-004

- (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 22-31-00-700-001

- (2) Do these steps:
 - (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.

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- (d) Push the LSK adjacent to A/T.
- (e) Make sure the autothrottle warning lights on the autoflight status annunciators (P1 and P3 panels) do not come on.

————— END OF TASK —————

TASK 22-31-00-440-801

3. Autothrottle System - Activation

A. General

- (1) This task restores electrical power to the autothrottle system.

B. Location Zones

<u>Zone</u>	<u>Area</u>
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 22-31-00-860-005

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00721	AUTOTHROTTLE DC 1

————— END OF TASK —————

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AUTOTHROTTLE SYSTEM - ADJUSTMENT/TEST

1. General

A. 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
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)
34-21-00-820-803	Air Data Inertial Reference System - Automatic Alignment from the IRS MSU (P/B 201)

C. Location Zones

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

D. Autothrottle System Operational Test

SUBTASK 22-31-00-860-007

- (1) 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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803 or 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 or Air Data Inertial Reference System - Automatic Alignment from the IRS MSU, TASK 34-21-00-820-803.

SUBTASK 22-31-00-860-008

- (2) Set the Captain and Center panel light control to full bright.

SUBTASK 22-31-00-740-001

- (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.

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- (d) Push the LSK adjacent to A/T.
- (e) Make sure the autothrottle warning lights on the autoflight status annunciators (P1 and P3 panels) come on continuously.



CAUTION

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.

- (f) Push the LSK adjacent to CURRENT STATUS.
- (g) Do the instructions on the CDU.
- (h) Push the LSK adjacent to CONTINUE.
- (i) Make sure that the A/T switch on the P7 panel automatically goes back to OFF.
- (j) Make sure that NO FAULTS shows on the CDU when the test is completed.
- (k) Push the LSK adjacent to INDEX.
- (l) Do the instructions on the CDU.
- (m) Push the LSK adjacent to CONTINUE.
- (n) Make sure that A/T BITE TEST index shows.
- (o) Push the LSK adjacent to INDEX.
- (p) Push the INIT REF key on the FMC CDU keyboard.
- (q) 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 22-31-00-860-009

- (4) If Inertial Reference System (IRS) outputs are no longer necessary, set the IRS-L and IRS-R mode select switches on the P5 panel to OFF.

END OF TASK

TASK 22-31-00-710-802

3. Autothrottle System - System Test

A. General

- (1) The system test uses autothrottle Built-In-Test Equipment (BITE) to make sure that the system operates correctly. Use the Flight Management Computer (FMC) Control Display Unit (CDU) on the P9 panel to do the BITE procedures. You can do the tests out of sequence or you can do each test independently.

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. Location Zones

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

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C. Prepare for the Test

SUBTASK 22-31-00-860-020

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01678	WEATHER RADAR RT RIGHT

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C00120	WEATHER RADAR RT

SUBTASK 22-31-00-710-001

- (2) Do this task: Autothrottle System - Operational Test, TASK 22-31-00-710-801.

SUBTASK 22-31-00-860-012

- (3) Make sure that the IRS-L and IRS-R mode select switches on the P5 panel are not in the OFF position.

SUBTASK 22-31-00-860-013

- (4) Set the captain and center panel light control to full bright.

SUBTASK 22-31-00-860-019

- (5) Do these steps on the Captain's CDU:
- (a) Push the INIT REF key.
 - (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.

D. Mode Annunciation Test

SUBTASK 22-31-00-740-002

- (1) Do these steps for the mode annunciation test:
- (a) Push the LSK adjacent to MODE ANNUNCIATION.
 - (b) Follow the instructions on the CDU.
 - (c) Push the LSK adjacent to INTERACTIVE.
 - (d) Push the LSK adjacent to MODE ANNUNCIATION.
 - (e) Set the displays source switch on the P5 panel to ALL ON 1.
 - (f) Make sure that N1 shows on the captain's and first officer's outboard display on the P1 panel.
 - (g) Push the LSK adjacent to YES.
 - (h) Make sure that FMC SPD shows on the captain's and first officer's outboard display on the P1 panel.
 - (i) Set the displays source switch on the P5 panel to ALL ON 2.
 - (j) Push the LSK adjacent to YES.
 - (k) Make sure that RETARD shows on the captain's and first officer's outboard display on the P1 panel.

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- (l) Push the LSK adjacent to YES.
- (m) Make sure that MCP SPD shows on the captain's and first officer's outboard display on the P1 panel.
- (n) Push the LSK adjacent to YES.
- (o) Set the displays source switch on the P5 panel to AUTO.
- (p) Push the LSK adjacent to YES.
- (q) 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.
- (s) Make sure that A/T LIM shows on the engine display.
- (t) Push the LSK adjacent to YES.
- (u) Make sure that ARM shows on the captain's and first officer's outboard display on the P1 panel.
- (v) Push the LSK adjacent to YES.
- (w) Make sure that GA shows on the captain's and first officer's outboard display on the P1 panel.
- (x) Push the LSK adjacent to YES.
- (y) Make sure that THR HLD shows on the captain's and first officer's outboard display on the P1 panel.
- (z) Push the LSK adjacent to YES.
- (aa) Push the LSK adjacent to INDEX to return to the INTERACTIVE INDEX page.

E. 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.

F. 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.

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- 3) 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.

- 4) Set the autothrottle switch to ARM.
 - 5) Push and release the A/T disengage thumb switch on thrust lever number 2.
 - 6) Make sure that the autothrottle switch goes to OFF and the captain's and first officer's autothrottle warning lights flash.
 - 7) Set the autothrottle switch to ARM.
 - 8) Push the LSK adjacent to PRESS.
 - 9) 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.
 - 3) Make sure that the captain's and first officer's autothrottle warning lights flash.
 - 4) Push the captain's autothrottle warning light.
 - 5) Make sure that the autothrottle warning lights go out.
 - 6) Set the autothrottle switch to ARM.
 - 7) Push the LSK adjacent to PRESS.
 - 8) Make sure that the captain's and first officer's autothrottle warning lights flash.
 - 9) Push the first officer's autothrottle warning light.
 - 10) Make sure that the autothrottle warning lights go out.
 - 11) Set the autothrottle switch to ARM.
 - 12) Push the LSK adjacent to PRESS.
 - 13) Make sure that the captain's and first officer's autothrottle warning lights flash.
 - 14) Push and release the A/T disengage thumb switch on thrust lever number 1.
 - 15) Make sure that the autothrottle warning lights go out.
 - 16) Set the autothrottle switch to ARM.
 - 17) Push the LSK adjacent to PRESS.
 - 18) Make sure that the captain's and first officer's autothrottle warning lights flash.
 - 19) Push and release the A/T disengage thumb switch on thrust lever number 2.
 - 20) Make sure that TEST PASSED shows on the CDU.
 - 21) Make sure that TEST PASSED shows on the CDU.
 - 22) Push the LSK adjacent to INDEX.
 - 23) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

G. Servo Motor Test

SUBTASK 22-31-00-860-014

- (1) Do these steps for the servo motor test:

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- (a) Push the LSK adjacent to THROTTLE TESTS.



CAUTION

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 22-31-00-740-005

- (2) Push the LSK adjacent to SERVO MOTOR TEST.

- (a) Do the instructions on the CDU.

NOTE: Make sure that the throttle levers are set to idle and the autothrottle is engaged.

- (b) Push the LSK adjacent to CONTINUE.
(c) Make sure that TEST IN PROGRESS is replaced by NO FAULTS when the test is completed.
(d) Push the LSK adjacent to INDEX.
(e) Make sure that the A/T BITE TEST INTERACTIVE THROTTLE TESTS page shows on the CDU.
(f) Push the LSK adjacent to INDEX again.
(g) Do the instructions on the CDU.
(h) Push the LSK adjacent to CONTINUE.
(i) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.

H. Range Check

SUBTASK 22-31-00-860-015

- (1) Do these steps for the range check:

- (a) Push the LSK adjacent to THROTTLE TESTS.



CAUTION

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 22-31-00-740-006

- (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.

- (c) Push the LSK adjacent to INDEX again.

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- (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.

I. Torque Test

SUBTASK 22-31-00-860-016

- (1) Do these steps for the torque test:
 - (a) Push the LSK adjacent to THROTTLE TESTS.



CAUTION

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 the 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.
- (g) Make sure that the A/T BITE TEST INTERACTIVE THROTTLE TESTS page shows on the CDU.
- (h) Push the LSK adjacent to INDEX again.
- (i) Do the instructions on the CDU.
- (j) Push the LSK adjacent to CONTINUE.

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J. Identification/Configuration Test

SUBTASK 22-31-00-740-008

(1) Do these steps for the identification/configuration test:

- (a) Push the LSK adjacent to INDEX.
- (b) Push the LSK adjacent to IDENT/CONFIG.
- (c) Push the LSK adjacent to CONFIG.
- (d) Make sure the CONFIG *OPTIONS SELECTED page shows:

NOTE: The NEXT PAGE or PREV PAGE key on the CDU may be pushed to display the other options.

Table 501/22-31-00-993-802 Config Options Selected

737-8
AIRPLANE CNFG STD
ALT ALERT OPT 3
A/S WARN
CWS WARN
DUAL CHAN
IRU-A/P INTLK ENABLE
INHIBIT G/S BEFORE LOC
MMR/GLS
WING LEVEL TOGA
FMC LNAV
SPD/ALT INTERVENTION
EDFCS
BL-01
CAT IIIB AIRPLANE

- (e) Push the LSK adjacent to INDEX.
- (f) Make sure that the A/T BITE TEST INTERACTIVE page shows on the CDU.
- (g) Push the INIT REF key on the FMC CDU keyboard.

SUBTASK 22-31-00-860-021

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

CAPT Electrical System Panel, P18-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01678	WEATHER RADAR RT RIGHT

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C00120	WEATHER RADAR RT

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K. Put The Airplane Back to Its Usual Condition

SUBTASK 22-31-00-860-017

- (1) If Inertial Reference System (IRS) outputs are no longer necessary, set the IRS-L and IRS-R mode select switches on the P5 panel to OFF.

END OF TASK

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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. **General**

- (1) This task is for the removal of the autothrottle disengage switch.

B. **Location Zones**

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

C. **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

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00721	AUTOTHROTTLE DC 1

D. **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** —————

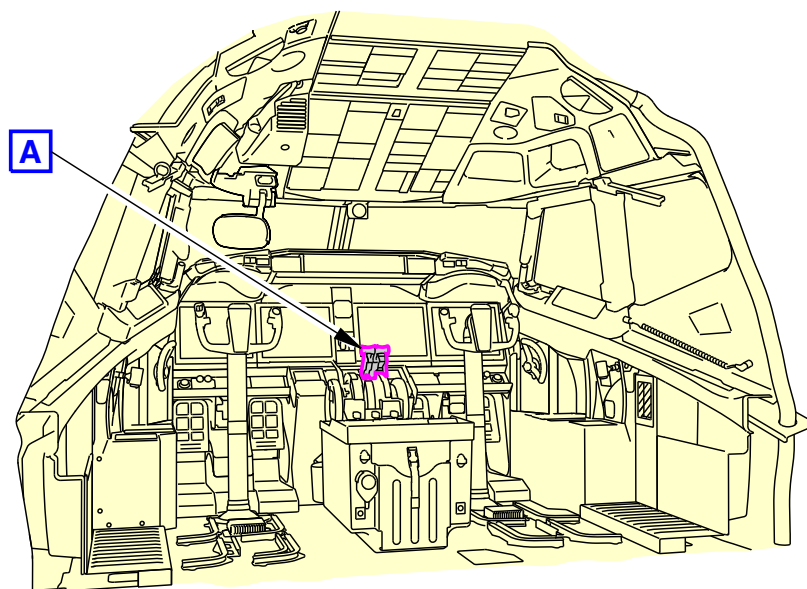
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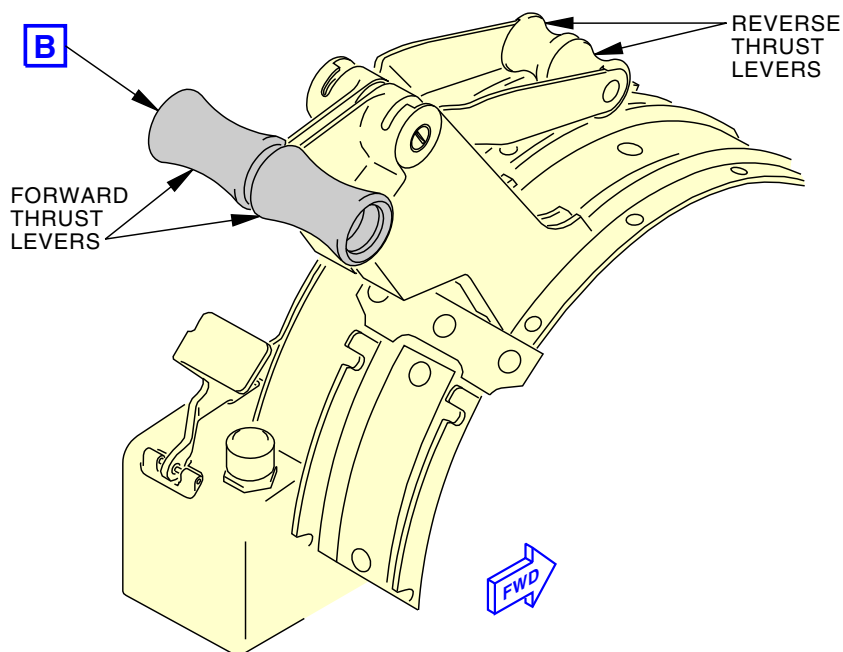
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FLIGHT COMPARTMENT



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)

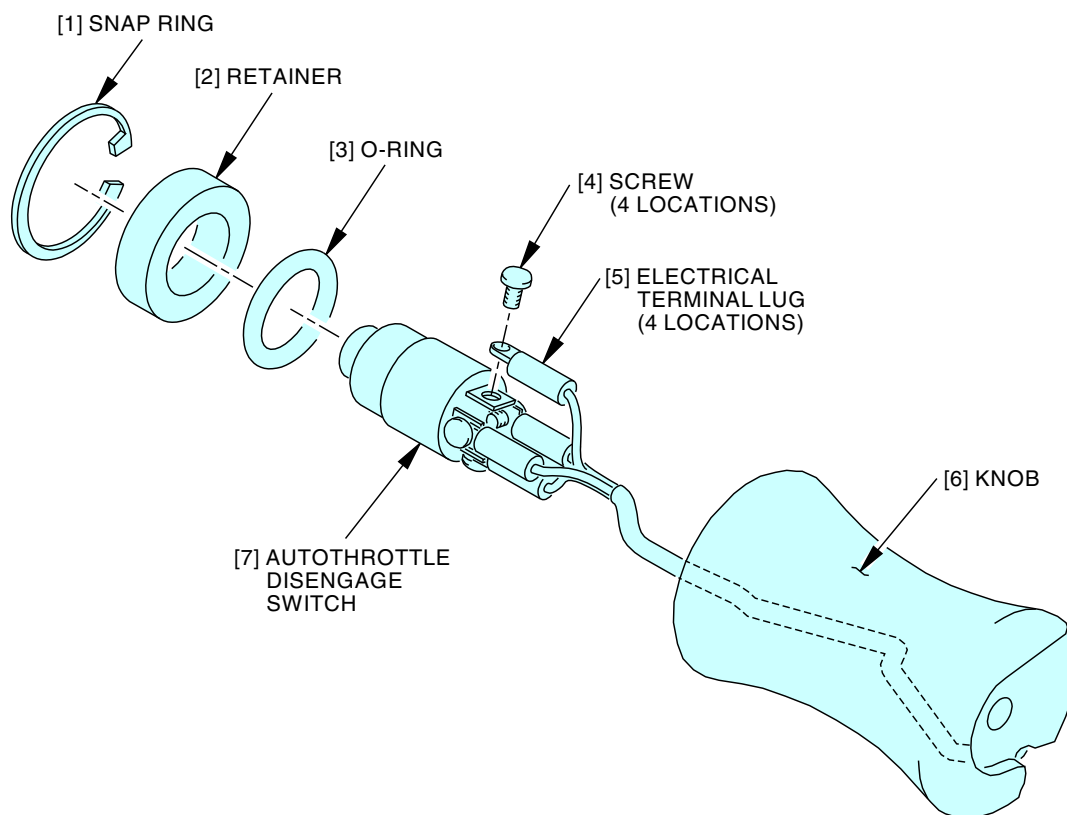
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B

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Autothrottle Disengage Switch Installation
Figure 401/22-31-51-990-801 (Sheet 2 of 2)

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TASK 22-31-51-400-801

3. Autothrottle Disengage Switch Installation

(Figure 401)

A. General

- (1) This task is for the installation of the autothrottle disengage switch.

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	22-31-51-03-025	SIA ALL
7	Disengage switch	22-31-51-03-030	SIA ALL

C. Location Zones

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

D. Autothrottle Disengage Switch Installation

SUBTASK 22-31-51-020-006

- (1) Install the screws [4] that attach the electrical terminal lugs [5] to the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-001

- (2) Install the autothrottle disengage switch [7] into the knob [6] .

SUBTASK 22-31-51-420-002

- (3) Install the new o-ring [3] on the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-003

- (4) Install the retainer [2] on the autothrottle disengage switch [7].

SUBTASK 22-31-51-420-004

- (5) Install the snap ring [1].

E. Put the Airplane Back to Its Usual Condition

SUBTASK 22-31-51-860-003

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00721	AUTOTHROTTLE DC 1

F. Autothrottle Disengage Switch Installation test

SUBTASK 22-31-51-860-004

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

SUBTASK 22-31-51-860-005

- (2) Push the line select key (LSK) adjacent to INDEX.

SUBTASK 22-31-51-860-006

- (3) Push the LSK adjacent to MAINT.

SUBTASK 22-31-51-860-007

- (4) Push the LSK adjacent to A/T.

NOTE: The two autothrottle warning lights come on during BITE.

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SUBTASK 22-31-51-860-008

- (5) Push the LSK adjacent to INTERACTIVE.

SUBTASK 22-31-51-860-009

- (6) Push the LSK adjacent to INPUT DISCRETES TEST.

SUBTASK 22-31-51-860-010

- (7) Follow the instructions on the CDU.

SUBTASK 22-31-51-860-018

- (8) Push the LSK adjacent to CPT TOGA SW.
(a) Push the LSK 6L KEY if no response occurs.
- (9) Push the F/O TOGA SW.
(a) Push the LSK adjacent to LSK 6L KEY if no response occurs.
- (10) Push the LSK adjacent to CPT THRUST LEVER DISENG SW.
(a) Push the LSK 6L KEY if no response occurs.
- (11) Push the LSK adjacent to F/O THRUST LEVER DISENG SW
(a) Push the LSK 6L KEY if no response occurs.
- (12) Make sure that the CDU indicates "TEST PASSED" at the end of the test.
- (13) Exit the A/T BITE maintenance menu completely.

———— **END OF TASK** ————

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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-G00	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 (TASK 22-31-91-020-801).

SUBTASK 22-31-81-010-001

- (2) Remove the associated autothrottle resolver (TASK 76-11-05-000-801-G00).

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** —————

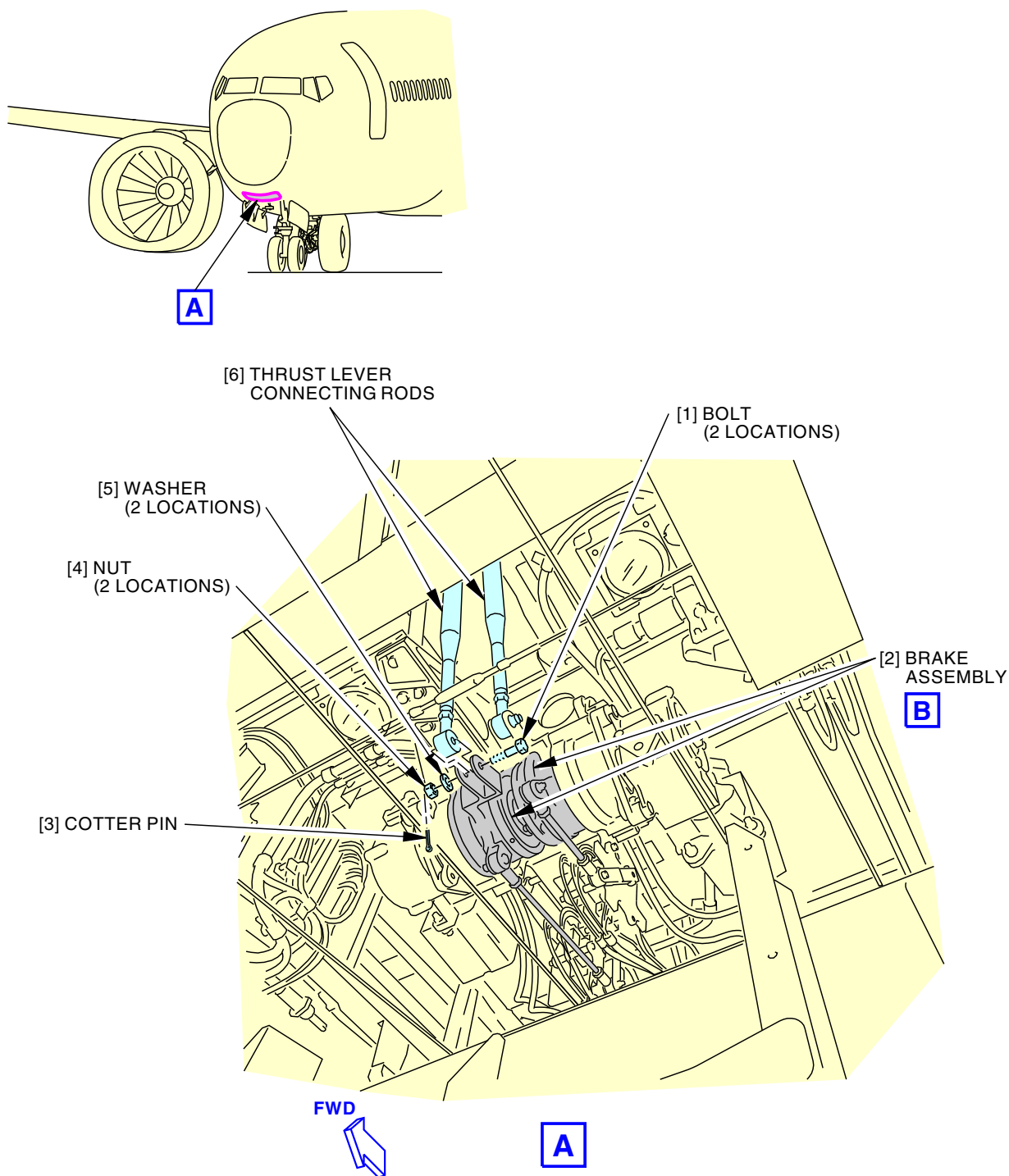
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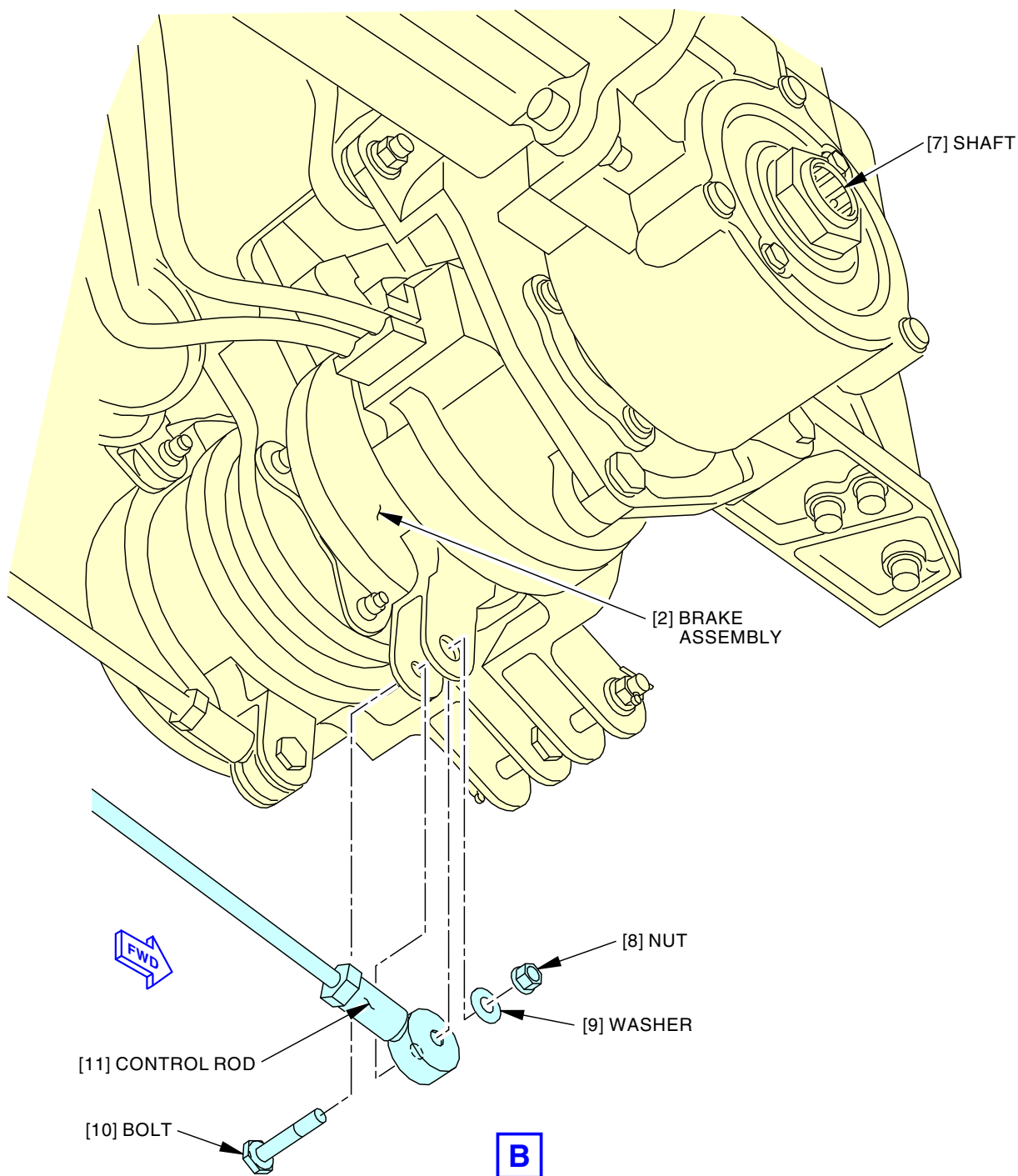
Autothrottle Brake Assembly Installation
Figure 401/22-31-81-990-801 (Sheet 1 of 2)

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Autothrottle Brake Assembly Installation
Figure 401/22-31-81-990-801 (Sheet 2 of 2)

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TASK 22-31-81-400-801

3. **Autothrottle Brake Assembly Installation**

(Figure 401)

A. General

- (1) The autothrottle brake assemblies are installed on the autothrottle assembly.

B. References

Reference	Title
22-31-91-400-801	Autothrottle Servo Motor and Gearbox Installation (P/B 401)
76-11-05-400-801-G00	Thrust Lever Angle Resolver and Autothrottle Brake Assembly Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Brake assembly	22-31-81-01-105	SIA ALL
		22-31-81-02-105	SIA ALL

E. 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

F. 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].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 22-31-81-400-001

- (1) Install the autothrottle resolver (TASK 76-11-05-400-801-G00).

SUBTASK 22-31-81-400-002

- (2) Install the autothrottle servo motor and gearbox (TASK 22-31-91-400-801).

————— END OF TASK —————

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AUTOTHROTTLE SERVO MOTOR AND GEARBOX - REMOVAL/INSTALLATION

1. General

- A. This procedure has these two tasks:
- (1) The removal of the autothrottle servo motor and gearbox.
 - (2) The installation of the autothrottle servo motor and gearbox.
- B. To access the autothrottle servo motors (M1836 and M1837) open the access door forward of the nose landing gear wheel well.

TASK 22-31-91-020-801

2. Autothrottle Servo Motor and Gearbox Removal

(Figure 401)

A. General

- (1) The autothrottle servo motor assembly (referred to as the servo motor) consists of a gearbox and the servo motor. The servo motor connects to the gearbox of the autothrottle assembly.
- (2) The servo motor and gearbox can be removed as a unit. To remove the servo motor and gearbox as a unit, do not remove the servo motor from the gearbox.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
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
113	Area Above and Outboard of Nose Landing Gear Wheel Well - Left
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right
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

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SUBTASK 22-31-91-860-002

- (2) Attach the DO NOT OPERATE tag, STD-858 to the thrust levers.

SUBTASK 22-31-91-480-001



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

- (3) Make sure that the downlock pins are in all the landing gears (TASK 32-00-01-480-801).

SUBTASK 22-31-91-010-001

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 22-31-91-010-003

- (5) Remove these access panels to get access to the servo motor and gearbox (TASK 53-14-01-020-801).

- (a) Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
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) Disconnect the electrical connector [7] from the servo motor [6].

SUBTASK 22-31-91-020-002

- (2) To remove the servo motor [6] from the gearbox [1] for the left side, do these steps:
 - (a) Remove the nuts [10], flat washers [9], bolts [8], and countersunk washers [12] that attach the servo motor [6] to the gearbox [1].
 - (b) Remove the servo motor [6].

SUBTASK 22-31-91-020-004

- (3) To remove the servo motor [6] from the gearbox [1] for the right side, do these steps:
 - (a) Remove the nuts [16], flat washers [15], bolts [13], countersunk washers [14] and the guard [17] that attach the servo motor [6] to the gearbox [1].
 - (b) Remove the servo motor [6].

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 three bolts [5] and washers [11] that attach the gearbox [1] to the support frame.
 - (d) Remove the gearbox [1].

————— END OF TASK —————

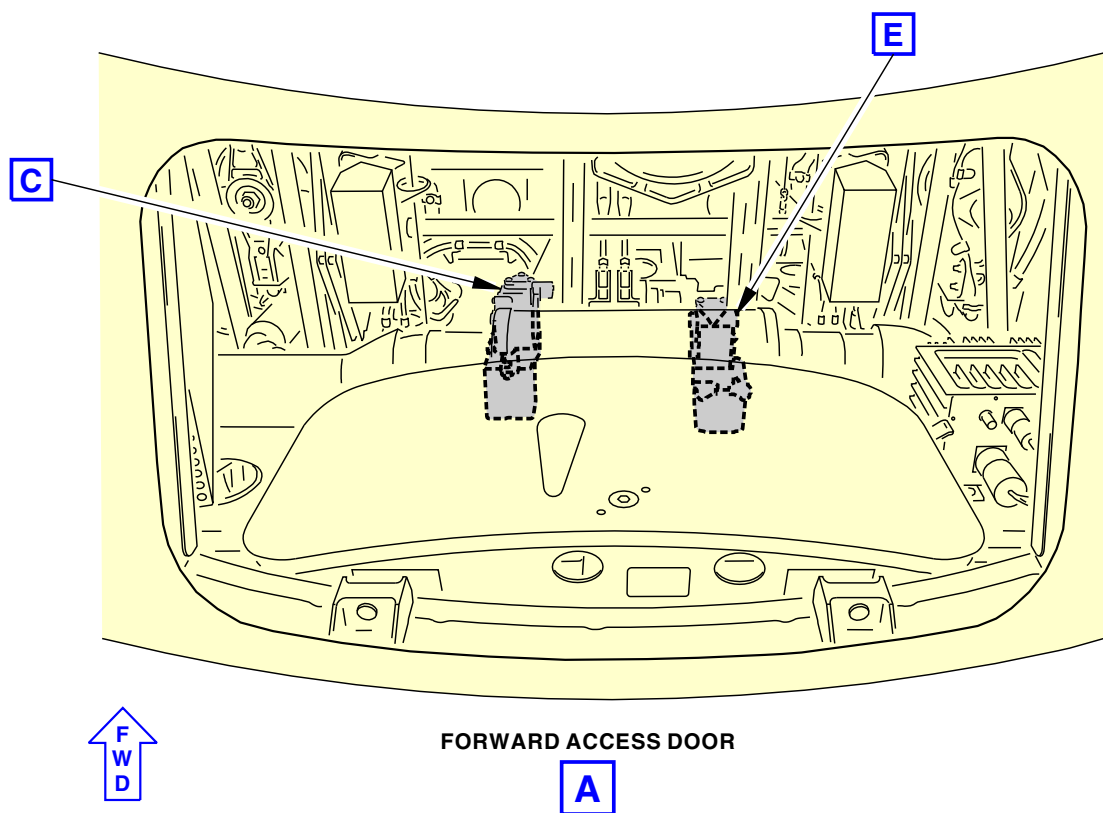
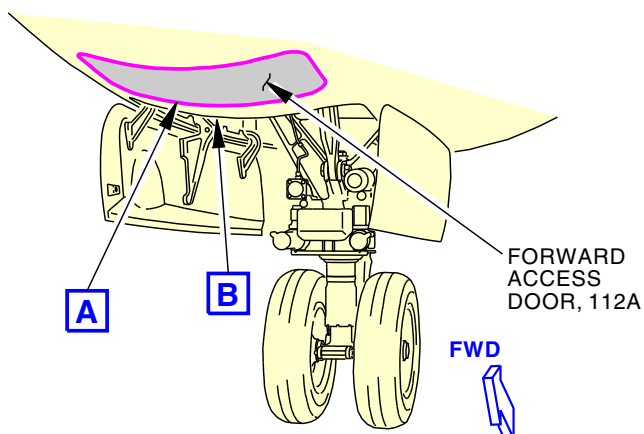
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Autothrottle Servo Motor and Gearbox Installation
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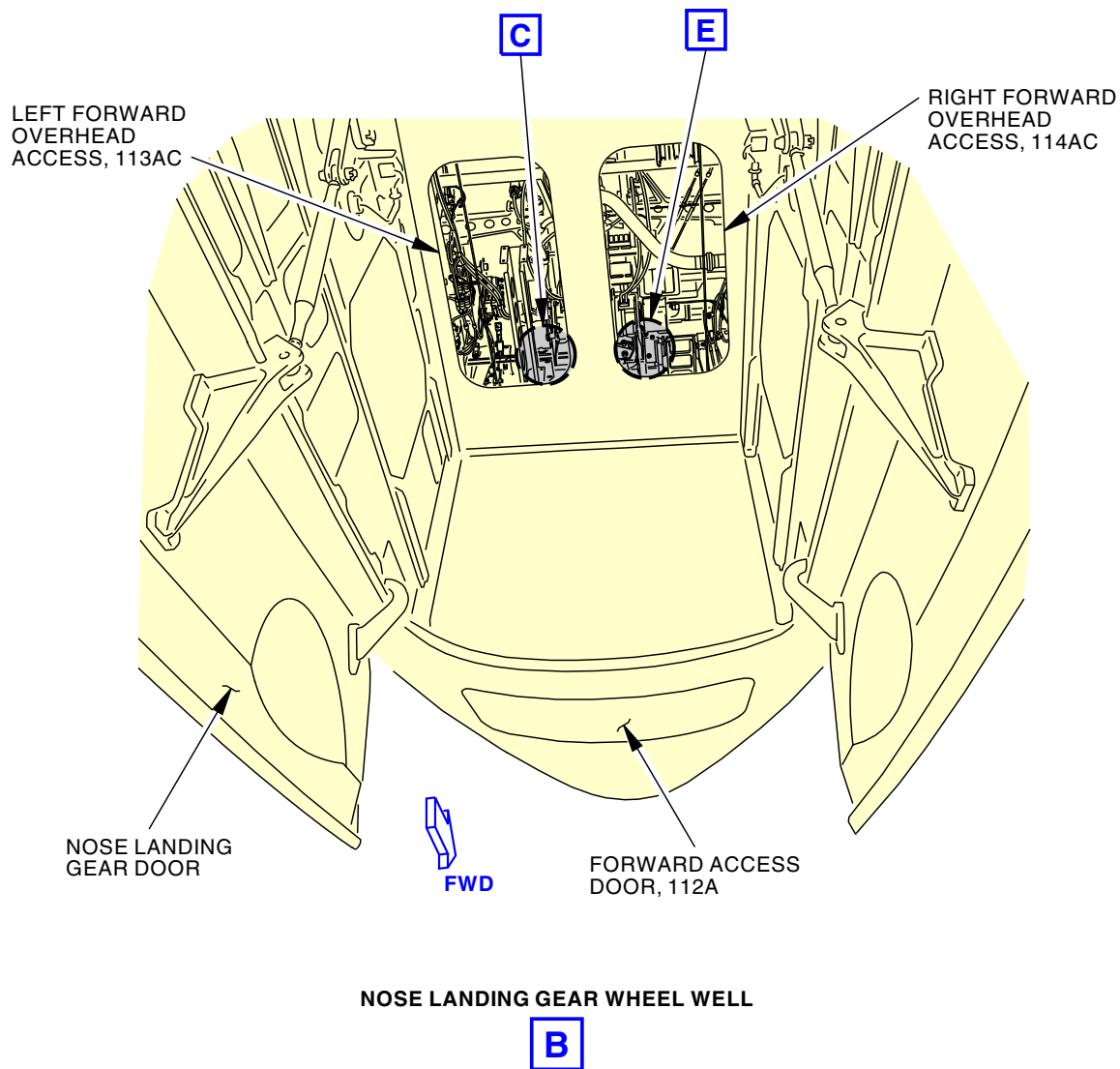
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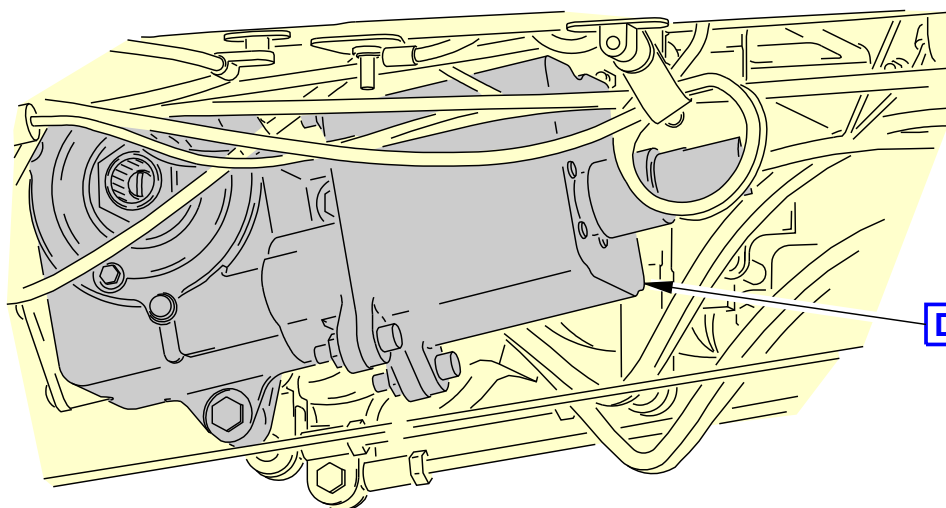
Autothrottle Servo Motor and Gearbox Installation
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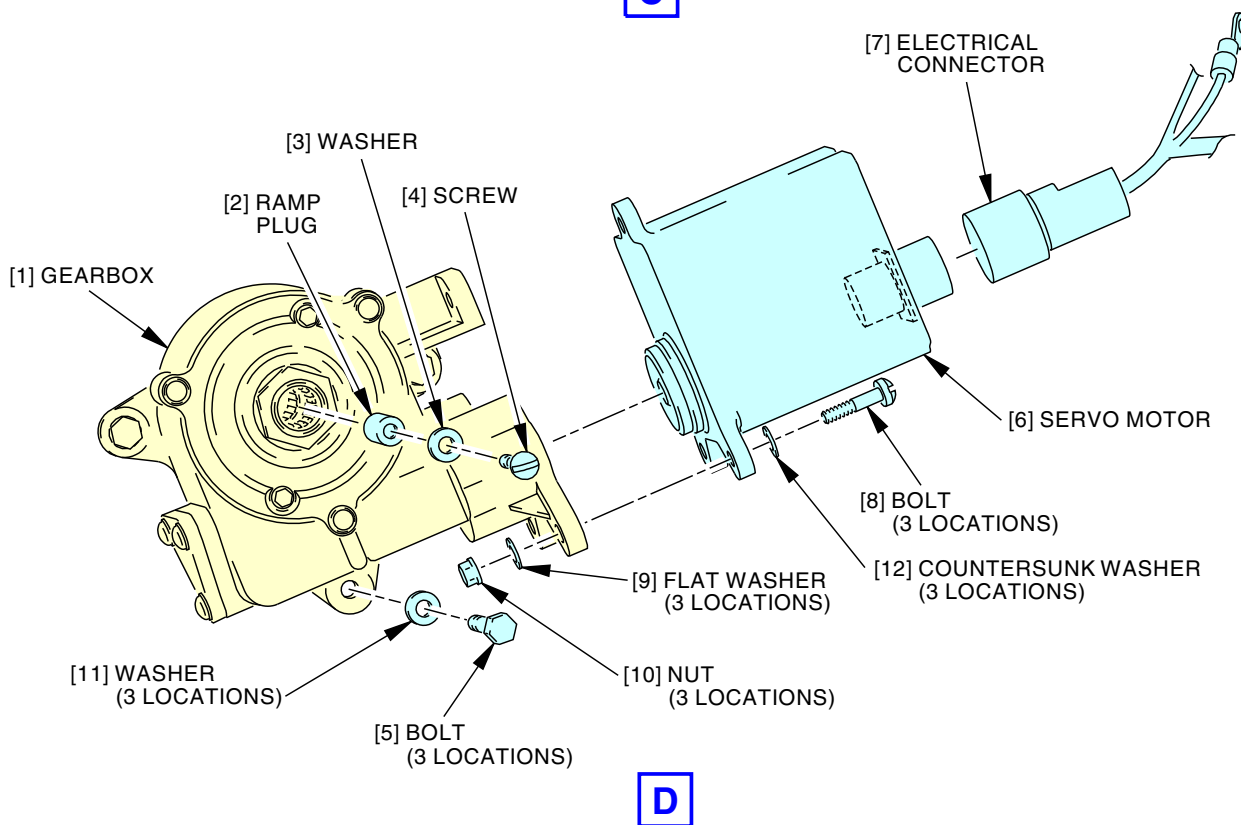
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(LEFT SIDE)

C



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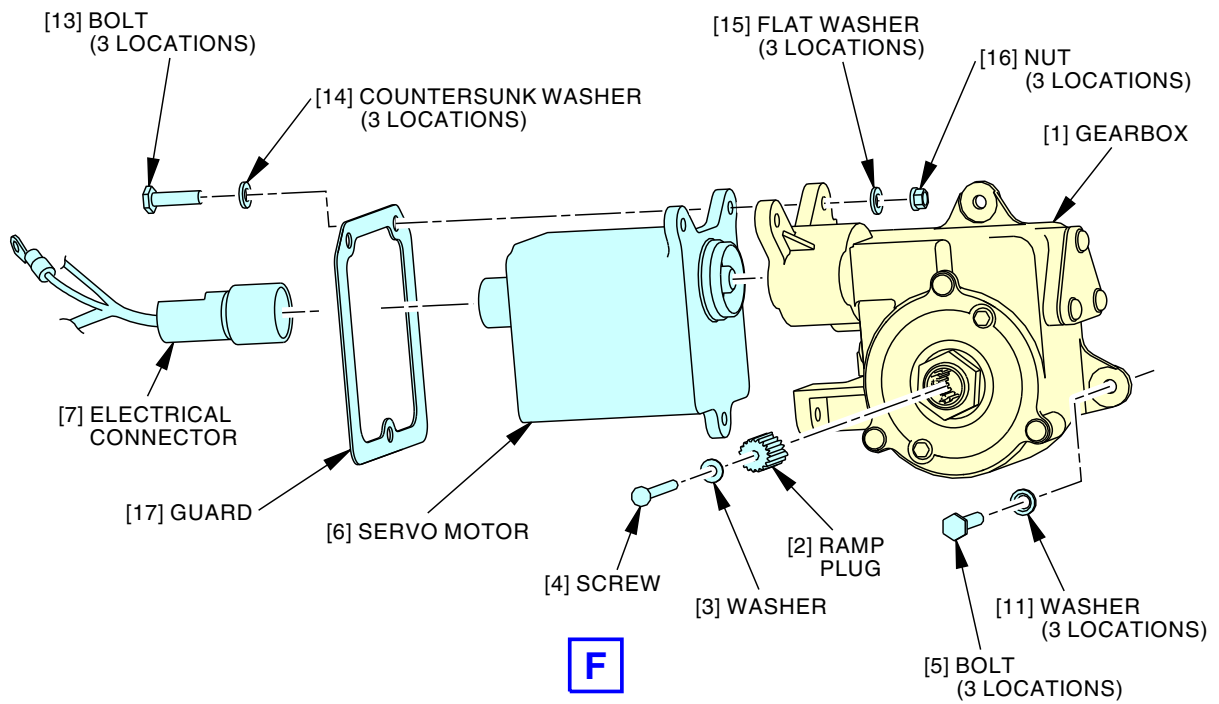
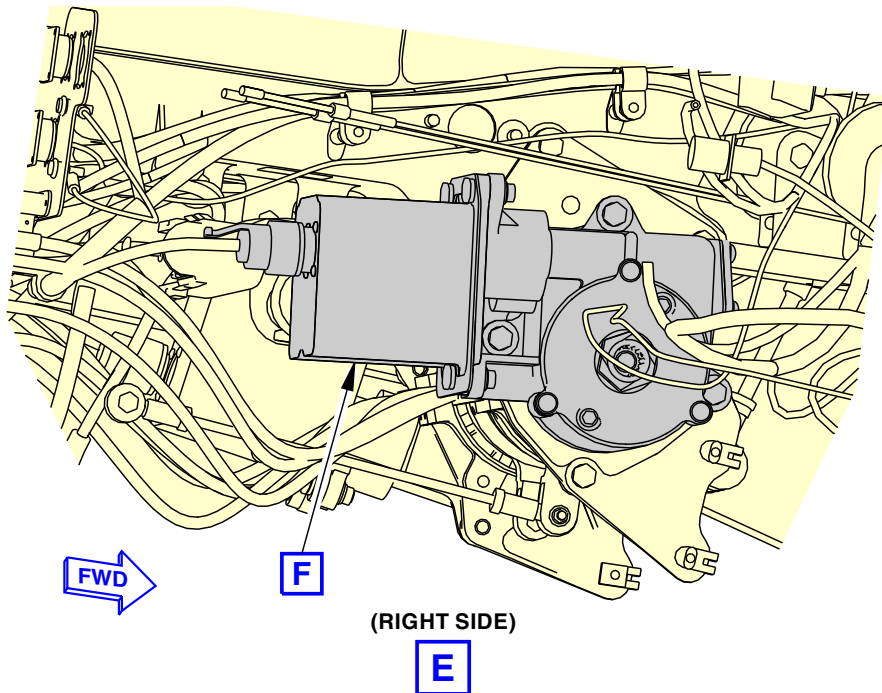
Autothrottle Servo Motor and Gearbox Installation
Figure 401/22-31-91-990-801 (Sheet 3 of 4)

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TASK 22-31-91-400-801

3. Autothrottle Servo Motor and Gearbox Installation

(Figure 401)

A. General

- (1) The servo motor and gearbox can be installed as a unit.

B. References

Reference	Title
53-14-01-420-801	Nose Wheel Well Access Panels Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gearbox	22-31-81-01-020	SIA ALL
		22-31-81-02-020	SIA ALL
		22-31-91-02-120	SIA ALL
6	Servo motor	22-31-91-01-025	SIA ALL

E. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
113	Area Above and Outboard of Nose Landing Gear Wheel Well - Left
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

F. 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

G. Autothrottle 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 spline shaft.

NOTE: Set the gearbox against the support frame.

SUBTASK 22-31-91-420-002

- (3) Install the bolts [5] and washers [11] to attach the gearbox [1] to the support frame.

SUBTASK 22-31-91-420-003

- (4) Align the spline teeth of the ramp plug [2] with the spline teeth of the shaft until the adjacent ramp faces touch.

SUBTASK 22-31-91-820-001

- (5) If the end of the ramp plug [2] is too high or below the spline relief, adjust it as follows:

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- (a) Remove the ramp plug [2].
- (b) Turn the ramp plug [2].
- (c) Engage the ramp plug spline.

NOTE: When the ramp plug is installed correctly, the end of the ramp plug aligns with the spline relief on the gearbox worn gear.

SUBTASK 22-31-91-420-004

- (6) Install the screw [4] and 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).

H. 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



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) Align the servo motor [6] on the gearbox [1].

SUBTASK 22-31-91-420-006

- (3) For the left side, install the bolts [8], countersunk washers [12], flat washers [9], and nuts [10] to attach the servo motor [6] to the gearbox [1].

SUBTASK 22-31-91-420-008

- (4) For the right side, attach the servo motor [6] to the gearbox [1] with the guard [17], bolts [13], countersunk washers [14], flat washers [15] and nuts [16].

SUBTASK 22-31-91-420-007

- (5) Connect the electrical connector [7] to the servo motor [6].

SUBTASK 22-31-91-410-007

- (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:

<u>Number</u>	<u>Name/Location</u>
113AC	Fwd Nose Wheel Well Upper Access Panel
114AC	Fwd Nose Wheel Well Upper Access Panel

SUBTASK 22-31-91-410-008

- (7) Close this access door:

<u>Number</u>	<u>Name/Location</u>
112A	Forward Access Door

SUBTASK 22-31-91-410-009

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

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00721	AUTOTHROTTLE DC 1

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I. Autothrottle Servo Motor and Gearbox Installation Test

SUBTASK 22-31-91-860-005

- (1) Make sure that the IRS-L/IRS-R mode select switches, on the P5 pilot's overhead panel, are not in the OFF position.

SUBTASK 22-31-91-740-001

- (2) 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.
 - (e) Make sure that the autothrottle warning lights on the autoflight status annunciators (P1 and P3 panels) come on continuously.



CAUTION

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.

- (f) Push the LSK adjacent to CURRENT STATUS.
- (g) Do the instructions on the CDU screen.
- (h) Push the LSK adjacent to CONTINUE.
- (i) Make sure that TEST IN PROGRESS shows on the CDU display.
- (j) Make sure that the A/T switch, on the P7 glareshield panel, automatically goes back to the OFF position.
- (k) Make sure that NO FAULTS shows on the CDU display when the test is completed.
- (l) Push the LSK adjacent to INDEX.
- (m) Do the instructions on the CDU display.
- (n) Push the LSK adjacent to CONTINUE.
- (o) Make sure that A/T BITE TEST index displays.
- (p) Push the LSK adjacent to INDEX.
- (q) Push the INIT REF key on the FMC CDU keyboard.

SUBTASK 22-31-91-860-006

- (3) If IRS outputs are not necessary, set the IRS-L/IRS-R mode select switches, on the P5 pilot's overhead panel, to the OFF position.

SUBTASK 22-31-91-860-011

- (4) Remove the DO NOT OPERATE tag from the thrust levers.

————— END OF TASK —————

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