

CHAPTER

49

**AIRBORNE
AUXILIARY
POWER**



777-200/300
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 49
AIRBORNE AUXILIARY POWER

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49-EFFECTIVE PAGES			49-11-00 (cont)			49-11-00		
1 thru 8	SEP 05/2018		203	Sep 05/2017		501	Sep 05/2017	
49-CONTENTS			204	Sep 05/2017		502	Sep 05/2017	
1	Jan 05/2017		205	Sep 05/2017		503	May 05/2017	
2	Sep 05/2017		206	Sep 05/2017		504	May 05/2017	
3	Sep 05/2017		207	Sep 05/2017		505	Sep 05/2017	
4	Jan 05/2015		208	May 05/2017		506	Sep 05/2017	
5	May 05/2017		209	May 05/2017		507	Sep 05/2017	
6	Jan 05/2015		210	Jan 05/2015		508	Sep 05/2017	
7	Jan 05/2016		211	Jan 05/2015		49-11-00		
8	Jan 05/2016		212	Jan 05/2015		601	May 05/2015	
9	Jan 05/2016		213	Jan 05/2015		602	Jan 05/2015	
10	Jan 05/2016		214	Jan 05/2015		603	Sep 05/2017	
11	Jan 05/2016		215	Jan 05/2015		604	Sep 05/2017	
12	Sep 05/2017		216	Jan 05/2015		49-11-01		
13	Sep 05/2017		217	Jan 05/2015		401	Sep 05/2017	
14	May 05/2017		218	Sep 05/2017		402	May 05/2018	
15	Jan 05/2017		219	Sep 05/2017		403	Sep 05/2017	
16	Jan 05/2017		220	May 05/2017		404	Sep 05/2017	
49-00-00			221	May 05/2017		405	Sep 05/2017	
901	Jan 05/2017		222	Sep 05/2017		406	Sep 05/2017	
902	Sep 05/2017		223	Sep 05/2017		407	Sep 05/2017	
903	Sep 05/2017		224	Jan 05/2015		408	Sep 05/2017	
904	Sep 05/2017		225	Jan 05/2015		409	Sep 05/2017	
905	Sep 05/2017		226	May 05/2017		410	Sep 05/2017	
906	May 05/2017		227	Jan 05/2015		411	Sep 05/2017	
907	Jan 05/2017		228	Jan 05/2015		412	Sep 05/2017	
908	Jan 05/2017		229	Jan 05/2015		413	Sep 05/2017	
909	Jan 05/2017		230	Jan 05/2015		414	Sep 05/2017	
910	Jan 05/2017		231	Jan 05/2015		415	Sep 05/2017	
911	Jan 05/2017		232	Jan 05/2015		416	Sep 05/2017	
912	Jan 05/2017		233	Jan 05/2015		417	Sep 05/2017	
913	Jan 05/2017		234	Jan 05/2015		418	Sep 05/2017	
914	Jan 05/2017		235	Jan 05/2015		419	Sep 05/2017	
49-11-00			236	Jan 05/2015		420	Sep 05/2017	
201	Jan 05/2015		237	Jan 05/2015		421	Sep 05/2017	
202	Sep 05/2017		238	BLANK		422	Sep 05/2017	

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49-11-01 (cont)			49-11-01 (cont)			49-11-02 (cont)		
423	Sep 05/2017		459	Sep 05/2017		210	Sep 05/2017	
424	Sep 05/2017		460	Sep 05/2017		211	Sep 05/2017	
425	Sep 05/2017		461	Sep 05/2017		212	BLANK	
426	Sep 05/2017		462	Sep 05/2017		49-13-01		
427	Sep 05/2017		463	Sep 05/2017		401	Jan 05/2015	
428	Sep 05/2017		464	Sep 05/2017		402	Sep 05/2017	
429	Sep 05/2017		465	Sep 05/2017		403	Sep 05/2017	
430	Sep 05/2017		466	Sep 05/2017		404	May 05/2017	
431	May 05/2018		467	Sep 05/2017		405	May 05/2017	
432	Sep 05/2017		468	Sep 05/2017		406	May 05/2017	
433	Jul 25/2018		469	Sep 05/2017		407	May 05/2017	
434	Sep 05/2017		470	Sep 05/2017		408	May 05/2017	
435	Jul 25/2018		471	Sep 05/2017		409	May 05/2017	
436	Jul 25/2018		472	Sep 05/2017		410	May 05/2017	
437	Sep 05/2017		473	Sep 05/2017		411	May 05/2017	
438	Sep 05/2017		474	Sep 05/2017		412	Jan 05/2015	
439	Jul 25/2018		475	Sep 05/2017		413	Jan 05/2015	
440	Jul 25/2018		476	Sep 05/2017		414	Sep 05/2017	
441	Jul 25/2018		477	Sep 05/2017		415	Sep 05/2017	
442	Jul 25/2018		478	Jul 25/2018		416	Sep 05/2017	
443	Jul 25/2018		479	Sep 05/2017		49-13-01		
444	Jul 25/2018		480	Jul 25/2018		601	Jan 05/2015	
445	Jul 25/2018		481	Sep 05/2017		602	Jan 05/2015	
446	Jul 25/2018		482	Sep 05/2017		603	May 05/2017	
447	Jul 25/2018		483	Sep 05/2017		604	May 05/2017	
448	Jul 25/2018		484	BLANK		605	May 05/2017	
449	Sep 05/2017		49-11-02			606	May 05/2017	
450	Sep 05/2017		201	Jan 05/2015		607	May 05/2017	
451	Sep 05/2017		202	Sep 05/2017		608	May 05/2017	
452	Sep 05/2017		203	Sep 05/2017		49-13-02		
453	Sep 05/2017		204	Sep 05/2017		401	Jan 05/2015	
454	Sep 05/2017		205	Sep 05/2017		402	Jan 05/2015	
455	Sep 05/2017		206	Sep 05/2017		403	May 05/2017	
456	Sep 05/2017		207	Sep 05/2017		404	May 05/2017	
457	Sep 05/2017		208	Sep 05/2017		405	Jan 05/2015	
458	Sep 05/2017		209	Sep 05/2017		406	Jan 05/2015	

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49-13-02 (cont)			49-14-00 (cont)			49-15-05		
407	Jan 05/2015		412	May 05/2017		401	Jan 05/2015	
408	BLANK		413	May 05/2017		402	Sep 05/2017	
49-13-02			414	May 05/2017		403	Sep 05/2017	
601	Jan 05/2015		415	May 05/2017		404	Sep 05/2017	
602	May 05/2016		416	May 05/2017		405	May 05/2017	
603	May 05/2017		417	May 05/2017		406	May 05/2017	
604	May 05/2017		418	May 05/2017		407	May 05/2017	
605	May 05/2017		419	May 05/2016		408	May 05/2017	
606	BLANK		420	May 05/2016		409	May 05/2017	
49-13-03			421	May 05/2016		410	May 05/2017	
401	Jan 05/2015		422	May 05/2016		411	Jan 05/2017	
402	May 05/2017		423	May 05/2016		412	Jan 05/2017	
403	May 05/2018		424	May 05/2016		413	Jan 05/2017	
404	Jan 05/2015		49-14-00			414	BLANK	
49-13-03			801	Jan 05/2015		49-15-05		
601	Jan 05/2015		802	May 05/2015		601	Jan 05/2015	
602	Jan 05/2015		803	May 05/2017		602	Jan 05/2015	
603	May 05/2017		804	May 05/2015		603	May 05/2017	
604	May 05/2018		805	May 05/2015		604	May 05/2017	
49-13-04			806	May 05/2017		49-15-06		
401	Jan 05/2015		807	Jan 05/2015		401	May 05/2017	
402	May 05/2017		808	BLANK		402	Sep 05/2017	
403	May 05/2017		49-15-02			403	Sep 05/2017	
404	Sep 05/2015		401	Jan 05/2015		404	Sep 05/2017	
49-14-00			402	Jan 05/2015		405	Sep 05/2017	
401	Jan 05/2015		403	May 05/2017		406	Sep 05/2017	
402	Jan 05/2015		404	Sep 05/2017		407	Sep 05/2017	
403	Jan 05/2015		405	Jan 05/2015		408	May 05/2017	
404	May 05/2017		406	Jan 05/2015		409	May 05/2017	
405	May 05/2017		49-15-04			410	May 05/2017	
406	May 05/2017		401	Jan 05/2015		411	May 05/2017	
407	May 05/2017		402	May 05/2017		412	May 05/2017	
408	May 05/2017		403	Jan 05/2015		413	May 05/2017	
409	May 05/2017		404	BLANK		414	May 05/2017	
410	May 05/2017					415	Sep 05/2017	
411	May 05/2017					416	Sep 05/2017	

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49-15-06 (cont)			49-15-51 (cont)			49-16-02		
417	Sep 05/2017		405	May 05/2017		401	May 05/2017	
418	Sep 05/2017		406	May 05/2017		402	May 05/2017	
419	Sep 05/2017		407	May 05/2017		403	May 05/2017	
420	BLANK		408	Sep 05/2017		404	Sep 05/2017	
49-15-06			409	Sep 05/2017		405	Sep 05/2017	
501	Sep 05/2017		410	BLANK		406	BLANK	
502	Jan 05/2015		49-15-51			49-16-03		
503	Sep 05/2016		601	May 05/2015		601	Jan 05/2015	
504	Jan 05/2015		602	Jan 05/2015		602	Jan 05/2015	
505	May 05/2017		603	Jan 05/2015		603	May 05/2017	
506	May 05/2017		604	Jan 05/2015		604	BLANK	
507	Jan 05/2015		49-15-99			49-16-99		
508	Jan 05/2015		601	Jan 05/2015		601	May 05/2015	
509	May 05/2017		602	May 05/2017		602	BLANK	
510	May 05/2017		49-15-99			49-20-99		
511	Jan 05/2015		801	Sep 05/2015		401	May 05/2015	
512	Jan 05/2015		802	Jan 05/2015		402	BLANK	
49-15-07			803	May 05/2017		49-21-00		
401	Jan 05/2015		804	BLANK		201	Jan 05/2016	
402	Jan 05/2015		49-16-00			202	Jan 05/2016	
403	May 05/2017		601	Jan 05/2015		203	Jan 05/2016	
404	May 05/2017		602	Jan 05/2015		204	Jan 05/2016	
405	Jan 05/2015		603	May 05/2017		49-21-00		
406	Jan 05/2015		604	Jan 05/2015		601	May 05/2015	
49-15-08			605	May 05/2017		602	May 05/2018	
401	Jan 05/2015		606	Sep 05/2015		603	May 05/2018	
402	Jan 05/2015		607	May 05/2017		604	May 05/2018	
403	May 05/2017		608	May 05/2017		605	Sep 05/2017	
404	Jan 05/2015		49-16-01			606	May 05/2018	
405	Jan 05/2015		401	Jan 05/2015		607	May 05/2018	
406	BLANK		402	Jan 05/2015		608	May 05/2018	
49-15-51			403	May 05/2017		609	Sep 05/2017	
401	Jan 05/2015		404	Jan 05/2015		610	Sep 05/2017	
402	Jan 05/2015		405	Jan 05/2015		611	Sep 05/2017	
403	May 05/2017		406	BLANK		612	Sep 05/2017	
404	May 05/2017					613	Sep 05/2017	

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49-21-00 (cont)			49-27-07			49-27-15		
614	Sep 05/2017		401	May 05/2017		401	May 05/2017	
615	Sep 05/2017		402	May 05/2017		402	May 05/2017	
616	Sep 05/2017		403	May 05/2017		403	May 05/2017	
617	Sep 05/2017		404	Sep 05/2017		404	Sep 05/2017	
618	Sep 05/2017		405	Jan 05/2015		405	Sep 05/2017	
619	Sep 05/2017		406	BLANK		406	BLANK	
620	Sep 05/2017		49-27-09			49-27-16		
49-27-03			401	May 05/2017		401	May 05/2017	
401	May 05/2017		402	Sep 05/2017		402	May 05/2017	
402	Sep 05/2017		403	May 05/2017		403	May 05/2017	
403	May 05/2017		404	Sep 05/2017		404	Sep 05/2017	
404	May 05/2016		405	Sep 05/2017		405	Jan 05/2015	
405	May 05/2017		406	May 05/2016		406	BLANK	
406	Sep 05/2017		49-27-09			49-27-17		
407	Sep 05/2017		701	May 05/2017		401	Jan 05/2015	
408	Sep 05/2017		702	May 05/2017		402	Jan 05/2015	
409	Sep 05/2017		703	May 05/2017		403	May 05/2017	
410	BLANK		704	BLANK		404	Sep 05/2017	
49-27-03			49-27-10			405	May 05/2016	
601	Jan 05/2015		401	May 05/2017		406	BLANK	
602	Jan 05/2015		402	Sep 05/2017		49-27-27		
603	Jan 05/2015		403	May 05/2017		401	Sep 05/2017	
604	BLANK		404	May 05/2017		402	Sep 05/2017	
49-27-04			405	Sep 05/2017		403	Sep 05/2017	
201	Jan 05/2015		406	May 05/2016		404	May 05/2017	
202	Sep 05/2017		407	May 05/2016		405	May 05/2017	
203	May 05/2017		408	BLANK		406	May 05/2017	
204	May 05/2017		49-27-14			407	Sep 05/2017	
205	May 05/2015		401	May 05/2017		408	Sep 05/2017	
206	Sep 05/2017		402	May 05/2017		409	Jan 05/2015	
207	Sep 05/2017		403	May 05/2017		410	BLANK	
208	Sep 05/2017		404	May 05/2016		49-31-02		
209	May 05/2017		405	Jan 05/2015		401	Sep 05/2016	
210	May 05/2016		406	BLANK		402	Sep 05/2016	
211	Jan 05/2015					403	May 05/2017	
212	BLANK					404	Sep 05/2017	

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49-31-02 (cont)			49-31-31 (cont)			49-41-41		
405	Jan 05/2015		408	Sep 05/2017		401	May 05/2015	
406	BLANK		409	Sep 05/2017		402	Sep 05/2017	
49-31-03			410	BLANK		403	Sep 05/2017	
401	Jan 05/2015		49-31-41			404	Sep 05/2017	
402	May 05/2017		401	Sep 05/2016		405	Sep 05/2017	
403	Sep 05/2017		402	Sep 05/2016		406	Jan 05/2015	
404	BLANK		403	May 05/2017		49-42-01		
49-31-04			404	Sep 05/2017		401	May 05/2015	
401	Sep 05/2016		405	Sep 05/2017		402	Sep 05/2017	
402	Sep 05/2017		406	BLANK		403	Sep 05/2017	
403	May 05/2017		49-41-02			404	Sep 05/2017	
404	Sep 05/2017		401	Jan 05/2018		405	Sep 05/2017	
405	Sep 05/2017		402	Jan 05/2018		406	Sep 05/2017	
406	BLANK		403	Sep 05/2017		407	May 05/2016	
49-31-06			404	Jan 05/2018		408	Jan 05/2015	
401	Jan 05/2015		405	Jan 05/2018		49-42-02		
402	May 05/2016		406	Jan 05/2018		401	May 05/2016	
403	May 05/2017		49-41-02			402	Sep 05/2017	
404	Sep 05/2017		601	Sep 05/2015		403	Sep 05/2017	
405	Jan 05/2015		602	Jan 05/2015		404	May 05/2016	
406	BLANK		603	Sep 05/2017		49-43-01		
49-31-07			604	BLANK		401	May 05/2016	
401	Jan 05/2015		49-41-03			402	Sep 05/2017	
402	Jan 05/2015		401	Jan 05/2015		403	Sep 05/2017	
403	May 05/2017		402	Sep 05/2017		404	Sep 05/2017	
404	Sep 05/2017		403	Sep 05/2017		405	Sep 05/2017	
405	May 05/2016		404	Sep 05/2017		406	Sep 05/2017	
406	BLANK		405	Jan 05/2015		407	Sep 05/2017	
49-31-31			406	BLANK		408	Sep 05/2017	
401	Sep 05/2016		49-41-04			49-43-02		
402	Sep 05/2016		401	Jan 05/2015		401	May 05/2015	
403	Jan 05/2015		402	Sep 05/2017		402	Sep 05/2017	
404	May 05/2017		403	Sep 05/2017		403	Sep 05/2017	
405	May 05/2017		404	Sep 05/2017		404	Sep 05/2017	
406	May 05/2017		405	Sep 05/2017		405	Jan 05/2015	
407	Sep 05/2017		406	Sep 05/2017		406	BLANK	

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49-43-03			49-52-04 (cont)			49-53-05		
401	May 05/2015		205	Jan 05/2016		401	Jan 05/2015	
402	May 05/2015		206	Sep 05/2017		402	Jan 05/2015	
403	Sep 05/2017		207	Jan 05/2016		403	Sep 05/2017	
404	Sep 05/2017		208	Jan 05/2016		404	Sep 05/2017	
405	May 05/2015		49-53-01			405	Jan 05/2015	
406	BLANK		401	Sep 05/2016		406	BLANK	
49-43-04			402	Sep 05/2016		49-53-53		
201	Jan 05/2015		403	Sep 05/2017		401	Sep 05/2016	
202	Jan 05/2015		404	Sep 05/2017		402	Sep 05/2016	
203	Sep 05/2017		405	Sep 05/2017		403	Jan 05/2015	
204	Sep 05/2017		406	Sep 05/2017		404	Sep 05/2017	
205	May 05/2015		407	Sep 05/2017		405	Sep 05/2017	
206	Sep 05/2017		408	BLANK		406	Sep 05/2017	
207	Sep 05/2017		49-53-02			407	Sep 05/2017	
208	Sep 05/2017		401	Jan 05/2015		408	Sep 05/2017	
209	Sep 05/2017		402	Jan 05/2015		409	May 05/2016	
210	Sep 05/2017		403	Sep 05/2017		410	May 05/2016	
49-52-02			404	Sep 05/2017		411	May 05/2015	
401	Sep 05/2016		405	May 05/2016		412	BLANK	
402	Sep 05/2016		406	BLANK		49-61-00		
403	Sep 05/2017		49-53-03			201	Sep 05/2017	
404	Sep 05/2017		401	May 05/2017		202	May 05/2018	
405	Sep 05/2017		402	Sep 05/2017		203	May 05/2018	
406	Sep 05/2017		403	Sep 05/2017		204	BLANK	
49-52-03			404	Sep 05/2017		49-61-02		
401	May 05/2015		405	Sep 05/2017		401	May 05/2015	
402	Jan 05/2015		406	Sep 05/2017		402	May 05/2015	
403	Sep 05/2017		407	Sep 05/2017		403	Sep 05/2017	
404	Sep 05/2017		408	BLANK		404	Sep 05/2017	
405	Sep 05/2017		49-53-04			405	Sep 05/2017	
406	BLANK		401	Jan 05/2015		406	May 05/2016	
49-52-04			402	Jan 05/2015		407	Sep 05/2015	
201	Jan 05/2016		403	Sep 05/2017		408	BLANK	
202	Jan 05/2016		404	Sep 05/2017		49-61-03		
203	Jan 05/2016		405	Sep 05/2017		401	Jan 05/2015	
204	Jan 05/2016		406	BLANK		402	Jan 05/2015	

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49-61-03 (cont)			49-72-00 (cont)					
403	Sep 05/2017		405	May 05/2015				
404	Sep 05/2017		406	Sep 05/2017				
405	Sep 05/2017		49-81-01					
406	BLANK		401	May 05/2018				
49-61-05			402	Sep 05/2017				
201	Sep 05/2017		403	May 05/2015				
202	Sep 05/2017		404	Sep 05/2017				
203	Sep 05/2017		405	Sep 05/2017				
204	May 05/2015		406	Sep 05/2017				
205	Jan 05/2015		407	Jan 05/2017				
206	Sep 05/2017		408	BLANK				
49-70-00			49-81-02					
201	Sep 05/2017		401	Sep 05/2017				
202	Sep 05/2015		402	Sep 05/2017				
203	Sep 05/2017		403	Sep 05/2017				
204	Sep 05/2017		404	Jan 05/2015				
205	Sep 05/2017		49-94-01					
206	Sep 05/2017		401	Sep 05/2017				
207	Jan 05/2015		402	Sep 05/2017				
208	Sep 05/2015		403	Sep 05/2017				
209	Jan 05/2015		404	May 05/2016				
210	Jan 05/2015		49-94-05					
211	Jan 05/2015		401	Jan 05/2015				
212	Jan 05/2015		402	Sep 05/2017				
49-71-01			403	May 05/2016				
401	Jan 05/2015		404	May 05/2016				
402	Jan 05/2015							
403	Sep 05/2017							
404	Sep 05/2017							
405	Sep 05/2017							
406	Sep 05/2017							
49-72-00								
401	Sep 05/2017							
402	Sep 05/2017							
403	Sep 05/2017							
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<u>SUBJECT</u>	<u>CHAPTER SECTION SUBJECT</u>	<u>CONF</u>	<u>PAGE</u>	<u>EFFECT</u>
<u>AIRBORNE AUXILIARY POWER - DDG MAINTENANCE PROCEDURES</u>	49-00-00		901	ARO ALL
MMEL 49-15-1 (DDG) Preparation - APU Air Inlet Door Actuation System Inoperative TASK 49-00-00-040-801			901	ARO ALL
MMEL 49-15-1 (DDG) Restoration - APU Air Inlet Door Actuation System Inoperative TASK 49-00-00-440-801			908	ARO ALL
MMEL 49-15-1-1 (DDG) Preparation - APU Air Inlet Door Actuator Position Indication Switch TASK 49-00-00-040-804			910	ARO ALL
MMEL 49-15-1-1 (DDG) Restoration - APU Air Inlet Door Actuator Position Indication Switch TASK 49-00-00-440-804			911	ARO ALL
MMEL 49-94-1 (DDG) Preparation - APU Oil Qty Indication System Inoperative TASK 49-00-00-040-802			912	ARO ALL
MMEL 49-94-1 (DDG) Restoration - APU Oil Qty Indication System Inoperative TASK 49-00-00-440-802			913	ARO ALL
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APU Starting and Operation TASK 49-11-00-860-804			201	ARO ALL
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AIRBORNE AUXILIARY POWER - DDG MAINTENANCE PROCEDURES

1. **General**

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks prepare the airplane for flight with certain systems/components inoperative.
- B. This procedure also has the tasks that put the airplane back to its usual condition.
- C. These are the tasks for the components in the airborne auxiliary power system:
 - (1) MMEL 49-15-1 (DDG) Preparation - APU Air inlet Door Actuation System Inoperative
 - (2) MMEL 49-15-1 (DDG) Restoration - APU Air inlet Door Actuation System Inoperative
 - (3) MMEL 49-15-1-1 (DDG) Preparation - APU Air inlet Door Actuator Position Indication Switch Inoperative
 - (4) MMEL 49-15-1-1 (DDG) Restoration - APU Air inlet Door Actuator Position Indication Switch Inoperative
 - (5) MMEL 49-94-1 (DDG) Preparation - APU OIL QTY Indication Inoperative
 - (6) MMEL 49-94-1 (DDG) Restoration - APU OIL QTY Indication Inoperative

TASK 49-00-00-040-801

2. **MMEL 49-15-1 (DDG) Preparation - APU Air Inlet Door Actuation System Inoperative**

(Figure 901 or Figure 902)

A. **General**

- (1) This task gives the maintenance steps to prepare the airplane for flight with the APU air inlet door actuation system inoperative.
- (2) Steps are given below to manually position the APU inlet door to 'fully open'.
- (3) EICAS Status Messages
 - (a) APU
 - (b) APU DOOR.

B. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Position to APU Inlet Door to Fully Open - APU Inlet Door Actuator Deactivation

SUBTASK 49-00-00-860-003

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-00-00-860-004

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-010-002

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-00-00-040-002

- (4) Do these steps to fully open the APU air inlet door:
 - (a) Remove the access cover from the inlet door actuator assembly.

NOTE: The access cover is held in place with retaining springs.



CAUTION

DO NOT APPLY MORE THAN 10 POUND INCHES (1.1 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (b) Turn the transfer cover socket on the inlet door actuator assembly counterclockwise until MAN shows in the window of the transfer cover.

NOTE: The manual drive socket will show. The inlet door actuator assembly is in the manual (MAN) mode.

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ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3 (Continued)



DO NOT APPLY MORE THAN 65 POUND INCHES (7.3 NEWTON METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- (c) Turn the manual drive socket counterclockwise until the torque value suddenly increases.

NOTE: The APU air inlet door fully opens.



MAKE SURE YOU PUT THE ACTUATOR IS IN THE ELECTRIC MODE. IF YOU DO NOT PUT THE ACTUATOR IN THE ELECTRIC MODE, THE INLET DOOR AND THE INLET DOOR ACTUATOR CAN BE DAMAGED DURING FLIGHT.

- (d) Turn the transfer cover socket clockwise until ELEC shows in the forward window of the transfer cover.

NOTE: The inlet door actuator assembly is in the electrical (ELEC) mode.

- (e) Put the access cover on the inlet door actuator assembly.

SUBTASK 49-00-00-860-005

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-860-006

- (6) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-00-00-410-002

- (7) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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F. Position to APU Inlet Door to Fully Open - APU Inlet Door Actuator Deactivation

SUBTASK 49-00-00-860-026

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-00-00-860-027

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-010-006

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-00-00-040-004

- (4) Do these steps to fully open the APU air inlet door:
 - (a) Remove the access cover from the inlet door actuator assembly.

NOTE: The access cover is held in place with retaining springs.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (b) Turn the transfer cover socket on the inlet door actuator assembly counterclockwise until transfer cover position mark aligns with the manual position "M".

NOTE: The manual drive socket will show. The inlet door actuator assembly is in the manual (M) mode.

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DO NOT APPLY MORE THAN 100 POUND INCHES (11.3 NEWTON METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- (c) Turn the manual drive socket counterclockwise until the torque value suddenly increases.

NOTE: The APU air inlet door fully opens.



MAKE SURE THAT THE ACTUATOR IS IN THE ELECTRICAL MODE. IF THE ACTUATOR IS NOT IN THE ELECTRICAL MODE, DAMAGE CAN OCCUR TO THE INLET DOOR AND INLET DOOR ACTUATOR DURING FLIGHT.

- (d) Turn the transfer cover socket clockwise until transfer cover position mark aligns with the electric position "E".

NOTE: The inlet door actuator assembly is in the electrical (E) mode.

- (e) Put the access cover on the inlet door actuator assembly.

SUBTASK 49-00-00-860-028

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-860-029

- (6) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-00-00-410-007

- (7) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

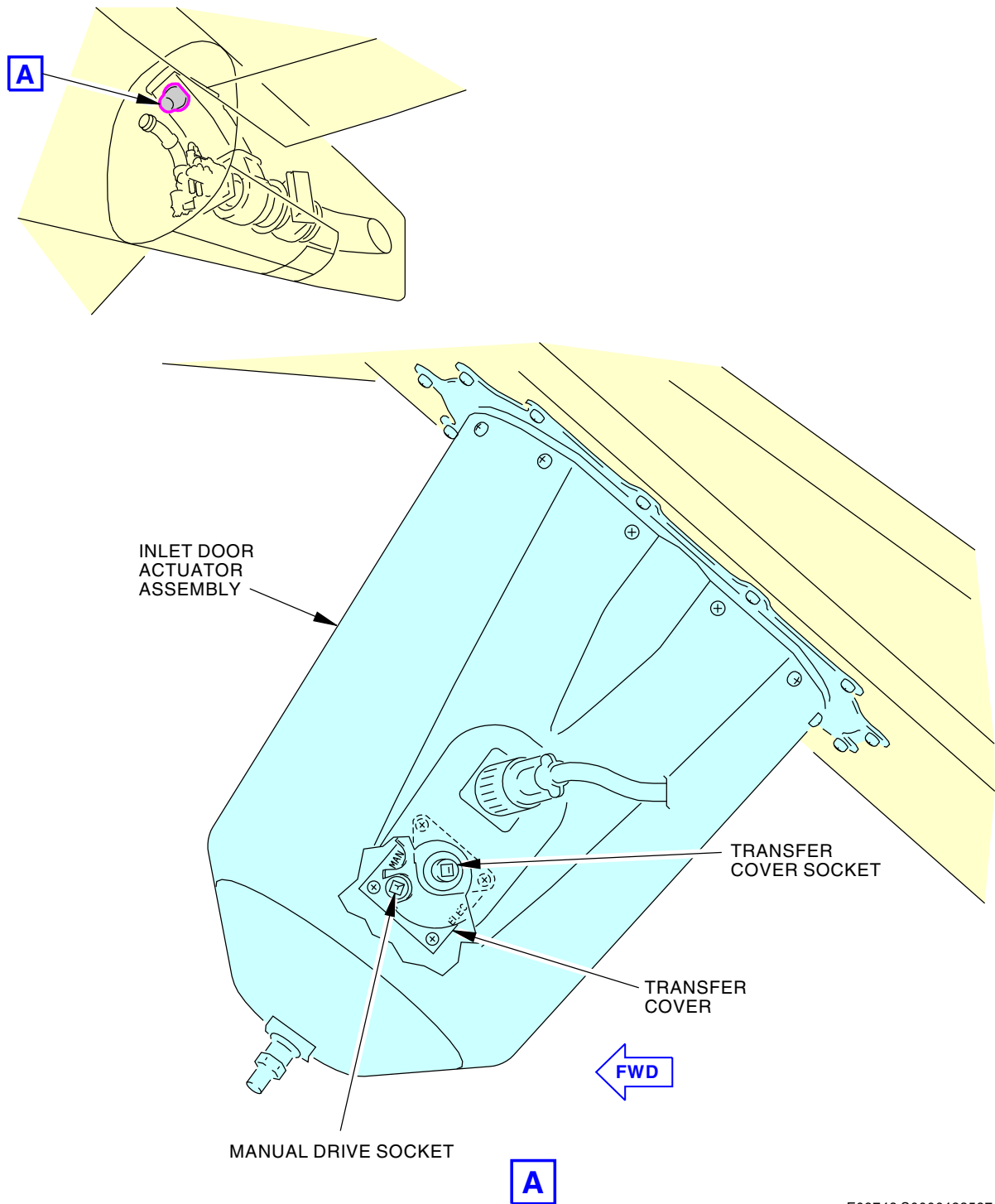
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E09748 S0006423587_V2

APU Air Inlet Door Actuator Deactivation (Actuator R5365-1, R5365-2, R5365-3)
Figure 901/49-00-00-990-801

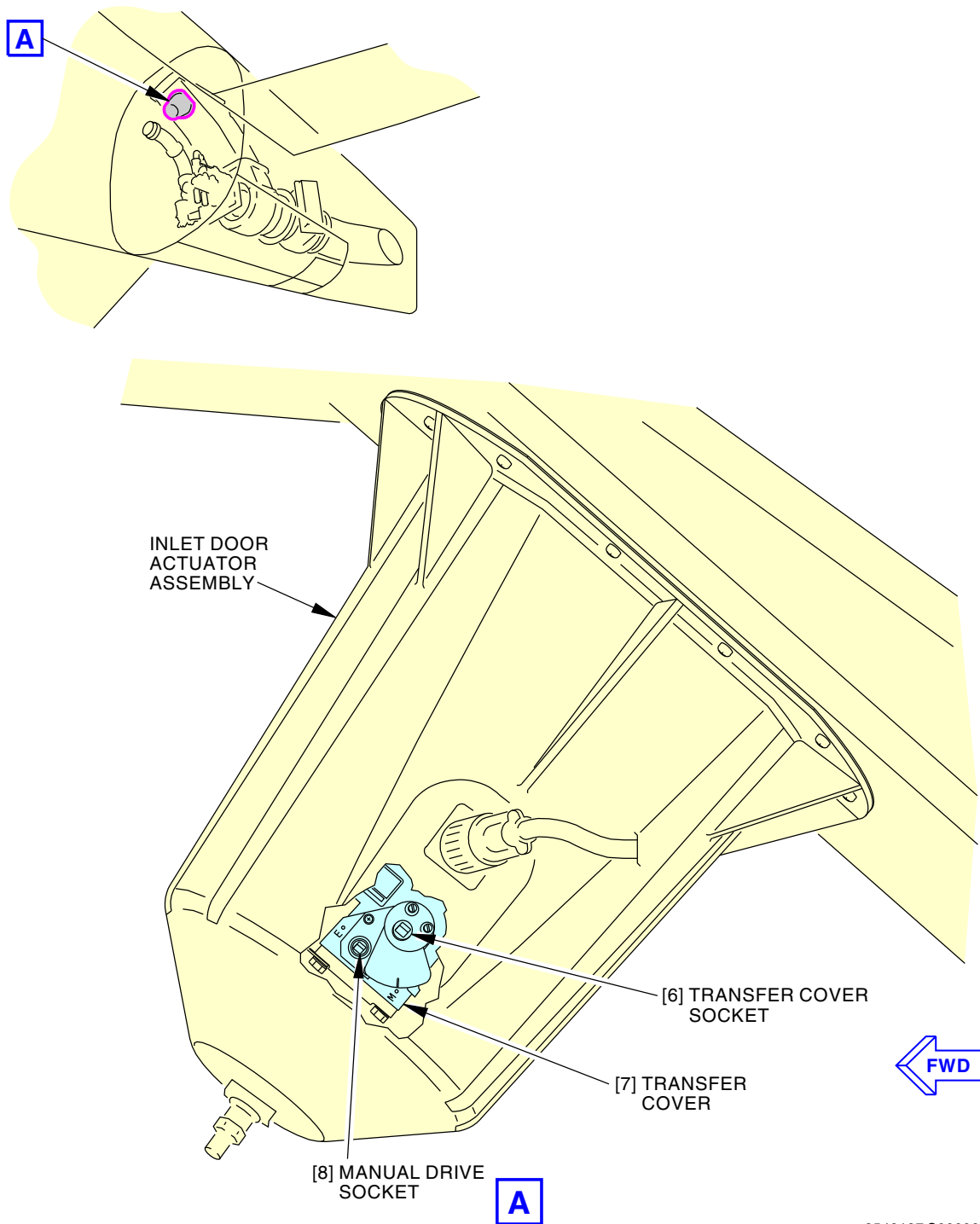
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APU Air Inlet Door Actuator Deactivation (Actuator 734-07390-01)
Figure 902/49-00-00-990-802

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TASK 49-00-00-440-801

3. MMEL 49-15-1 (DDG) Restoration - APU Air Inlet Door Actuation System Inoperative

A. General

- (1) This task gives the maintenance steps to prepare the APU air inlet door actuation system for operation after the deactivation procedure.

B. References

Reference	Title
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Restoration

SUBTASK 49-00-00-860-007

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-00-00-860-008

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-010-003

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Air Inlet Door Actuation System Restoration

SUBTASK 49-00-00-740-001

- (1) Go to the MAT and find the EICAS status message.
 - (a) Find the fault code and the correlated maintenance message numbers on the MAT.

SUBTASK 49-00-00-810-001

- (2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapters).
 - (a) For each correlated maintenance message, find the maintenance message number to the right side of the fault code.
 - (b) Find the task number on the same line as the maintenance message number.

SUBTASK 49-00-00-810-002

- (3) Go to the task in the FIM and do the steps in the task.

SUBTASK 49-00-00-860-009

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-00-00-860-010

- (5) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

G. APU Air Inlet Door Actuation System Test

SUBTASK 49-00-00-710-002

- (1) Do these steps for an operational check of the APU air inlet door actuation system:
 - (a) Get access to the APU maintenance page on EICAS. To get access, do this task:
Showing a Maintenance Page, TASK 31-61-00-800-804.
NOTE: The APU-related displays on the APU maintenance page will be blank until the APU controller is energized (powered up).
 - (b) Make sure the APU DOOR POSITION shows CLOSED.

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- (c) Move the APU selector on the P5 overhead panel to the ON position.
NOTE: The APU air inlet door opens in 5 to 45 seconds.
- (d) Make sure the EICAS message APU DOOR does not show.
- (e) After 45 seconds, make sure the APU DOOR POSITION shows OPEN.
- (f) Make sure the APU air inlet door is open on the top right side of the tail cone.
- (g) Move the APU selector on the P5 overhead panel to the OFF position.
NOTE: The APU air inlet door closes in 5 to 120 seconds.
- (h) Make sure these EICAS messages do not show:
 - 1) APU
 - 2) APU DOOR.
- (i) After 120 seconds, make sure the APU DOOR POSITION shows CLOSED.
- (j) Make sure the APU air inlet door is closed.

SUBTASK 49-00-00-410-003

- (2) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

TASK 49-00-00-040-804

4. MMEL 49-15-1-1 (DDG) Preparation - APU Air Inlet Door Actuator Position Indication Switch

A. General

- (1) This task gives the maintenance steps to prepare the airplane for flight with the APU air inlet door actuator position indication switch inoperative.
- (2) The APU inlet door must be verified to operate normally before each departure.
- (3) Both ELMS P310 panel channels must operate normally.
- (4) EICAS Status Messages
 - (a) APU
 - (b) APU DOOR.

B. References

<u>Reference</u>	<u>Title</u>
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

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D. APU Air Inlet Door Actuation System Test

SUBTASK 49-00-00-710-004

- (1) Do these steps for an operational check of the APU air inlet door:
 - (a) Get access to the APU maintenance page on EICAS. To get access, do this task:
Showing a Maintenance Page, TASK 31-61-00-800-804.
NOTE: The APU-related displays on the APU maintenance page will be blank until the APU controller is energized (powered on).
 - (b) Make sure the APU DOOR POSITION shows CLOSED.
 - (c) Move the APU selector on the P5 overhead panel to the ON position.
NOTE: The APU air inlet door opens in 5 to 45 seconds.
 - (d) After 45 seconds, make sure the APU DOOR POSITION shows OPEN.
 - (e) Make sure the APU air inlet door is open on the top right side of the tail cone.
 - (f) Move the APU selector on the P5 overhead panel to the OFF position.
NOTE: The APU air inlet door closes in 5 to 120 seconds.
 - (g) After 120 seconds, make sure the APU DOOR POSITION shows CLOSED.
 - (h) Make sure the APU air inlet door is closed.

————— END OF TASK —————

TASK 49-00-00-440-804

5. MMEI 49-15-1-1 (DDG) Restoration - APU Air Inlet Door Actuator Position Indication Switch

A. General

- (1) This task puts the airplane back to its original condition after operation with the APU Air Inlet Door Actuator Position Indication Switch Inoperative.

B. References

Reference	Title
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. APU Air Inlet Door Actuator Position Indication Switch Repair

SUBTASK 49-00-00-740-005

- (1) Go to the MAT and find the EICAS status message.
 - (a) Find the fault code and the correlated maintenance message numbers on the MAT.

SUBTASK 49-00-00-810-005

- (2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapters).
 - (a) For each correlated maintenance message, find the maintenance message number to the right side of the fault code.
 - (b) Find the task number on the same line as the maintenance message number.

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SUBTASK 49-00-00-810-006

- (3) Go to the task in the FIM and do the steps in the task.

E. APU Air Inlet Door Actuation System Test

SUBTASK 49-00-00-710-005

- (1) Do these steps for an operational check of the APU air inlet door:
- (a) Get access to the APU maintenance page on EICAS. To get access, do this task:
Showing a Maintenance Page, TASK 31-61-00-800-804.
NOTE: The APU-related displays on the APU maintenance page will be blank until the APU controller is energized (powered on).
 - (b) Make sure the APU DOOR POSITION shows CLOSED.
 - (c) Move the APU selector on the P5 overhead panel to the ON position.
NOTE: The APU air inlet door opens in 5 to 45 seconds.
 - (d) After 45 seconds, make sure the APU DOOR POSITION shows OPEN.
 - (e) Make sure the APU air inlet door is open on the top right side of the tail cone.
 - (f) Move the APU selector on the P5 overhead panel to the OFF position.
NOTE: The APU air inlet door closes in 5 to 120 seconds.
 - (g) After 120 seconds, make sure the APU DOOR POSITION shows CLOSED.
 - (h) Make sure the APU air inlet door is closed.

————— END OF TASK —————

TASK 49-00-00-040-802

6. MMEL 49-94-1 (DDG) Preparation - APU Oil Qty Indication System Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU OIL QTY Indication Inoperative.
- (2) EICAS Status Messages
- (a) APU OIL QTY

B. References

Reference	Title
12-13-04-600-801	APU Oil Replenishing (P/B 301)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. APU Oil QTY Inspection

SUBTASK 49-00-00-010-004

- (1) Open APU access doors. APU Access Doors (Open), TASK 49-11-02-010-801

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-00-00-210-001

- (2) Look at the oil level sight glass on the APU gearbox.
- (a) If the oil level is below the ADD line, do this task: APU Oil Replenishing, TASK 12-13-04-600-801.

SUBTASK 49-00-00-410-004

- (3) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

TASK 49-00-00-440-802

7. MMEL 49-94-1 (DDG) Restoration - APU Oil Qty Indication System Inoperative

A. General

- (1) This task puts the airplane back to its original condition after operation with the APU Oil Qty Indication System Inoperative.

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Oil Qty Indication Repair

SUBTASK 49-00-00-740-003

- (1) Go to the MAT and find the EICAS status message.
- (a) Find the fault code and the correlated maintenance message numbers on the MAT.

SUBTASK 49-00-00-810-003

- (2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapters).
- (a) For each correlated maintenance message, find the maintenance message number to the right side of the fault code.
- (b) Find the task number on the same line as the maintenance message number.

SUBTASK 49-00-00-810-004

- (3) Go to the task in the FIM and do the steps in the task.

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D. APU Oil Quantity Indication Test

SUBTASK 49-00-00-740-004

- (1) Do the steps that follow to test the APU oil quantity indication system:
 - (a) Move the APU maintenance switch on the maintenance panel, P61 to MAINT.
 - (b) Make sure the EICAS message APU OIL QTY does not show on the EICAS status page.
 - (c) Move the APU maintenance switch to NORM.

———— **END OF TASK** ————

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AUXILIARY POWER UNIT (APU) - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) APU Starting and Operation
 - (2) APU Shutdown Procedure
 - (3) APU Emergency Shutdown Procedure
 - (4) Motor the APU
 - (5) APU Preservation - Mild Environment
 - (6) APU Preservation - Severe Environment
 - (7) APU Depreservation
 - (8) APU Deactivation
 - (9) APU Activation
- C. Use the APU Operation Limits when you operate or motor the APU. If the APU is not in the specified limits when you operate it, you can cause damage to the APU.
- D. Use the APU Shutdown Procedure to do shutdowns for the APU.
- E. The APU Motoring Procedure operates the APU without fuel and without the ignition system energized.
- F. The APU preservation Procedure gives protection to the APU when is not used (and stored on the airplane). The preservation can be done for time periods of one month to two years. The APU Operation and the APU Motoring Procedures are used in the APU Preservation Procedure.
- G. The Depreservation Procedure puts the APU back to a serviceable condition after preservation.

TASK 49-11-00-860-804

2. APU Starting and Operation

A. General

- (1) This task gives the steps to operate the APU engine in the usual conditions. Use this procedure to do a check of the APU operation and other related systems when APU operation is necessary.
- (2) It is recommended that you do an APU starting and operation procedure at a minimum of one time monthly if the airplane has not operated and you did not do the APU preservation procedure during this time. You must operate the APU for a minimum of five minutes under a "no-load" condition and then do the APU shutdown procedure. In most conditions, the operation of the APU during this monthly interval will prevent internal/external corrosion and damage to the fuel and oil seals/components.
 - (a) If the APU is in a corrosive environment of high moisture and salt air, it is recommended that you start the APU once a week to prevent corrosion; which can lead to an APU no-start condition, due to seizure of the rotating group.
 - 1) If the APU cannot be motored or operated normally, hand-crank the APU with a socket and ratchet inserted into the electric starter motor pad.

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- (3) The left main fuel tank must have a minimum of 1000 pounds (455 kilograms) of fuel to operate the APU for one hour. Schedule 675 pounds (307 kilograms) of fuel for each hour of the APU operation after the first hour. It is possible that more fuel will be necessary in the left main fuel tank for other airplane systems or operations.

NOTE: A minimum of 300 pounds (136 kg) of fuel is necessary to operate the AC boost pump.



COLD WEATHER OPERATION OF THE APU ON THE GROUND DURING VISIBLE PRECIPITATION MAY LEAD TO COMPRESSOR DAMAGE.

- (4) The APU may experience soft foreign object damage (FOD) of the load compressor or first stage power compressor due to internal ice build-up and ingestion. Ice build-up can occur when the APU is operated on the ground and outside air temperature is between 5°F (-15°C) and 40°F (4°C) with visible precipitation (snow, rain, fog). Cold weather precipitation conditions may cause moisture to freeze on structure inside the APU inlet plenum screen. Ice has been observed to form within 30 minutes of operation. This ice may be ingested into the load compressor or power section compressor bending one or more blade tips. With sufficient blade damage, the APU will produce a loud, high pitched "whine" and may eventually result in the bent portion of the blade(s) liberating, causing hard FOD.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-13-04-600-801	APU Oil Replenishing (P/B 301)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 49-11-00-860-047



IF A REFUELING OPERATION IS IN THE AREA, OBEY THE WARNINGS AND CAUTIONS IN THE PRESSURE REFUELING PROCEDURE BEFORE YOU DO THE APU STARTING AND OPERATION PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS CAN OCCUR.

- (1) If there is a refueling operation in the area, make sure you obey the WARNINGS and CAUTIONS in the pressure refueling procedure (TASK 12-11-01-650-801).

SUBTASK 49-11-00-860-048



THE BATTERY CONNECTOR AND ELECTRICAL CONNECTOR MUST BE CONNECTED TO THE MAIN BATTERY. IF YOU DO NOT CONNECT THE BATTERY CONNECTOR AND ELECTRICAL CONNECTOR AND YOU START THE APU, DAMAGE TO THE APU AIR INLET PLENUM AND THE APU CAN OCCUR.

- (2) Make sure the battery connector and electrical connector are connected to the main battery located on a shelf between the E3 and E4 equipment racks in the main equipment center.

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SUBTASK 49-11-00-210-001

- (3) Make sure there are no free objects near the APU air inlet door.

SUBTASK 49-11-00-860-033

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-11-00-860-001

- (5) Set the switches (Figure 201):

- (a) Set the BATTERY switch on the P5 overhead panel to the ON position.
- (b) Make sure the APU GEN switch on the P5 panel is in the ON position.

NOTE: When the APU is at 95 percent RPM, the APU generator will automatically energize the left and right busses when other sources of electrical power are not available.

SUBTASK 49-11-00-720-001

- (6) If electrical power is available, do the test for the fire detection system:



CAUTION

DO NOT HOLD THE FIRE/OVHT SWITCH FOR MORE THAN 30 SECONDS. IF YOU HOLD THE FIRE/OVHT SWITCH FOR MORE THAN 30 SECONDS, EICAS MESSAGES THAT ARE NOT NECESSARY CAN SHOW.

- (a) Push and hold the FIRE/OVHT TEST switch on the P5 panel.
- (b) These lights will come on:
 - 1) APU fire handle on the P5 panel
 - 2) MASTER WARNING light on the glare shield panel, P7.
- (c) The TEST IN PROGRESS message will show on EICAS.
- (d) The fire alarm in the control cabin will come on.
- (e) The fire alarm on the service panel and APU remote shutdown, P40, will come on.
- (f) After 5 seconds, the TEST PASSED message will show on EICAS.
- (g) Release the FIRE/OVHT TEST switch.
- (h) The fire alarms will go off.

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- (i) These lights will go off:
 - 1) The fire handle on the P5 panel
 - 2) Master Warning on the P7 panel.

SUBTASK 49-11-00-710-001



WARNING

KEEP PERSONNEL AWAY FROM THE ENGINE AND APU DURING THIS TEST. IF A SQUIB RELEASES ACCIDENTALLY, THE FIRE BOTTLE WILL RELEASE ITS CONTENTS. INJURIES TO PERSONNEL CAN OCCUR.



WARNING

KEEP PERSONS AWAY FROM THE CARGO COMPARTMENTS, ENGINES, APU AND LLAR/OFAR (IF APPLICABLE). EACH TEST SUPPLIES POWER TO ALL THE SQUIBS ON THE AIRPLANE. INJURIES TO PERSONS COULD OCCUR.

- (7) If electrical power is available, use a maintenance access terminal (MAT) to do the operational test of the engine and APU squibs:
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 26 Fire Extinguishing System
 - 5) OPERATIONAL TEST
 - 6) Engine and APU Squibs
 - 7) CONTINUE.
 - (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST.
 - (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

SUBTASK 49-11-00-860-002

- (8) If electrical power is available, show the APU maintenance page on EICAS. To show the APU maintenance page, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

NOTE: The APU related displays on the APU maintenance page will be blank until the APU controller is powered.

- (a) Move the APU selector on the P5 overhead panel to the ON position.
 - 1) The APU controller will do the BITE test.
 - 2) The FAULT light on the P5 overhead panel will flash one time.
 - 3) The APUC MODE display on the APU maintenance page may show TEST for approximately 3 seconds.
 - 4) The APUC MODE display will then show APUC IDLE.
- (b) Make sure the EICAS STATUS message, APU OIL QTY, does not show (Figure 201).

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- 1) If the APU OIL QTY message shows, fill the APU with oil. To fill it, do this task: APU Oil Replenishing, TASK 12-13-04-600-801.

NOTE: The APU OIL QTY message will show when there is less than 3.8 quarts, or the oil quantity/sump temperature sensor is failed. The APU holds about 8 quarts of oil.

- 2) Make sure the oil consumption is satisfactory (Figure 202).

SUBTASK 49-11-00-210-003



MAKE SURE THAT THERE IS SUFFICIENT FUEL IN THE FUEL TANK TO KEEP THE BOOST PUMP INLETS FILLED WITH FUEL. DO NOT OPERATE THE BOOST PUMPS IN A DRY CONDITION WITH FLAMMABLE FUMES IN THE FUEL TANK. FLAMMABLE FUMES IN THE FUEL TANK CAN CAUSE A FIRE OR EXPLOSION.

- (9) Look at the fuel quantity indicator.

NOTE: The left main fuel tank must have a minimum of 1000 pounds (455 kilograms) of fuel to operate the APU for one hour. After the first hour of APU operation, 675 pounds (307 kilograms) of fuel is necessary for each hour of APU operation. It is possible that more fuel will be necessary in the left main fuel tank for other airplane systems or operations.

NOTE: A minimum of 300 pounds (136 kilograms) of fuel is necessary to operate the AC boost pump.

- (a) If you must use the fuel boost pumps and the quantity of fuel is less than these limits, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights and the fuel quantity indicator.
- (b) If the quantity of fuel is more than these limits, do one of these two alternatives:
 - 1) It is permitted to not have a maintenance person or observer in the flight compartment if you calculate the time that you must go back to the flight compartment when the quantity of fuel is less than these limits.
 - 2) A maintenance person or observer is in the flight compartment to continuously monitor the LOW PRESSURE lights and fuel quantity indicator.
- (c) If the quantity of fuel is less than these limits and the LOW PRESSURE light comes on and stays on, shut down the APU.

SUBTASK 49-11-00-280-001



DO NOT OPERATE THE APU WITH THE APU ACCESS DOORS OPEN AND THERE IS NO OBSERVER. AN OBSERVER MUST BE NEAR THE APU COMPARTMENT TO LOOK FOR A FIRE. THE APU FIRE DETECTION SYSTEM CANNOT SENSE A SMALL FIRE. IF THERE IS A FIRE, THE CONTENTS OF THE APU FIRE EXTINGUISHER WILL GO OUT OF THE APU ACCESS DOORS. FIRE DAMAGE TO THE APU AND THE AIRPLANE CAN OCCUR.

- (10) Make sure there is an observer near the APU compartment to look for a fire if the APU access doors are open during the APU operation.

NOTE: The observer should be in voice contact with aircraft personnel to report if a fire condition occurs. Aircraft personnel can do the APU emergency shutdown procedure and other corrective actions (include the use of fire extinguishers).



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SUBTASK 49-11-00-860-003

- (11) Do these steps to start the APU (Figure 203):

NOTE: The APU has two starters, an air turbine starter and an electric starter motor. If pneumatic power is available, the APU can do an air turbine start attempt. If pneumatic power is not available, the APU will do an electric start attempt.

- (a) Start the APU with the air turbine starter:

- 1) Supply pneumatic power with an engine or an external source. To supply it, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.
- 2) Make sure the APU BLEED switch is in the AUTO position.
- 3) Move the APU selector switch on the P5 panel to the START position, hold the switch at the START position for one second and manually move the switch to the ON position.

NOTE: It is recommended that you do not release the APU selector switch from the START position to the ON position. Damage to the internal contacts in the APU selector switch can cause an APU no start problem.

NOTE: The APUC MODE on the APU maintenance page will show START AIR.

NOTE: If you did not show the APU maintenance page and the APU selector switch is in the OFF position, the APU FAULT light will flash one time when you move the APU selector switch from the OFF to the START position.

Table 201/49-11-00-993-810

DUTY CYCLE FOR THE APU STARTER	
START SYSTEM	TIME NECESSARY TO COOL THE STARTER MOTORS
Electric Starter Motor	3 start attempts in a 60 minute period
Air Turbine Starter	3 start attempts in a 60 minute period

- (b) Start the APU with the electric starter:

- 1) Make sure the APU BLEED switch is in the OFF position.



MAKE SURE YOU OBEY THE DUTY CYCLE FOR THE STARTER MOTOR (TABLE 201). IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE STARTER OR THE APU.

- 2) Move the APU selector switch on the P5 panel to the START position, hold the switch at the START position for one second and manually move the switch to the ON position.

NOTE: It is recommended that you do not release the APU selector switch from the START position to the ON position. Damage to the internal contacts in the APU selector switch can cause an APU no start problem.

NOTE: The APUC MODE on the APU maintenance page will show START ELEC.

NOTE: If you did not show the APU maintenance page and the APU selector switch is in the OFF position, the APU FAULT light will flash one time when you move the APU selector switch from the OFF to the START position.

- (c) If the APU maintenance page shows, look at the RPM and EGT indications.
- (d) The APU RUNNING message will show on EICAS when the APU is on speed.

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- (e) If you did not examine the APU oil quantity, make sure the EICAS STATUS message, APU OIL QTY, does not show.
- 1) If the APU OIL QTY message shows, fill the APU with oil. To fill it, do this task: APU Oil Replenishing, TASK 12-13-04-600-801.
NOTE: The APU OIL QTY message will show when there is less than 3.8 quarts or the oil quantity/sump temperature sensor is failed. The APU holds about 8 quarts of oil.
 - 2) Make sure the oil consumption is satisfactory (Figure 202).

SUBTASK 49-11-00-720-002

- (12) If you did not do the test for the fire detection system, do these steps:



CAUTION

DO NOT HOLD THE FIRE/OVHT SWITCH FOR MORE THAN 30 SECONDS. IF YOU HOLD THE FIRE/OVHT SWITCH FOR MORE THAN 30 SECONDS, THE APU WILL DO AN EMERGENCY SHUTDOWN.

- (a) Push and hold the FIRE/OVHT TEST switch on the P5 panel.
- (b) These lights will come on:
 - 1) APU fire handle on the P5 panel
 - 2) MASTER WARNING light on the glare shield panel, P7.
- (c) The TEST IN PROGRESS message will show on EICAS.
- (d) The fire alarm in the control cabin will come on.
- (e) The fire alarm on the service panel and APU remote shutdown, P40, will come on.
- (f) After 5 seconds, the TEST PASSED message will show on EICAS.
- (g) Release the FIRE/OVHT TEST switch.
- (h) The fire alarms will go off.
- (i) These lights will go off:
 - 1) The fire handle on the P5 panel
 - 2) Master Warning on the P7 panel.

———— **END OF TASK** ————

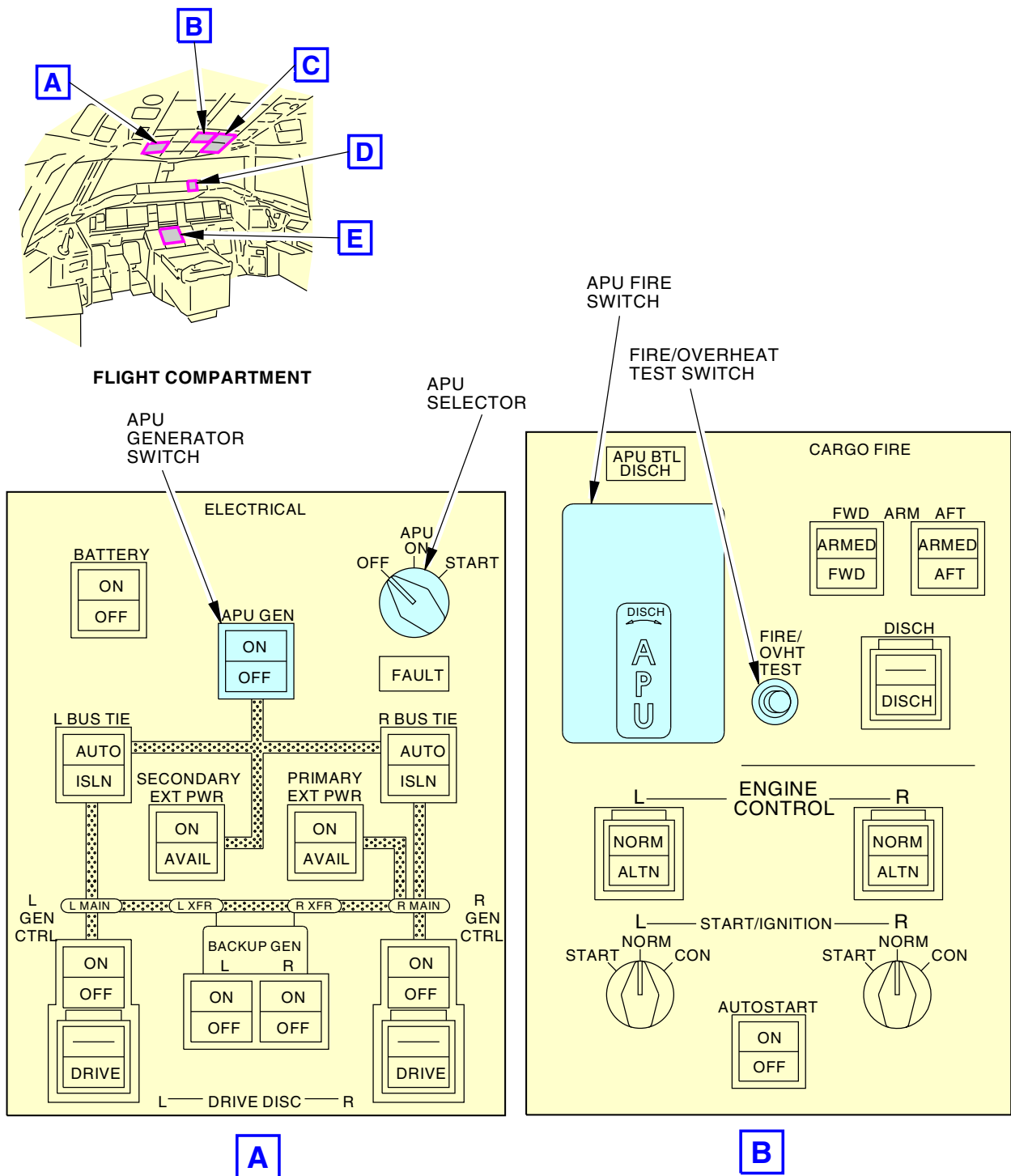
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APU Flight Compartment Controls
Figure 201/49-11-00-990-801 (Sheet 1 of 3)

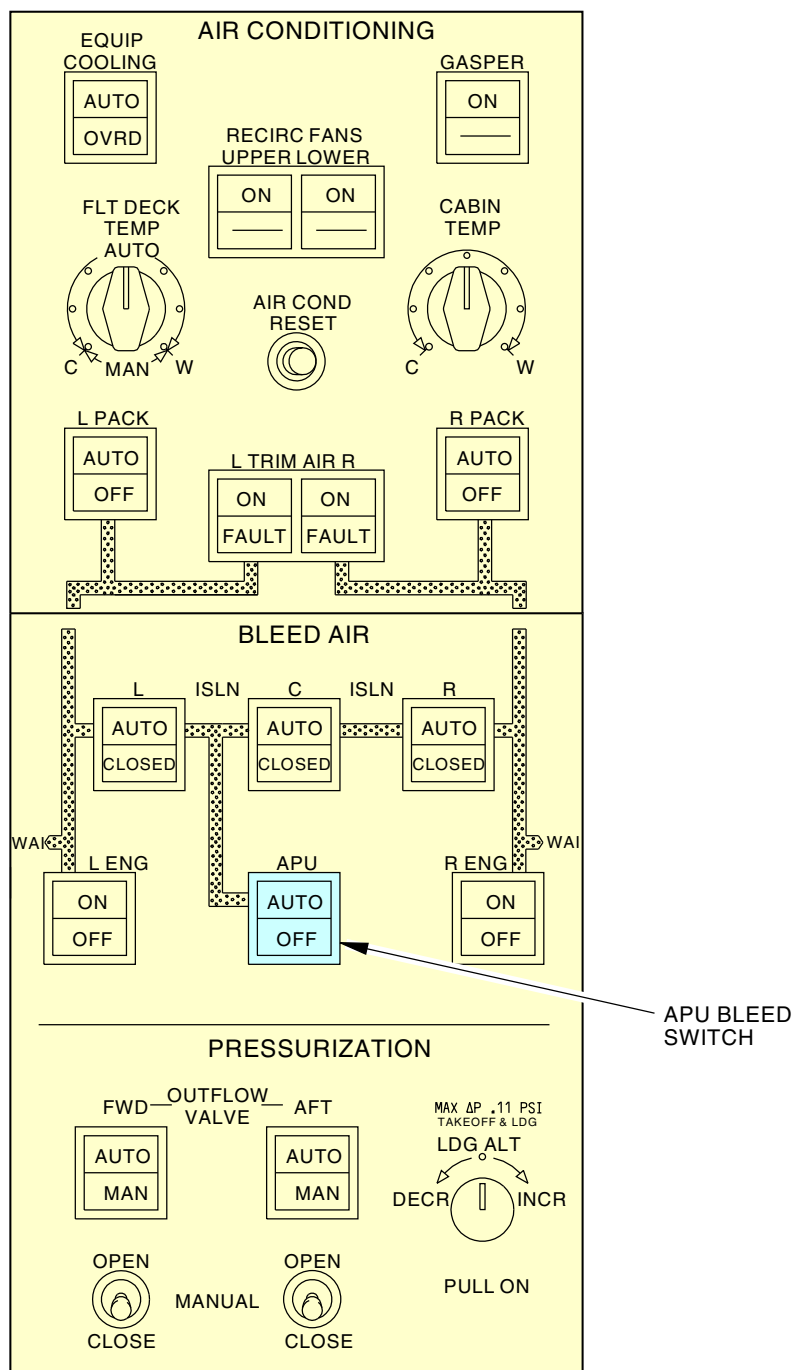
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C

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APU Flight Compartment Controls
Figure 201/49-11-00-990-801 (Sheet 2 of 3)

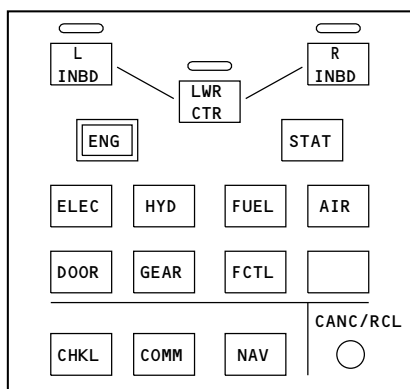
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DISPLAY SELECT PANEL

(D)

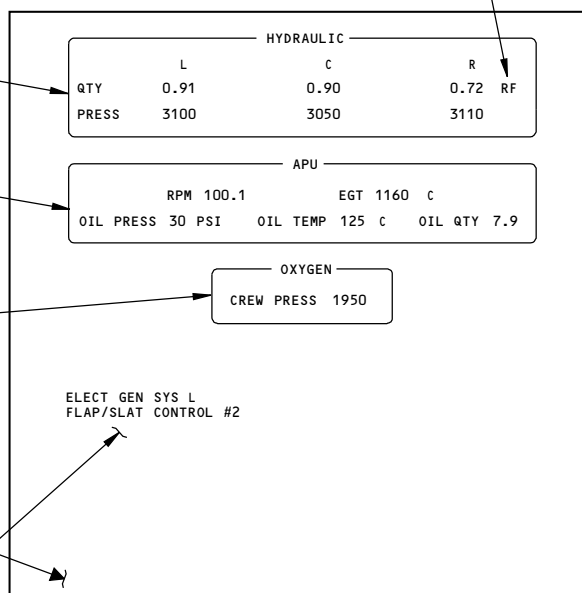
HYDRAULIC
SYSTEM
INFORMATION

APU
INFORMATION

CREW OXYGEN

STATUS
MESSAGE
FIELD

REFILL MESSAGE



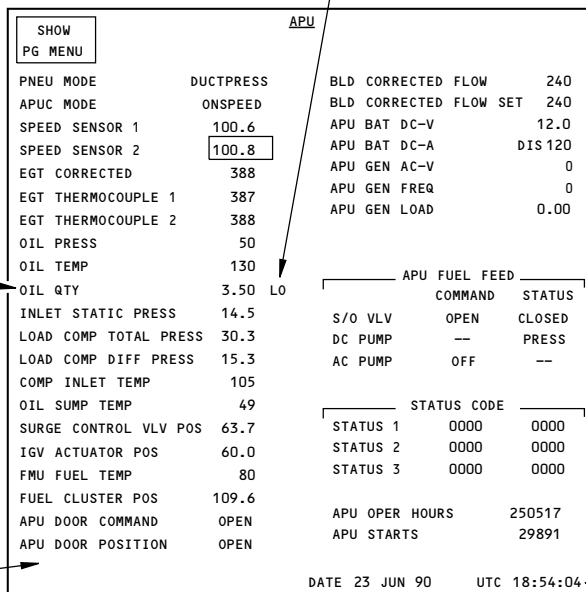
STATUS PAGE

(E)

LOW OIL QUANTITY INDICATION

OIL QUANTITY
IN QUARTS

AUTO EVENT
MESSAGE



APU MAINTENANCE PAGE

(E)

SYSTEM
DATA

DATE AND TIME
MESSAGE FIELD

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APU Flight Compartment Controls
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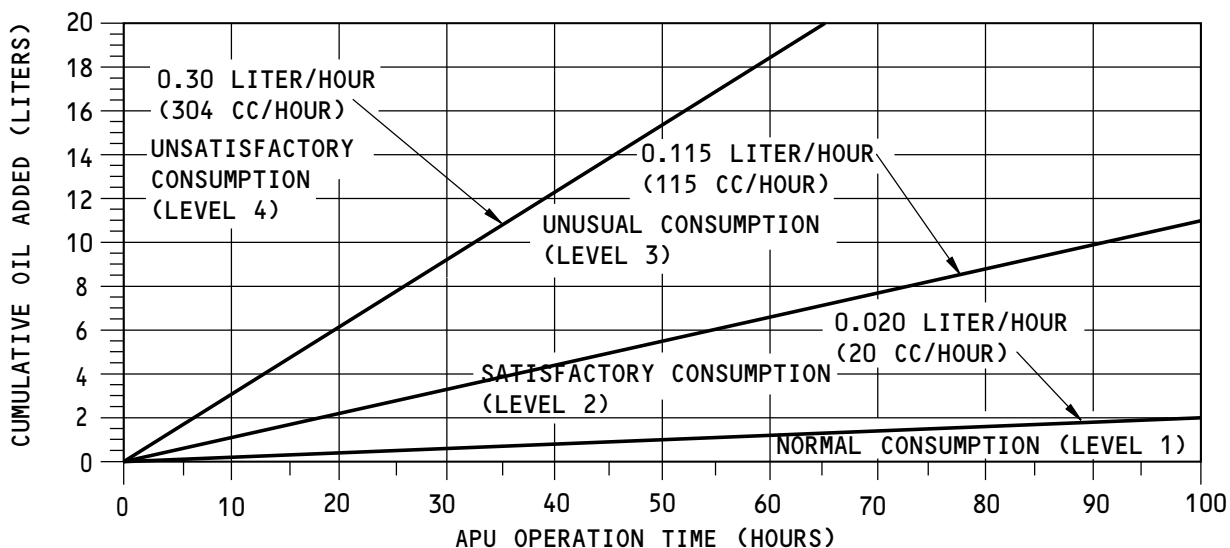
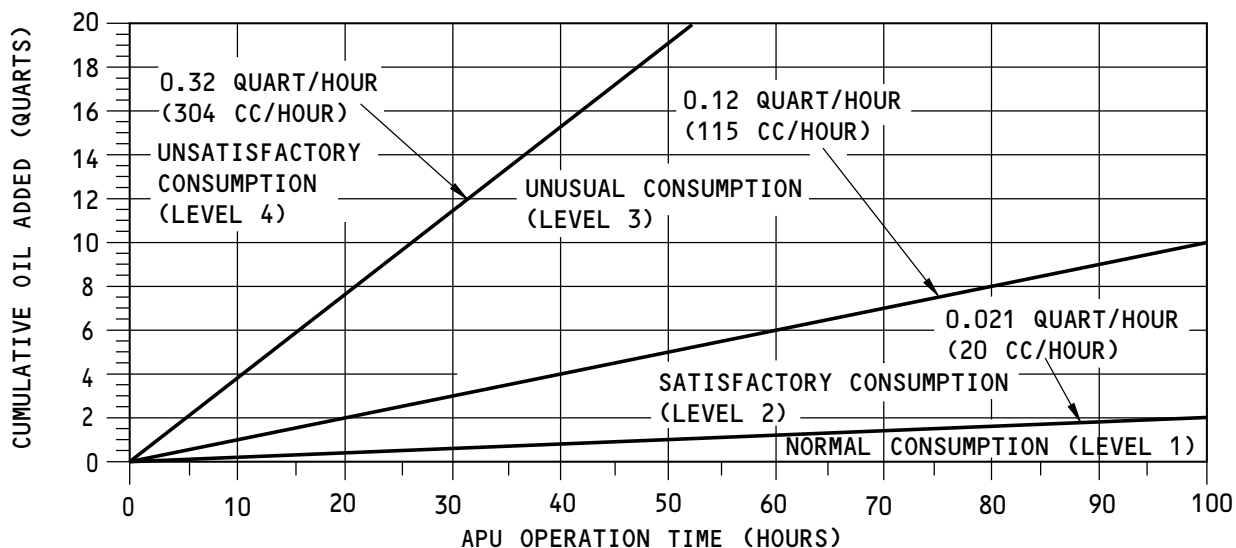
49-11-00

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NOTE: THESE GRAPHS ARE USED TO MONITOR THE APU OIL CONSUMPTION THROUGH TIME FOR AN INSTALLED APU.

TOTAL APU OIL CAPACITY (INCLUDES OIL COOLER AND OIL DELIVERY

SYSTEM = 12.4 QUARTS (11.7 LITERS) (11,700 CC)

GEARBOX OIL CAPACITY = 7.6 QUARTS (7.2 LITERS) (7200 CC)

GEARBOX USABLE OIL QUANTITY WHEN FILLED = 6.1 QUARTS (5.8 LITERS) (5810 CC)

GEARBOX OIL QUANTITY WITH LOQ INDICATION = 3.8 QUARTS (3.6 LITERS) (3600 CC)

GEARBOX USABLE OIL QUANTITY WITH LOQ INDICATION = 2.3 QUARTS (2.2 LITERS) (2210 CC)

C75289 S0006423607_V5

Oil Consumption Limit Graph
Figure 202/49-11-00-990-802 (Sheet 1 of 3)

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CONDITION	LIMITS	ACTION
LEVEL 1	OIL CONSUMPTION IS LESS THAN OR EQUAL TO 0.021 QUART/HOUR (0.020 LITER/HOUR OR 20 CC/HOUR)	1. OIL CONSUMPTION IS GOOD. 2. OIL SERVICE AS NECESSARY (TASK 12-13-04-600-801).
LEVEL 2	OIL CONSUMPTION IS BETWEEN 0.021 QUART/HOUR (0.020 LITER/HOUR OR 20CC/HOUR) AND 0.12 QUART/HOUR (0.115 LITER/HOUR OR 115 CC/HOUR)	1. OIL CONSUMPTION IS SATISFACTORY. 2. RECOMMENDED TROUBLESHOOTING TASKS ARE: (1) EXAMINE THE APU FOR EXTERNAL OIL LEAKS. (2) DO FIM CHECK FOR ODOR IN CABIN (FIM 49-10 TASK 808). (3) MAGNETIC CHIP COLLECTOR INSPECTION (TASK 49-27-04-200-801) AND OIL FILTER ELEMENTS INSPECTION (TASK 49-27-03-200-801). 3. OIL SERVICE AS NECESSARY (TASK 12-13-04-600-801). 4. OIL CONSUMPTION MONITORING PER INTERVAL ON SHEET 3.
LEVEL 3	OIL CONSUMPTION IS BETWEEN 0.12 QUART/HOUR (0.115 LITER/HOUR OR 115 CC/HOUR) AND 0.32 QUART/HOUR (0.30 LITER/HOUR OR 304 CC/HOUR)	1. OIL CONSUMPTION IS SATISFACTORY IF YOU DO THE RECOMMENDED TROUBLESHOOTING TASKS. 2. RECOMMENDED TROUBLESHOOTING TASKS ARE: (1) SAME TASKS IDENTIFIED IN LEVEL 2 CONDITION FOR OIL CONSUMPTION IS LESS THAN 0.12 QUART/HOUR (0.115 LITER/HOUR OR 115 CC/HOUR). (2) EXAMINE THE TAILPIPE FOR STATIC OIL LEAK ADJACENT TO THE THIRD STAGE TURBINE ROTOR AND OIL LEAK FROM THE EDUCTOR. 3. OIL SERVICE THE APU GEARBOX TO THE "FULL" LINE ON THE APU "OFF" SIDE OF THE OIL LEVEL SIGHT GAGE BEFORE EACH FLIGHT (TASK 12-13-04-600-801). 4. OIL CONSUMPTION MONITORING ON A PER-FLIGHT BASIS. REPLACE THE APU IF THERE IS MORE THAN A 10 PERCENT INCREASE IN OIL CONSUMPTION FROM THE LAST FLIGHT.
LEVEL 4	OIL CONSUMPTION IS MORE THAN 0.32 QUART/HOUR (0.30 LITER/HOUR OR 304 CC/HOUR)	1. REPLACE THE APU.

479861 S0000142991_V7

**Oil Consumption Limit Graph
Figure 202/49-11-00-990-802 (Sheet 2 of 3)**

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OIL CONSUMPTION MONITORING INTERVAL	
BASED ON FULLY SERVICED GEARBOX (7.6 QT/7.2 L) TO LOQ (3.8 QT/3.6 L) INDICATION	
CONSUMPTION RATE (CC/HR)	INSPECTION INTERVAL (HR)
21-30	120
31-40	90
41-50	72
51-60	60
61-70	51
71-80	45
81-90	40
91-100	36
101-110	33
111-115	31

1439188 S0000259836_V2

**Oil Consumption Limit Graph
Figure 202/49-11-00-990-802 (Sheet 3 of 3)**

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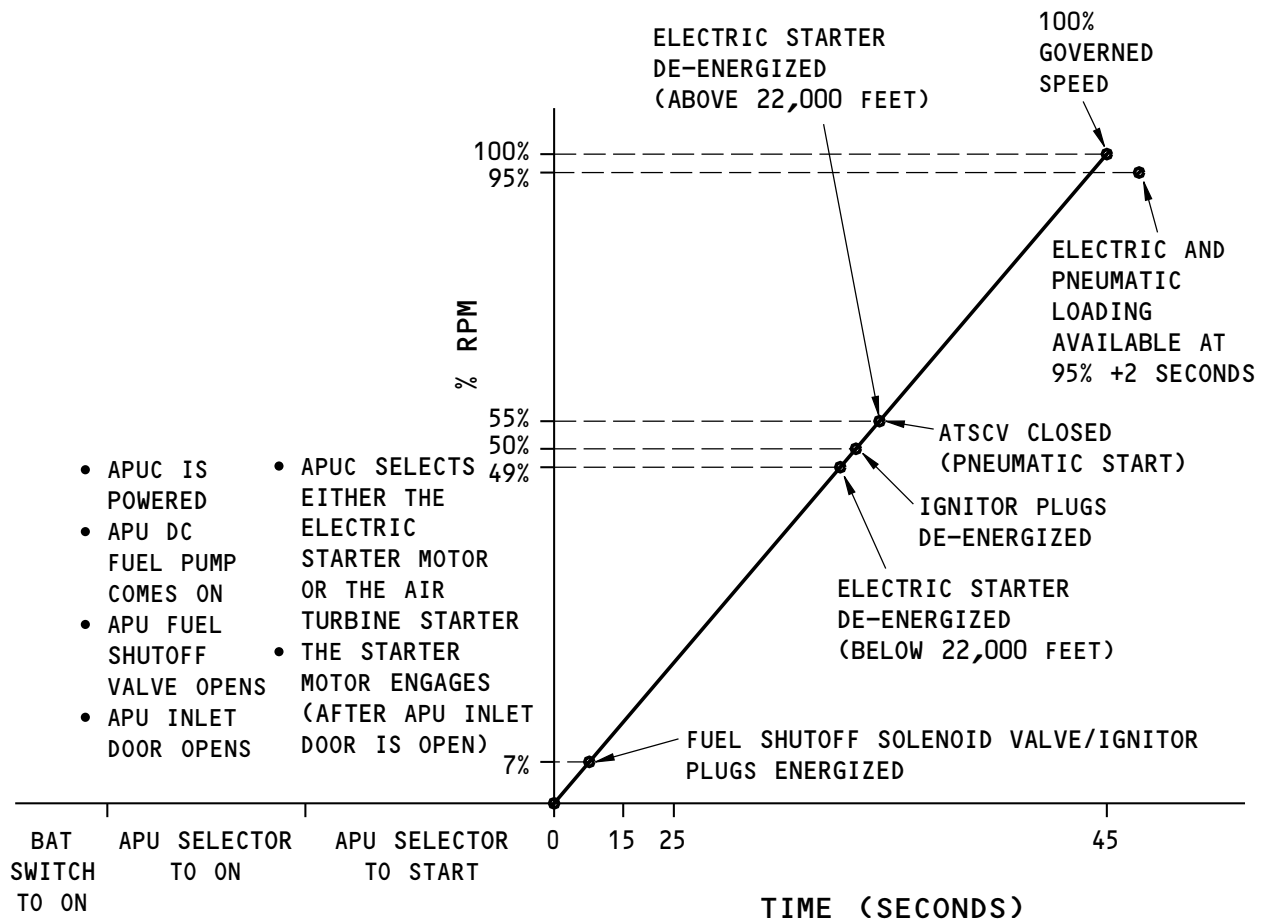
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C75483 S0006423608_V2

APU Start Sequence
Figure 203/49-11-00-990-803

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TASK 49-11-00-860-805

3. APU Usual Shutdown

A. General

- (1) There are two modes of operating the APU, attended and unattended.
 - (a) The APU is in the attended mode when the airplane is in the conditions that follow:
 - 1) The airplane is in the air.
 - 2) The airplane is on the ground while a main engine starts or operates.
 - (b) The APU is in the unattended mode when the airplane is on the ground and the engines are shutdown.
- (2) An APU shutdown is in one of these groups:
 - (a) A usual shutdown
 - (b) An automatic shutdown
 - (c) An emergency shutdown
- (3) The APU will do an automatic shutdown under these conditions:
 - (a) In the attended mode:
 - 1) No acceleration when the APU is starting
 - 2) No flame when the APU is starting
 - 3) APU inlet door closes to less than 70% open
 - 4) Overspeed protection is failed
 - 5) Reverse flow through the load compressor
 - 6) A fire in the inlet duct (inlet temperature T2 greater than 177 °C)
 - 7) APU controller failure
 - 8) Fire in the APU compartment
 - 9) Overspeed (greater than 106% RPM)
 - 10) Speed droop (less than 88% RPM and no acceleration for 10 seconds)
 - 11) Loss of power to APUC
 - (b) In the unattended mode:
 - 1) Low oil pressure (less than 35 psi)
 - 2) High EGT (calculated turbine inlet temperature greater than 1288 °C)
 - 3) High oil temperature (greater than 156 °C)
 - 4) Loss of oil pressure signal from both the pressure sensor and low oil pressure switch
 - 5) Loss of EGT signal
 - 6) Generator scavenge oil filter clogged
 - 7) All conditions listed for the attended mode.
 - (c) The APU will do an emergency shutdown in these conditions:
 - 1) The fire switch on the P5 overhead panel is pulled
 - 2) The APU FIRE SHUTDOWN switch on the service panel and APU remote shutdown, P40, is pushed.
 - 3) The fire detection system finds a fire in the APU compartment.

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B. Location Zones

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

C. Procedure (Usual Shutdown)

SUBTASK 49-11-00-860-004

- (1) Move the APU selector to the OFF position (Figure 204).

NOTE: The APU COOLDOWN message will show on EICAS.

- (a) When you move the APU selector to OFF, the APU will start the 105 second cooldown cycle.

NOTE: The APU will not do a cooldown cycle during an automatic shutdown or an emergency shutdown.

- 1) The APU bleed valve will automatically close.
- 2) The APU will stay at 100 percent speed for 15 seconds.

NOTE: The APU generator can continue to operate for the first 13 seconds of the cooldown cycle.

- 3) The APU speed will decrease from 100 percent to 70 percent in 90 seconds and then shutdown.
- 4) The inlet door and the fuel valve will close when the APU speed is less than 15 percent for 1 second.

- (b) If electrical power is not necessary, push the BATTERY switch on the P5 overhead panel to OFF.

ARO 005-999; ARO 001-004 POST SB 777-52-0049

SUBTASK 49-11-00-010-007

- (2) If you will open the APU compartment doors, wait 3-5 minutes after APU shutdown before you open the APU compartment doors.

NOTE: This will allow time for the pressure to equalize when the APU vent doors are deactivated.

——— **END OF TASK** ———

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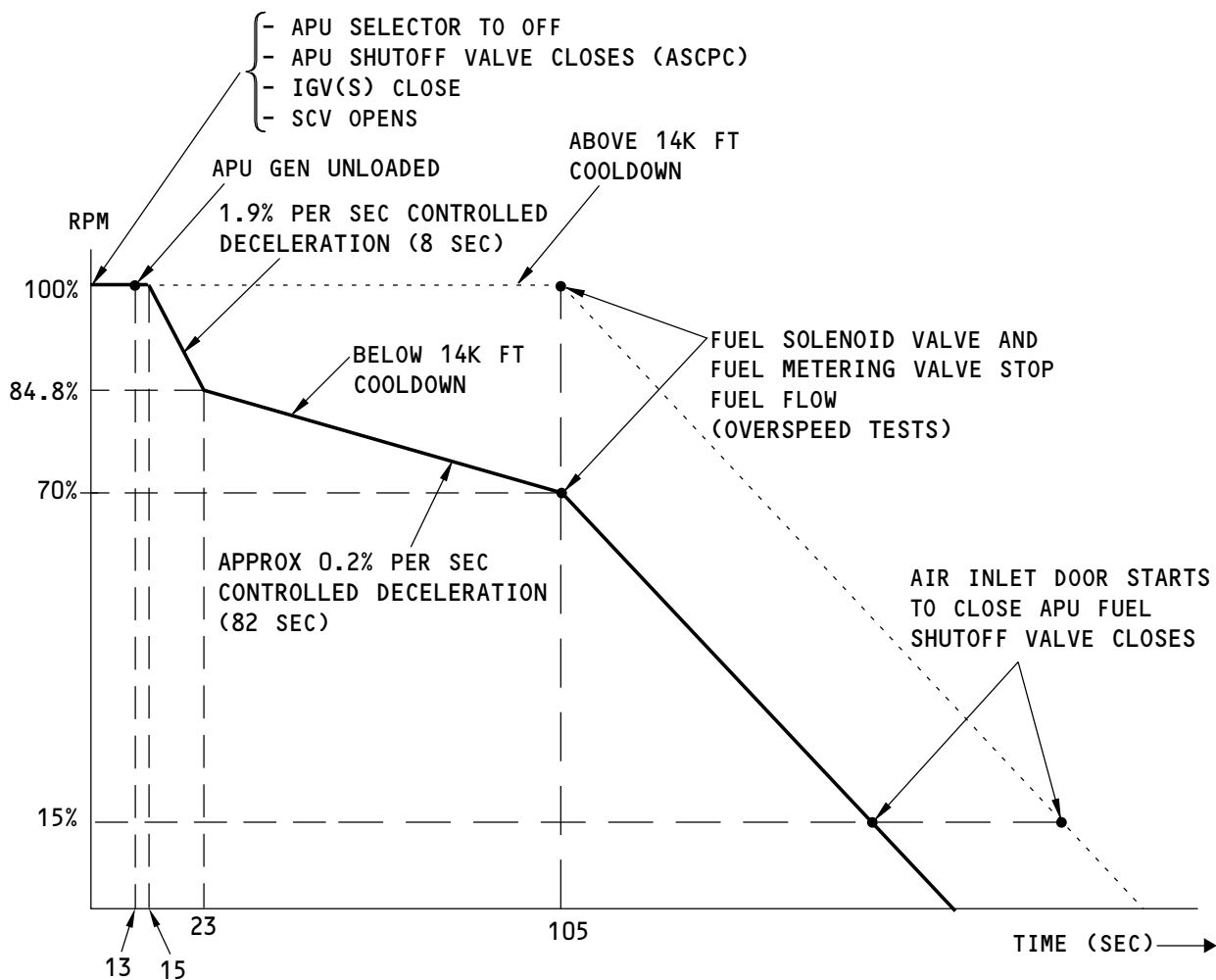
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APU Shutdown Sequence
Figure 204/49-11-00-990-810

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ARO 005-999; ARO 001-004 POST SB 777-52-0049 (Continued)

TASK 49-11-00-860-801

4. APU Emergency Shutdown

A. General

- (1) There are 2 ways to manually shutdown the APU in an emergency:
 - (a) Pull the fire switch on the P5 overhead panel
 - (b) Push the remote APU FIRE SHUTDOWN switch on the service panel and APU remote shutdown, P40.
 - 1) The P40 panel is on the nose gear.

B. References

Reference	Title
49-11-00-200-801	Inspection After an Auxiliary Power Unit (APU) Fire (P/B 601)

C. Location Zones

Zone	Area
212	Flight Compartment, Right
711	Nose Landing Gear

D. Procedure (Emergency Shutdown)

SUBTASK 49-11-00-860-005

- (1) Do an emergency APU shutdown from the flight compartment (Figure 201):



WHEN YOU SHUTDOWN THE APU WITH THE FIRE SWITCH, THE FIRE EXTINGUISHER IS AUTOMATICALLY ARMED. BE CAREFUL NOT TO ACCIDENTALLY RELEASE THE CONTENTS OF THE FIRE EXTINGUISHER BOTTLE. MAKE SURE THERE IS A FIRE BEFORE YOU RELEASE THE CONTENTS OF THE FIRE EXTINGUISHER BOTTLE.

- (a) Pull the APU fire switch on the P5 overhead panel.

NOTE: The APU will do an emergency shutdown. When the APU does an emergency shutdown, it will not do the cooldown cycle.

 - 1) These EICAS messages will show:
 - a) APU SHUTDOWN (Advisory)
 - b) APU (Status)
 - 2) If there is a fire in the APU compartment, turn the fire switch.

NOTE: The fire extinguisher bottle will release its contents.
- (b) Turn the APU selector on the P5 overhead panel to the OFF position.
- (c) Push the fire switch to set the switch.
- (d) Do the inspection after an APU fire. To inspect it, do this task: Inspection After an Auxiliary Power Unit (APU) Fire, TASK 49-11-00-200-801.

SUBTASK 49-11-00-860-006

- (2) Do an APU emergency shutdown from the nose gear (Figure 205):

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ARO 005-999; ARO 001-004 POST SB 777-52-0049 (Continued)

- (a) Push the APU FIRE SHUTDOWN switch on the service and APU shutdown panel, P40.

NOTE: The APU will do an emergency shutdown. When the APU does an emergency shutdown, it will not do the cooldown cycle.

- 1) These EICAS messages will show:

- a) APU SHUTDOWN (Advisory)
- b) APU (Status)
- c) APU REMOTE SHUTDOWN (Status)

- 2) If there is a fire in the APU compartment, push the APU BOTTLE DISCHARGE switch on the P40 panel.

NOTE: The fire extinguisher bottle will release its contents.

- (b) Turn the APU selector on the P5 overhead panel to the OFF position.
- (c) Push the FIRE/OVHT TEST switch on the P5 overhead panel to set the fire system to normal.
- (d) Do the inspection after an APU fire. To inspect it, do this task: Inspection After an Auxiliary Power Unit (APU) Fire, TASK 49-11-00-200-801.

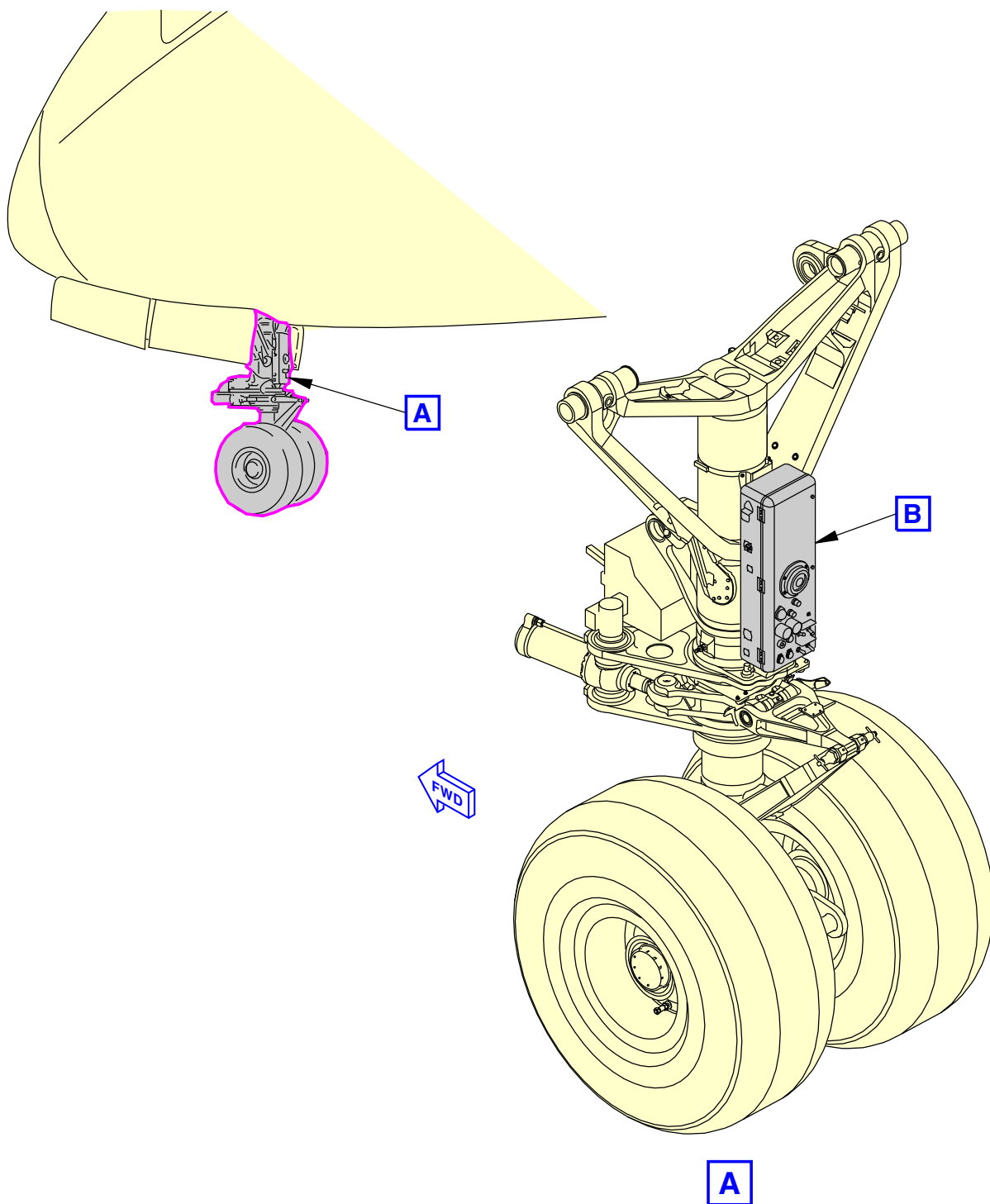
———— **END OF TASK** ————

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Service and APU Shutdown Panel, P40
Figure 205/49-11-00-990-805 (Sheet 1 of 2)

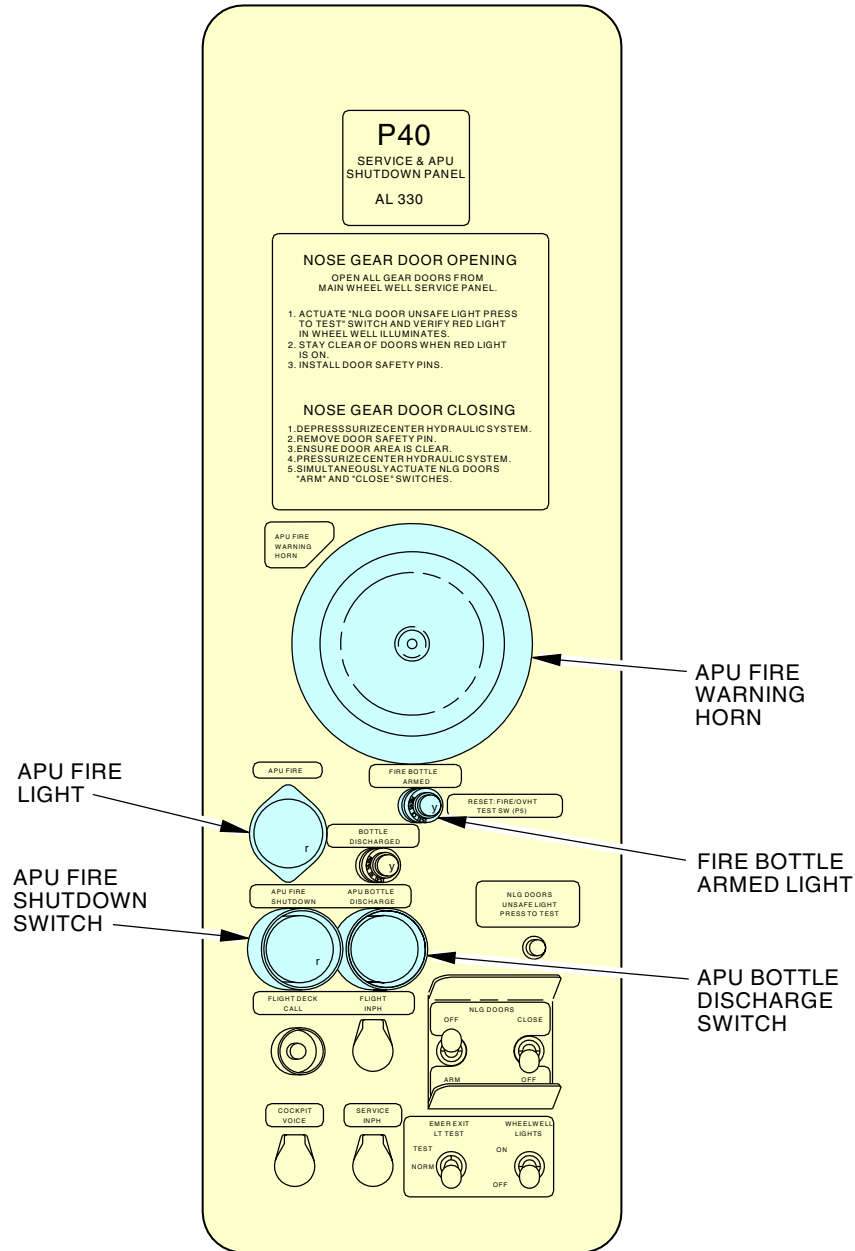
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B

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Service and APU Shutdown Panel, P40
Figure 205/49-11-00-990-805 (Sheet 2 of 2)

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ARO 005-999; ARO 001-004 POST SB 777-52-0049 (Continued)

TASK 49-11-00-800-801

5. Motor the APU

A. General



CAUTION

MOTOR THE APU ONLY WHEN YOU DO AN APU PRESERVATION PROCEDURE. IF YOU DO NOT OBEY THIS INSTRUCTION, YOU CAN CAUSE DAMAGE TO THE APU FUEL PUMP.

- (1) This task gives the steps to motor the APU. After you do this task, you must clear these EICAS messages:
 - (a) APU SHUTDOWN (Advisory)
 - (b) APU (Status)
 - (c) APU START SYSTEM (Status)

B. References

Reference	Title
31-61-00-800-802	Erasing a EICAS Status Message Latched by AIMS (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-11-00-040-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-007

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

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ARO 005-999; ARO 001-004 POST SB 777-52-0049 (Continued)

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-010-001

- (3) Open the APU access doors.APU Access Doors (Open), TASK 49-11-02-010-801

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-11-00-020-001

- (4) Disconnect the electrical connector [2] from the ignition unit [1].

SUBTASK 49-11-00-860-008

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-860-009

- (6) Motor the APU:Figure 206
- (a) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 panel.
- (b) Set the BATTERY switch to ON.



CAUTION

MAKE SURE YOU OBEY THE DUTY CYCLE FOR THE STARTER MOTOR. IF YOU DO NOT OBEY THE DUTY CYCLE, DAMAGE TO THE STARTER MOTOR CAN OCCUR.

- (c) Move the APU selector switch to the START position, hold the switch at the START position for one second and manually move the switch to the ON position.
- (d) The APU will motor until it has a shutdown.
- 1) These EICAS messages will show:
- a) APU SHUTDOWN (Advisory)
- b) APU (Status)
- c) APU START SYSTEM (Status)
- d) FUEL VALVE APU (Status)

SUBTASK 49-11-00-860-010

- (7) Move the APU selector to OFF and attach a DO-NOT-OPERATE tag.

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SUBTASK 49-11-00-860-011

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-420-001

- (9) Connect the electrical connector [2] to the ignition unit [1].

SUBTASK 49-11-00-860-012

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-860-013

- (11) Remove the DO-NOT-OPERATE tag from the APU selector.

SUBTASK 49-11-00-860-014

- (12) Do the steps that follow to clear the EICAS status messages:
- Do this task: APU Starting and operation.
 - Do this task: APU Usual Shutdown.
 - Erase these STATUS messages, TASK 31-61-00-800-802:
 - APU (Status)
 - APU START SYSTEM (Status)
 - FUEL VALVE APU (Status)

SUBTASK 49-11-00-410-001

- (13) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801

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Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

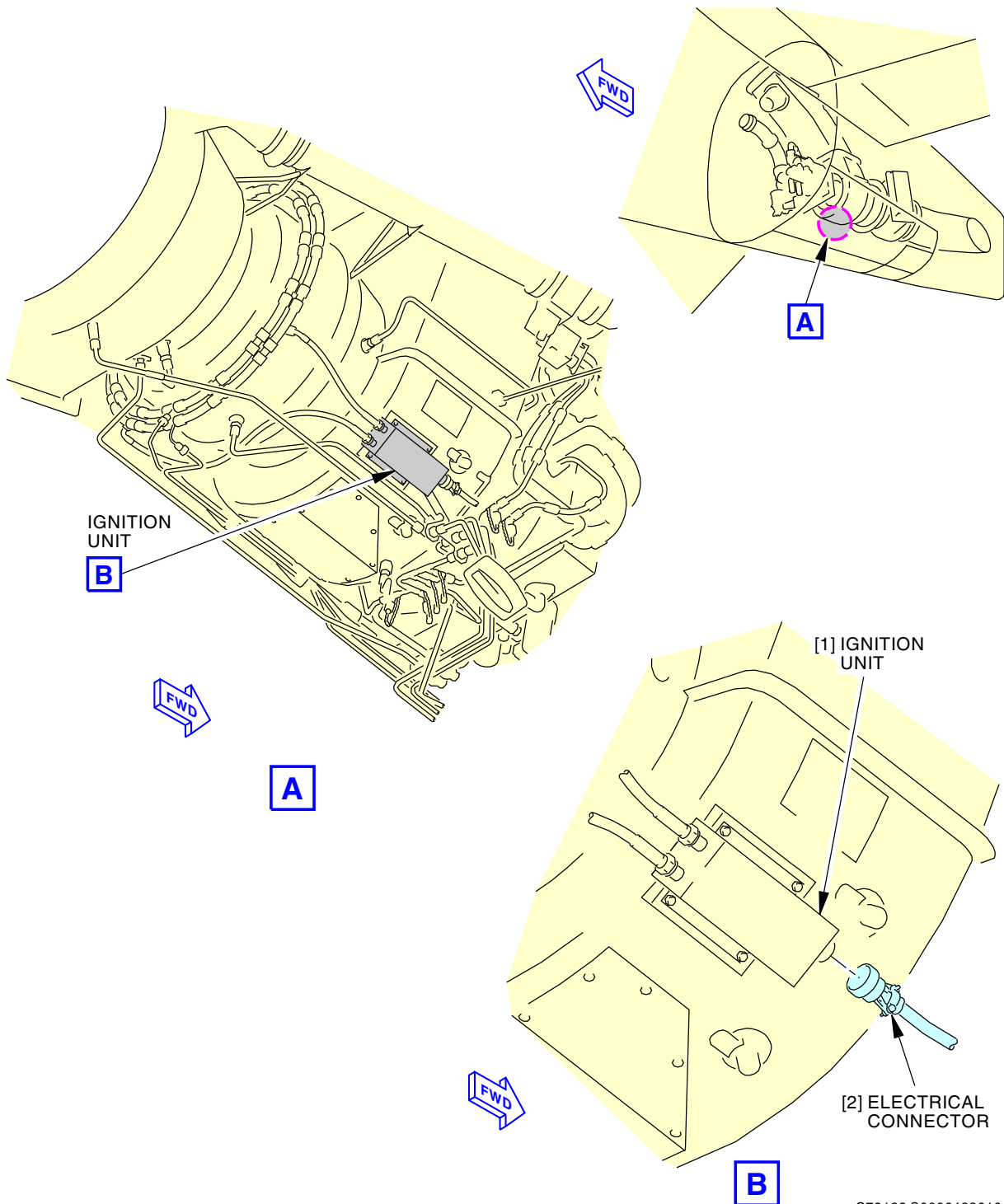
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APU Motoring - Ignition Unit Connector
Figure 206/49-11-00-990-806

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TASK 49-11-00-620-801

6. APU Preservation - Mild Environment

A. General

- (1) Do the preservation task immediately when the APU will not be used. Continue the preservation until the APU goes to the engine shop.
- (2) Honeywell SB 49-7997 (APU - Gas Turbine Engine - Standard Storage and Preservation Guidelines) provides standardized long-term preservation and storage procedures for all Honeywell APU's.
- (3) This task is for an installed APU (on the airplane).
 - (a) For an APU not installed on an airplane, reference Honeywell SB 49-7997.
- (4) This task contains the steps that are necessary for the APU preservation in a mild environment.
 - (a) A mild environment is where the ambient temperature is between 30 to 125 F (-1.11 to 51.67 C), the humidity is below 40%, and there is no salt air present.
 - (b) If the environment does not meet the mild definition, use the task that follows for a severe environment.
- (5) Do the preservation task immediately when the APU will not be used. Continue the preservation until the APU goes to the engine shop.
- (6) The factors that control the APU preservation and storage are:
 - Where the aircraft or vehicle will be parked or stored.
 - How long the aircraft or vehicle will be parked or stored.
 - If the APU can be periodically motored.
 - If the APU can be periodically operated.
 - If the aircraft or vehicle fuel system have been preserved.
- (7) Desiccant in the APU inlet and exhaust can help reduce corrosion, fungus and humidity in the sealed APU area. Desiccant can be put in the APU air inlet and/or exhaust. If space is limited, the desiccant can be distributed between the air inlet and the exhaust. DO NOT put the desiccant in the bleed air ducts.
- (8) The best general practices are to:
 - (a) Operate the APU a minimum of five minutes before the preservation procedure to dry out the APU.
 - (b) Operate the APU periodically, the interval will depend on the storage environment.
 - (c) If the APU is not operable during storage, motor the APU periodically. The interval will depend on the storage environment.
 - (d) If the APU cannot be motored or started, put desiccant in the gas path and seal the fuselage openings. Periodically check the desiccant and the seal on the fuselage openings.
- (9) The storage guidelines below are shown in terms of maximum desired storage periods without APU operation. Periodic no-load operation of the APU approximately every 2 months can avoid preservation requirements indefinitely. Periodic motoring of the APU every month can avoid preservation requirements for up to two years.

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- (10) The preservation of the APU fuel control with preservation oil is not necessary, if the APU stays in the airplane and the APU fuel control is not removed or replaced. The low pressure fuel filter replacement is permitted. If the fuel control is replaced, the fuel system can be preserved by motoring or operating the APU at no load for one minute.

B. References

Reference	Title
12-22-05-610-801	Drain the APU Oil (P/B 301)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00253	Material - Barrier Materials, Greaseproofed, Waterproof, Flexible, Heat-Sealable	MIL-PRF-121 (Supersedes MIL-B-121)
G00626	Desiccant - Activated, Bagged, Packaging Use And Static Dehumidification	MIL-D-3464

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Preservation

SUBTASK 49-11-00-860-069

- (1) Operate the APU (TASK 49-11-00-860-804) for a minimum of five minutes (to dry out the APU).
(a) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Preservation Guidelines - less than two months:

SUBTASK 49-11-00-860-053

- (1) No preservation steps are necessary.

H. Preservation Guidelines - more than two months, less three months:

SUBTASK 49-11-00-680-001

- (1) Drain the oil (TASK 12-22-05-610-801).

I. Preservation Guidelines - more than three months, less than one year:

SUBTASK 49-11-00-680-002

- (1) Drain the oil (TASK 12-22-05-610-801).

SUBTASK 49-11-00-620-004

- (2) Add 2.00 lb (0.91 kg) of desiccant, G00626 to the gas path.
(a) One pound (0.45 kg) each of desiccant at the inlet and the exhaust.
(b) DO NOT put the desiccant in the bleed air ducts.
(c) Add a humidity indicator in a location that you can easily monitor.

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SUBTASK 49-11-00-860-054

- (3) Seal the APU inlet and exhaust openings at the fuselage as follows:
 - (a) Install barrier material, G00253 covers and plugs on these APU air openings for protection.
 - 1) APU exhaust duct
 - 2) Eductor scoop on the air inlet duct
 - 3) Air/oil cooler

SUBTASK 49-11-00-860-055

- (4) Replace the DO-NOT-OPERATE tag on the APU control switch on the P5 panel with an APU PRESERVATION tag.

SUBTASK 49-11-00-410-007

- (5) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

J. Preservation Guidelines - more than one year, less than two years:

SUBTASK 49-11-00-680-003

- (1) Drain the oil (TASK 12-22-05-610-801).

SUBTASK 49-11-00-860-056

- (2) Put caps (plugs or covers) on the fluid lines and drains.

SUBTASK 49-11-00-620-005

- (3) Add 2.00 lb (0.91 kg) of desiccant, G00626 to the gas path.
 - (a) One pound (0.45 kg) each of desiccant at the inlet and the exhaust.
 - (b) DO NOT put the desiccant in the bleed air ducts.
 - (c) Add a humidity indicator in a location that you can easily monitor.
 - 1) Do a check of the humidity indicator every 30 days, add additional desiccant as needed.

SUBTASK 49-11-00-620-006

- (4) Seal the APU inlet and exhaust openings at the fuselage as follows:
 - (a) Install barrier material, G00253 covers and plugs on these APU air openings for protection.
 - 1) APU exhaust duct
 - 2) Eductor scoop on the air inlet duct
 - 3) Air/oil cooler

SUBTASK 49-11-00-860-057

- (5) Replace the DO-NOT-OPERATE tag on the APU control switch on the P5 panel with an APU PRESERVATION tag.

SUBTASK 49-11-00-410-008

- (6) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801

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Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

K. Preservation Extension or Preservation after Expired Periods

SUBTASK 49-11-00-620-007

- (1) If the APU was not preserved when the aircraft was last powered, it can be preserved up to 1 month after the last operation without regard to controlled or uncontrolled storage.
 - (a) It is not necessary to return the APU to a repair facility.
- (2) The APU can be preserved up to 2 months after the last operation if the aircraft is stored in a mild environment.
 - (a) It is not necessary to return the APU to a repair facility.
- (3) If the APU was preserved at the last operation, but the preservation was compromised afterward, the APU can be preserved again to any of the options above, more than 2 months.
 - (a) The preservation must occur 5 days or less after it is compromised.

————— END OF TASK —————

TASK 49-11-00-620-802

7. APU Preservation - Severe Environment

A. General

- (1) This task contains the steps to do the preservation for the APU in a severe environment.
- (2) Do the preservation task immediately when the APU will not be used. Continue the preservation until the APU goes to the engine shop.
- (3) Honeywell SB 49-7997 (APU - Gas Turbine Engine - Standard Storage and Preservation Guidelines) provides standardized long-term preservation and storage procedures for all Honeywell APU's.
- (4) This task is for an installed APU (on the airplane).
 - (a) For an APU not installed on an airplane, reference Honeywell SB 49-7997.
- (5) This task contains the steps that are necessary for the APU preservation in a severe environment.
 - (a) A severe environment is where the ambient temperature is not between 30 to 125 F (-1.11 to 51.67 C), or the humidity is above 40%, or there is salt air present.
- (6) Do the preservation task immediately when the APU will not be used. Continue the preservation until the APU goes to the engine shop.
- (7) The factors that control the APU preservation and storage are:
 - Where the aircraft or vehicle will be parked or stored.
 - How long the aircraft or vehicle will be parked or stored.
 - If the APU can be periodically motored.
 - If the APU can be periodically operated.
 - If the aircraft or vehicle fuel system have been preserved.

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- (8) Desiccant in the APU inlet and exhaust can help reduce corrosion, fungus and humidity in the sealed APU area. Desiccant can be put in the APU air inlet and/or exhaust. If space is limited, the desiccant can be distributed between the air inlet and the exhaust. DO NOT put the desiccant in the bleed air ducts.
- (9) The best general practices are to:
 - (a) Operate the APU a minimum of five minutes before the preservation procedure to dry out the APU.
 - (b) Operate the APU periodically, the interval will depend on the storage environment.
 - 1) For severe environments, it is recommended to operate the APU every three days for a minimum of five minutes.
 - (c) If the APU is not operable during storage, motor the APU periodically. The interval will depend on the storage environment.
 - (d) If the APU cannot be motored or started, put desiccant in the gas path and seal the fuselage openings. Periodically check the desiccant and the seal on the fuselage openings.
- (10) The storage guidelines below are shown in terms of maximum desired storage periods without APU operation. Periodic no-load operation of the APU approximately every 2 months can avoid preservation requirements indefinitely. Periodic motoring of the APU every month can avoid preservation requirements for up to two years.
- (11) The preservation of the APU fuel control with preservation oil is not necessary, if the APU stays in the airplane and the APU fuel control is not removed or replaced. The low pressure fuel filter replacement is permitted. If the fuel control is replaced, the fuel system can be preserved by motoring or operating the APU at no load for one minute.

B. References

Reference	Title
12-22-05-610-801	Drain the APU Oil (P/B 301)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00253	Material - Barrier Materials, Greaseproofed, Waterproof, Flexible, Heat-Sealable	MIL-PRF-121 (Supersedes MIL-B-121)
G00626	Desiccant - Activated, Bagged, Packaging Use And Static Dehumidification	MIL-D-3464

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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F. Prepare for the Preservation

SUBTASK 49-11-00-860-070

- (1) Operate the APU (TASK 49-11-00-860-804) for a minimum of five minutes (to dry out the APU).
 - (a) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Preservation Guidelines - less than two weeks:

SUBTASK 49-11-00-620-015

- (1) Make sure you do the above task to operate the APU.
- (2) If it is not possible to operate the APU, seal the APU inlet and exhaust openings at the fuselage as follows:
 - (a) Install barrier material, G00253 covers and plugs on these APU air openings for protection.
 - 1) Educator housing
 - 2) Oil cooler
 - 3) Exhaust duct muffler

H. Preservation Guidelines - more than two weeks, less than six months:

SUBTASK 49-11-00-620-016

- (1) Do this task: Drain the APU Oil, TASK 12-22-05-610-801.

SUBTASK 49-11-00-620-017

- (2) Put caps (plugs or covers) on the fluid lines and drains.

SUBTASK 49-11-00-620-018

- (3) Add 2.00 lb (0.91 kg) of desiccant, G00626 to the gas path.
 - (a) One pound (0.45 kg) each of desiccant at the inlet and the exhaust.
 - (b) DO NOT put the desiccant in the bleed air ducts.
 - (c) Add a humidity indicator in a location that you can easily monitor.

SUBTASK 49-11-00-620-019

- (4) Seal the APU inlet and exhaust openings at the fuselage as follows:
 - (a) Install barrier material, G00253 covers and plugs on these APU air openings for protection.
 - 1) Educator housing
 - 2) Oil cooler
 - 3) Exhaust duct muffler

SUBTASK 49-11-00-620-020

- (5) Replace the DO-NOT-OPERATE tag on the APU control switch on the P5 panel with an APU PRESERVATION tag.

SUBTASK 49-11-00-410-014

- (6) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

I. Preservation Guidelines - more than six months, less than two years:

SUBTASK 49-11-00-620-022

- (1) Do this task: Drain the APU Oil, TASK 12-22-05-610-801.

SUBTASK 49-11-00-620-023

- (2) Put caps (plugs or covers) on the fluid lines and drains.

SUBTASK 49-11-00-620-024

- (3) Add 2.00 lb (0.91 kg) of desiccant, G00626 to the gas path.
- (a) One pound (0.45 kg) each of desiccant at the inlet and the exhaust.
 - (b) DO NOT put the desiccant in the bleed air ducts.
 - (c) Add a humidity indicator in a location that you can easily monitor.
 - 1) Do a check of the humidity indicator every 30 days, add additional desiccant as needed.

SUBTASK 49-11-00-620-025

- (4) Seal the APU inlet and exhaust openings at the fuselage as follows:
- (a) Install barrier material, G00253 covers and plugs on these APU air openings for protection.
 - 1) Eductor housing
 - 2) Oil cooler
 - 3) Exhaust duct muffler

SUBTASK 49-11-00-620-026

- (5) Replace the DO-NOT-OPERATE tag on the APU control switch on the P5 panel with an APU PRESERVATION tag.

SUBTASK 49-11-00-410-015

- (6) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801
- Close the access doors that follow:

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

315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

J. Preservation Extension or Preservation after Expired Periods

SUBTASK 49-11-00-620-014

- (1) If the APU was not preserved when the aircraft was last powered, it can be preserved up to 1 month after the last operation without regard to controlled or uncontrolled storage.
- (a) It is not necessary to return the APU to a repair facility.
- (2) The APU can be preserved up to 2 months after the last operation if the aircraft is stored in a mild environment.
- (a) It is not necessary to return the APU to a repair facility.
- (3) If the APU was preserved at the last operation, but the preservation was compromised afterward, the APU can be preserved again to any of the options above, more than 2 months.

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- (a) The preservation must occur 5 days or less after it is compromised.

————— END OF TASK —————

TASK 49-11-00-630-801

8. APU Depreservation

A. General

- (1) This task contains the steps to do the depreservation of an APU that has been stored (both on the airplane or off the airplane) after APU Preservation. These steps apply for an APU preservation for all lengths of time.

B. References

Reference	Title
12-22-05-600-801	Fill the APU with Oil (P/B 301)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-11-00-860-030

- (1) Make sure the APU selector on the P5 panel is OFF and replace the APU PRESERVATION tag with a DO-NOT-OPERATE tag.

SUBTASK 49-11-00-860-046

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-010-005

- (3) Open the APU access doors. APU Access Doors (Open), TASK 49-11-02-010-801
Open the access panels that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-11-00-630-002

(4) Do the APU depreservation:

(a) If installed, remove the covers or plugs from these openings:

- 1) APU exhaust duct
- 2) Eductor scoop on the air inlet duct
- 3) Air/oil cooler

(b) If installed, remove the desiccant and the humidity indicators from the APU.

(c) If installed, remove the caps from all the APU fluid lines.

(d) Fill the oil (TASK 12-22-05-600-801).

SUBTASK 49-11-00-860-031

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-410-005

(6) Close the APU access doors. APU Access Doors (Close), TASK 49-11-02-410-801

Close the access doors that follow:

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

315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-11-00-860-064

(7) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 panel.

SUBTASK 49-11-00-860-032

(8) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

NOTE: It can be necessary to try to start the APU more than one time.

(a) Let the APU operate for a minimum of 5 minutes.

(b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

———— **END OF TASK** ————

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TASK 49-11-00-040-801

9. APU Deactivation

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU inoperative.
- (2) APU may be inoperative provided:
 - (a) Other procedures do not require its use.
 - (b) Flight remains within 180 minutes of landing at a suitable airport.

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Deactivation

SUBTASK 49-11-00-860-065

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach an APU INOP tag.

SUBTASK 49-11-00-860-066

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

————— END OF TASK —————

TASK 49-11-00-440-801

10. APU Activation

A. General

- (1) This task puts the airplane back to its usual condition after operation with an APU inoperative.

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

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C. APU Activation

SUBTASK 49-11-00-860-067

- (1) Remove the APU INOP tag from the APU selector on the P5 overhead panel.

SUBTASK 49-11-00-860-068

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR

SUBTASK 49-11-00-710-003

- (3) Do this task: APU Starting and Operation, TASK 49-11-00-860-804

SUBTASK 49-11-00-710-004

- (4) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805

————— END OF TASK —————

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AUXILIARY POWER UNIT (APU) - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

- (1) APU shutdown switch test (remote panel location)
- (2) APU fire switch shutdown test (flight compartment)
- (3) APU bite test

TASK 49-11-00-700-801

2. APU Fire Shutdown Switch Test (Remote Panel Location)

A. **General**

- (1) The APU fire shutdown test examines the circuits from the service and APU shutdown panel, P40, to the APU controller.

B. **References**

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-802	Erasing a EICAS Status Message Latched by AIMS (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
711	Nose Landing Gear

D. **Procedure**

SUBTASK 49-11-00-860-041

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 49-11-00-480-001

- (2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 49-11-00-480-002



MAKE SURE YOU INSTALL THE LOCKS FOR THE LANDING GEAR DOORS CORRECTLY. AN INCORRECT INSTALLATION OF THE LOCKS CAN CAUSE A FAST MOVEMENT OF THE LANDING GEAR DOORS. A FAST MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 49-11-00-860-042

- (4) Set the switches:
 - (a) Make sure the APU selector is in the OFF position.
 - (b) Set the BATTERY switch on the P5 panel to the ON position.

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- (c) Make sure the APU maintenance switch on the APU/EEC maintenance panel, P61 is in the NORM position.

SUBTASK 49-11-00-860-035

- (5) Move the APU selector on the P5 overhead panel to the ON position.

SUBTASK 49-11-00-860-036

- (6) Do the steps that follow to do the APU fire shutdown test (Figure 501):



CAUTION

DO NOT PUSH THE APU BOTTLE DISCHARGE SWITCH. IF YOU PUSH THE APU BOTTLE DISCHARGE SWITCH, THE APU FIRE BOTTLE WILL RELEASE ITS CONTENTS.

- (a) Push the APU FIRE SHUTDOWN switch on the service and APU shutdown panel, P40, on the nose gear.

NOTE: The APU FIRE SHUTDOWN switch arms the fire bottle.

Keep the APU FIRE SHUTDOWN switch pushed for a minimum of 5 seconds.

- (b) Make sure these EICAS messages show:

- 1) APU (Status)
- 2) APU REMOTE SHUTDOWN (Status)

NOTE: If the APU was operating before the APU FIRE SHUTDOWN switch was pushed, the EICAS message APU SHUTDOWN (ADVISORY) would also show.

- (c) Move the APU selector on the P5 overhead panel to the OFF position.
(d) Press the FIRE/OVERHEAT TEST switch on the P5 overhead panel.

NOTE: The fire/overheat test disarms the APU fire bottle.

- (e) Erase these EICAS status messages, do this task: Erasing a EICAS Status Message Latched by AIMS, TASK 31-61-00-800-802
- 1) APU REMOTE SHUTDOWN
 - 2) APU

E. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-080-001

- (1) Do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801.

SUBTASK 49-11-00-080-002



WARNING

MAKE SURE YOU REMOVE THE LOCKS FOR THE LANDING GEAR DOORS CORRECTLY. AN INCORRECT REMOVAL OF THE LOCKS CAN CAUSE A FAST MOVEMENT OF THE LANDING GEAR DOORS. A FAST MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (2) To remove the safety pins for the landing gear doors if they are not necessary, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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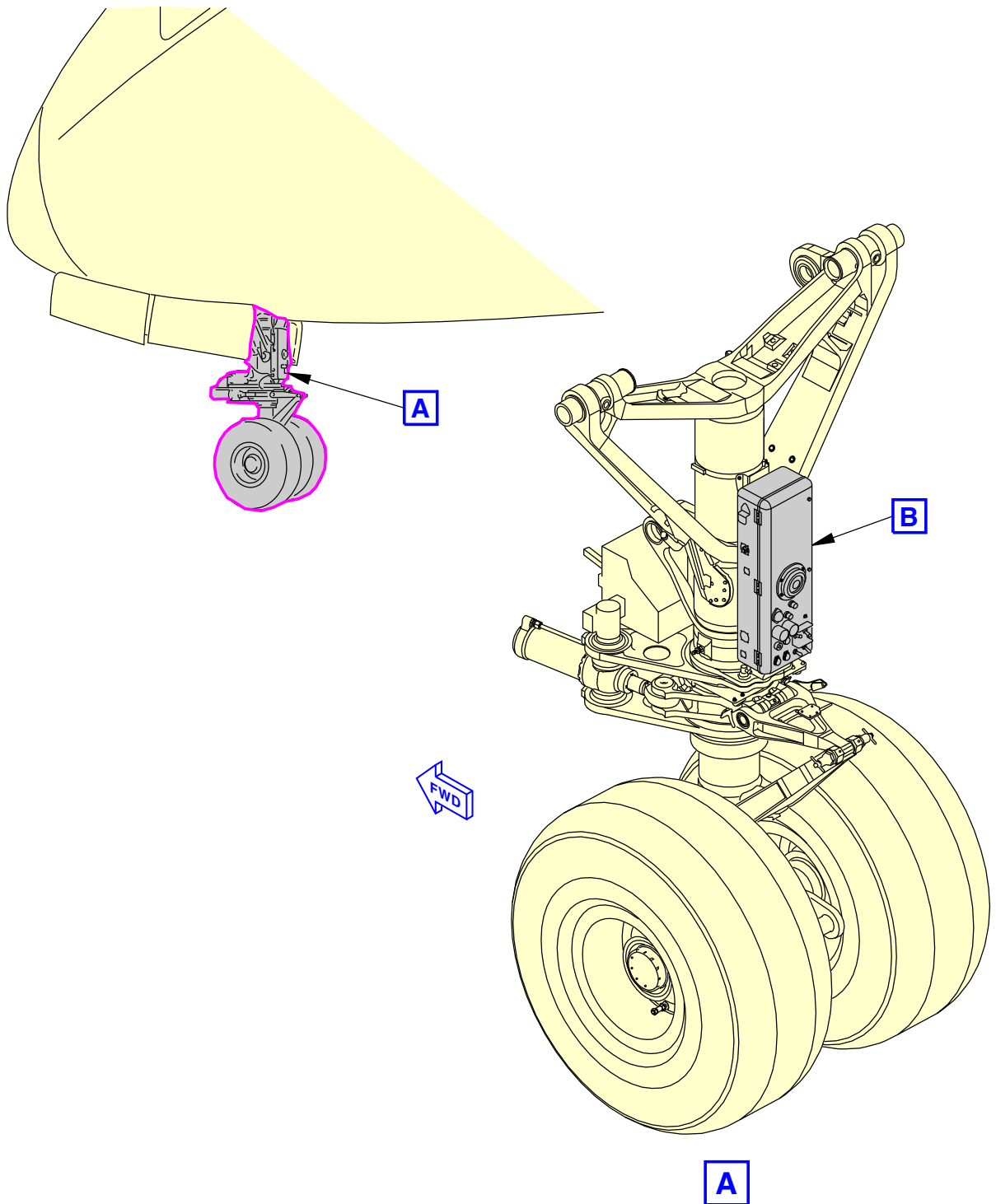
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APU Fire Switch Shutdown Test (Remote Panel Location)
Figure 501/49-11-00-990-808 (Sheet 1 of 2)

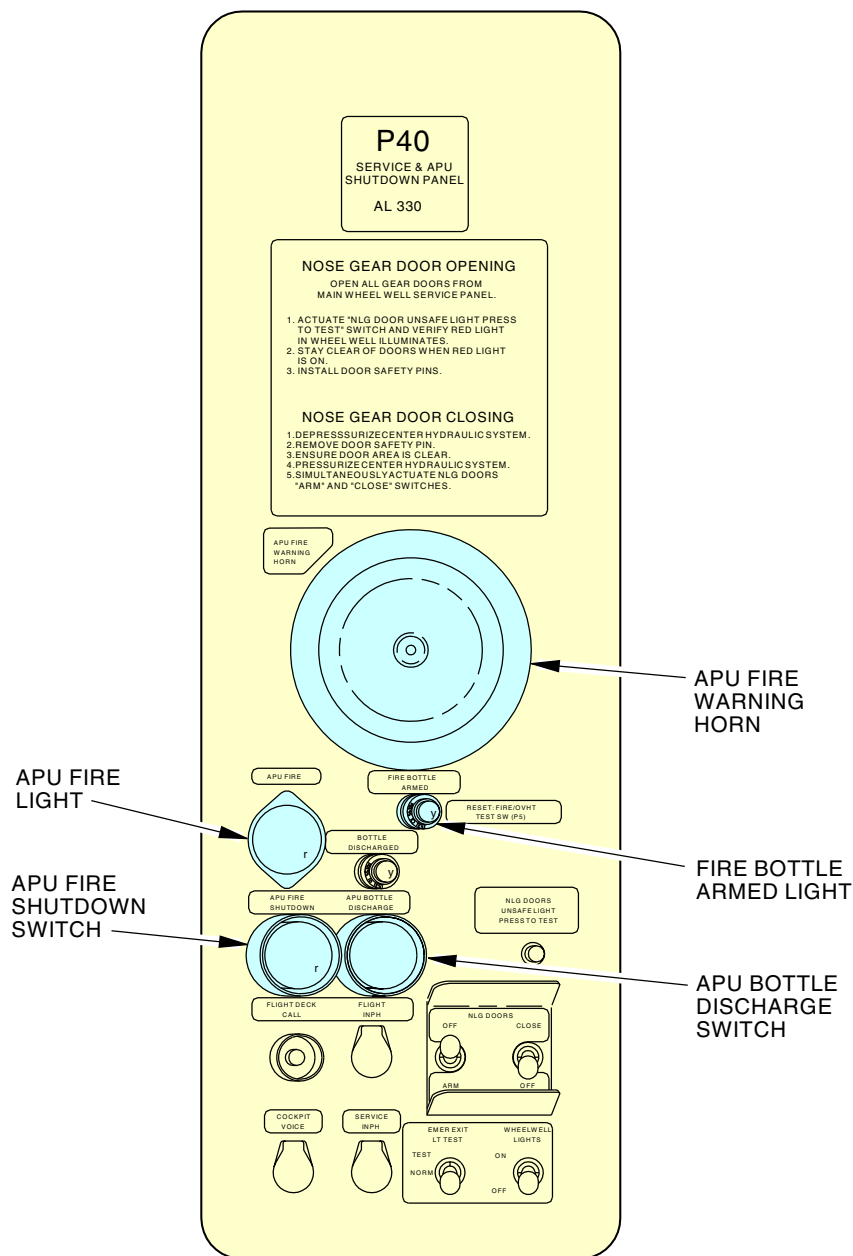
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SERVICE AND APU SHUTDOWN PANEL, P40

B

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APU Fire Switch Shutdown Test (Remote Panel Location) Figure 501/49-11-00-990-808 (Sheet 2 of 2)

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TASK 49-11-00-700-802

3. APU Fire Switch Shutdown Test (Flight Compartment)

A. General

- (1) The APU fire switch shutdown test examines the circuits between the P5 overhead panel and the APU controller.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-802	Erasing a EICAS Status Message Latched by AIMS (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 49-11-00-860-038

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 49-11-00-860-039

- (2) Set the switches:
 - (a) Make sure the APU selector is in the OFF position.
 - (b) Set the BATTERY switch on the P5 panel to the ON position.
 - (c) Make sure the APU maintenance switch on the APU/EEC maintenance panel, P61 is in the NORM position.

SUBTASK 49-11-00-860-040

- (3) Do the test of the fire switch shutdown (Figure 502):
 - (a) Turn the APU selector on the P5 overhead panel to the ON position.



CAUTION

DO NOT TURN THE APU FIRE SWITCH. IF YOU TURN THE APU FIRE SWITCH, THE APU FIRE BOTTLE WILL RELEASE ITS CONTENTS.

- (b) Pull the APU fire switch on the P5 overhead panel.
NOTE: The APU fire switch arms the fire bottle.
- (c) Make sure the EICAS messages APU (STATUS) shows:
NOTE: If the APU was operating before the APU FIRE SWITCH was pulled, the EICAS message APU SHUTDOWN (ADVISORY) would also show.
- (d) Move the APU selector on the P5 overhead panel to the OFF position.
- (e) Push the APU fire switch to set the fire switch to the normal position.
- (f) Press the FIRE/OVERHEAT TEST switch on the P5 overhead panel.
NOTE: The fire/overheat test disarms the APU fire bottle.
- (g) To erase the APU status message, do this task: Erasing a EICAS Status Message Latched by AIMS, TASK 31-61-00-800-802.

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E. Put the Airplane Back to Its Usual Condition

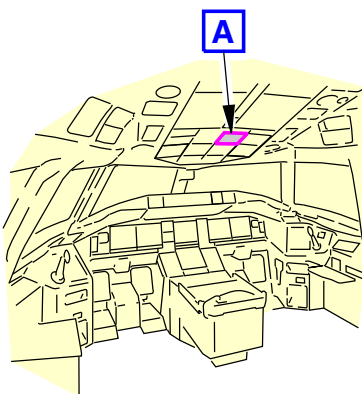
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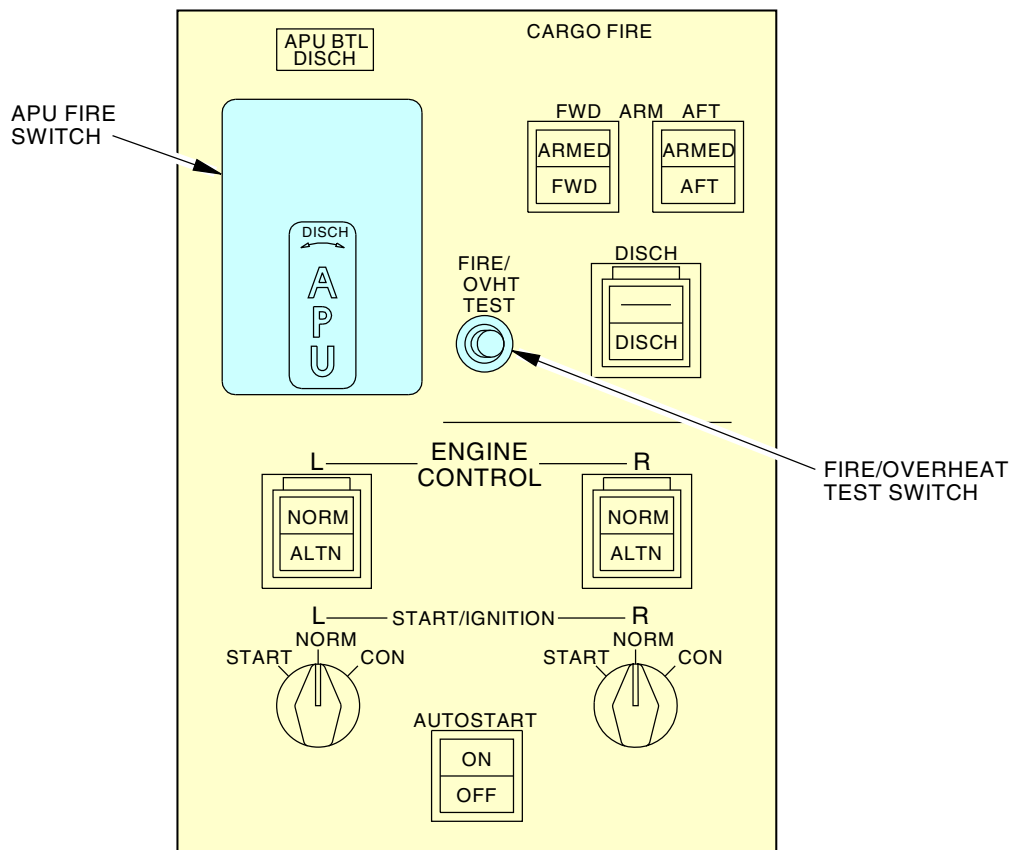
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FLIGHT COMPARTMENT



D09289 S0006423627_V2

**APU Fire Switch Shutdown Test
Figure 502/49-11-00-990-809**

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TASK 49-11-00-740-801

4. **APU Bite Test**

A. General

- (1) A maintenance access terminal is necessary for this procedure. For instruction on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 49-11-00-860-043

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 49-11-00-860-044

- (2) Move the APU MAINT switch on the P61 overhead panel to the TEST position.

SUBTASK 49-11-00-740-001

- (3) Use a maintenance access terminal (MAT) to make sure there are no maintenance messages for the APU.

- (a) Make these selections on the MAT:

- 1) ONBOARD MAINTENANCE
- 2) EXTENDED MAINTENANCE
- 3) EXISTING FAULTS

- (b) Look for 49 APU System.

NOTE: If 49 Auxiliary Power does not show and the APU controller (APUC) has power, then there are no maintenance messages in existing faults for the APU. The APUC must have power to show any APU maintenance messages.

- (c) If 49 APU System shows, do this:

- 1) Select 49 Auxiliary Power
- 2) Select CONTINUE

- (d) Make sure no maintenance messages show or are active for the applicable APU system.

- (e) If maintenance messages are ACTIVE or LATCHED for the applicable APU system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 49-11-00-860-045

- (4) Move the APU MAINT switch to the NORM position.

————— **END OF TASK** —————

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AUXILIARY POWER UNIT (APU) - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the APU after a fire.

TASK 49-11-00-200-801

2. Inspection After an Auxiliary Power Unit (APU) Fire

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1068	Vacuum - High Capacity

C. Consumable Materials

Reference	Description	Specification
B01023	Cleaner - Primary - Ardrox 6025	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00110	Sponge - Silicone Rubber, Closed-Cell, General Purpose, Non-Solvent Use	BMS1-23
G02439	Brush - Nylon Bristle	
G50140	Gloves - Protective, Latex or Nitrile	

D. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Inspection

SUBTASK 49-11-00-860-049

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

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SUBTASK 49-11-00-860-050

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-010-006

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Procedure

SUBTASK 49-11-00-210-004

- (1) Visually examine the APU for the cause of the APU fire or an APU that became too hot.
- (a) If you find external damage to the APU, replace the APU. These are the tasks:
- Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or
 - Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801,
 - Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or
 - Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.
- (b) If you do not find external damage to the APU, refer to the fault isolation manual for the APU fire detection system to find the cause of the high temperature indication.

SUBTASK 49-11-00-210-005

- (2) Do these steps to visually examine the APU compartment and its structural components for signs of fire damage:
- (a) Visually examine the APU compartment and its structural components for signs of fire damage.
- (b) Visually examine the three APU mounts for signs of fire damage.
- (c) If you find signs of fire damage in the APU compartment and its structural components, contact Boeing Service Engineering for the disposition of the APU and APU compartment due to a fire condition.

NOTE: An APU fire will affect the safety and structural components integrity of the airplane. Boeing engineering and structural repair personnel will review airline operator-supplied information and provide recommendations on a case-by-case basis.

SUBTASK 49-11-00-160-001

- (3) Do these steps to remove and/or clean the contents of the fire extinguisher used for the APU fire from the external surfaces of the APU and APU compartment:
- (a) Do these steps if foam was in the fire extinguisher:

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DO NOT LET THE FOAM GO IN THE HOLES ON THE APU. FOAM THAT STAYS IN THE APU CAN CAUSE CORROSION OF THE ENGINE INTERNAL COMPONENTS.

- 1) Clean the areas of the APU and APU compartment where the foam was used with clean water, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.
 - 2) Make sure you remove all signs of the foam from the APU and APU compartment.
- (b) Do these steps if dry chemical powder was in the fire extinguisher:



DO NOT USE WATER TO REMOVE THE DRY CHEMICAL POWDER FROM THE APU. THE DRY AGENTS IN THE CHEMICAL POWDER AND WATER WILL MAKE A COMPOUND THAT CAN CAUSE CORROSION. DO NOT LET THE DRY CHEMICAL POWDER GO IN THE HOLES ON THE APU. DRY CHEMICAL POWDER THAT STAYS IN THE APU CAN CAUSE CORROSION OF THE ENGINE INTERNAL COMPONENTS.

- 1) Clean the areas of the APU and APU compartment where the dry chemical powder was used with a high capacity vacuum, STD-1068 or other equivalent tool to remove the powder.
 - 2) If the dry chemical powder was changed to a glaze-like formation due to high temperatures, clean the areas with Ardrex 6025 cleaner, B01023, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.
 - 3) Make sure you remove all signs of the dry chemical powder from the APU and APU compartment.
- (c) Do these steps if halogen or halon was in the fire extinguisher:
- 1) In-flight use of the fire extinguishing system is permitted with no special cleaning procedure.



DO NOT BREATHE THE CONTENTS OF THE FIRE EXTINGUISHER IN THE APU COMPARTMENT. DO NOT LET THE CONTENTS OF THE FIRE EXTINGUISHER TOUCH YOUR SKIN. YOU MUST HAVE A GOOD FLOW OF AIR IN THE APU COMPARTMENT. IF YOU DO NOT OBEY THESE PRECAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- 2) Ground use of the fire extinguishing system is permitted but make sure the APU access doors are opened for a minimum of 30 minutes to remove all halogen or halon gases. No special cleaning procedure is necessary.
- 3) If it is necessary, clean the external surfaces of the eductor housing with clean water, cotton wiper, G00034, brush, G02439, sponge, G00110, protective gloves, G50140 or other equivalent equipment.



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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-051

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-11-00-860-052

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-11-00-410-006

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the auxiliary power unit (APU) (hydraulic jack method)
 - (2) An installation of the auxiliary power unit (APU) (hydraulic jack method)
 - (3) A removal of the auxiliary power unit (APU) (fishpole hoist method)
 - (4) An installation of the auxiliary power unit (APU) (fishpole hoist method)
- B. There are two procedures available for the removal and installation of the APU. Each procedure is optional to the other. The procedure that is used is given by the ground equipment that is available.
- (1) Procedure 1:
 - (a) This procedure uses a hydraulic jack and a maintenance stand to lift and lower the APU. The APU cradle is attached to the hydraulic jack with retaining plates. The maintenance stand is used to lift the APU and the hydraulic jack to the APU compartment. The hydraulic jack then moves the APU in and out of the APU compartment.
 - (2) Procedure 2:
 - (a) This procedure uses two fishpole hoists to lift and lower the APU. In addition to the fishpole hoists, special pulley equipment is required.

TASK 49-11-01-000-801

2. Auxiliary Power Unit Removal (Hydraulic Jack Method)

NOTE: This procedure is a scheduled maintenance task.

A. General



DO NOT REMOVE THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME. IF YOU REMOVE BOTH THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME, YOU WILL LOSE THE DATA FOR THE APU.

- (1) The APU controller and the data memory module have the data for the APU. The data memory module is located on the left side of the APU inlet plenum. When the APU is replaced, the new data memory module will send the new APU data to the APU controller.

B. References

Reference	Title
05-41-03-210-805	INTERNAL - ZONAL (GV): APU COMPARTMENT - AS VISIBLE WITH APU REMOVED (P/B 201)
21-00-01-100-801	Oil Contamination Removal from Air Conditioning and Pneumatic Systems (P/B 201)
36-12-04-100-801	Air Supply Duct Cleaning (P/B 701)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-13-01-200-801	Forward Support and Vibration Isolation Mount Inspection (P/B 601)
49-13-02-200-801	Aft Support and Vibration Isolation Mount Inspection (P/B 601)
49-13-03-200-801	Aft Mount Yoke Inspection (P/B 601)
49-13-04-000-801	Forward Mount Fitting Removal (P/B 401)

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(Continued)

Reference	Title
49-15-99-210-801	APU Inlet Duct and Intake Plenum Flange Seal Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-1561	Jack - Hydraulic Part #: 930002 Supplier: 65834 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1956	Protector - Thread, APU Cone Bolt Part #: G49007-5 Supplier: 81205 Opt Part #: G49007-1 Supplier: 81205 Opt Part #: PRE65B00780-1 Supplier: 81205
SPL-1962	Adapter - Jacking, APU Cradle Part #: J20009-68 Supplier: 81205 Opt Part #: J20009-64 Supplier: 81205 Opt Part #: J49005-1 Supplier: 81205
SPL-1964	Dolly - APU Transportation Part #: J49007-29 Supplier: 81205
SPL-1974	Cradle - APU, For Use with Transportation Dolly Part #: J49006-67 Supplier: 81205
SPL-2468	Sling - APU, Shop Handling Part #: J49002-29 Supplier: 81205
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1102	Tie - Plastic

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Removal

SUBTASK 49-11-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

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SUBTASK 49-11-01-010-005

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
313AL	Controls Bay Access Door

SUBTASK 49-11-01-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-11-01-860-014

- (4) Make sure the EICAS message 'FUEL VALVE APU' shows on the EICAS display.

SUBTASK 49-11-01-010-001

- (5) Open the APU access doors. APU Access Doors (Open), TASK 49-11-02-010-801

Open the access doors that follows:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Auxiliary Power Unit Removal

SUBTASK 49-11-01-020-001

- (1) Disconnect the electrical connections (Figure 401):

NOTE: There are 3 gearbox heaters on the APU gearbox. The gearbox heaters are identified with a HOT label.

- (a) Do the steps that follow to disconnect the APU wire harness:
- 1) Disconnect the APU wire harness connector, D49001P [1].
 - 2) Disconnect the APU wire harness connector, D49002P [2].
 - 3) Disconnect the APU wire harness connector, D49003P [4].

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- 4) Disconnect the APU wire harness connector, D49004P [3].
 - 5) Install caps on the connectors to prevent contamination.
 - 6) Open the clamps [16] that hold the APU wire harness [15] to the strut [13] (Figure 401) (View D).
 - 7) Open the clamps [14] that hold the APU wire harness [15] to the firewall (Figure 401) (View D).
 - 8) Attach the APU wire harness [15] to the APU surge duct with the plastic tie, STD-1102.
- (b) Do the steps that follow to disconnect the generator leads and connectors (Figure 401) (View C):
- 1) Remove the bolts [12] and the washers [11] that attach the terminal block cover [5] to the generator [10].
 - 2) Remove the terminal block cover [5].
 - 3) Put tags on the generator leads [7] to identify their correct position.
 - 4) Remove the captive washer nuts [6].
 - 5) Disconnect the leads [7].
 - 6) Install the captive washer nuts [6] on the generator [10].
NOTE: For the 6-point Spiralock (Belleville) nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.
 - 7) Install the terminal block cover [5] on the generator [10].
 - 8) Install the washers [11] and the bolts [12] that attach the terminal block cover [5] to the generator [10].
 - 9) Disconnect the electrical connector, DM24003A [8] from the generator [10].
 - 10) Disconnect the electrical connector, DM24003B [9] from the generator [10].
 - 11) Install caps on the electrical connectors to prevent contamination.
- (c) Do the steps that follow to disconnect the leads [18] and [20] from the electric starter motor [17] (Figure 401) (View E):
- 1) Move the terminal block cover [19] along the leads [18] and [20] to expose the terminals.
 - 2) Remove the nut [21] that attaches the positive lead [18] to the electric starter motor [17].
 - 3) Disconnect the positive lead [18] from the electric starter motor [17].
 - 4) Install the nut [21] on the electric starter motor [17].
 - 5) Remove the nut [22] that attaches the negative lead [20] to the electric starter motor [17].
 - 6) Disconnect the negative lead [20] from the electric starter motor [17].
 - 7) Install the nut [22] on the electric starter motor [17].
 - 8) Remove the terminal block cover [19] from the leads [18] and [20].
NOTE: The terminal block cover [19] is part of the APU assembly.
 - 9) Put the terminal block cover [19] on the electric starter motor [17].
- (d) Do the steps that follow to disconnect the ground jumpers [26] (Figure 401) (View F):

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- 1) Remove the nuts [25] and the washers [24] that attach the ground jumpers [26] to the gearbox [27].
- 2) Disconnect the ground jumpers [26] from the gearbox [27].
- 3) Install the washers [24] and the nuts [25] on the gearbox [27].

SUBTASK 49-11-01-020-002

- (2) Disconnect the ducts (Figure 402):
 - (a) Remove the clamp [42] that attaches the APU [43] to the bleed duct [41].
 - (b) Remove the exhaust duct clamp [44] that attaches the exhaust duct [45] to the APU [43].
 - (c) Loosen the 3 coupling nuts [46] and remove the APU drain assembly [47] from the APU [43].

H. Cradle/Hydraulic Jack Installation

SUBTASK 49-11-01-480-010

- (1) Do the steps that follow to disconnect the APU cradle, SPL-1974 from the APU transportation dolly, SPL-1964 (Figure 403):
 - (a) Remove the 4 pins [63] that attach the cradle [62] to the dolly [61].
 - (b) Use a fork-lift to remove the cradle [62] from the dolly [62].

SUBTASK 49-11-01-480-011

- (2) Do the steps that follow to connect the cradle [62] to the hydraulic jack, SPL-1561 [71] (Figure 404):
 - (a) Install the APU cradle jacking adapter, SPL-1962 on the hydraulic jack [71].
 - (b) Set the cradle [62] on the hydraulic jack [71].

NOTE: The "I" section of the cradle [62] fits between the pegs on the hydraulic jack [71].
 - (c) Install the retaining plates [73] and the bolts [72].

SUBTASK 49-11-01-480-012

- (3) Do the steps that follow to connect the cradle [62] to the APU [43] (Figure 404):
 - (a) Put the hydraulic jack [71] on the maintenance stand.
 - 1) Make sure the hydraulic jack [71] is centered under the APU [43].
 - (b) Raise the maintenance stand to the tail cone.
 - (c) Remove the bolts [81] that attach the installation fittings [80] to the cradle [62].
 - (d) Remove the installation fittings [80] from the cradle [62].
 - (e) Attach the installation fittings [80] to the forward mount fittings [79] with the pins [78].
 - (f) Raise the hydraulic jack [71] until the aft support arms [74] are in position.
 - (g) Move the aft support arms [74] up and install the pins [77].

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62]. The bolts on the cradle [62] (View B) are used as hinges to turn the aft support arms [74] away from the APU [43].
 - 1) Attach the aft support arms [74] to the bottom hole of the lift flange [75] with the pins [76].
 - (h) Install the bolts that attach the installation fittings [80] to the cradle [62].

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I. Auxiliary Power Unit (APU) Removal

SUBTASK 49-11-01-020-006

- (1) Do the steps that follow to disconnect the fuel supply line [23] from the APU [43] (Figure 401) View E.
 - (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 under the fuel supply line [23].
 - (b) Disconnect the fuel supply line [23] from the APU [43].
 - 1) Hold the reducer with a wrench and disconnect the fuel supply line [23] from the reducer.

SUBTASK 49-11-01-020-003

- (2) Disconnect the APU from the mounts (Figure 405):
 - (a) One at a time, slowly loosen nut [92], nut [97], nut [99] 2 full turns.
 - (b) Continue to loosen nut [92], nut [97], nut [99] until the hydraulic jack fully supports the weight of the APU [43].
 - (c) Remove the nut [92], nut [97], nut [99] and the washer [93], washer [98].

NOTE: It is necessary that the nut [92], nut [97], nut [99] must be dye-penetrant inspected for its subsequent APU installation or use a new nut.



WARNING

MAKE SURE THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONEBOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU MOUNTS CAN GET CAUGHT ON THE THREAD PROTECTOR. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (d) Install the APU cone bolt thread protector, SPL-1956 [105] on the cone bolts [104].

NOTE: The cone bolts are a part of the shock mounts [91], [95], and [101].

SUBTASK 49-11-01-020-004

- (3) Remove the APU:
 - (a) Slowly lower the APU [43] out of the tailcone.
 - (b) Use a forklift to move the APU [43] and the cradle [62]/hydraulic jack [71] off of the maintenance stand.
 - (c) Use a fork-lift to hold the APU [43] and the cradle [62] while you remove the bolts [72] and the retaining plates [73] (Figure 404).
 - (d) Use the fork-lift to lift the APU [43] and the cradle [62] off of the hydraulic jack [71].
 - (e) Set the APU [43] and the cradle [63] onto the dolly [61] (Figure 403)
 - (f) Install the 4 pins [63] (Figure 403).

SUBTASK 49-11-01-530-001

- (4) If necessary for transportation, prepare the APU and the APU cradle, SPL-1974 (Figure 406):

NOTE: The APU cradle has an installation configuration and a transportation configuration. The installation configuration has forward fittings with quick release pins. The installation configuration is necessary to remove and install the APU in the compartment. Either the installation or the transportation configuration may be used to hold the APU during travel. If you choose to transport the APU with the cradle in the transportation configuration, you must remove the forward mount fittings from the APU.

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CONNECT THE SHOP HANDLING SLING TO THE APU TO REMOVE THE FORWARD MOUNT FITTINGS. IF YOU USE ANY OTHER TOOL TO LIFT THE APU YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (a) Do the steps that follow to connect the APU shop handling sling, SPL-2468 [106] to the APU [43]:
 - 1) Put the forward sling bracket [108] on the APU so the bolts [107] align with the forward lift lugs [109].
 - a) Tighten the bolts [107] to 204-276 pound-inches.
 - 2) Connect the aft cable assembly [110] to the top hole of the right lift flange [75] with the pin [111].
 - 3) Connect the aft cable assembly [110] to the top hole of the left lift flange [75] with the pin [111].
- (b) Use the fork-lift to lift the APU with the APU shop handling sling, SPL-2468 to tighten the forward and aft cable assemblies.
- (c) Do the steps that follow to disconnect the APU [43] from the cradle [62]:
 - 1) Remove the bolts [81] that attach the installation fittings [80] to the cradle [62] (Figure 404).
 - 2) Remove the 2 pins [76] that attach the aft support arms [74] to the lift flanges [75] (Figure 406).
 - 3) Remove the 2 pins [77] that lock the aft support arms [74] in position (Figure 406).
 - 4) Turn the aft support arms [74] away from the APU [43].

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62].
 - 5) Lift the APU to make clearance between the installation fittings [80] and the cradle [62].
 - 6) Remove the 2 pins [78] that attach the installation fittings [80] to the forward mount fittings [79] (Figure 404).
 - 7) Remove the installation fittings [80] from the APU [43].
- (d) To remove the forward mount fittings [79] from the APU, do this task: Forward Mount Fitting Removal, TASK 49-13-04-000-801.
- (e) Connect the APU [43] to the APU cradle, SPL-1974 [62] and the APU transportation dolly, SPL-1964 [61] (Figure 406):
 - 1) Attach the transportation fittings [113] to the APU [43]. Use the bolts [112] that are kept with the transportation fittings.
 - 2) Lower the APU [43] into the cradle - dolly, [62] and [61], assembly.
 - 3) Turn the aft support arms [74] up.

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62]. The bolts are used as hinges to turn the aft support arms [74] away from the APU [43].
 - 4) Install the pins [77] that lock the aft support arms [74] to the vertical supports for the cradle [62].
 - 5) Install the pins [76] that attach the lift flanges [75] to the aft support arms [74].
 - 6) Install the bolts [81] that attach the transportation fittings [113] to the cradle [62].



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- 7) Loosen the 3 bolts [107] and remove the forward sling bracket [108] from the gearbox [27].
NOTE: The bolts [107] cannot be removed from the forward sling bracket [108].
- 8) Remove the pin [111] that attaches the aft cable assembly [110] to the left lift flange [75].
- 9) Remove the pin [111] that attaches the aft cable assembly [110] to the right lift flange [75].

SUBTASK 49-11-01-020-007

- (5) Make sure you install all necessary protection covers.

J. APU Mount Inspection

NOTE: With the APU removed, the shock mounts will be free to move slightly in relation to the struts. This freedom of movement is intentional and should not be considered an indication of worn parts. Worn parts will be identified by evidence of galling or by excessive movement of the shock mount. When the APU is installed, all supports should be tight and rigid.

SUBTASK 49-11-01-210-010

- (1) Visually examine the forward struts and the shockmounts for cracks, wear and damage.
 - (a) If there is signs of wear, inspect the forward support and vibration isolators.
 - 1) Do this task: Forward Support and Vibration Isolation Mount Inspection, TASK 49-13-01-200-801.

SUBTASK 49-11-01-210-011

- (2) Visually examine the aft struts and the shockmounts for cracks, wear and damage.
 - (a) If there is signs of wear, inspect the aft support and vibration isolators.
 - 1) Do this task: Aft Support and Vibration Isolation Mount Inspection, TASK 49-13-02-200-801.

SUBTASK 49-11-01-210-012

- (3) Visually examine the aft mount yoke assembly for cracks, wear and damage.
 - (a) If there is signs of wear, inspect the aft mount yoke assembly.
 - 1) Do this task: Aft Mount Yoke Inspection, TASK 49-13-03-200-801.

SUBTASK 49-11-01-210-013

- (4) Visually examine the APU mounts for cracks, wear and damage.

SUBTASK 49-11-01-210-014

- (5) Visually examine the internal and external portions of the inlet duct and inlet plenum seal for condition and security.
 - (a) Do this task: APU Inlet Duct and Intake Plenum Flange Seal Inspection, TASK 49-15-99-210-801.

SUBTASK 49-11-01-210-021

- (6) Visually examine the bleed duct [41] (Figure 402) for signs of oil and other contamination.
 - (a) If you find signs of oil and other contamination, then do these tasks:
 - 1) Clean the bleed duct [41]. To clean it, do this task: Air Supply Duct Cleaning, TASK 36-12-04-100-801.
 - 2) Remove the oil contamination from the air conditioning and pneumatic systems. To remove it, do this task: Oil Contamination Removal from Air Conditioning and Pneumatic Systems, TASK 21-00-01-100-801.

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SUBTASK 49-11-01-210-015

- (7) Do this task: INTERNAL - ZONAL (GV): APU COMPARTMENT - AS VISIBLE WITH APU REMOVED, TASK 05-41-03-210-805.

———— **END OF TASK** ————

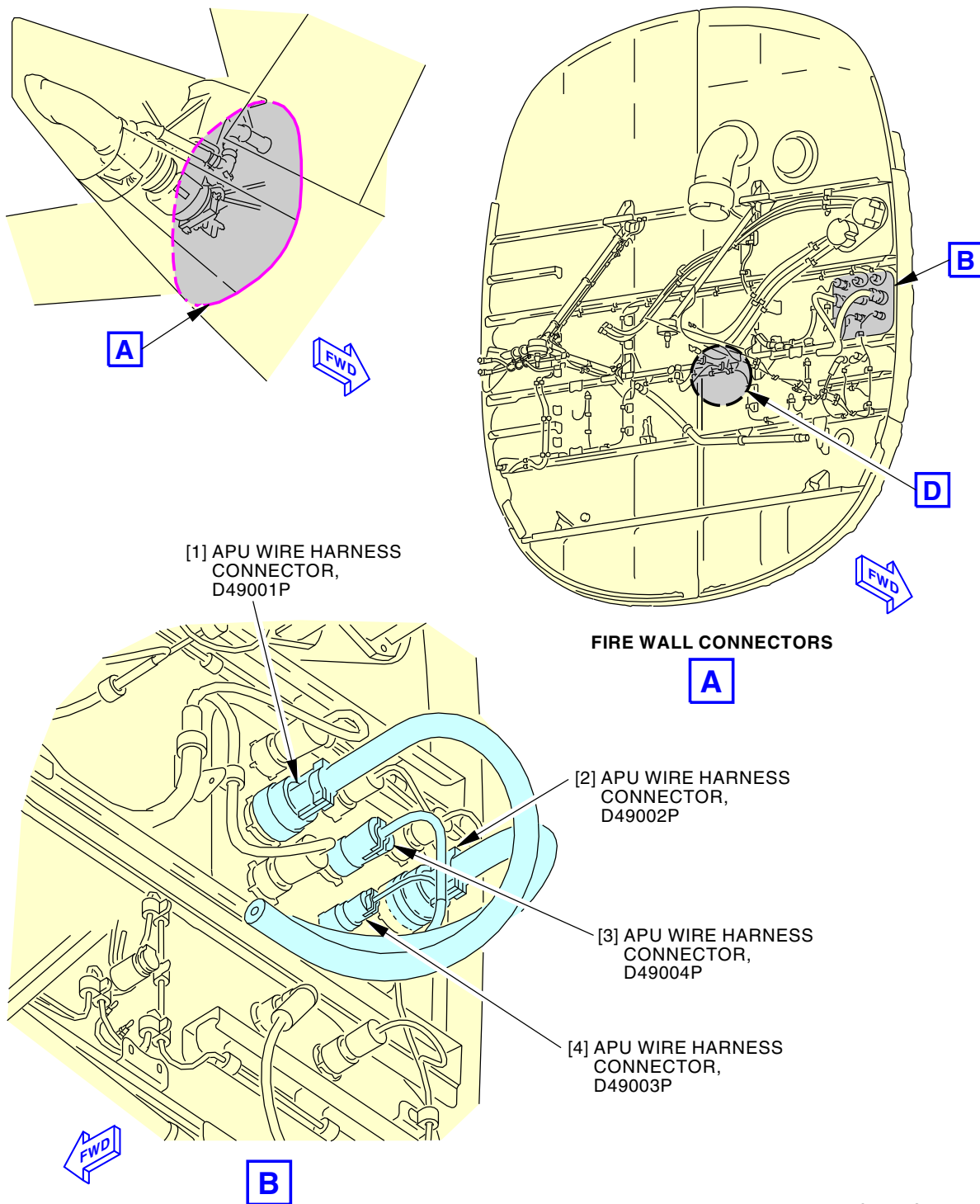
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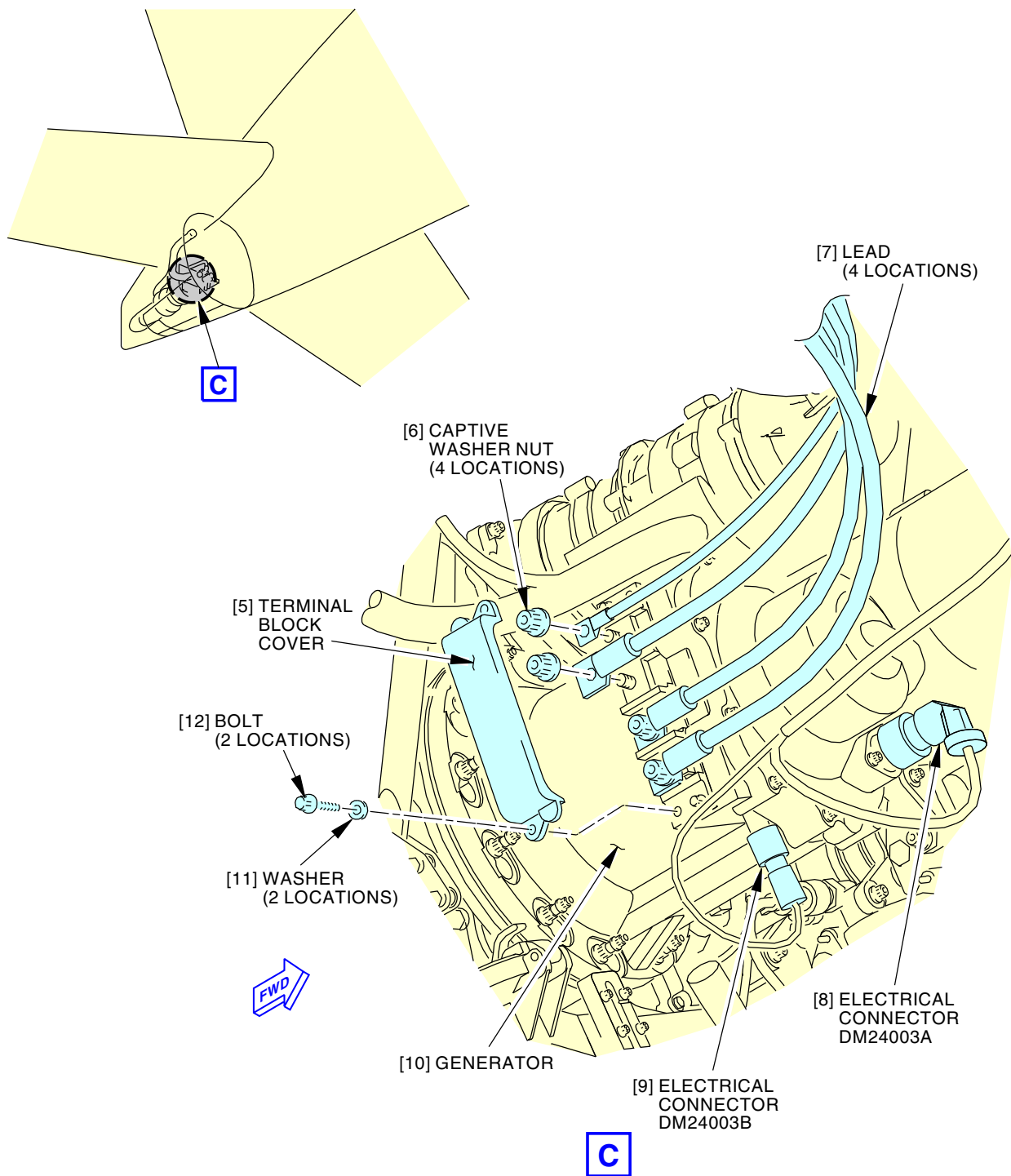
**APU Electrical and Tubing Connections (Hydraulic Jack Procedure)
Figure 401/49-11-01-990-801 (Sheet 1 of 5)**

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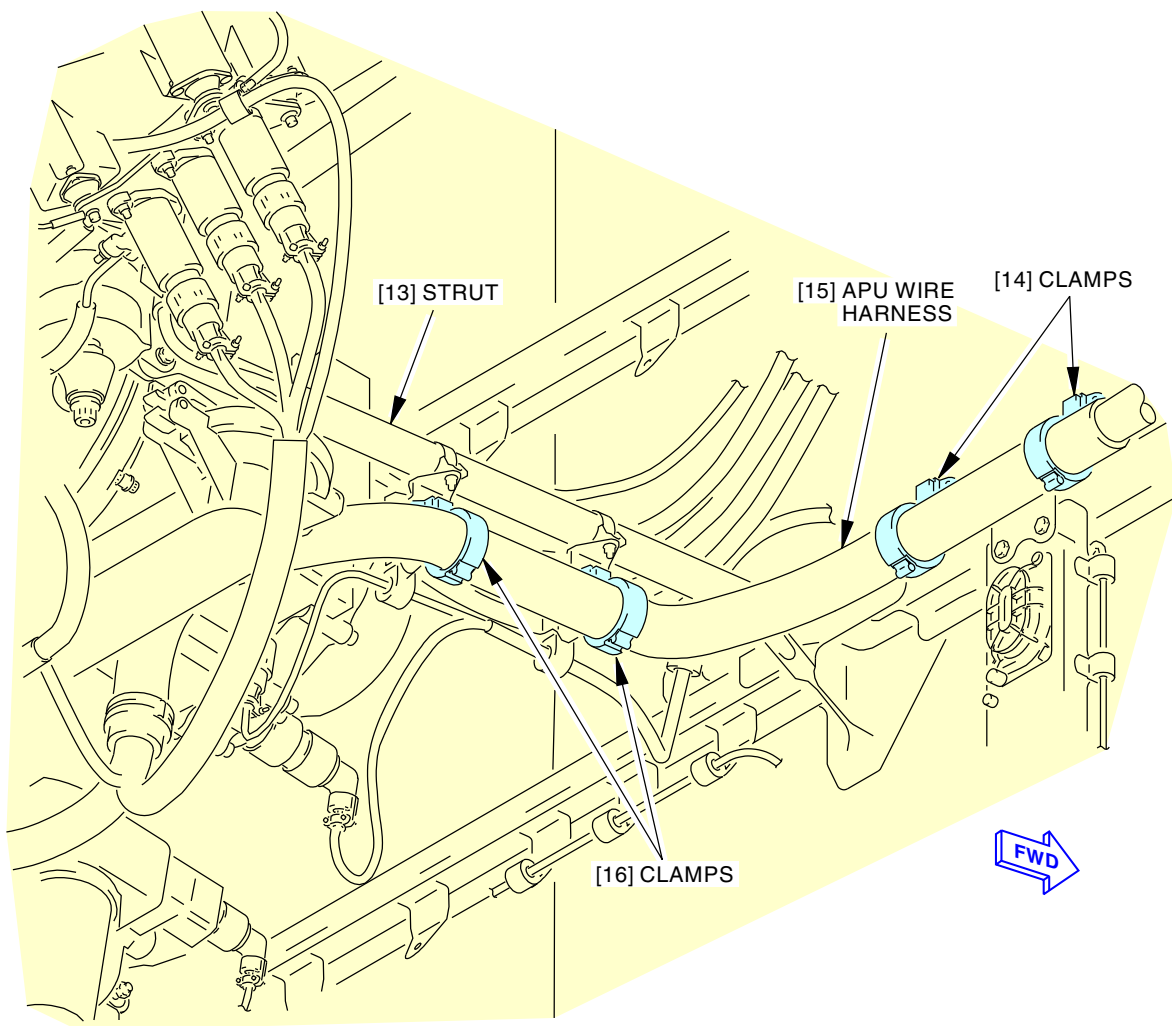
APU Electrical and Tubing Connections (Hydraulic Jack Procedure)
Figure 401/49-11-01-990-801 (Sheet 2 of 5)

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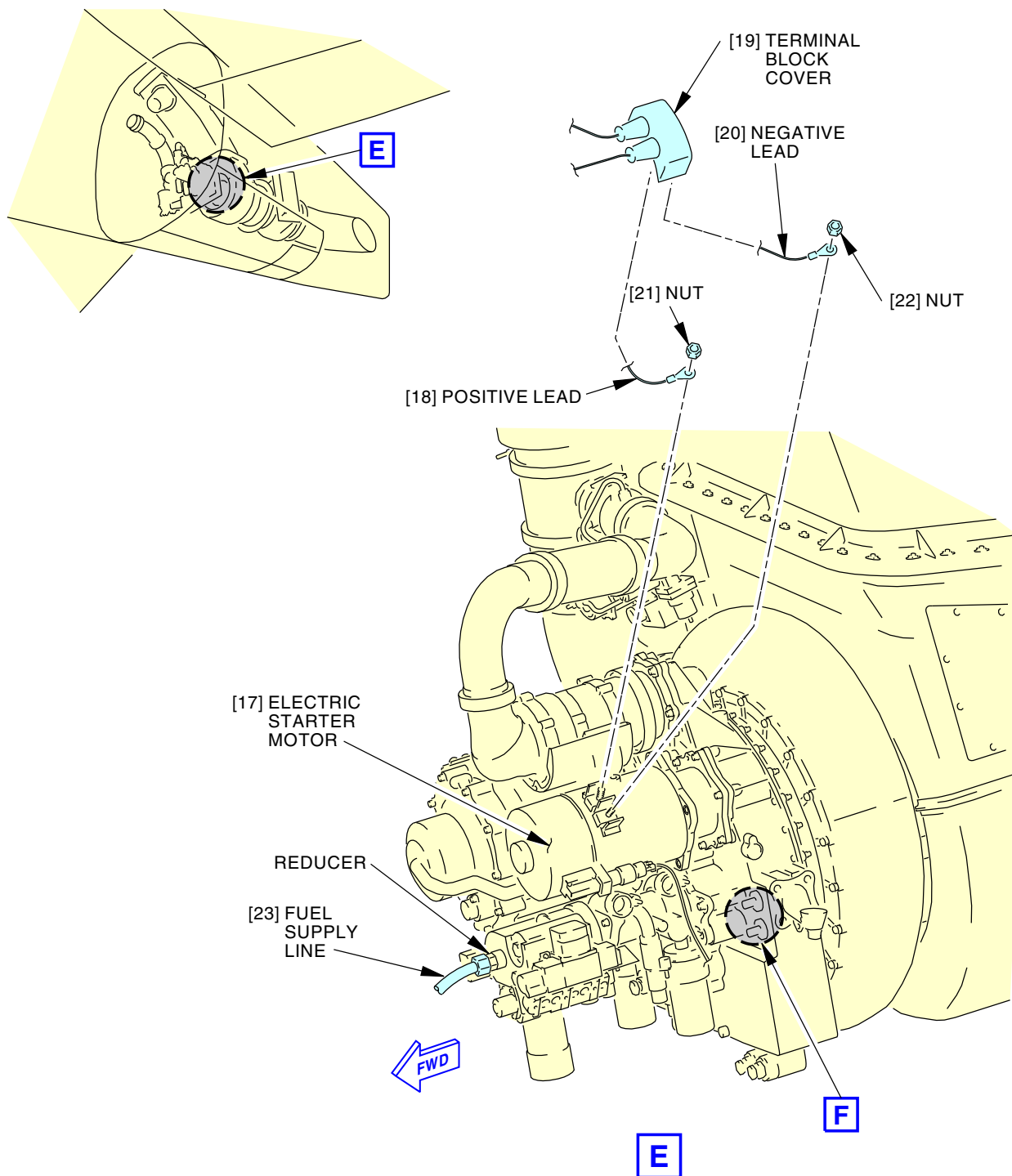
**APU Electrical and Tubing Connections (Hydraulic Jack Procedure)
Figure 401/49-11-01-990-801 (Sheet 3 of 5)**

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APU Electrical and Tubing Connections (Hydraulic Jack Procedure)
Figure 401/49-11-01-990-801 (Sheet 4 of 5)

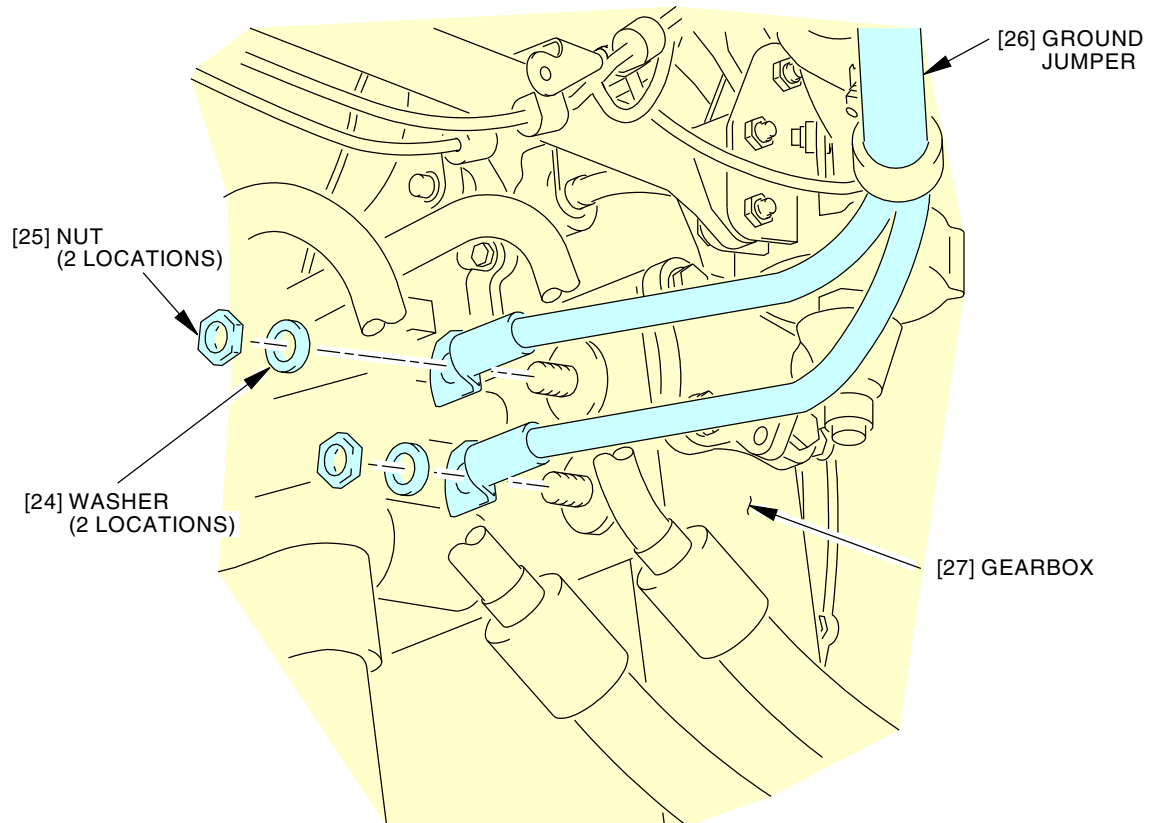
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APU Electrical and Tubing Connections (Hydraulic Jack Procedure)
Figure 401/49-11-01-990-801 (Sheet 5 of 5)

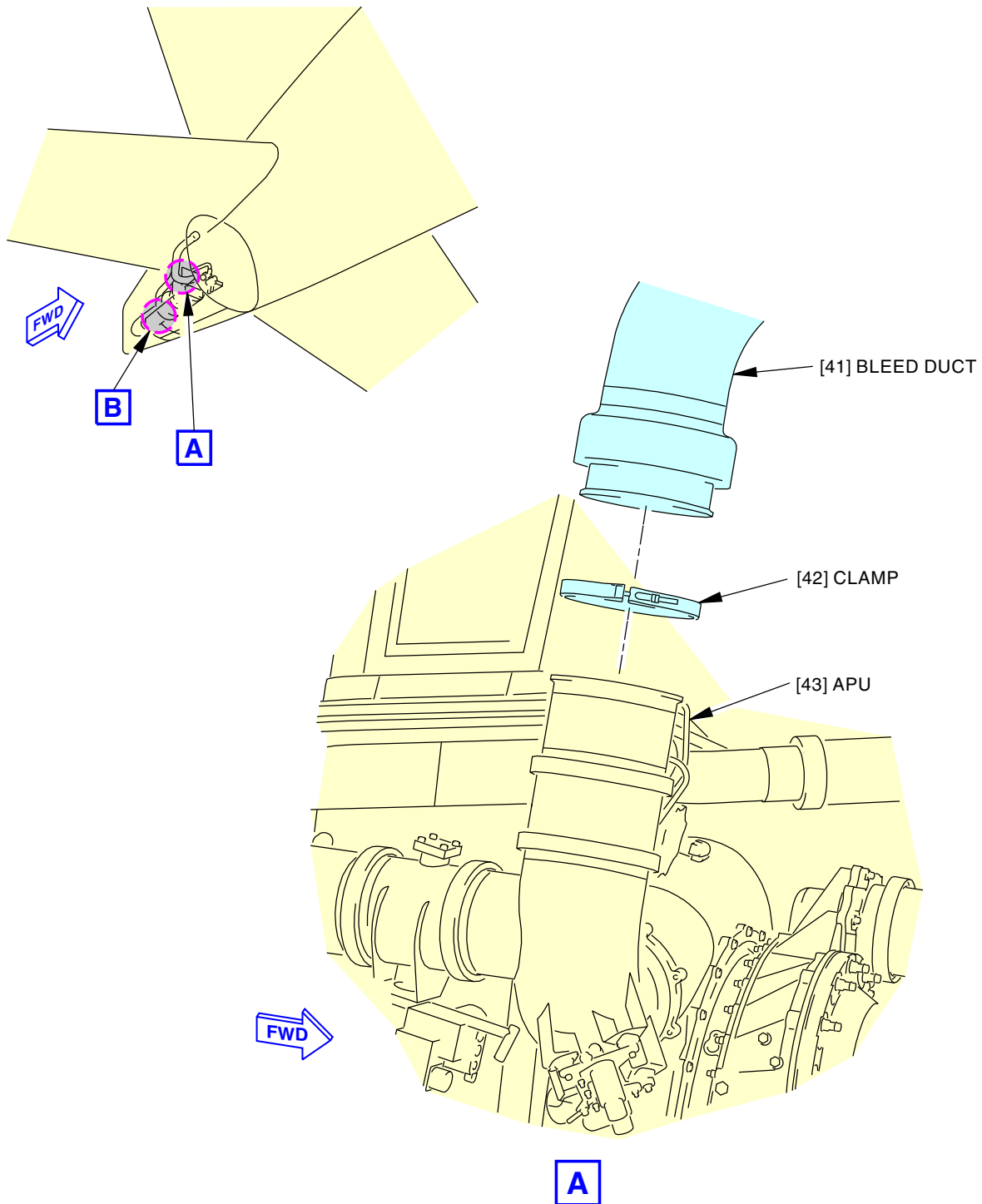
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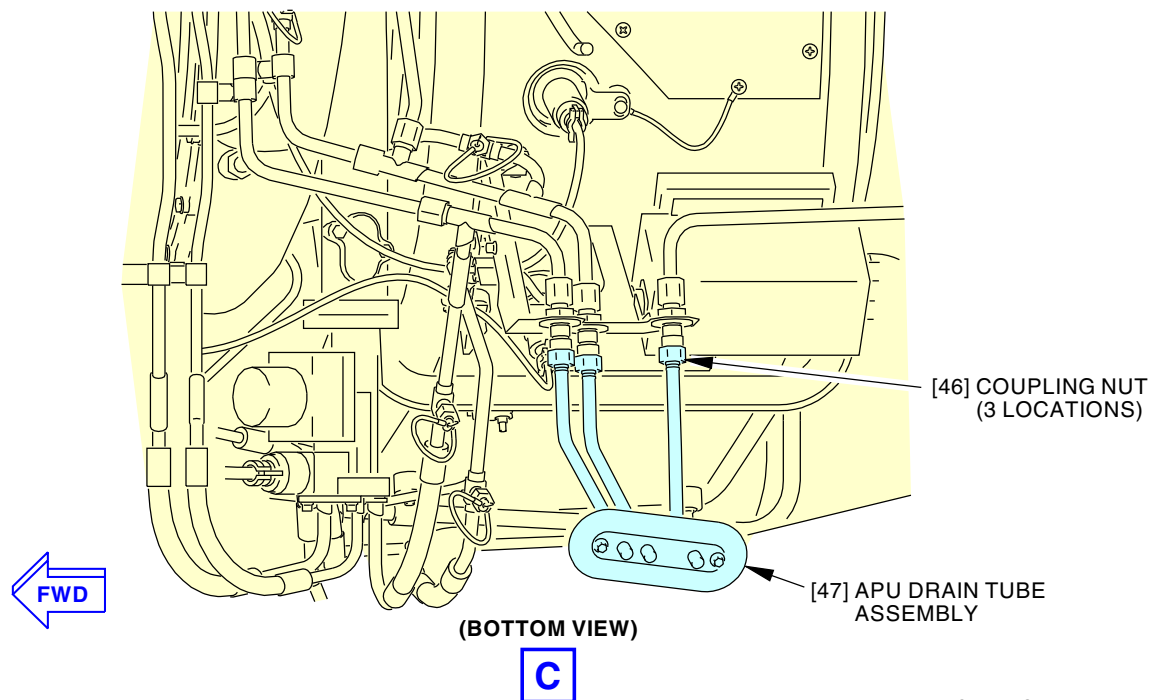
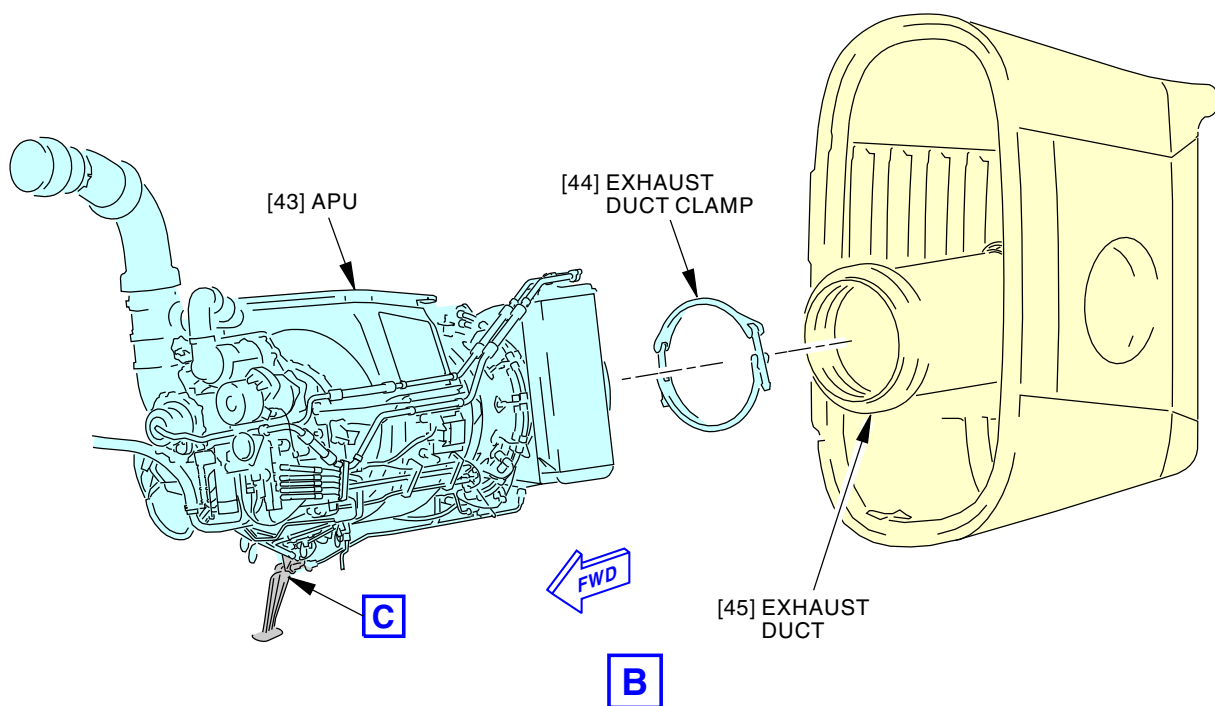
APU Duct and Drain Connections (Hydraulic Jack Procedure)
Figure 402/49-11-01-990-802 (Sheet 1 of 2)

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APU Duct and Drain Connections (Hydraulic Jack Procedure)
Figure 402/49-11-01-990-802 (Sheet 2 of 2)

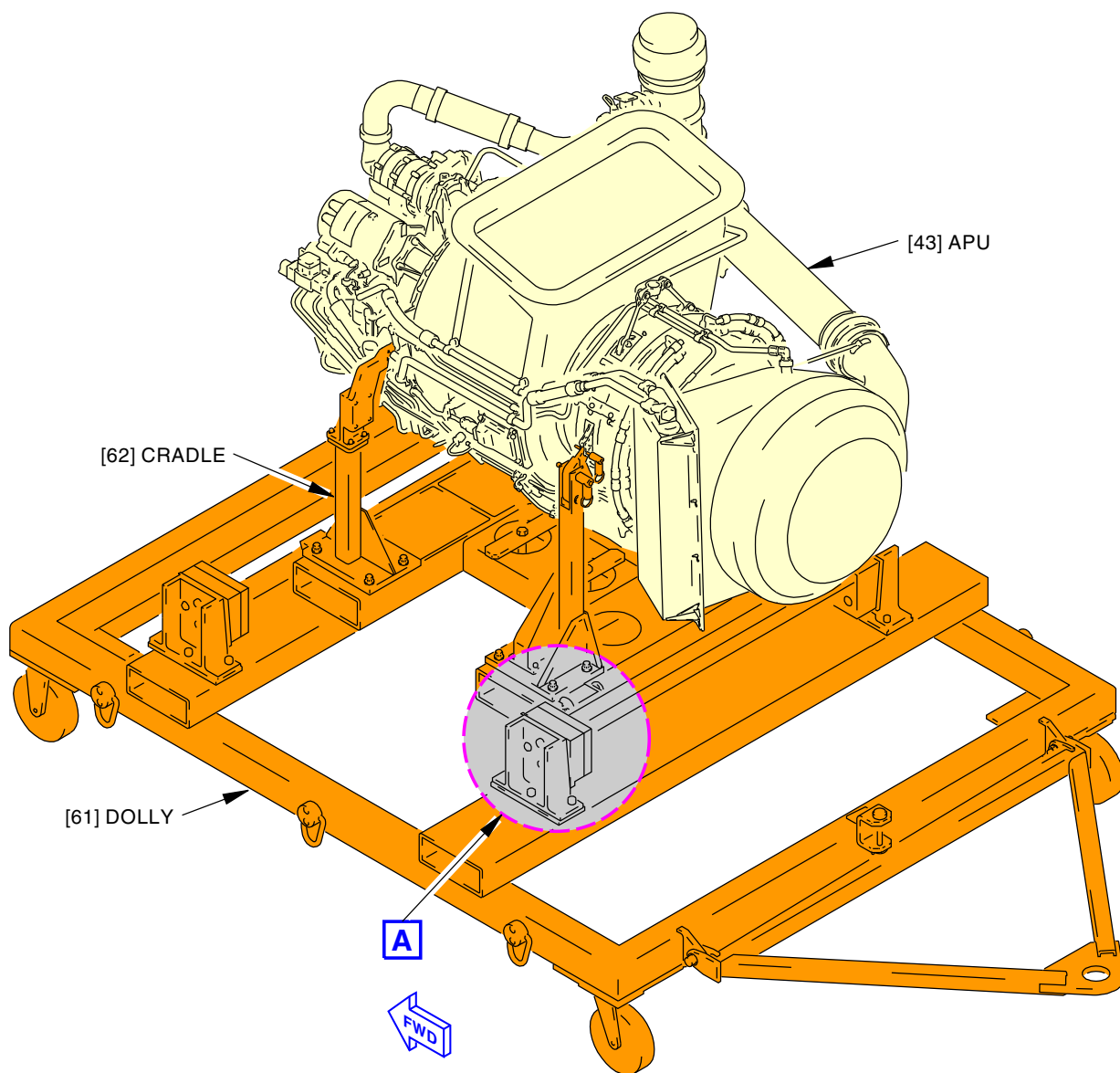
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APU Cradle/Dolly Interface (Hydraulic Jack Procedure)
Figure 403/49-11-01-990-803 (Sheet 1 of 2)

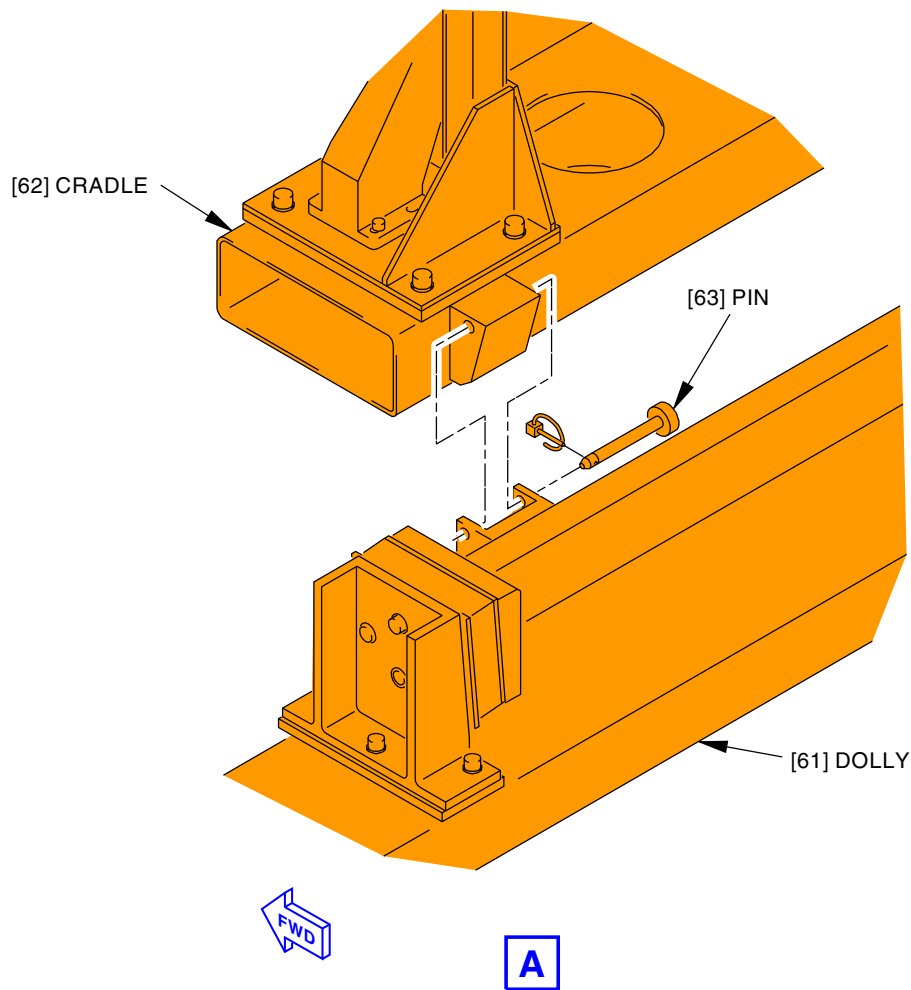
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APU Cradle/Dolly Interface (Hydraulic Jack Procedure)
Figure 403/49-11-01-990-803 (Sheet 2 of 2)

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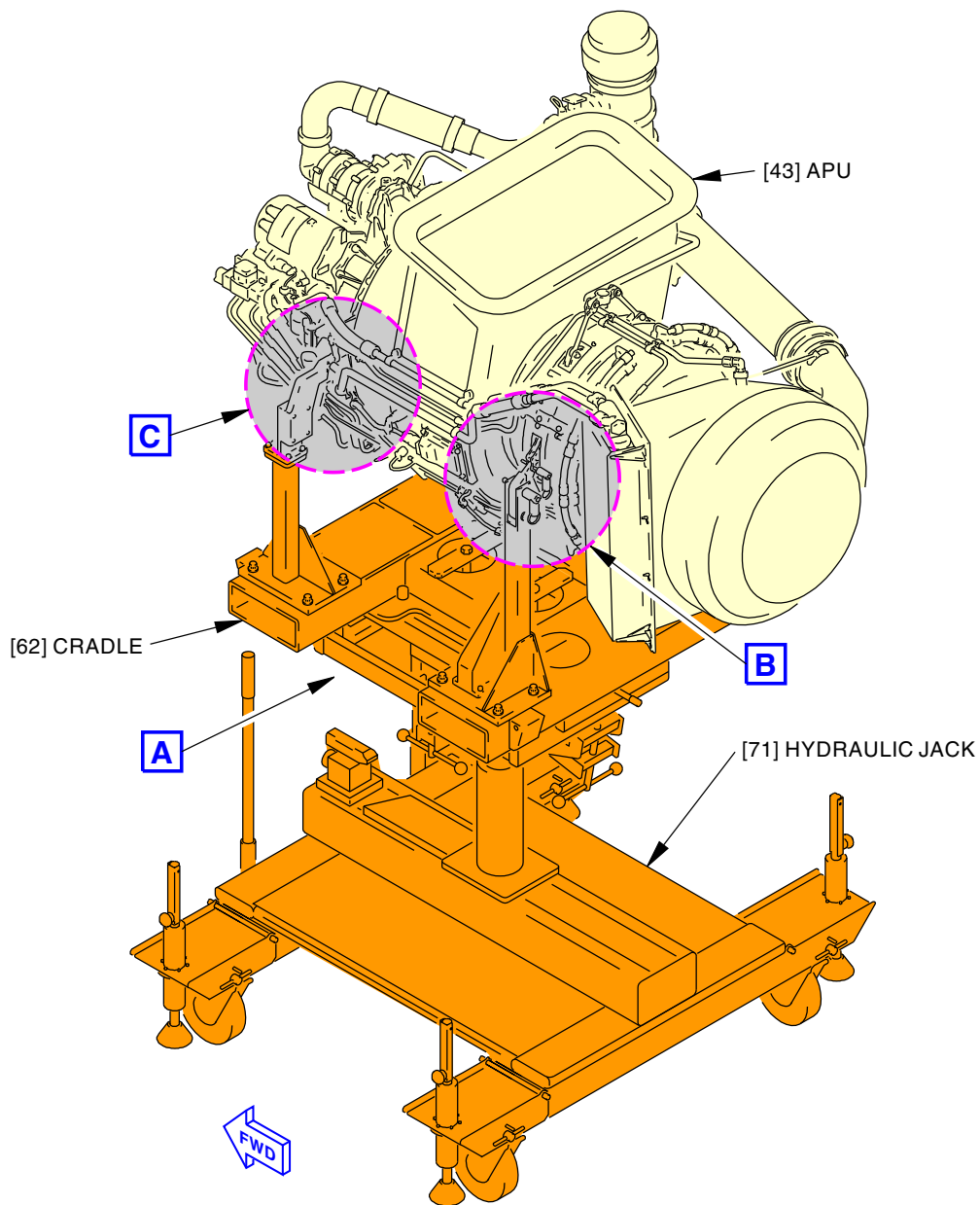
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Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)
Figure 404/49-11-01-990-804 (Sheet 1 of 4)

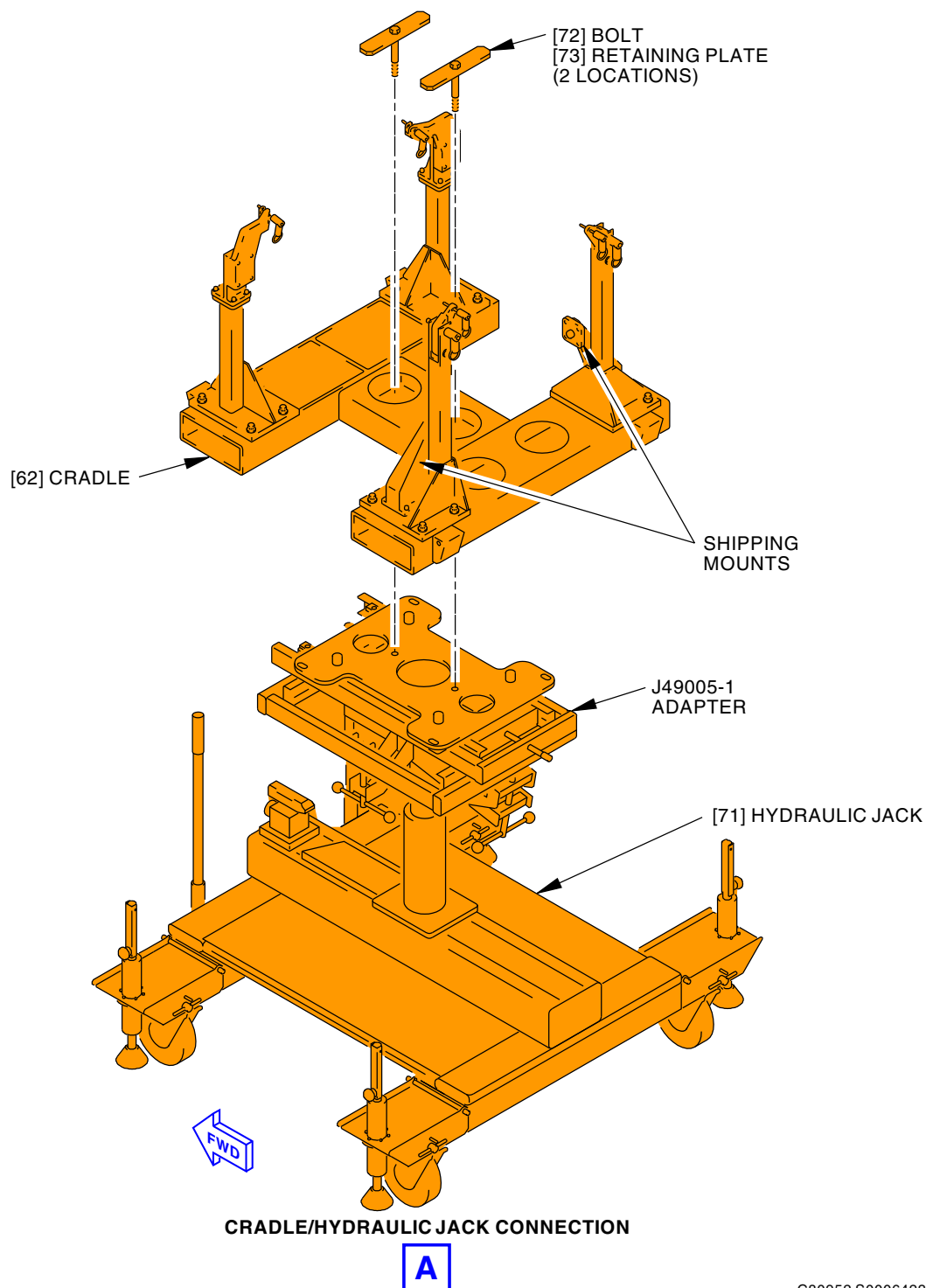
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Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)
Figure 404/49-11-01-990-804 (Sheet 2 of 4)

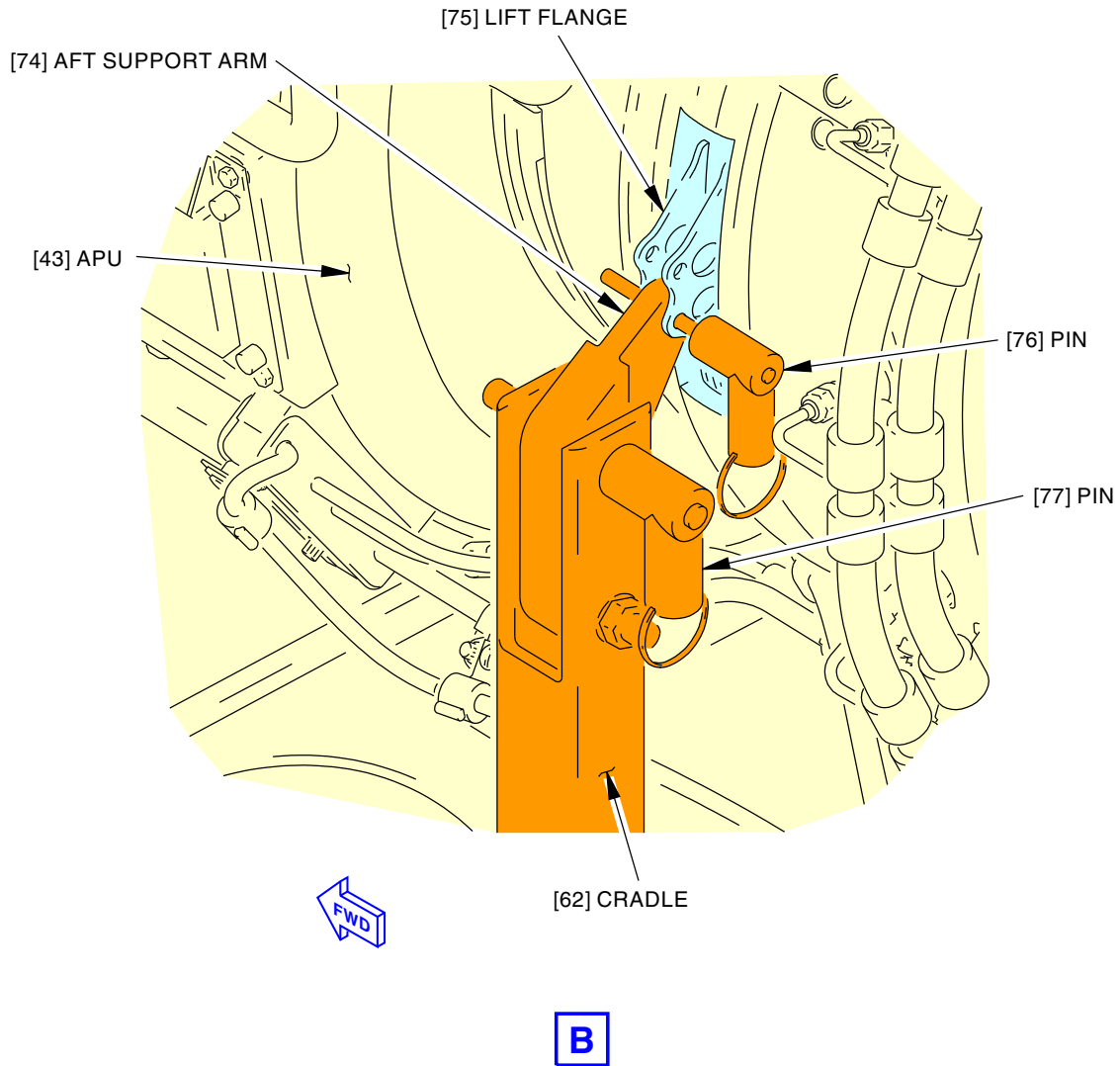
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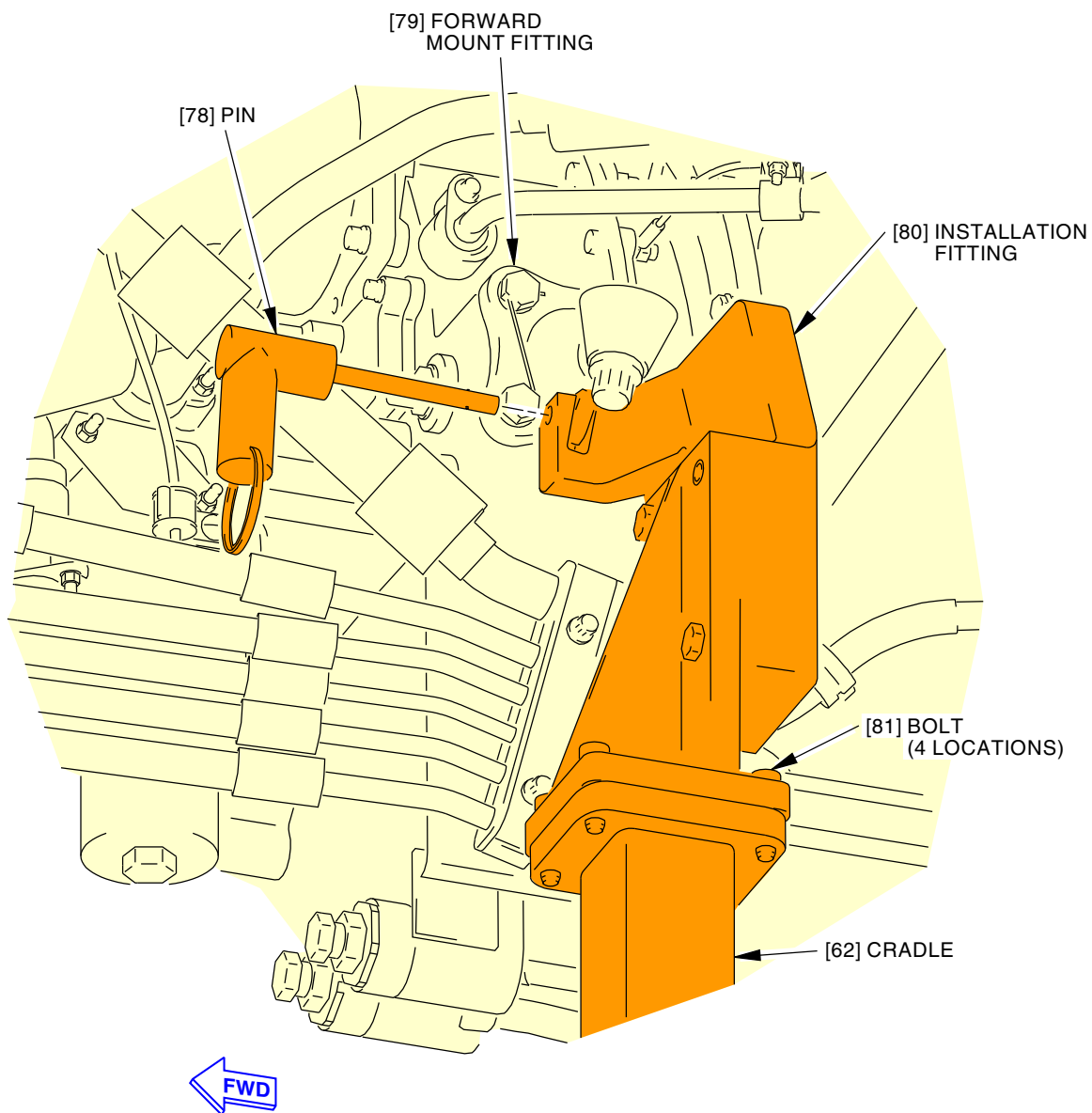
Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)
Figure 404/49-11-01-990-804 (Sheet 3 of 4)

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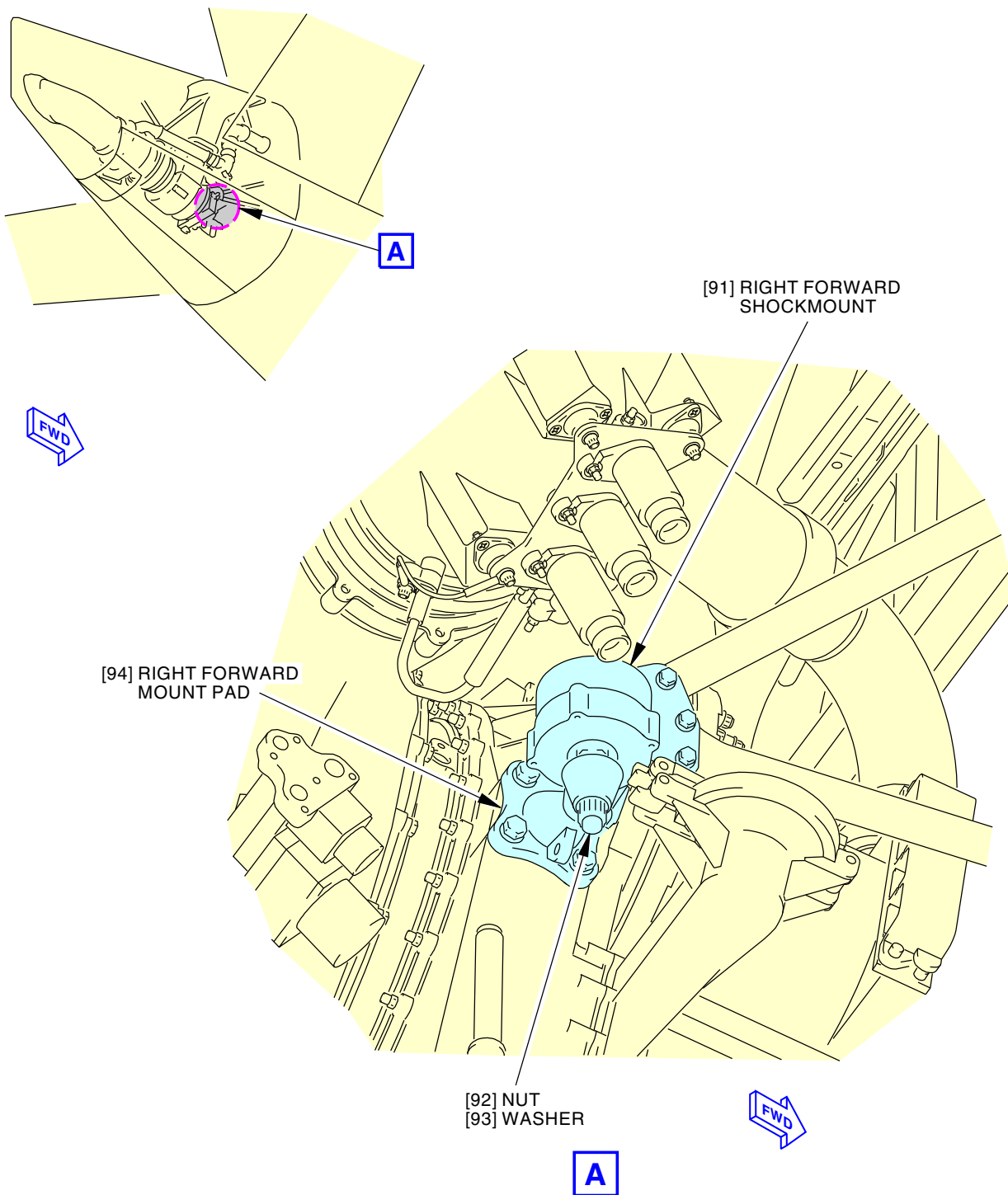
Auxiliary Power Unit (APU) Installation (Hydraulic Jack Procedure)
Figure 404/49-11-01-990-804 (Sheet 4 of 4)

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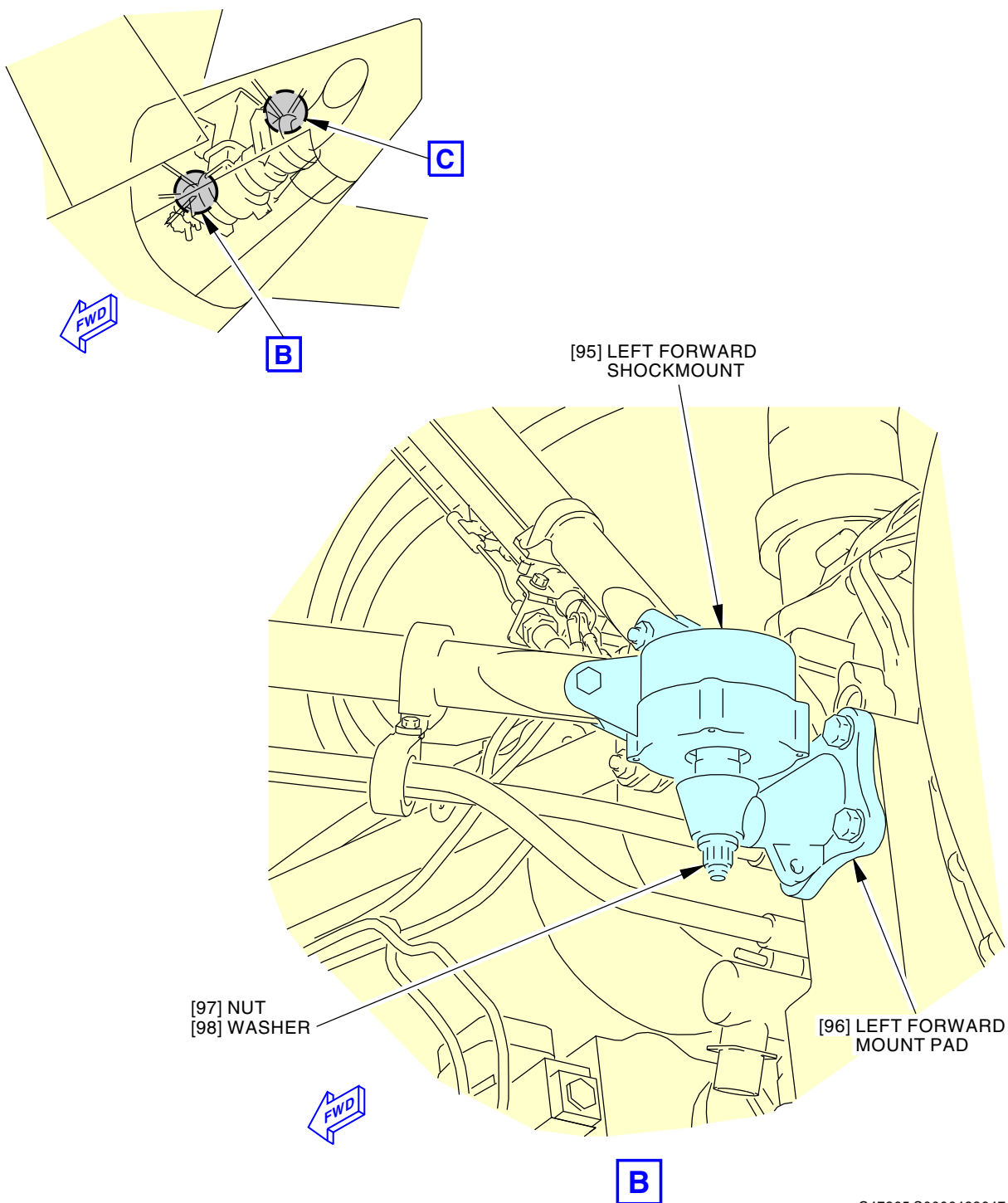
**APU Mount Connections (Hydraulic Jack Procedure)
Figure 405/49-11-01-990-805 (Sheet 1 of 4)**

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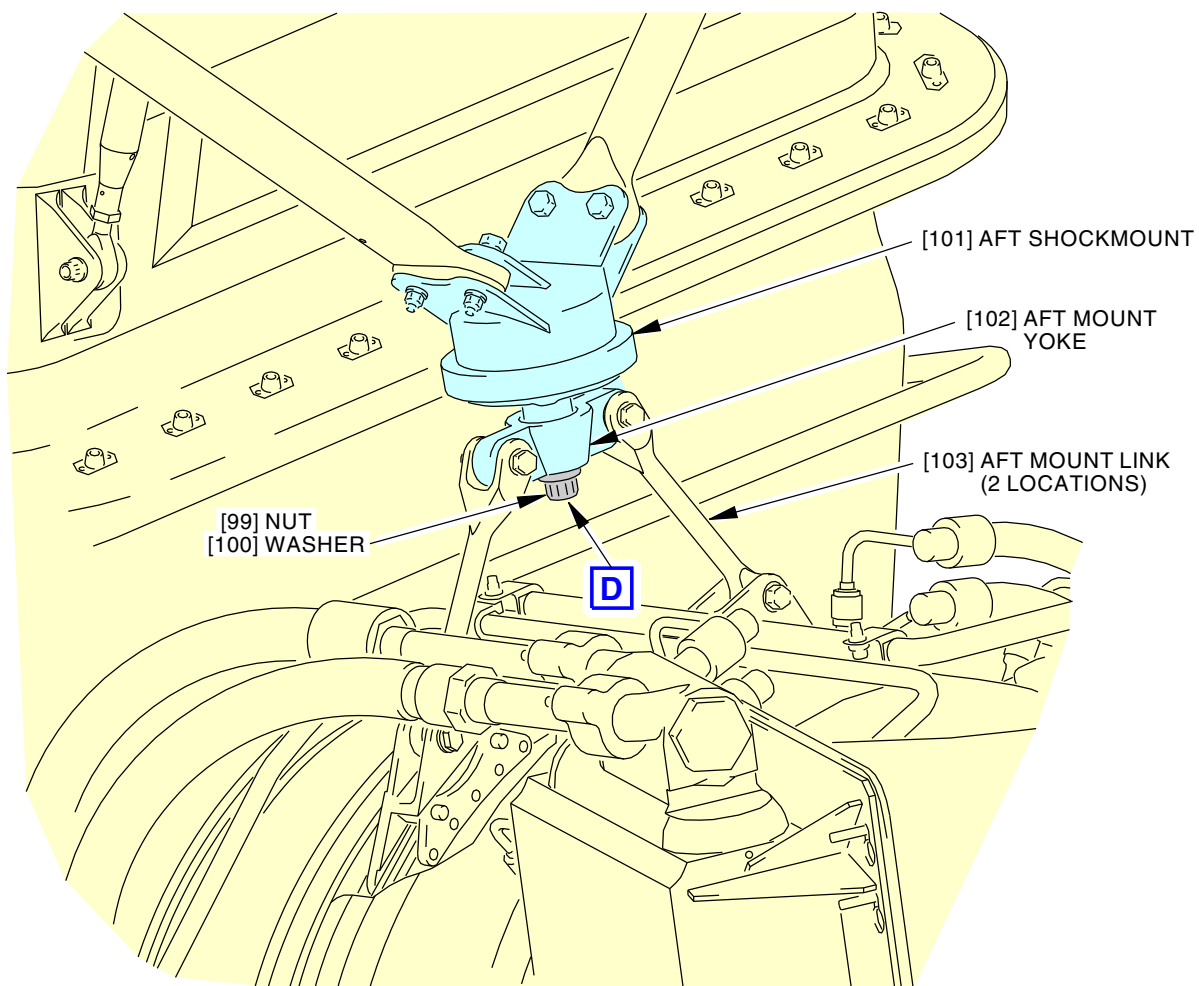
**APU Mount Connections (Hydraulic Jack Procedure)
Figure 405/49-11-01-990-805 (Sheet 2 of 4)**

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APU Mount Connections (Hydraulic Jack Procedure)
Figure 405/49-11-01-990-805 (Sheet 3 of 4)

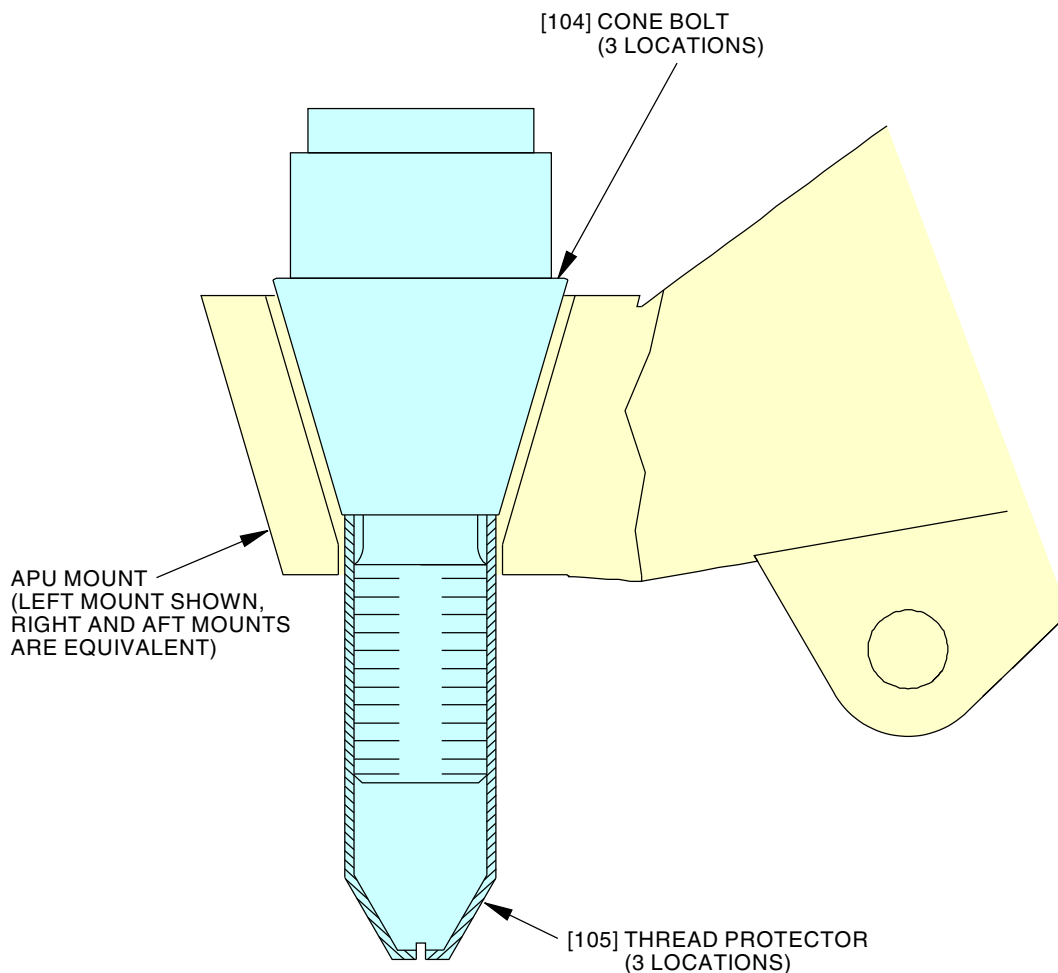
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D

NOTE:

MAKE SURE THE THREAD PROTECTORS ARE FULLY SEATED AGAINST THE CONE BOLTS. THIS WILL PREVENT INTERFERENCE BETWEEN THE THREAD PROTECTORS AND THE APU MOUNTS WHEN THE APU IS LOWERED.

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**APU Mount Connections (Hydraulic Jack Procedure)
Figure 405/49-11-01-990-805 (Sheet 4 of 4)**

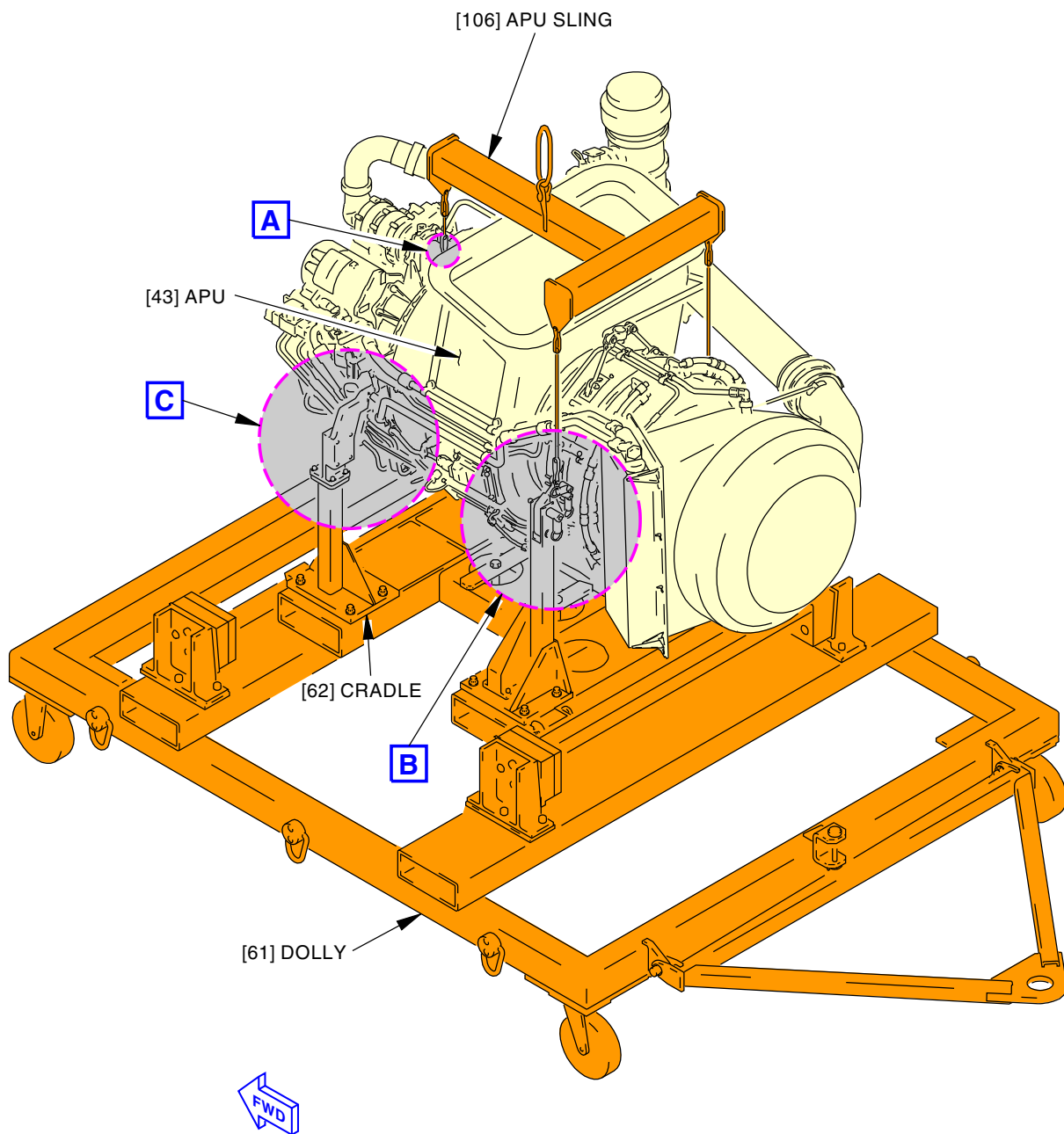
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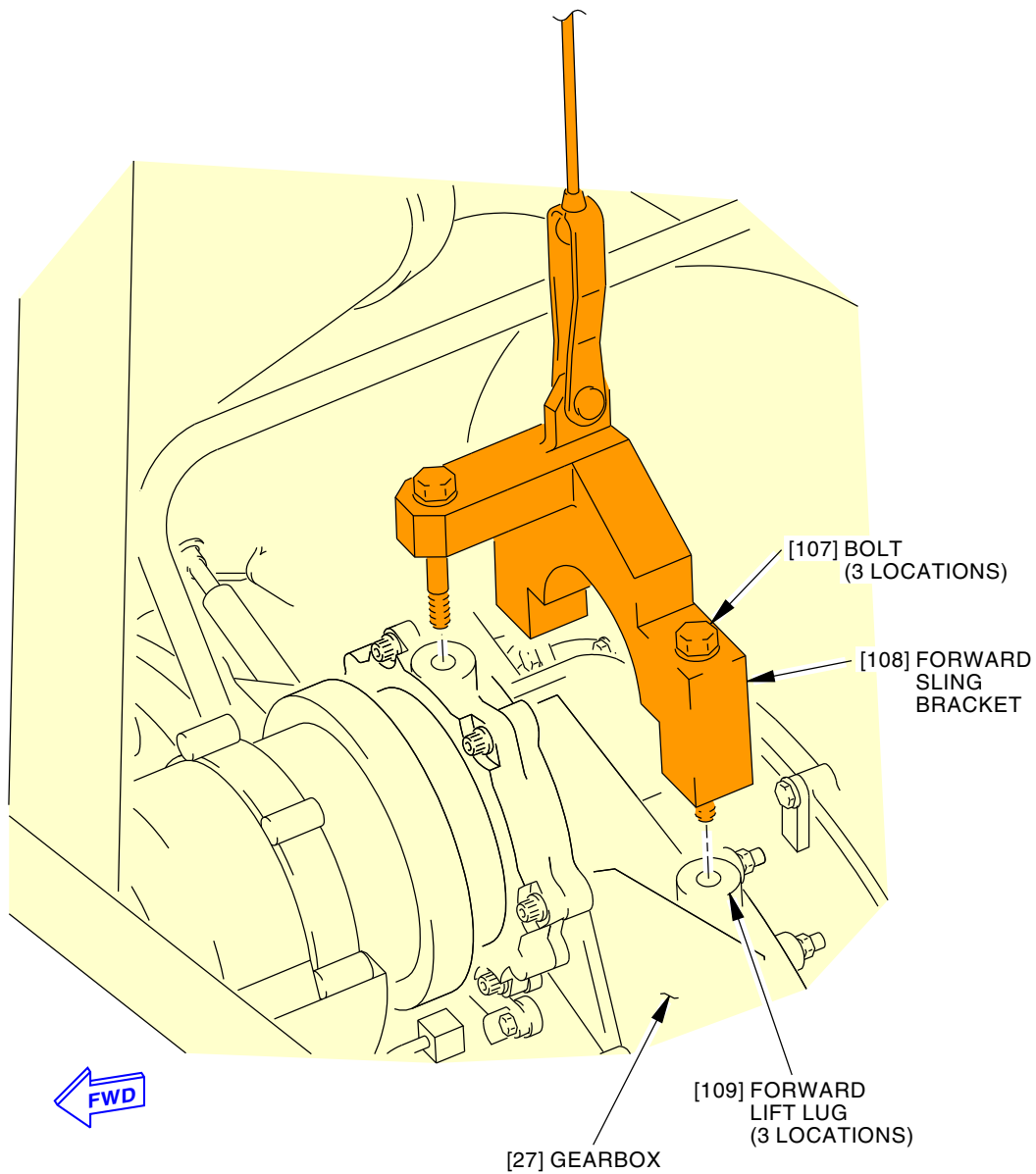
**APU/Sling Interface (Hydraulic Jack Procedure)
Figure 406/49-11-01-990-811 (Sheet 1 of 4)**

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FORWARD SLING BRACKET INSTALLATION

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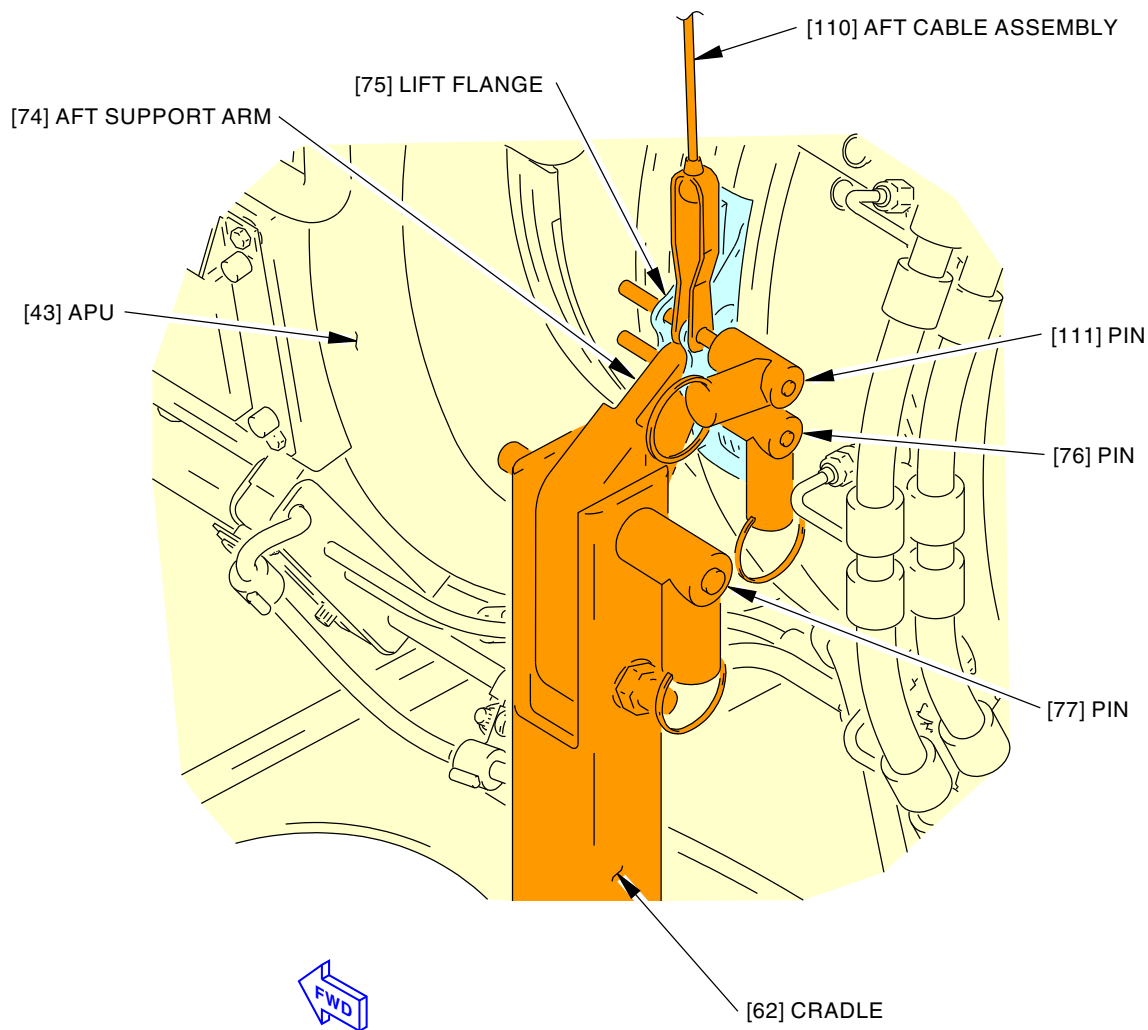
**APU/Sling Interface (Hydraulic Jack Procedure)
Figure 406/49-11-01-990-811 (Sheet 2 of 4)**

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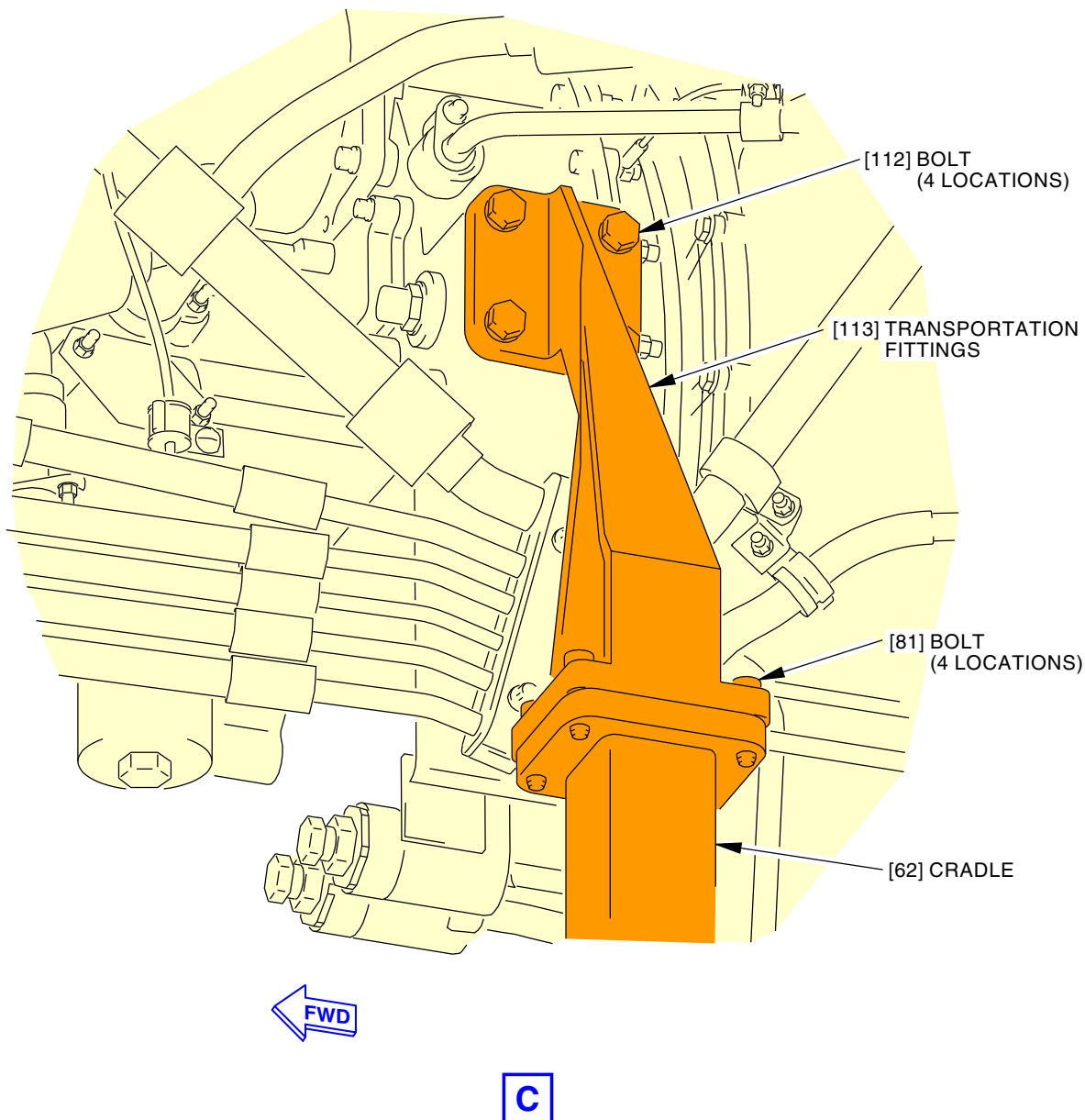
**APU/Sling Interface (Hydraulic Jack Procedure)
Figure 406/49-11-01-990-811 (Sheet 3 of 4)**

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APU/Sling Interface (Hydraulic Jack Procedure)
Figure 406/49-11-01-990-811 (Sheet 4 of 4)

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TASK 49-11-01-400-801

3. Auxiliary Power Unit Installation (Hydraulic Jack Method)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task contains the steps to install the APU into the tailcone.

B. References

Reference	Title
12-13-04	AUXILIARY POWER UNIT REPLENISHING
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-13-04-400-801	Forward Mount Fitting Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meters - 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 #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
SPL-1561	Jack - Hydraulic Part #: 930002 Supplier: 65834 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1956	Protector - Thread, APU Cone Bolt Part #: G49007-5 Supplier: 81205 Opt Part #: G49007-1 Supplier: 81205 Opt Part #: PRE65B00780-1 Supplier: 81205
SPL-1964	Dolly - APU Transportation Part #: J49007-29 Supplier: 81205
SPL-1974	Cradle - APU, For Use with Transportation Dolly Part #: J49006-67 Supplier: 81205
SPL-2468	Sling - APU, Shop Handling Part #: J49002-29 Supplier: 81205
STD-583	Mallet - Non-metallic

D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III

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E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
92	Nut	49-11-01-01-125	ARO ALL
97	Nut	49-11-01-01-125	ARO ALL
99	Nut	49-11-01-01-125	ARO ALL

F. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

G. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

H. Cradle/APU Preparation

NOTE: The cradle must be in the installation configuration and the forward mount fittings must be installed before you can install the APU.

SUBTASK 49-11-01-420-011

- (1) If the APU cradle, SPL-1974 is in the transportation configuration do the steps that follow:



CAUTION

CONNECT THE SHOP HANDLING SLING TO THE APU TO REMOVE THE FORWARD MOUNT FITTINGS. IF YOU USE ANY OTHER TOOL TO LIFT THE APU YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (a) Do the steps that follow to connect the APU shop handling sling, SPL-2468 [106] to the APU [43] (Figure 406):
 - 1) Put the forward sling bracket [108] on the APU so the bolts [107] align with the forward lift lugs [109].
 - a) Tighten the bolts [107] to 204-276 pound-inches (23.05-31.19 newton-meters).
 - 2) Connect the aft cable assembly [110] to the top hole of the right lift flange [75] with the pin [111].
 - 3) Connect the aft cable assembly [110] to the top hole of the left lift flange [75] with the pin [111].
- (b) Use the fork-lift to lift the APU with the APU shop handling sling, SPL-2468 to tighten the forward and aft cable assemblies.
- (c) Do the steps that follow to disconnect the APU [43] from the cradle [62]:
 - 1) Remove the bolts [81] that attach the transportation fittings [113] to the cradle [62].
 - 2) Remove the 2 pins [76] that attach the aft support arms [74] to the lift flanges [75].
 - 3) Remove the 2 pins [77] that lock the aft support arms [74] in its position.
 - 4) Turn the aft support arms [74] away from the APU [43].

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62].
 - 5) Lift the APU to make clearance between the transportation fittings [113] and the cradle [62].

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- 6) Remove the bolts [112] that attach the transportation fittings [113] to the APU [43].
- 7) Remove the transportation fittings [113] from the APU [43].
- (d) To install the forward mount fittings on the APU, do this task: Forward Mount Fitting Installation, TASK 49-13-04-400-801.
- (e) Connect the APU [43] to the APU cradle, SPL-1974 [62] and the APU transportation dolly, SPL-1964 [61]:
 - 1) Attach the installation fittings [80] to the forward mount fittings [79] with the pins [78] (Figure 404).
 - 2) Lower the APU [43] into the cradle - dolly, [62] and [61], assembly (Figure 406).
 - 3) Turn the aft support arms [74] up.

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62]. The bolts are used as hinges to turn the aft support arms [74] away from the APU [43].
 - 4) Install the pins [77] that lock the aft support arms [74] to the vertical supports for the cradle [62].
 - 5) Install the pins [76] that attach the lift flanges [75] to the aft support arms [74].
 - 6) Install the bolts [81] that attach the installation fittings [80] to the cradle [62] (Figure 404).
 - 7) Loosen the 3 bolts [107] and remove the forward sling bracket [108] from the gearbox [27] (Figure 406).

NOTE: The bolts [107] cannot be removed from the forward sling bracket [108].
 - 8) Remove the pin [111] that attaches the aft cable assembly [110] to the left lift flange [75].
 - 9) Remove the pin [111] that attaches the aft cable assembly [110] to the right lift flange [75].

I. Cradle/Hydraulic Jack Installation

SUBTASK 49-11-01-480-013

- (1) Do the steps that follow to disconnect the APU cradle, SPL-1974 from the APU transportation dolly, SPL-1964 (Figure 403).
 - (a) Remove the 4 pins [63] that attach the cradle [62] to the dolly [61].
 - (b) Use a fork-lift to remove the cradle [62] and the APU [43] from the dolly [61].

SUBTASK 49-11-01-480-014

- (2) Do the steps that follow to connect the cradle [62] to the hydraulic jack, SPL-1561 [71] (Figure 404):
 - (a) Set the cradle [62] on the hydraulic jack [71].

NOTE: The "I" section of the cradle [62] fits between the pegs on the hydraulic jack [71].
 - (b) Install the retaining plates [73] and the bolts [72].
 - (c) Use a forklift to put the hydraulic jack [71] (with the APU [43] and the cradle [62]) on the maintenance stand.

J. APU Installation

SUBTASK 49-11-01-420-002

- (1) Raise the APU into the tailcone:
 - (a) Make sure the hydraulic jack [71] is directly under the APU [43].

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- (b) Tilt the APU so that the forward end of the APU is lower than the aft end.
NOTE: When the APU is installed, it is in the 10 ° forward-end-down position.
- (c) Lift the APU into position (Figure 405):
 - 1) Hold the aft mount yoke [102] and the aft shockmount [101] in position.
 - 2) Make sure the forward shockmounts [95] and [91] are engaged at the same time.
 - 3) Slowly raise the APU so the yoke [102] will engage the aft shockmount [101].
 - 4) Raise the APU [43] until the inlet seal is engaged.
 - 5) Make sure the clearance between the APU inlet plenum and the inlet duct is 0.20 in. (5.08 mm) or more on all sides.
- (d) Remove the APU cone bolt thread protector, SPL-1956 [105] from the three conebolts [104].



YOU MUST USE DYE-PENETRANT INSPECTED NUTS [92], [97], [99] OR USE NEW NUTS FOR THE APU INSTALLATION ON THE THREE CONEBOLTS. THE USE OF CRACKED OR DAMAGED NUTS ON THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (e) Install the washer [93], washer [98], washer [100], and the nut [92], nut [97], nut [99] on the three conebolts [104].
- (f) Do the torque limit test for the nut [92], nut [97], nut [99]:
 - 1) Tighten the three nuts to a run-on torque of not more than 150 inch-pounds (17.0 newton-meters) until you can see one to two full threads and the conebolt chamfer extends below each nut.
NOTE: Use an open-end wrench on the flats of the conebolt to hold the conebolt in position while you tighten each nut.
 - 2) Make sure the three washers [93], [98], [100] do not touch the bottom surface of the structure.
 - 3) Make sure the break-away torque necessary to turn the three nuts from this position is more than 18 inch-pounds (2.0 newton-meters).
 - 4) Replace the nut(s) that do not meet these torque limits.
 - 5) If the nut(s) were replaced, do the torque limit test again for the new nut(s).
- (g) Tighten the nut [92], nut [97], nut [99] to 800-900 inch-pounds (90.4-101.7 newton-meters).

K. Hydraulic Jack Removal

SUBTASK 49-11-01-080-010

- (1) Do the steps that follow to disconnect the cradle [62] from the APU [43] (Figure 404).
 - (a) Remove the bolts [81] that attach the installation fitting [80] to the cradle [62].
 - (b) Remove the pins [76] that attach the aft support arm [74] to the lift flange [75].
 - (c) Remove the 2 pins [77] that lock the aft support arm [74] in position.
 - (d) Turn the aft support arm [74] away from the APU [43].
NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62].
 - (e) Lower the cradle [62] the rest of the way down.

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- (f) Remove the pins [78] that attach the installation fittings [80] to the forward mount fittings [79].
- (g) Install the installation fittings [80] on the cradle [62].
- (h) Install the bolts [81].

SUBTASK 49-11-01-080-011

- (2) Do the steps that follow to remove the cradle [62] from the hydraulic jack [71] (Figure 404):
 - (a) Use a fork-lift to hold the cradle [62] while you remove the bolts [72] and the retaining plates [73].
 - (b) Use the fork-lift to lift the cradle [62] off of the hydraulic jack [71].
 - (c) Install the retaining plates [73] and the bolts [72] on the hydraulic jack [71].

SUBTASK 49-11-01-080-012

- (3) Do the steps that follow to connect the cradle [62] to the dolly [61]:
 - (a) Set the cradle [62] onto the dolly [61].
 - (b) Install the 4 pins [63].

L. Electrical, Pneumatic, Fuel Connections, and Oil replenishing

SUBTASK 49-11-01-420-005



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AN NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the plugs from the fuel supply line [23] and the APU [43] (Figure 401).
 - (a) Connect the fuel supply line [23] to the APU [43].
 - (b) Hold the reducer with a wrench and tighten the coupling nut for the fuel supply line [23] to 665-735 pound-inches (75.15-83.06 newton-meters).

SUBTASK 49-11-01-420-003

- (2) Connect the ducts (Figure 402):
 - (a) Install the clamp [42] that connects the bleed duct [41] to the APU [43].
 - 1) Tighten the clamp [42] to 55-75 pound-inches (6.2-8.5 newton-meters).
 - (b) Move the exhaust duct [45] so that it is aligned with the APU [43].

NOTE: The exhaust duct [45] is held to the exhaust duct panel with a leaf spring.
 - (c) Install the exhaust duct clamp [44].
 - 1) Tighten the nuts on the exhaust duct clamp [44] to 70-90 pound-inches (7.9-10.1 newton-meters).
 - 2) Lightly hit the edge of the exhaust duct clamp [44] with the non-metallic mallet, STD-583.
 - 3) Continue to tighten the nuts and hit the clamp until the torque value stays constant.

SUBTASK 49-11-01-420-004

- (3) Connect the electrical and tubing connections:
 - (a) Do the steps that follow to connect the ground jumper [26] to the gearbox [27] (Figure 401) (View F).
 - 1) Remove the washers [24] and the nuts [25] from the gearbox [27].
 - 2) Clean the surface of the gearbox [27] around the studs for the ground jumper [26]:

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- a) Apply the solvent, B00083 to a bristle brush or a cleaning cloth.
 - b) Use a small amount of pressure on the brush or the cleaning cloth while you clean the gearbox [27].
 - c) Continue to clean the gearbox until there is no visible residue on the gearbox [27].
- 3) Connect the ground jumper [26] to the gearbox [27].
 - 4) Install the washer [24] and the nuts [25].
 - 5) Tighten the nuts [25] to 480-520 pound-inches (54.24-58.76 newton-meters).
 - 6) With an intrinsically safe approved bonding meter, COM-1550, make sure the resistance from the gearbox [27] to the ground jumper [26] is less than 0.5 milliohm.
- (b) Do the steps that follow to connect the leads [18] and [20] to the electric starter motor [17] (Figure 401) (View E):
- 1) Remove the terminal block cover [19] from the electric starter motor [17].
 - 2) Thread the leads [18] and [20] through the terminal block cover [19].
 - 3) Remove the nut [21].
 - 4) Connect the positive lead [18] to the electric starter motor [17].
 - 5) Install the nut [21].
 - a) Tighten the nut [21] to 140-160 pound-inches (15.82-18.08 newton-meters).
 - 6) Remove the nut [22].
 - 7) Connect the negative lead [20] to the electric starter motor [17].
 - 8) Install the nut [22].
 - a) Tighten the nut [22] to 140-160 pound-inches (15.82-18.08 newton-meters).
 - 9) Move the terminal block cover [19] over the terminals for the electric starter motor [17].
- (c) Install the APU drain assembly [47].
- 1) Tighten the coupling nuts [46].
- (d) Do the steps that follow to connect the APU wire harness:
- 1) Remove the caps from the electrical connector and the electrical receptacles.
 - 2) Connect the APU wire harness to the strut [13] with the clamps [16] (Figure 401) (View D).
 - 3) Connect the APU wire harness to the firewall with the clamps [14] (Figure 401) (View D).
 - 4) Remove the caps from the electrical connectors.
 - 5) Connect the APU wire harness connector, D49001P [1] to the firewall receptacle (Figure 401) (View B).
 - 6) Connect the APU wire harness connector, D49002P [2] to the firewall receptacle (Figure 401) (View B).
 - 7) Connect the APU wire harness connector, D49003P [4] to the firewall receptacle (Figure 401) (View B).
 - 8) Connect the APU wire harness connector, D49004P [3] to the firewall receptacle (Figure 401) (View B).



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- (e) Do the steps that follow to connect the electrical connectors and leads to the generator [10] (Figure 401) (View C):
- 1) Remove the bolts [12] and the washers [11] that connect the terminal block cover [5] to the generator [10].
 - 2) Remove the terminal block cover [5] from the generator [10].
 - 3) Remove the 4 captive washer nuts [6].
 - 4) Connect the leads [7] to the generator [10].
 - a) Make sure the labels (N, T1, T2, and T3) on the leads [7] agree with the terminal labels.
 - 5) Install the 4 captive washer nuts [6].

NOTE: For the 6-point Spiralock (Belleville) nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.

 - a) Tighten the nuts to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).
 - 6) Install the terminal block cover [5] on the generator [10].
 - 7) Install the washers [11] and the bolts [12].
 - 8) Remove the caps from the electrical connectors.
 - 9) Connect the electrical connector, DM24003B [9] to the generator [10].
 - 10) Connect the electrical connector, DM24003A [8] to the generator [10].

SUBTASK 49-11-01-610-001

- (4) Replenish the APU with oil:
- (a) Do this task: AUXILIARY POWER UNIT REPLENISHING, SUBJECT 12-13-04.

M. Auxiliary Power Unit (APU) Installation Test

SUBTASK 49-11-01-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

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This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-11-01-860-015

- (2) Make sure the EICAS message FUEL VALVE APU does not show on the EICAS display.

SUBTASK 49-11-01-860-004

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-11-01-410-004

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
313AL	Controls Bay Access Door

SUBTASK 49-11-01-790-001

- (5) Do the steps that follow to do the installation test for the APU:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- 1) Examine the APU for leakage.
 - 2) Make sure these EICAS status messages do not show:
 - a) APU
 - b) APU DOOR
 - c) APU START SYSTEM
 - d) APU AIR TURBINE STARTER
 - e) APU LIMIT
 - f) APU CONTROL.
- (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

N. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

TASK 49-11-01-000-805

4. Auxiliary Power Unit Removal (Fishpole Hoist Method)

NOTE: This procedure is a scheduled maintenance task.

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A. General

- (1) The fishpole hoists can have either cables or chains. A different procedure is provided where necessary for the cable type hoist and the chain type hoist.
- (2) The fishpole hoist does not always contain sufficient cable or chain to lower the Auxiliary Power Unit (APU) and cradle all the way to the ground. A lift truck or other platform must be available with the fishpole hoist for APU removal and installation.



DO NOT REMOVE THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME. IF YOU REMOVE THE TWO, THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME, YOU WILL LOOSE THE DATA FOR THE APU.

- (3) The APU controller and the data memory module have the data for the APU. The data memory module is located on the left side of the APU inlet plenum. When the APU is replaced, the new data memory module will send the new APU data to the APU controller.

B. References

Reference	Title
05-41-03-210-805	INTERNAL - ZONAL (GV): APU COMPARTMENT - AS VISIBLE WITH APU REMOVED (P/B 201)
21-00-01-100-801	Oil Contamination Removal from Air Conditioning and Pneumatic Systems (P/B 201)
36-12-04-100-801	Air Supply Duct Cleaning (P/B 701)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-13-01-200-801	Forward Support and Vibration Isolation Mount Inspection (P/B 601)
49-13-02-200-801	Aft Support and Vibration Isolation Mount Inspection (P/B 601)
49-13-03-200-801	Aft Mount Yoke Inspection (P/B 601)
49-13-04-000-801	Forward Mount Fitting Removal (P/B 401)
49-15-99-210-801	APU Inlet Duct and Intake Plenum Flange Seal Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain Part #: AP6108 Supplier: 4Y309
SPL-1956	Protector - Thread, APU Cone Bolt Part #: G49007-5 Supplier: 81205 Opt Part #: G49007-1 Supplier: 81205 Opt Part #: PRE65B00780-1 Supplier: 81205
SPL-1964	Dolly - APU Transportation Part #: J49007-29 Supplier: 81205

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Reference	Description
SPL-1966	Equipment - Hoist, APU Installation/Removal (cable fishpole hoist) Part #: J49003-43 Supplier: 81205
SPL-1974	Cradle - APU, For Use with Transportation Dolly Part #: J49006-67 Supplier: 81205
SPL-4254	Equipment - Hoist, APU Installation/Removal (Chain Fishpole hoist) Part #: J49003-47 Supplier: 81205
STD-1102	Tie - Plastic

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Removal

SUBTASK 49-11-01-860-005

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-11-01-010-006

- (2) Open this access panel:

Number	Name/Location
313AL	Controls Bay Access Door

SUBTASK 49-11-01-860-006

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

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This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-11-01-860-016

- (4) Make sure the Engine Indication and Crew Alerting System (EICAS) message FUEL VALVE APU shows on the EICAS display.

SUBTASK 49-11-01-010-002

- (5) Open the APU access doors. APU Access Doors (Open), TASK 49-11-02-010-801

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Auxiliary Power Unit (APU) Removal

SUBTASK 49-11-01-020-008



WARNING

DO NOT TOUCH THE APU GEARBOX HEATERS. THE GEARBOX HEATERS STAY HOT WHEN THE AIRPLANE HAS AC POWER. HOT COMPONENTS CAN BURN YOU.

- (1) Disconnect the electrical connections:
 - (a) Do the steps that follow to disconnect the APU wire harness (Figure 407).
 - 1) Disconnect the APU wire harness connector, D49001P [1].
 - 2) Disconnect the APU wire harness connector, D49002P [2].
 - 3) Disconnect the APU wire harness connector, D49003P [4].
 - 4) Disconnect the APU wire harness connector, D49004P [3].
 - 5) Install caps on the connectors to prevent contamination.
 - 6) Open the clamps [16] that hold the APU wire harness [15] to the strut [13] (Figure 407) (View D).
 - 7) Open the clamps [14] that hold the APU wire harness [15] to the firewall (Figure 407) (View D).
 - 8) Attach the APU wire harness [15] to the APU surge duct with the plastic tie, STD-1102.
 - (b) Do the steps that follow to disconnect the generator leads and connectors (Figure 407) (View C):
 - 1) Remove the bolts [12] and the washers [11] that attach the terminal block cover [5] to the generator [10].
 - 2) Remove the terminal block cover [5].
 - 3) Put tags on the generator leads [7] to identify the their correct position.
 - 4) Remove the captive washer nuts [6].
 - 5) Disconnect the leads [7].

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- 6) Install the captive washer nuts [6] on the generator [10].
NOTE: For the 6-point Spiralock (Belleville) nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.
- 7) Install the terminal block cover [5] on the generator [10].
- 8) Install the washers [11] and the bolts [12] that attach the terminal block cover [5] to the generator [10].
 - a) Tighten the bolts to 20 to 22 pound inches (2.3 to 2.5 newton meters).
- 9) Disconnect the electrical connector, DM24003A [8] from the generator [10].
- 10) Disconnect the electrical connector, DM24003B [9] from the generator [10].
- 11) Install caps on the electrical connectors to prevent contamination.
- (c) Do the steps that follow to disconnect the leads [18] and [20] from the electric starter motor [17] (Figure 407) (View E):
 - 1) Move the terminal block cover [19] along the leads [18] and [20] to expose the terminals.
 - 2) Remove the nut [21] that attaches the positive lead [18] to the electric starter motor [17].
 - 3) Disconnect the positive lead [18] from the electric starter motor [17].
 - 4) Install the nut [21] on the electric starter motor [17].
 - 5) Remove the nut [22] that attaches the negative lead [20] to the electric starter motor [17].
 - 6) Disconnect the negative lead [20] from the electric starter motor [17].
 - 7) Install the nut [22] on the electric starter motor [17].
 - 8) Remove the terminal block cover [19] from the leads [18] and [20].
NOTE: The terminal block cover [19] is part of the APU assembly.
 - 9) Put the terminal block cover [19] on the electric starter motor [17].
- (d) Do the steps that follow to disconnect the ground jumper [26] (Figure 407) (View F):
 - 1) Remove the nuts [25] and the washer [24] that attach the ground jumper [26] to the gearbox [27].
 - 2) Disconnect the ground jumper [26] from the gearbox [27].
 - 3) Install the washer [24] and the nut [25] on the gearbox [27].

SUBTASK 49-11-01-020-009

- (2) Disconnect the ducts (Figure 408):
 - (a) Remove the clamp [42] that attaches the APU [43] to the bleed duct [41].
 - (b) Remove the exhaust duct clamp [44] that attaches the exhaust duct [45] to the APU [43].
 - (c) Loosen the 3 coupling nuts [46] and remove the APU drain tube assembly [47] from the APU [43].

H. APU Hoist Equipment Installation (Cable Type Fishpole Hoist)

SUBTASK 49-11-01-800-001

- (1) The APU hoist APU installation/removal cable fishpole hoist equipment, SPL-1966 has these parts:
 - (a) Aft lift assembly

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- (b) Aft spreader assembly
- (c) Forward fishpole assembly
- (d) Forward bracket assembly
- (e) Installation rod
- (f) Pins.

SUBTASK 49-11-01-480-015

- (2) Do the steps that follow to inspect the cable fishpole hoist, COM-1563 and the keyhole slots:
 - (a) Wind off and examine cables for the fishpole hoists to make sure they are not frayed.



CAUTION

MAKE SURE THAT YOU DO AN INSPECTION OF THE KEY HOLE SLOT AREAS. A DAMAGED KEY HOLE SLOT CAN CAUSE INCORRECT SUPPORT OF THE ACM. THIS CAN CAUSE DAMAGE TO THE ACM.

- (b) Visually examine the key hole slot [124] and [131] areas with a flashlight to make sure there is no signs of cracking or elongation.

SUBTASK 49-11-01-480-016

- (3) Do the steps that follow to connect the forward bracket assembly [129] to the APU [43] (Figure 407).
 - (a) Make sure the forward lift lugs [130] are free of unwanted material.
 - (b) Put the forward bracket assembly [129] on the APU so the bolts [128] align the forward lift lugs [130].
 - 1) Tighten the bolts [128] to 240-276 pound-inches.

SUBTASK 49-11-01-480-017

- (4) Do the steps that follow to install the forward hoist equipment in the APU compartment (Figure 409):
 - (a) Use the installation rod [123] to connect the forward fishpole assembly [126] to the forward key hole slot [124].
 - (b) Connect the forward fishpole [121] to the forward fishpole assembly [126] with the pin [125].
 - (c) Pull the fishpole hoist cable through the pulley on the forward bracket assembly [129] and connect it to the forward fishpole assembly [126] with the pin [127].

SUBTASK 49-11-01-480-018

- (5) Do the steps that follow to install the aft hoist equipment in the APU compartment (Figure 409):
 - (a) Hold the aft spreader assembly [132] into its position.
 - (b) Turn the aft spreader assembly [132] 90 ° about its axis and insert the left end into the left keyhole slot [131].
 - (c) Extend the right end of the aft spreader assembly [132] and insert it into the right keyhole slot [131].
 - (d) Turn the aft spreader assembly [132] down 90 °.
 - (e) Make sure the aft spreader assembly [132] is fully engaged in the keyhole slots [131].
 - (f) Connect the aft fishpole [122] to the aft spreader assembly [132] with the pin [133].

SUBTASK 49-11-01-480-019

- (6) Do the steps that follow to connect the aft lift assembly [134] to the APU [43].

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- (a) Connect the aft lift assembly [134] to the top hole of the right lift flange [135] with the pin [136].
- (b) Connect the aft lift assembly [134] to the top hole on the left lift flange [138] with the pin [137].
- (c) Pull the fishpole hoist cable through the pulleys on the aft lift assembly [134] and connect it to the aft spreader assembly [132] with the pin [139].

I. APU Hoist Equipment Installation (Chain Type Fishpole Hoist)

SUBTASK 49-11-01-800-003

- (1) The APU hoist APU installation/removal chain fishpole hoist equipment, SPL-4254 has these parts:
 - (a) Upper beam assembly
 - (b) Lower beam assembly
 - (c) Forward bracket assembly
 - (d) Forward fishpole hoist assembly
 - (e) Installation rod
 - (f) Pins

SUBTASK 49-11-01-480-021

- (2) Do the steps that follow to inspect the chain fishpole hoist, COM-1592 and the keyhole slots:
 - (a) Wind off and examine chains of the fishpole hoists to make sure they are not damaged.



CAUTION

MAKE SURE THAT YOU DO AN INSPECTION OF THE KEY HOLE SLOT AREAS. A DAMAGED KEY HOLE SLOT CAN CAUSE INCORRECT SUPPORT OF THE ACM. THIS CAN CAUSE DAMAGE TO THE ACM.

- (b) Visually examine the key hole slot [143] and [150] areas with a flashlight to make sure there is no signs of cracking or elongation.

SUBTASK 49-11-01-480-022

- (3) Do the steps that follow to connect the forward bracket assembly [148] to the APU [43] (Figure 410):
 - (a) Make sure the forward lift lugs [149] are free of unwanted material.
 - (b) Put the forward bracket assembly [148] on the APU so the bolts [147] align the forward lift lugs [149].
 - 1) Tighten the bolts [147] to 240 in-lb (27 N·m) - 276 in-lb (31 N·m).

SUBTASK 49-11-01-480-023

- (4) Do the steps that follow to install the forward hoist equipment in the APU compartment (Figure 410):
 - (a) Use the installation rod [142] to connect the forward fishpole hoist assembly [144] to the forward key hole slot [143].
 - (b) Connect the forward fishpole [140] to the forward fishpole hoist assembly [144] with the pin [145].
 - (c) Connect the forward bracket assembly [148] to the end of the forward fishpole hoist [140] with the pin [146].

SUBTASK 49-11-01-480-024

- (5) Do the steps that follow to install the aft hoist equipment in the APU compartment (Figure 410):

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- (a) Hold the upper beam assembly [151] into its position.
- (b) Turn the upper beam assembly [151] 90 ° about its axis and insert the left end into the left keyhole slot [150].
- (c) Extend the right end of the upper beam assembly [151] and insert it into the aft keyhole slot [150].
- (d) Turn the upper beam assembly [151] down 90 °.
- (e) Make sure the upper beam assembly [151] is fully engaged in the keyhole slots [150].
- (f) Connect the aft fishpole [141] to the upper beam assembly [151] with the pin [152].
- (g) Pull the chain of the aft fishpole [141] through the pulley on the upper beam assembly [151] and connect it to the lower beam assembly [153] with the pin [154].

SUBTASK 49-11-01-480-025

- (6) Do the steps that follow to connect the lower beam assembly [153] to the APU [43] (Figure 410):
 - (a) Connect the lower beam assembly [153] to the top hole of the right lift flange [155] with the pin [156].
 - (b) Connect the lower beam assembly [153] to the top hole on the left lift flange [157] with the pin [158].

J. Auxiliary Power Unit Removal

SUBTASK 49-11-01-020-010

- (1) Disconnect the fuel supply line [23] from the APU [43] (Figure 407) (View E).
 - (a) Hold the reducer with a wrench and disconnect the fuel supply line [23] from the reducer.
 - (b) Install the plugs on the fuel supply line [23] and the APU [43].
 - (c) Put the fuel supply line into the retention bracket on the APU firewall.

SUBTASK 49-11-01-020-011

- (2) Disconnect the APU from the mounts (Figure 411):
 - (a) Tighten the fishpole hoists [121] and [122] until the cables are tight, or fishpole hoists [140] and [141] until the chains are tight.
 - (b) One at a time, slowly loosen the nut [92], nut [97], nut [99] two full turns.
NOTE: Use an open end wrench on the shaft flats between the mount bracket and the shock mount. This holds the shaft while you remove the cone bolt nuts.
 - (c) Make sure the cables for the fishpole hoists [121] and [122] are tight, or the chains for fishpole hoists [140] and [141] are tight.
 - (d) Continue to loosen the nut [92], nut [97], nut [99] until the cables or chains fully support the weight of the APU [43].
 - (e) Remove the nut [92], nut [97], nut [99] and the washer [93], washer [98], washer [100].
NOTE: It is necessary that the three nuts [92], [97], [99] must be dye-penetrant inspected for its subsequent APU installation or use a new nut.

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MAKE SURE THAT THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONEBOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU MOUNTS CAN GET CAUGHT ON THE THREAD PROTECTOR. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (f) Install the thread APU cone bolt thread protector, SPL-1956 [105] on the conebolts [104].

NOTE: The cone bolts are a part of the shock mounts [91], [95], and [101].

SUBTASK 49-11-01-020-012

- (3) Remove the APU [43]:



KEEP PERSONS AND EQUIPMENT CLEAR OF THE FRONT OF THE APU. THE APU CAN MOVE FORWARD SUDDENLY WHEN THE APU IS LOWERED OFF THE MOUNTS. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Slowly lower the APU [43] until the APU mounts are disengaged from the APU.



MAKE SURE THAT THE FORWARD AND AFT FISHPOLE HOISTS ARE UNWOUND TO THE POINT THAT THE APU DOES NOT MOVE FORWARD. THE PNEUMATIC CLUSTER AND THE AIR TURBINE STARTER DUCT CAN HIT THE RIGHT FORWARD MOUNT SHOCKMOUNT. THIS CAN CAUSE DAMAGE TO THE APU.

- (b) Slowly unwind the aft fishpole hoist [122] or [141], then the forward fishpole hoist [121] or [140], until the air turbine starter duct clears the right forward mount.
- (c) Continue to slowly lower the APU [43] until it clears the APU compartment.

SUBTASK 49-11-01-020-014

- (4) If you will use the APU cradle, SPL-1974 in the transportation configuration, prepare the APU:

NOTE: The APU cradle has an installation configuration and a transportation configuration.

The installation configuration has forward fittings with quick release pins. The transportation configuration has stronger forward fittings to hold the APU during travel. You must remove the forward mount fittings from the APU to use the cradle in the transportation configuration.

- (a) To remove the forward mount fittings from the APU, do this task: Forward Mount Fitting Removal, TASK 49-13-04-000-801.

SUBTASK 49-11-01-420-006

- (5) Connect the APU [43] to the APU cradle, SPL-1974 [62] and the APU transportation dolly, SPL-1964 [61] (Figure 412):

- (a) Remove the bolts [81] that attach the installation fittings [80] or transportation fittings [83] to the cradle [62].
- (b) Remove the installation fittings [80] or transportation fittings [83] from the cradle [62].
- (c) If the cradle [62] is in the installation configuration, attach the installation fittings [80] to the forward mount fittings [79] with the pins [78].
- (d) If the cradle [62] is in the transportation configuration, attach the transportation fittings [83] to the APU [43]. Use the bolts [82] that are kept with the transportation fittings.
- (e) Lower the APU [43] into the cradle - dolly, [62] and [61], assembly (Figure 411).

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- (f) Install the bolts [81] that attach the installation fittings [80] or the transportation fittings [83] to the cradle [62].
- (g) Turn the aft support arms [74] up.
NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62]. The bolts are used as a hinges to turn the aft support arms [74] away from the APU [43].
- (h) Install the pins [77] that lock the aft support arms [74] to the vertical supports for the cradle [62].
- (i) Install the pins [76] that attach the lift flanges [75] to the aft support arms [74].

SUBTASK 49-11-01-020-015

- (6) Disconnect the lift assemblies (cable type fishpole hoists) (Figure 409)
 - (a) Loosen the 3 bolts [128] and remove the forward bracket assembly [129] from the APU [43].
NOTE: The bolts [128] cannot be removed from the forward bracket assembly [129].
 - (b) Remove the pin [137] that attaches the aft lift assembly [134] to the left lift flange [138].
 - (c) Remove the pin [136] that attaches the aft lift assembly [134] to the right lift flange [135].

SUBTASK 49-11-01-020-016

- (7) Disconnect the lift assemblies (chain type fishpole hoists) (Figure 410)
 - (a) Loosen the 3 bolts [147] and remove the forward bracket assembly [148] from the APU [43].
NOTE: The bolts [147] cannot be removed from the forward bracket assembly [148].
 - (b) Remove the pin [158] that attaches the lower beam assembly [153] to the left lift flange [157].
 - (c) Remove the pin [156] that attaches the lower beam assembly [153] to the right lift flange [155].

SUBTASK 49-11-01-020-013

- (8) Make sure you install all necessary protection covers.

K. APU Mount Inspection

NOTE: With the APU removed, the shock mounts will be free to move slightly in relation to the struts. This freedom of movement is intentional and should not be considered an indication of worn parts. Worn parts will be identified by evidence of galling or by excessive movement of the shock mount. When the APU is installed, all supports should be tight and rigid.

SUBTASK 49-11-01-210-016

- (1) Visually examine the forward struts and the shockmounts for cracks, wear and damage.
 - (a) If there is signs of wear, do this task: Forward Support and Vibration Isolation Mount Inspection, TASK 49-13-01-200-801.

SUBTASK 49-11-01-210-017

- (2) Visually examine the aft struts and the shockmounts for cracks, wear and damage.
 - (a) If there is signs of wear, do this task: Aft Support and Vibration Isolation Mount Inspection, TASK 49-13-02-200-801.

SUBTASK 49-11-01-210-018

- (3) Visually examine the aft mount yoke assembly for cracks, wear and damage.
 - (a) If there is signs of wear, do this task: Aft Mount Yoke Inspection, TASK 49-13-03-200-801.

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SUBTASK 49-11-01-210-019

- (4) Visually examine the APU mounts for cracks, wear and damage.

SUBTASK 49-11-01-210-032

- (5) Visually examine the internal and external portions of the inlet duct and inlet plenum seal for condition and security.
- (a) Do this task: APU Inlet Duct and Intake Plenum Flange Seal Inspection, TASK 49-15-99-210-801.

SUBTASK 49-11-01-210-022

- (6) Visually examine the bleed duct [41] (Figure 408) for signs of oil and other contamination.
- (a) If you find signs of oil and other contamination, then do these tasks:
- 1) Clean the bleed duct [41]. To clean it, do this task: Air Supply Duct Cleaning, TASK 36-12-04-100-801.
 - 2) Remove the oil contamination from the air conditioning and pneumatic systems. To remove it, do this task: Oil Contamination Removal from Air Conditioning and Pneumatic Systems, TASK 21-00-01-100-801.

SUBTASK 49-11-01-210-020

- (7) Do this task: INTERNAL - ZONAL (GV): APU COMPARTMENT - AS VISIBLE WITH APU REMOVED, TASK 05-41-03-210-805.

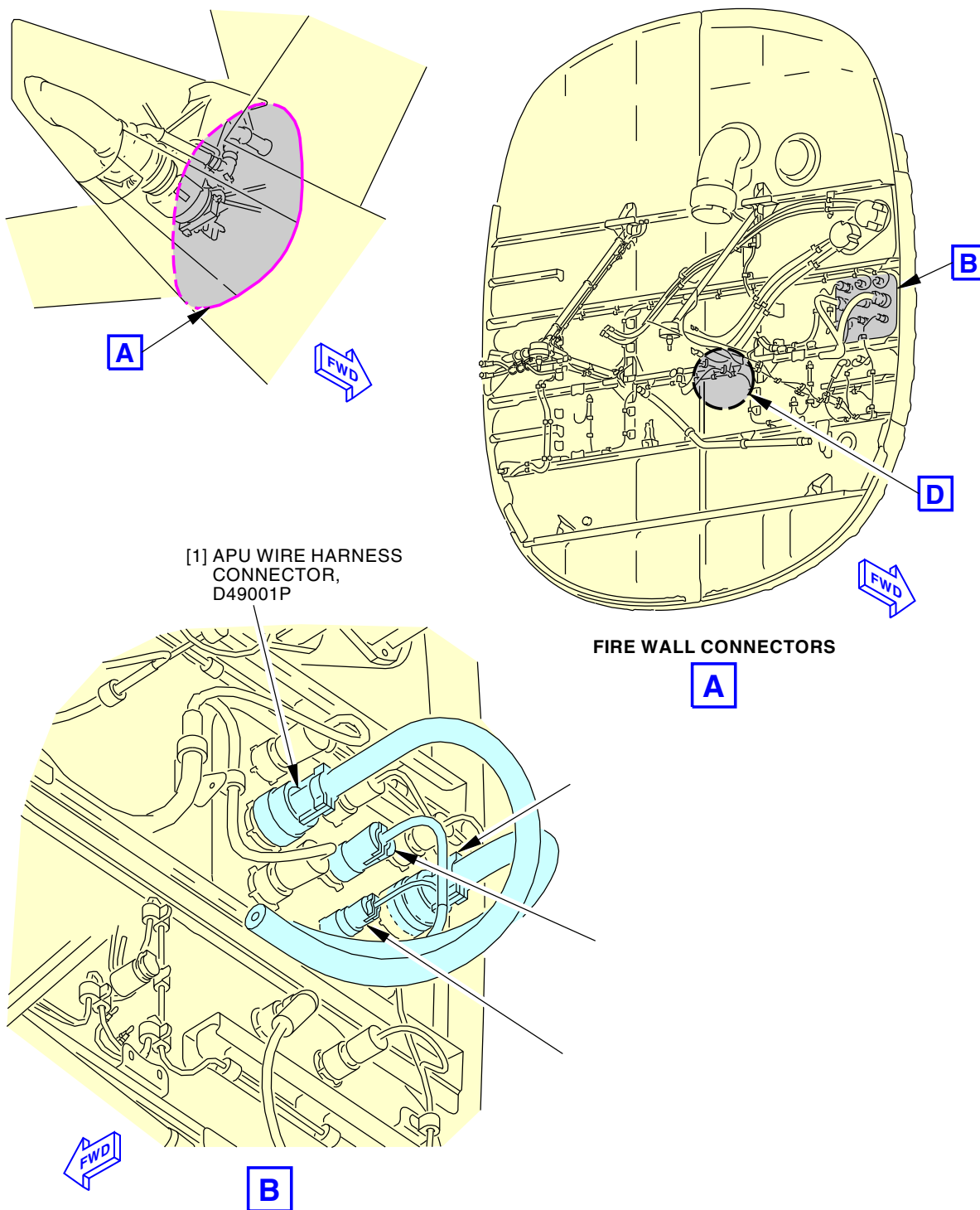
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**APU Electrical and Tubing Connections (Fishpole Hoist Procedure)
Figure 407/49-11-01-990-813 (Sheet 1 of 5)**

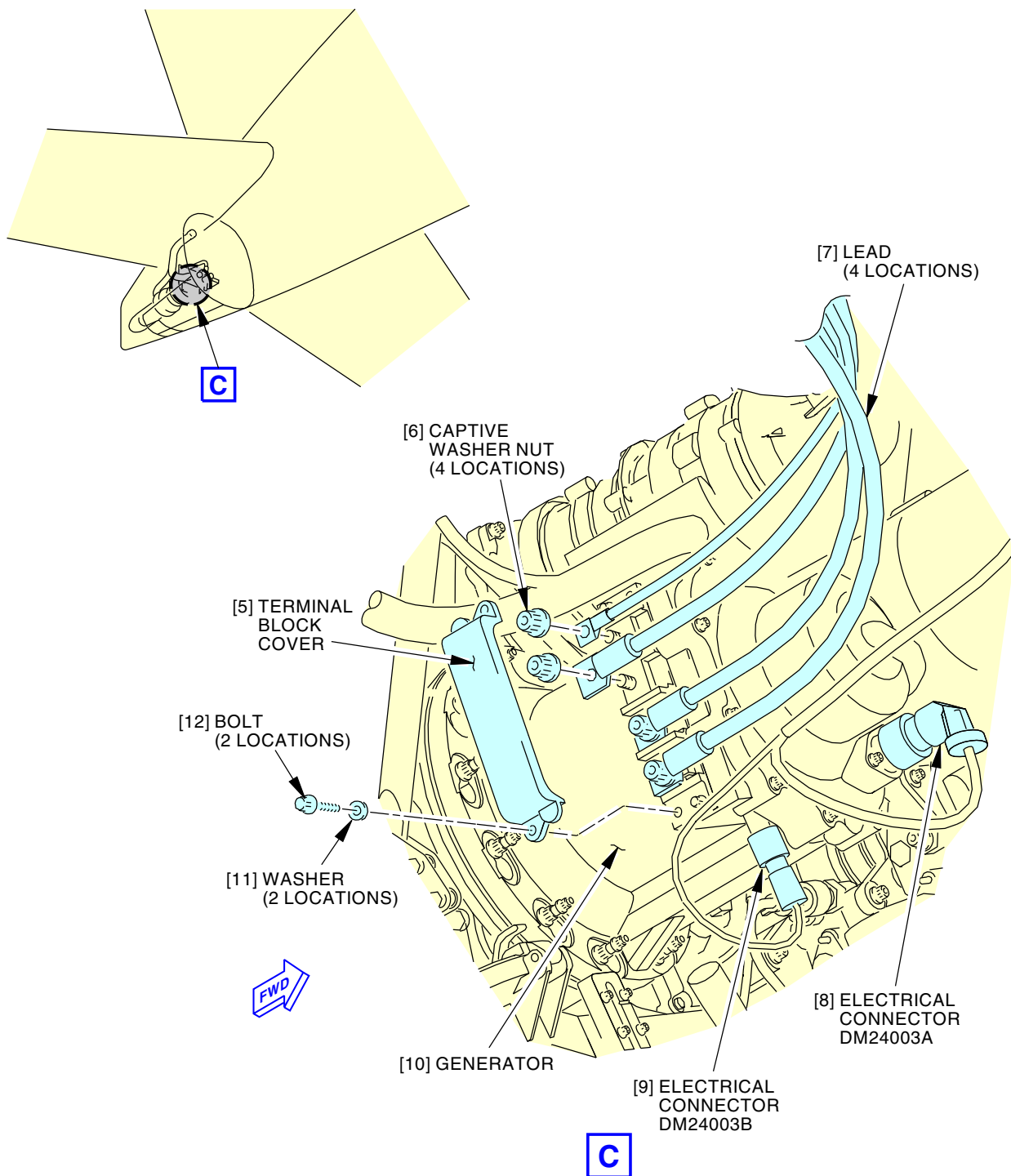
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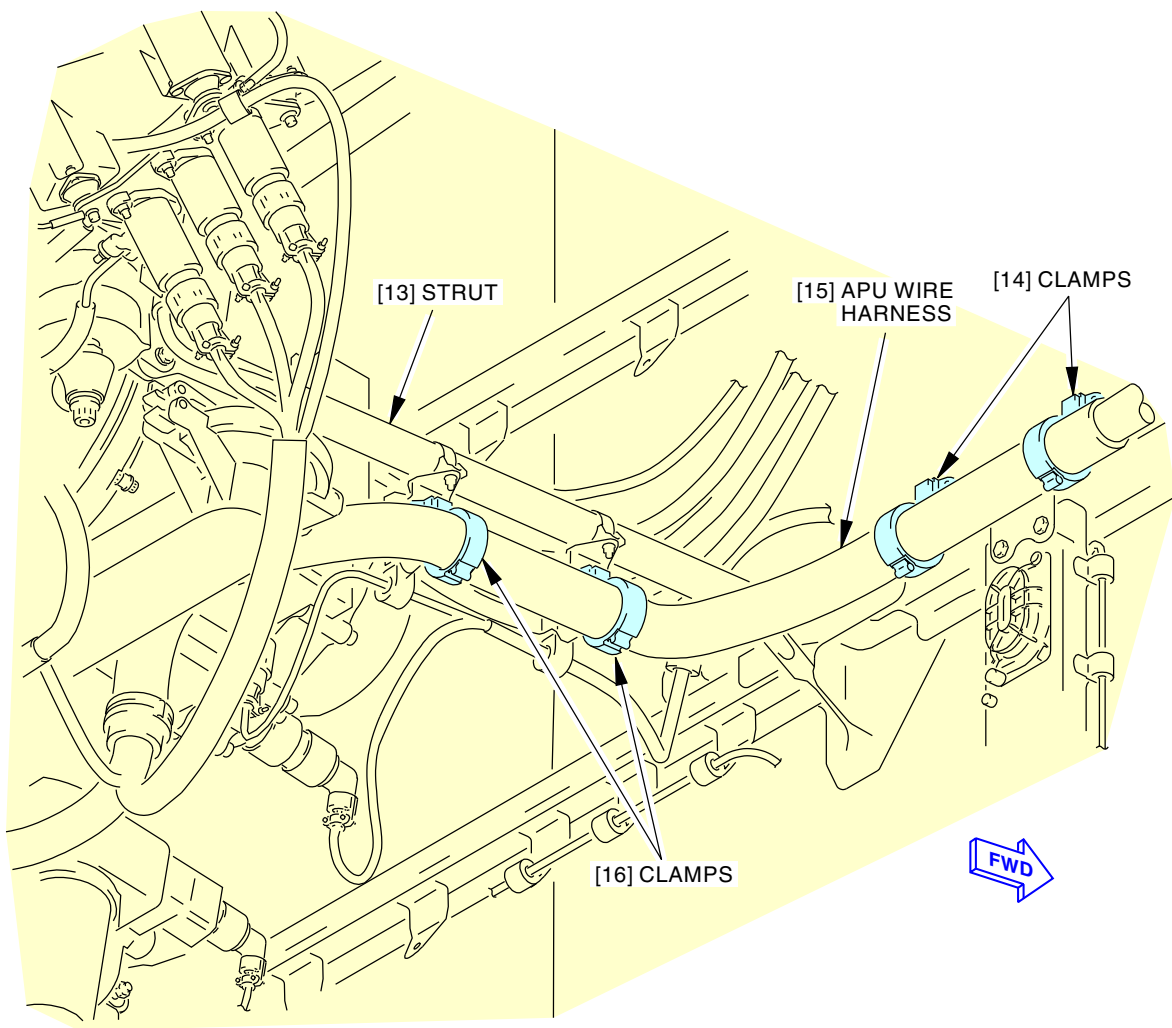
**APU Electrical and Tubing Connections (Fishpole Hoist Procedure)
Figure 407/49-11-01-990-813 (Sheet 2 of 5)**

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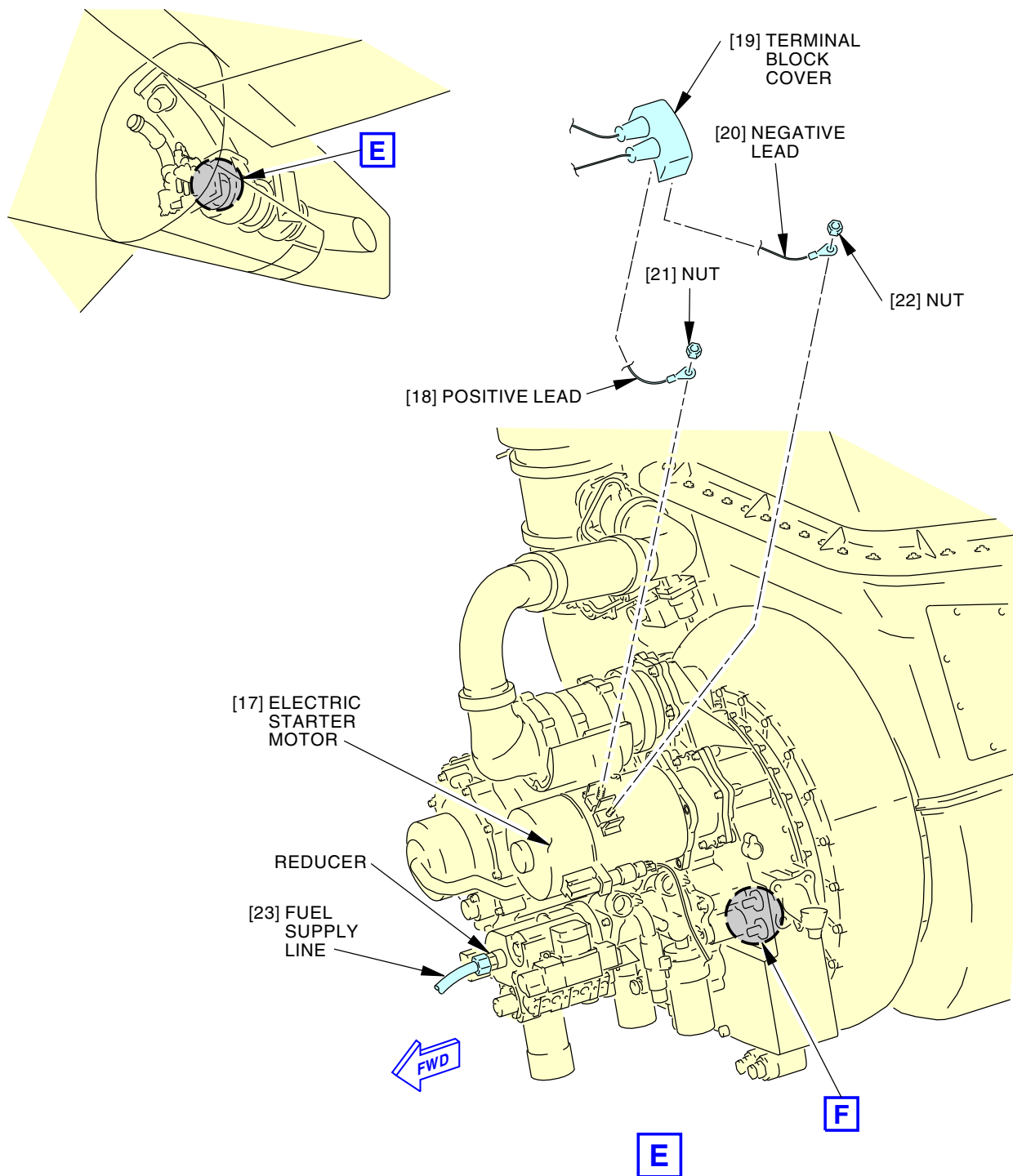
**APU Electrical and Tubing Connections (Fishpole Hoist Procedure)
Figure 407/49-11-01-990-813 (Sheet 3 of 5)**

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APU Electrical and Tubing Connections (Fishpole Hoist Procedure)
Figure 407/49-11-01-990-813 (Sheet 4 of 5)

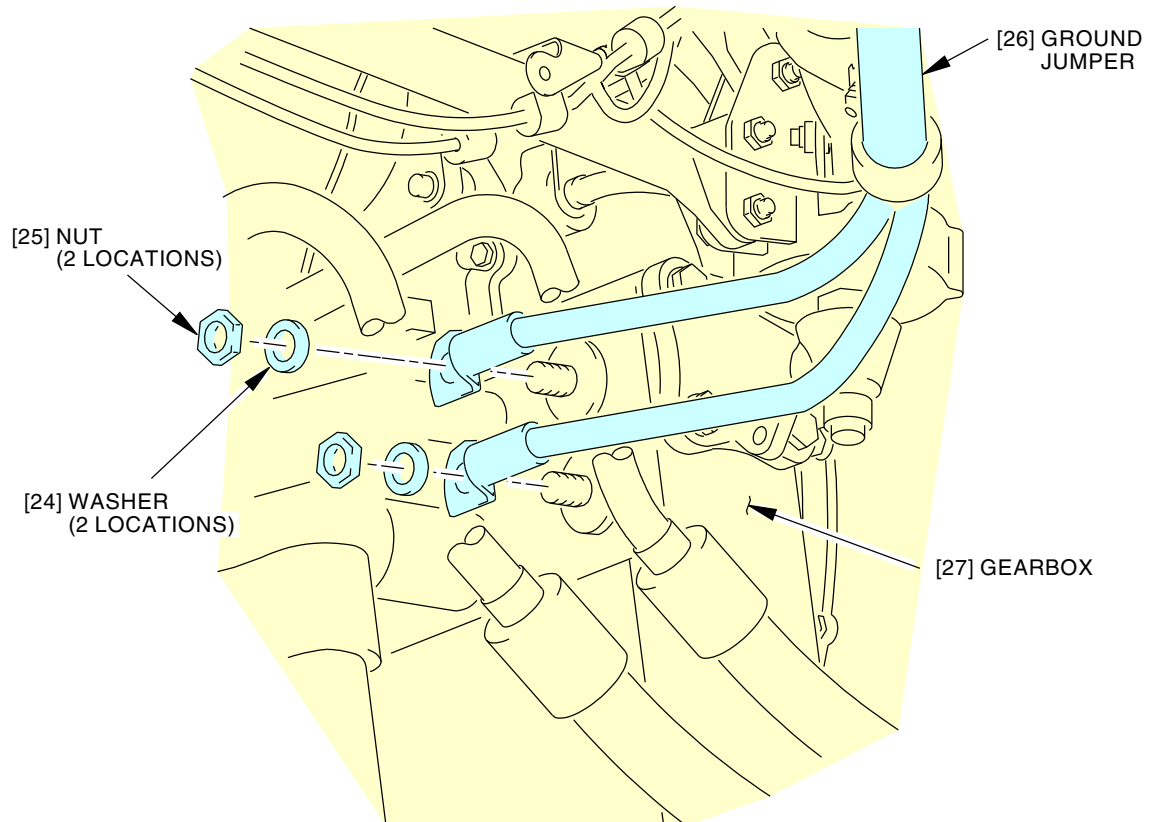
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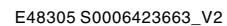
APU Electrical and Tubing Connections (Fishpole Hoist Procedure)
Figure 407/49-11-01-990-813 (Sheet 5 of 5)

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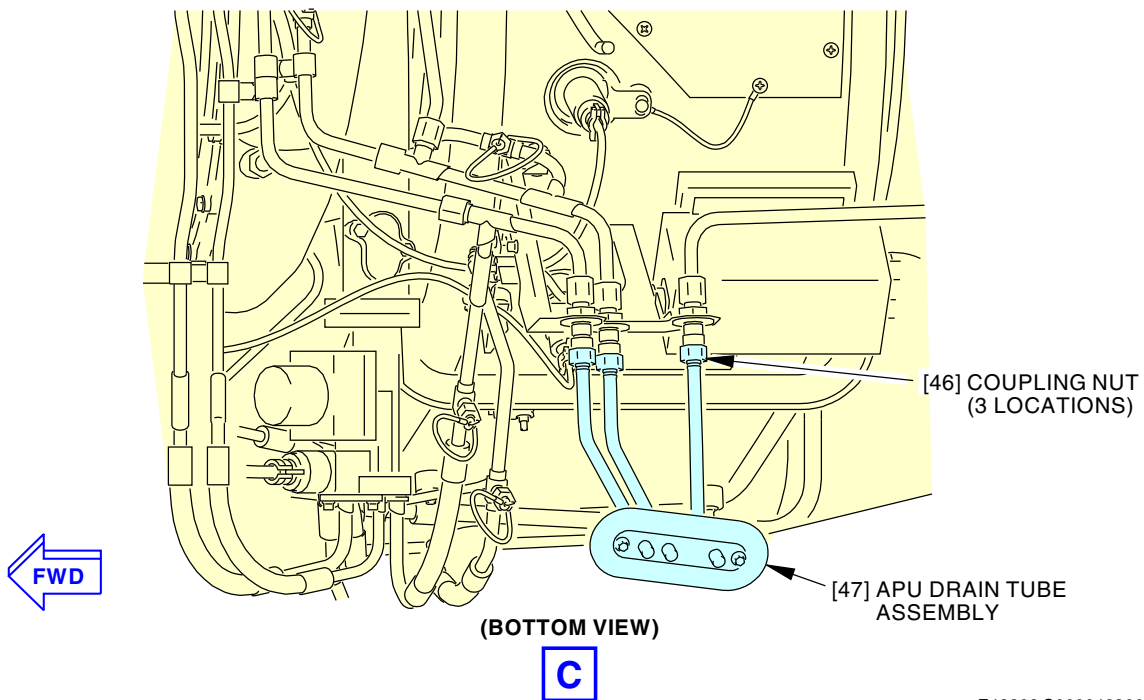
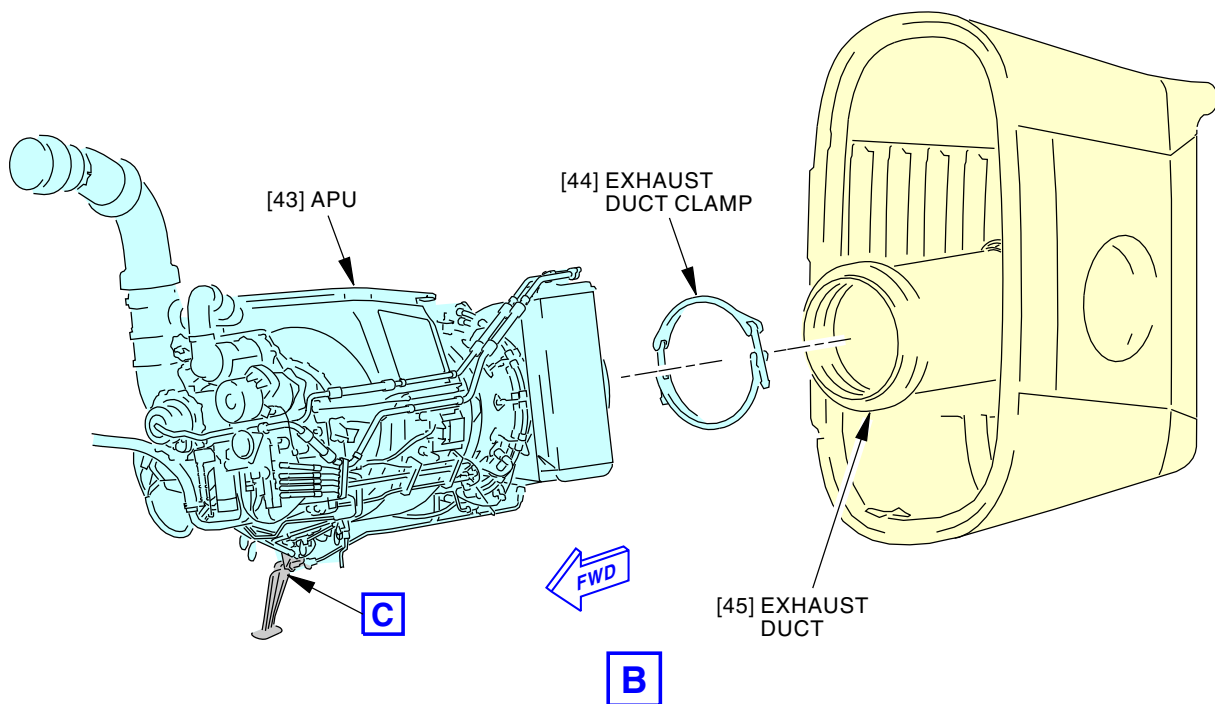
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APU Duct and Drain Connections (Fishpole Hoist Procedure)
Figure 408/49-11-01-990-807 (Sheet 1 of 2)

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**APU Duct and Drain Connections (Fishpole Hoist Procedure)
Figure 408/49-11-01-990-807 (Sheet 2 of 2)**

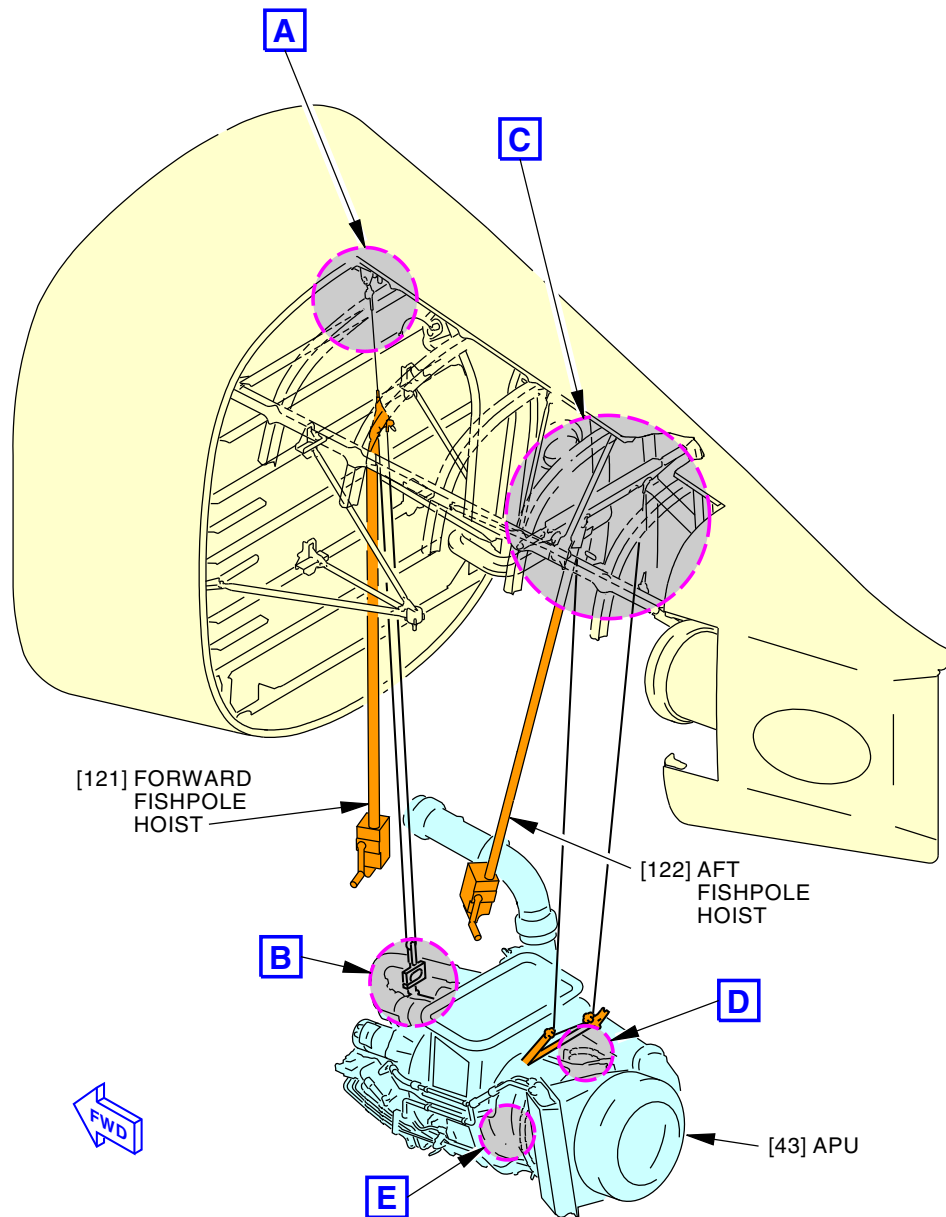
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Auxiliary Power Unit (APU) Installation (Cable Fishpole Hoist Procedure)
Figure 409/49-11-01-990-808 (Sheet 1 of 5)

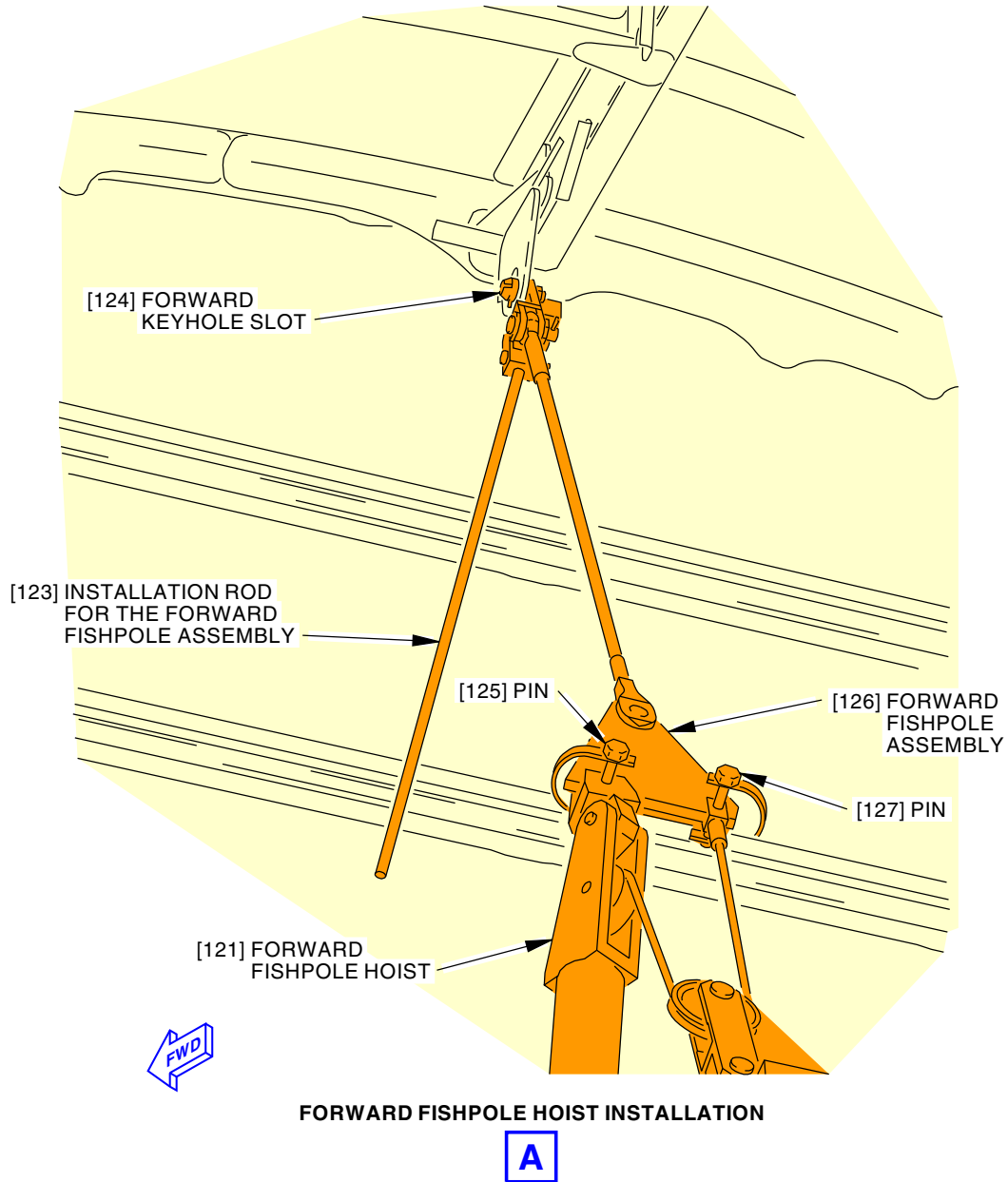
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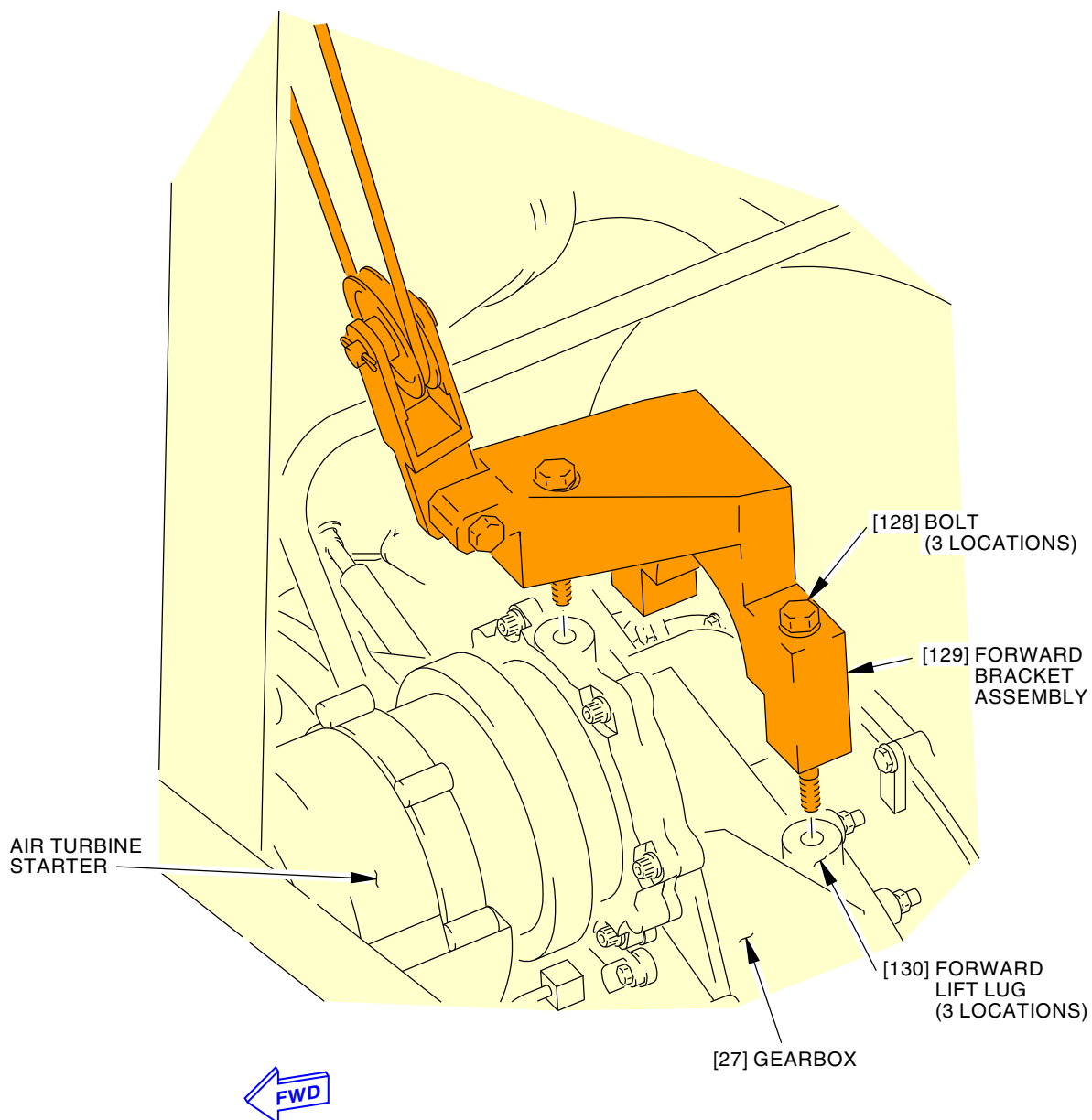
Auxiliary Power Unit (APU) Installation (Cable Fishpole Hoist Procedure)
Figure 409/49-11-01-990-808 (Sheet 2 of 5)

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FORWARD BRACKET INSTALLATION

B

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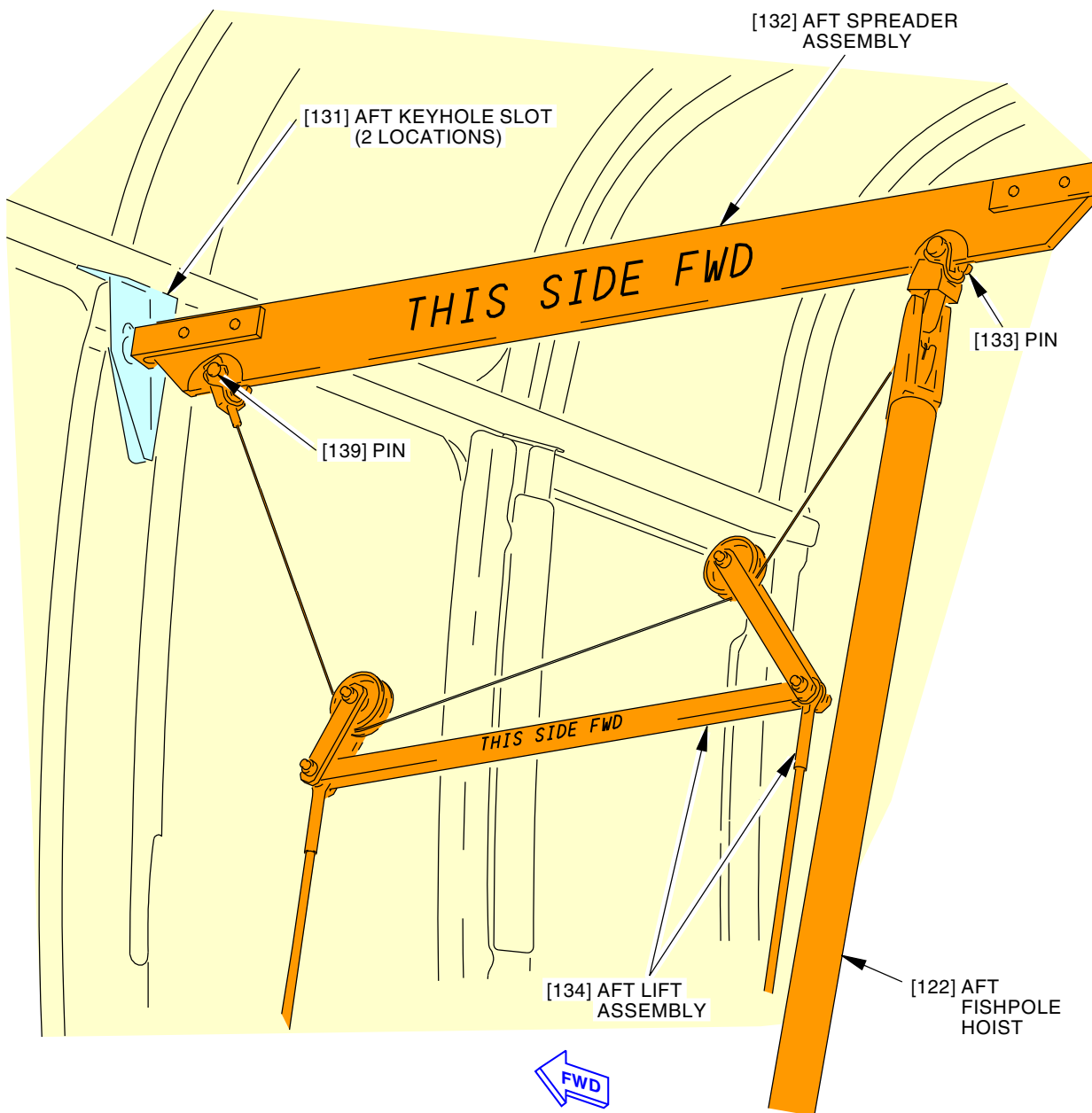
Auxiliary Power Unit (APU) Installation (Cable Fishpole Hoist Procedure)
Figure 409/49-11-01-990-808 (Sheet 3 of 5)

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AFT FISHPOLE HOIST AND AFT LIFT ASSEMBLY INSTALLATION

C

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**Auxiliary Power Unit (APU) Installation (Cable Fishpole Hoist Procedure)
Figure 409/49-11-01-990-808 (Sheet 4 of 5)**

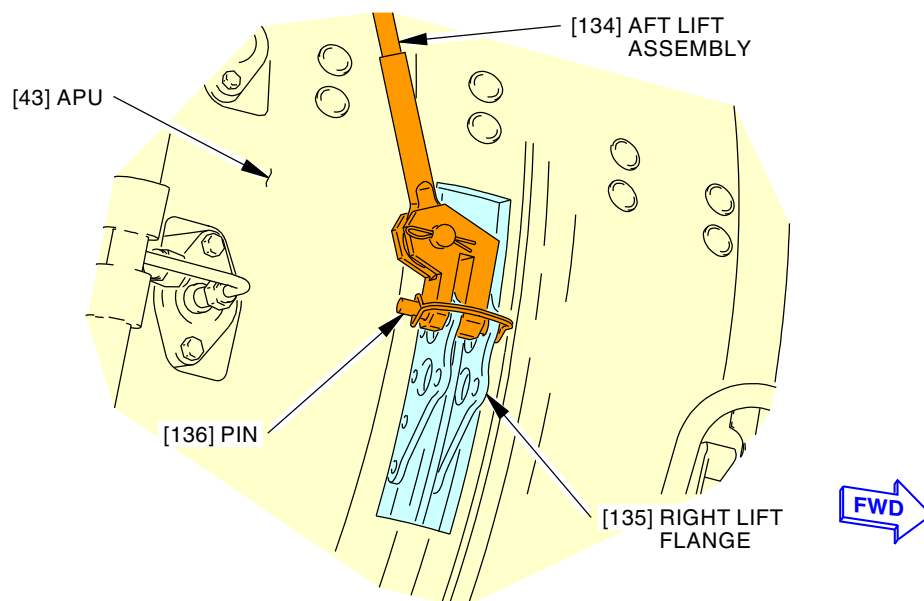
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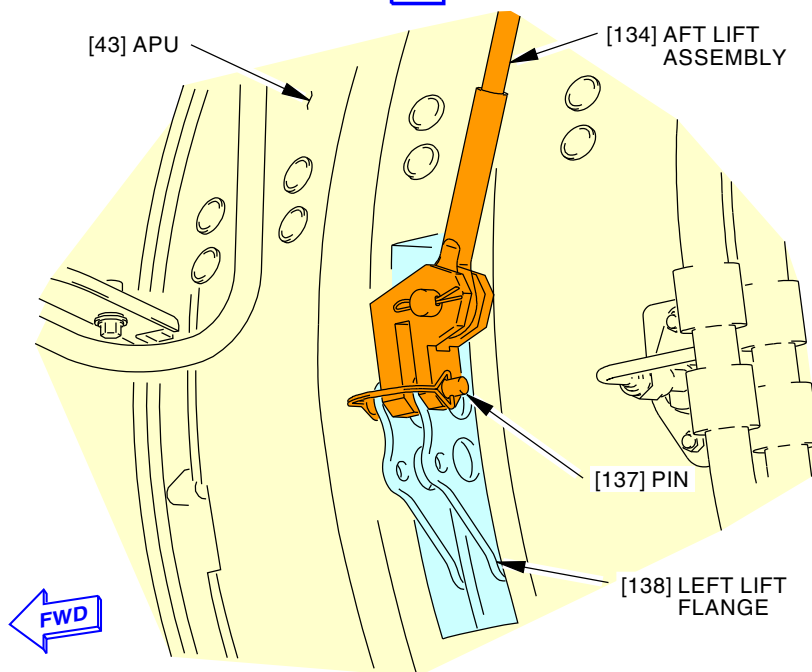
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AFT LIFT ASSEMBLY/APU CONNECTION

D



AFT LIFT ASSEMBLY/APU CONNECTION

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Auxiliary Power Unit (APU) Installation (Cable Fishpole Hoist Procedure)
Figure 409/49-11-01-990-808 (Sheet 5 of 5)

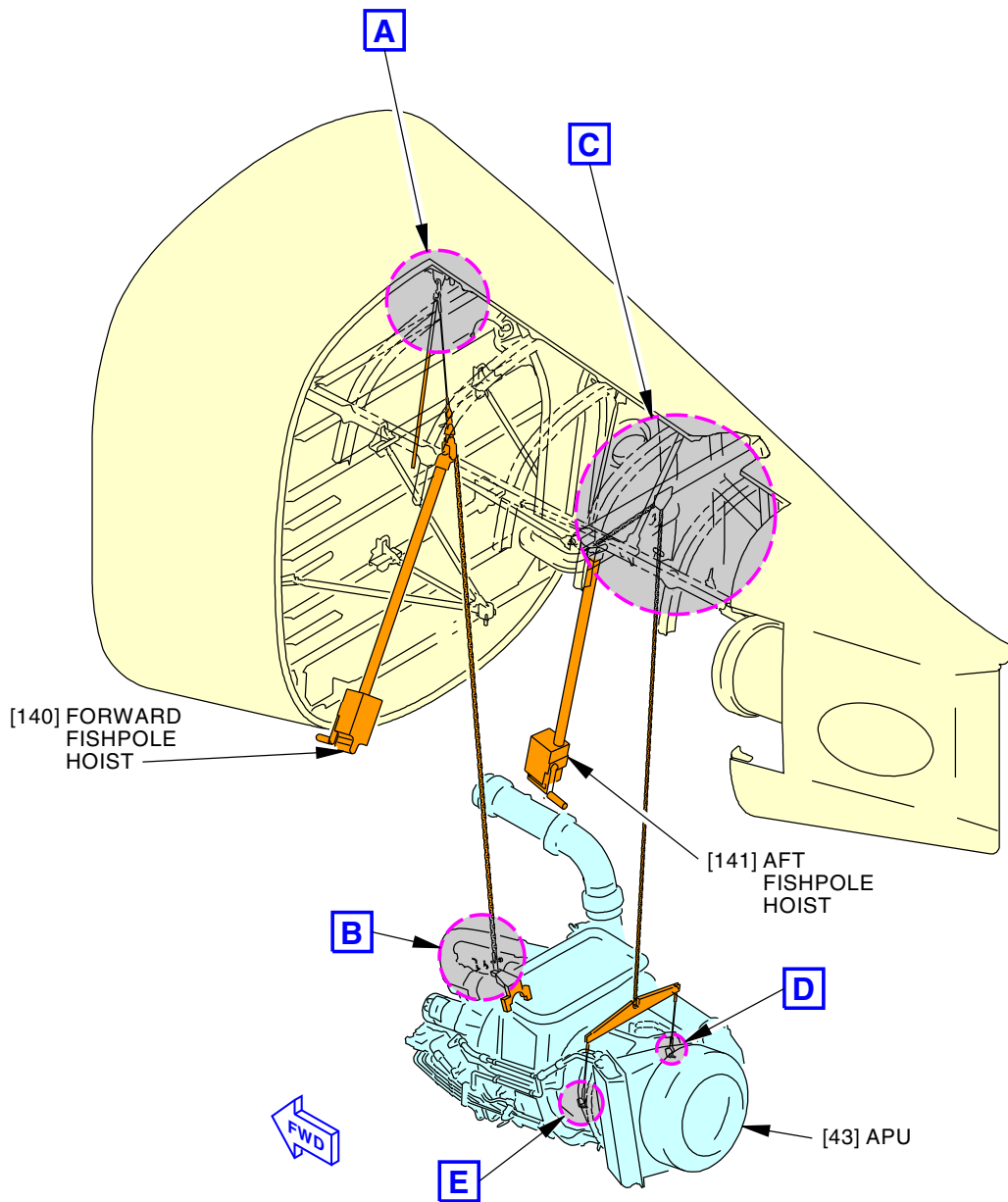
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Auxiliary Power Unit (APU) Installation (Chain Fishpole Hoist Procedure)
Figure 410/49-11-01-990-809 (Sheet 1 of 5)

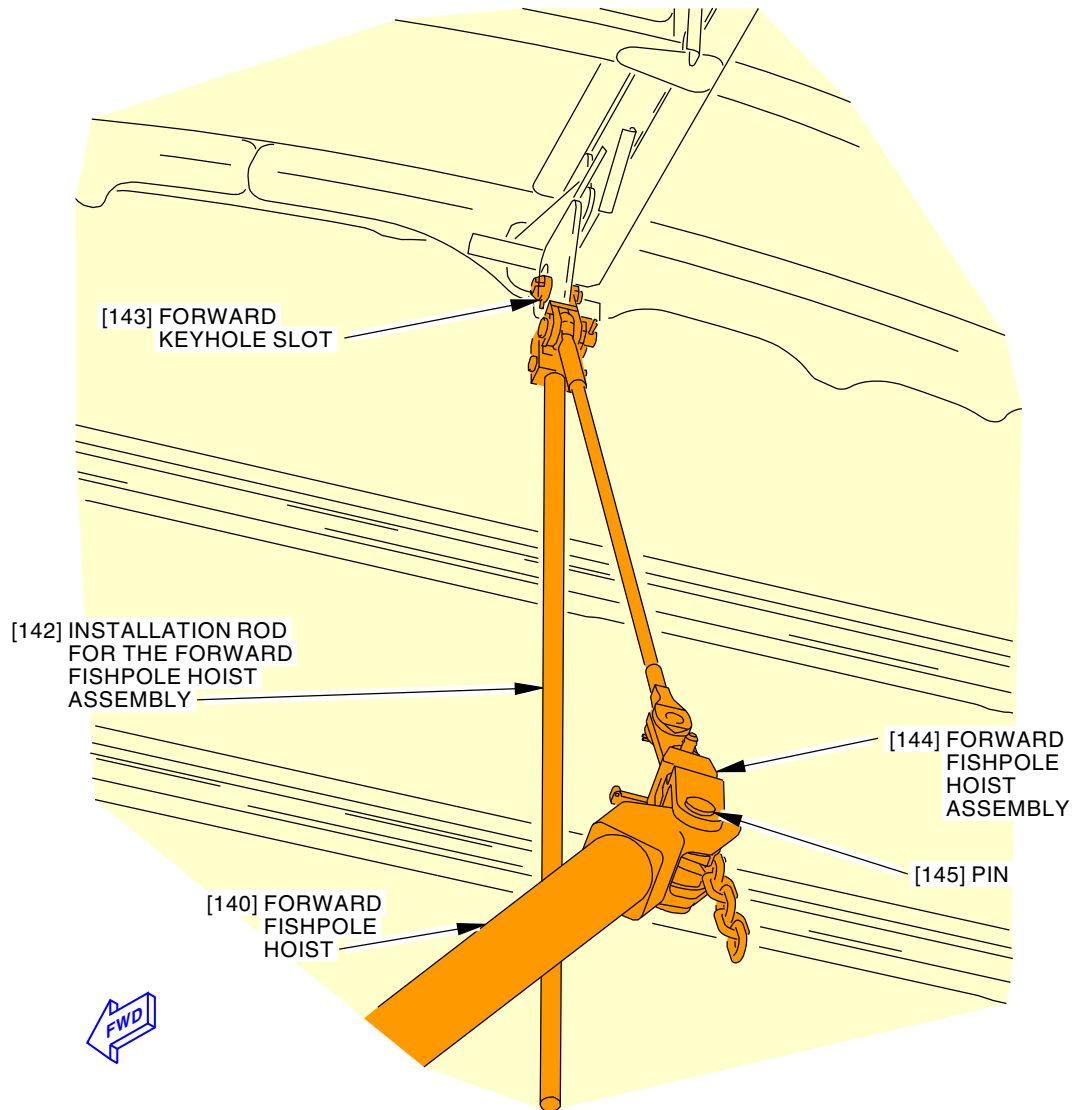
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FORWARD FISHPOLE HOIST INSTALLATION

A

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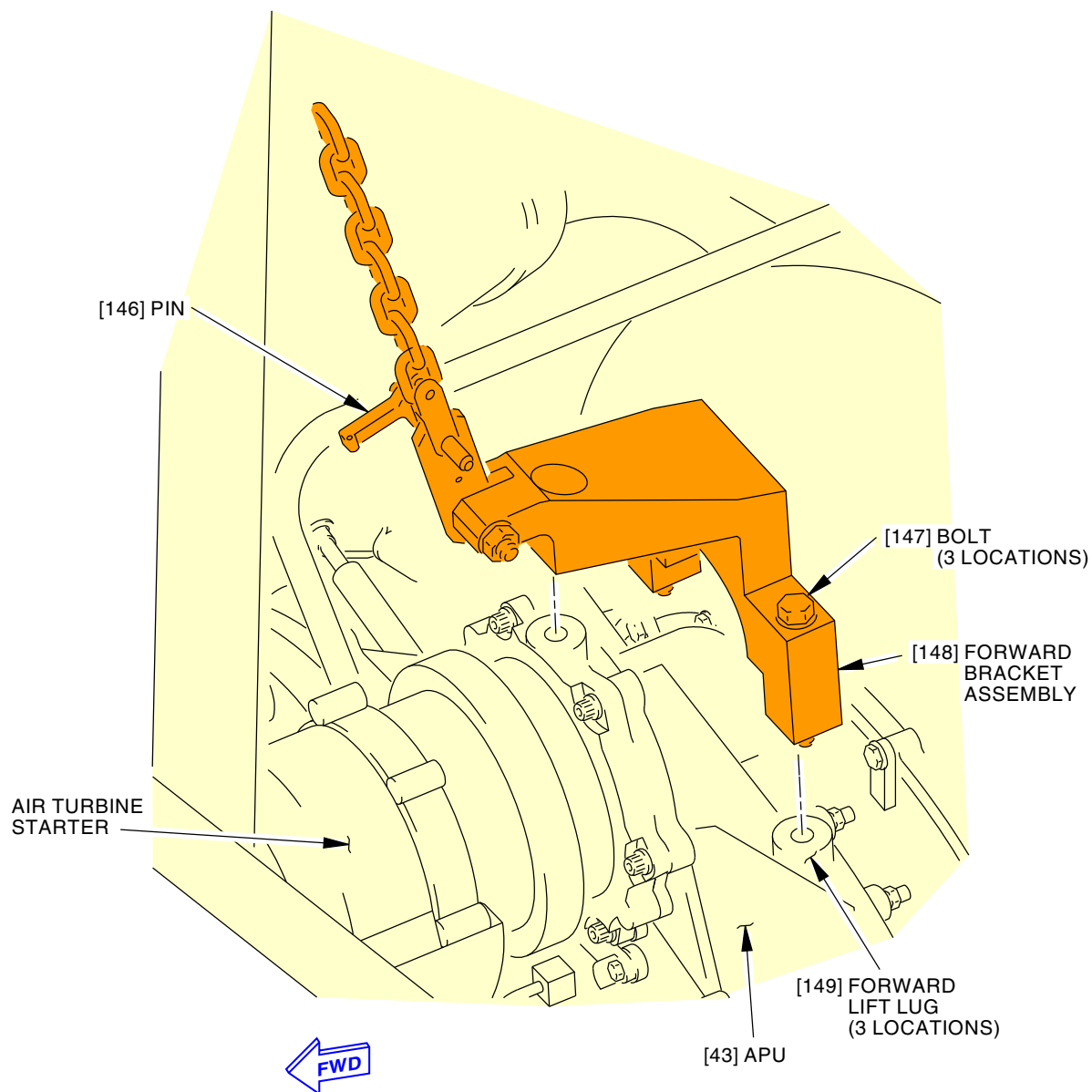
Auxiliary Power Unit (APU) Installation (Chain Fishpole Hoist Procedure)
Figure 410/49-11-01-990-809 (Sheet 2 of 5)

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FORWARD BRACKET INSTALLATION

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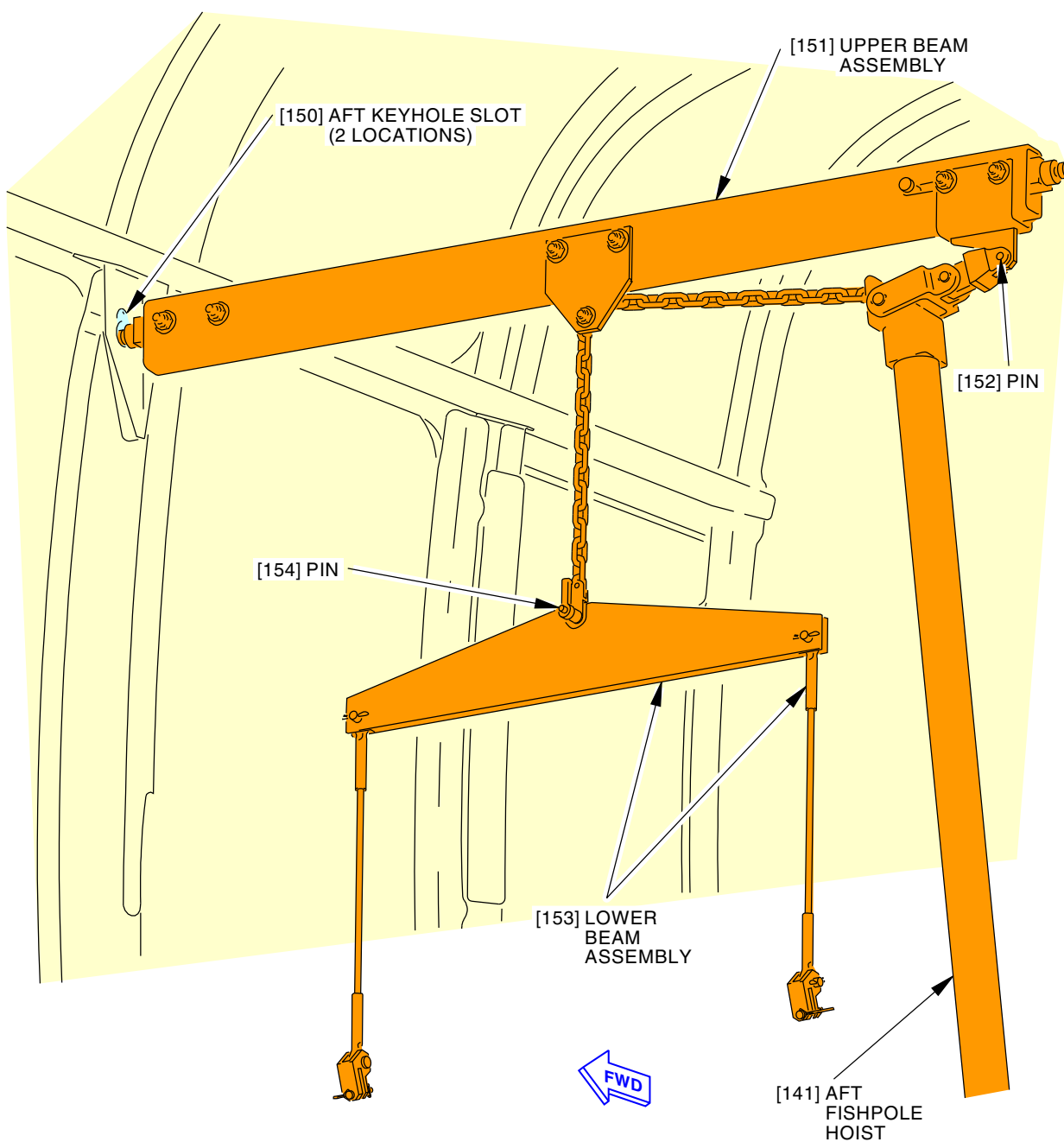
Auxiliary Power Unit (APU) Installation (Chain Fishpole Hoist Procedure)
Figure 410/49-11-01-990-809 (Sheet 3 of 5)

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AFT FISHPOLE HOIST AND AFT BEAM ASSEMBLY INSTALLATION

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**Auxiliary Power Unit (APU) Installation (Chain Fishpole Hoist Procedure)
Figure 410/49-11-01-990-809 (Sheet 4 of 5)**

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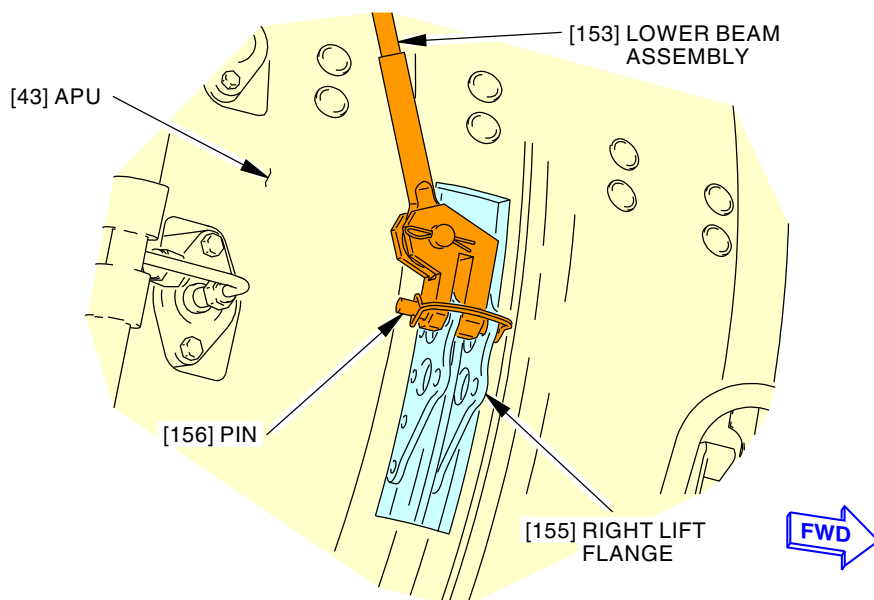
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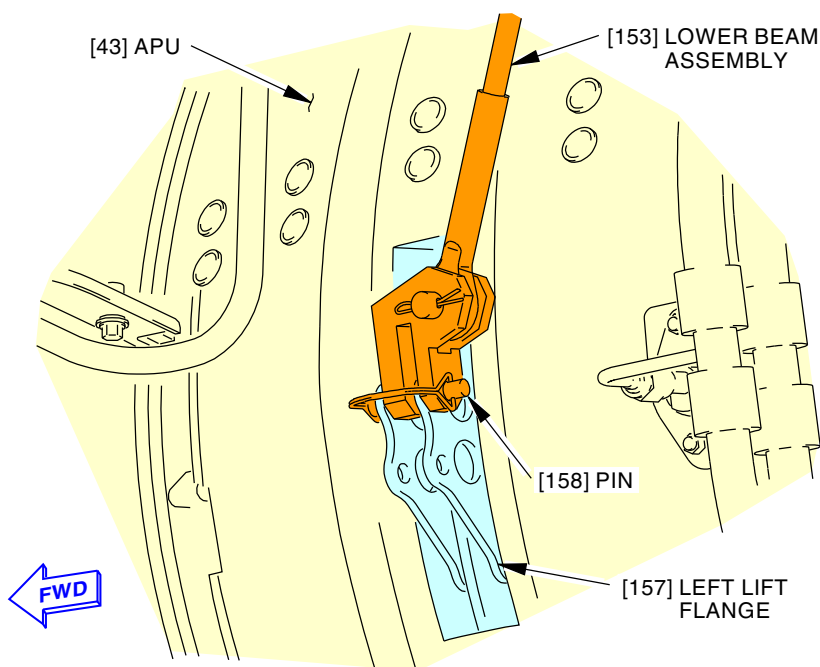
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LOWER BEAM ASSEMBLY/APU CONNECTION

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LOWER BEAM ASSEMBLY/APU CONNECTION

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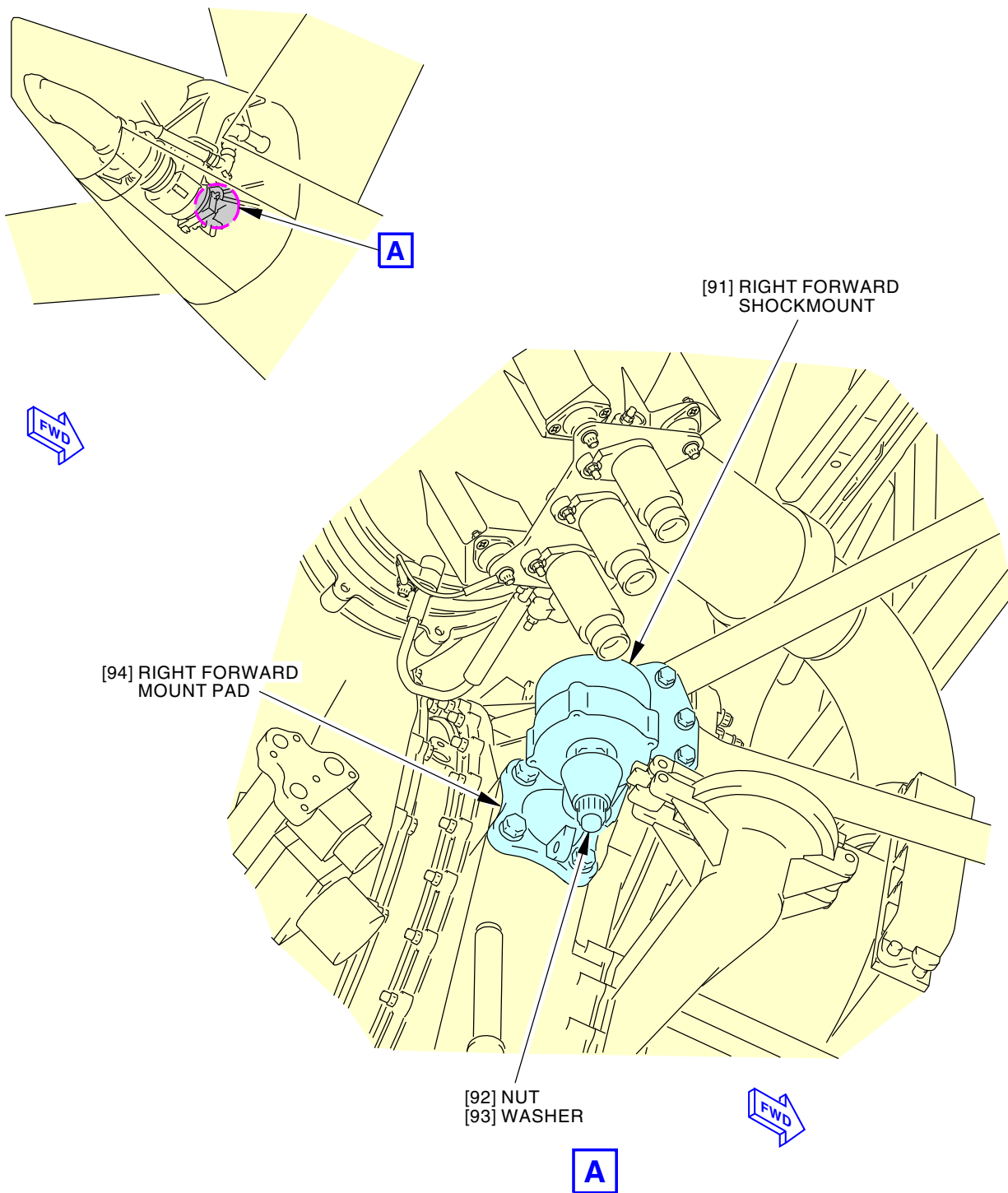
Auxiliary Power Unit (APU) Installation (Chain Fishpole Hoist Procedure)
Figure 410/49-11-01-990-809 (Sheet 5 of 5)

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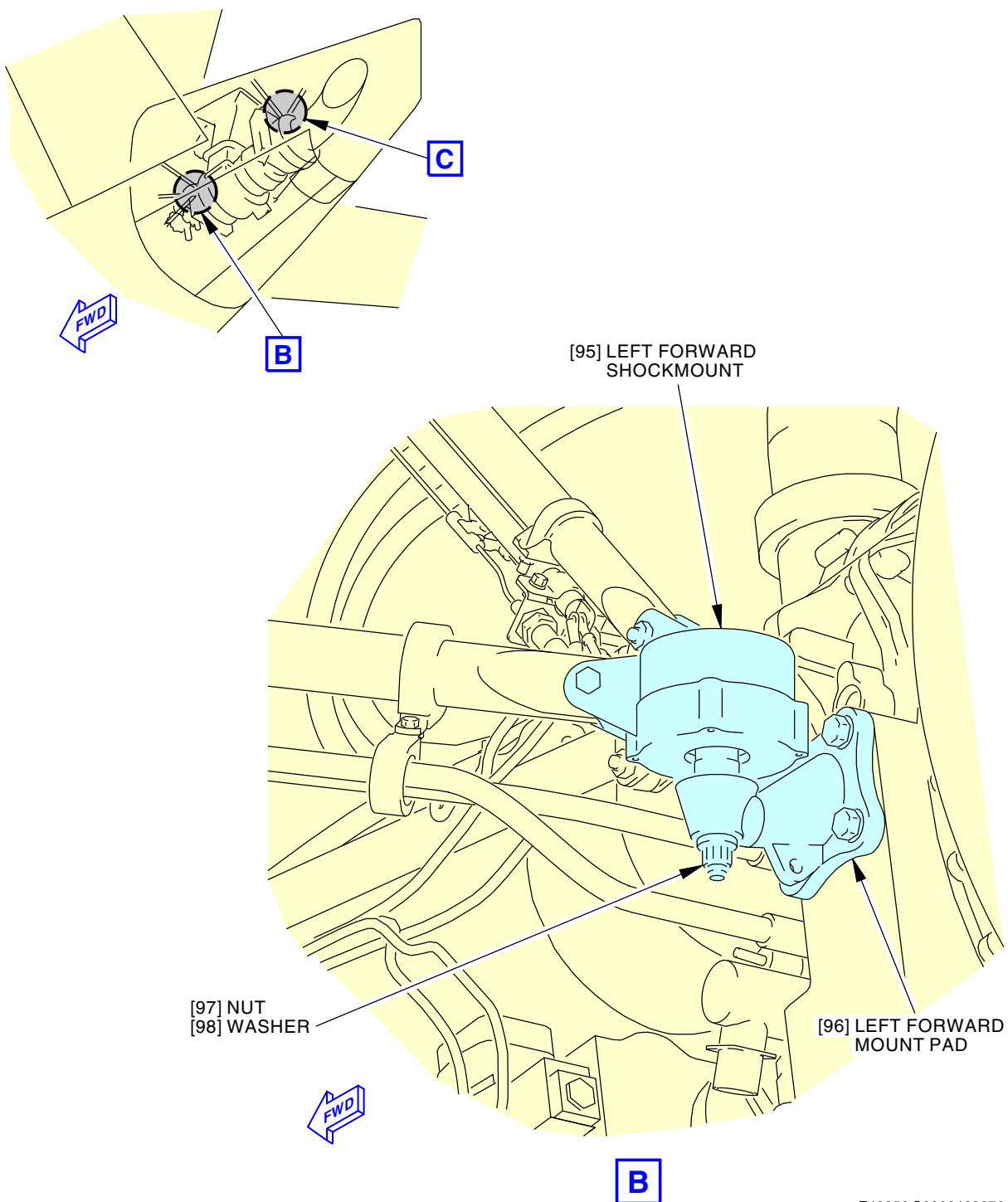
**APU Mount Connections (Fishpole Hoist Procedure)
Figure 411/49-11-01-990-810 (Sheet 1 of 4)**

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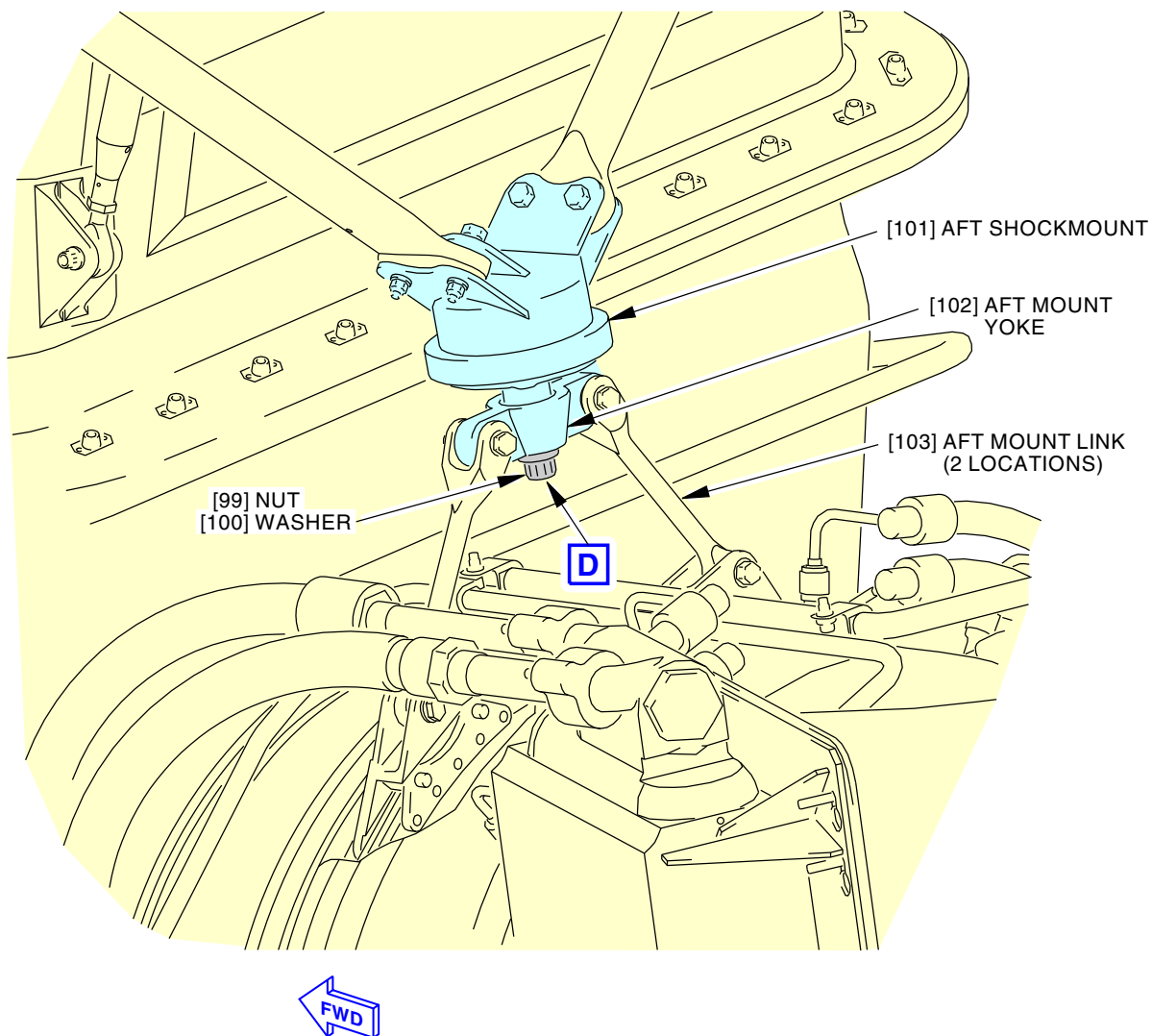
**APU Mount Connections (Fishpole Hoist Procedure)
Figure 411/49-11-01-990-810 (Sheet 2 of 4)**

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APU Mount Connections (Fishpole Hoist Procedure)
Figure 411/49-11-01-990-810 (Sheet 3 of 4)

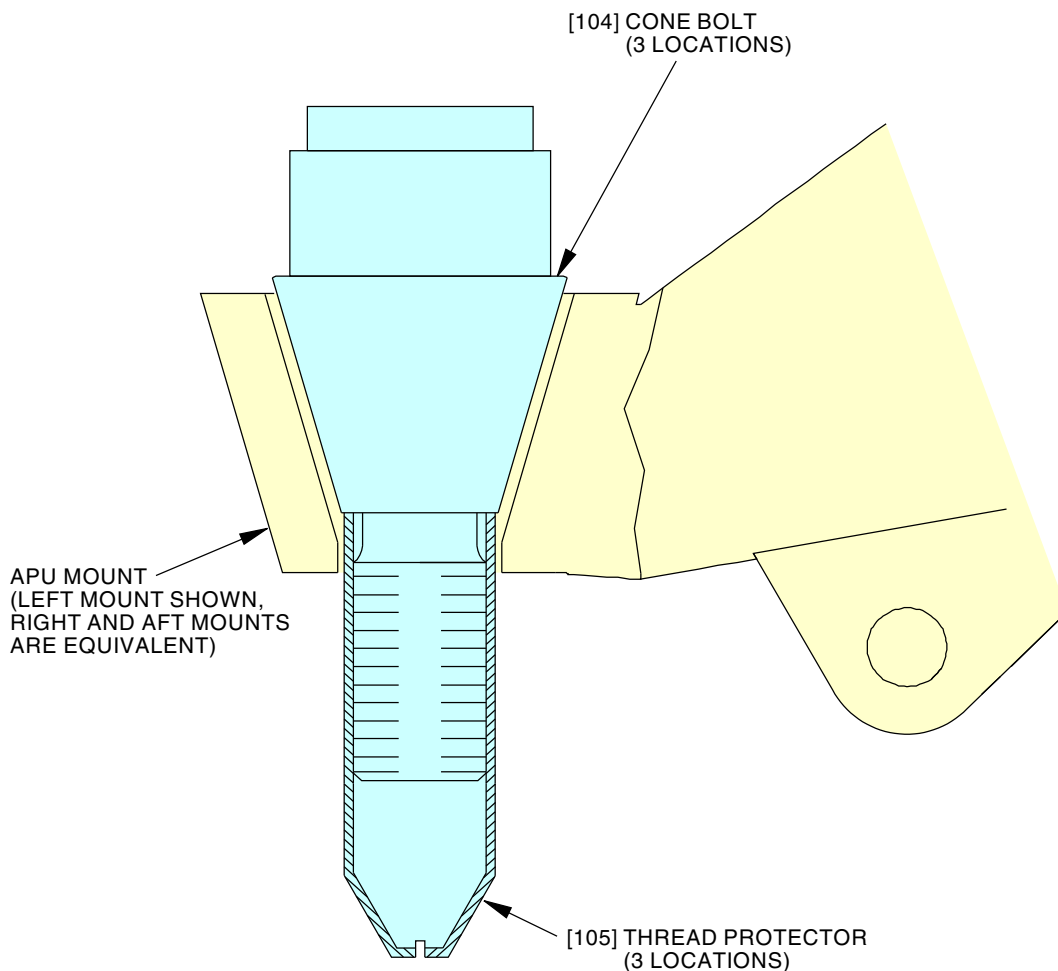
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NOTE:

MAKE SURE THE THREAD PROTECTORS ARE FULLY SEATED AGAINST THE CONE BOLTS. THIS WILL PREVENT INTERFERENCE BETWEEN THE THREAD PROTECTORS AND THE APU MOUNTS WHEN THE APU IS LOWERED.

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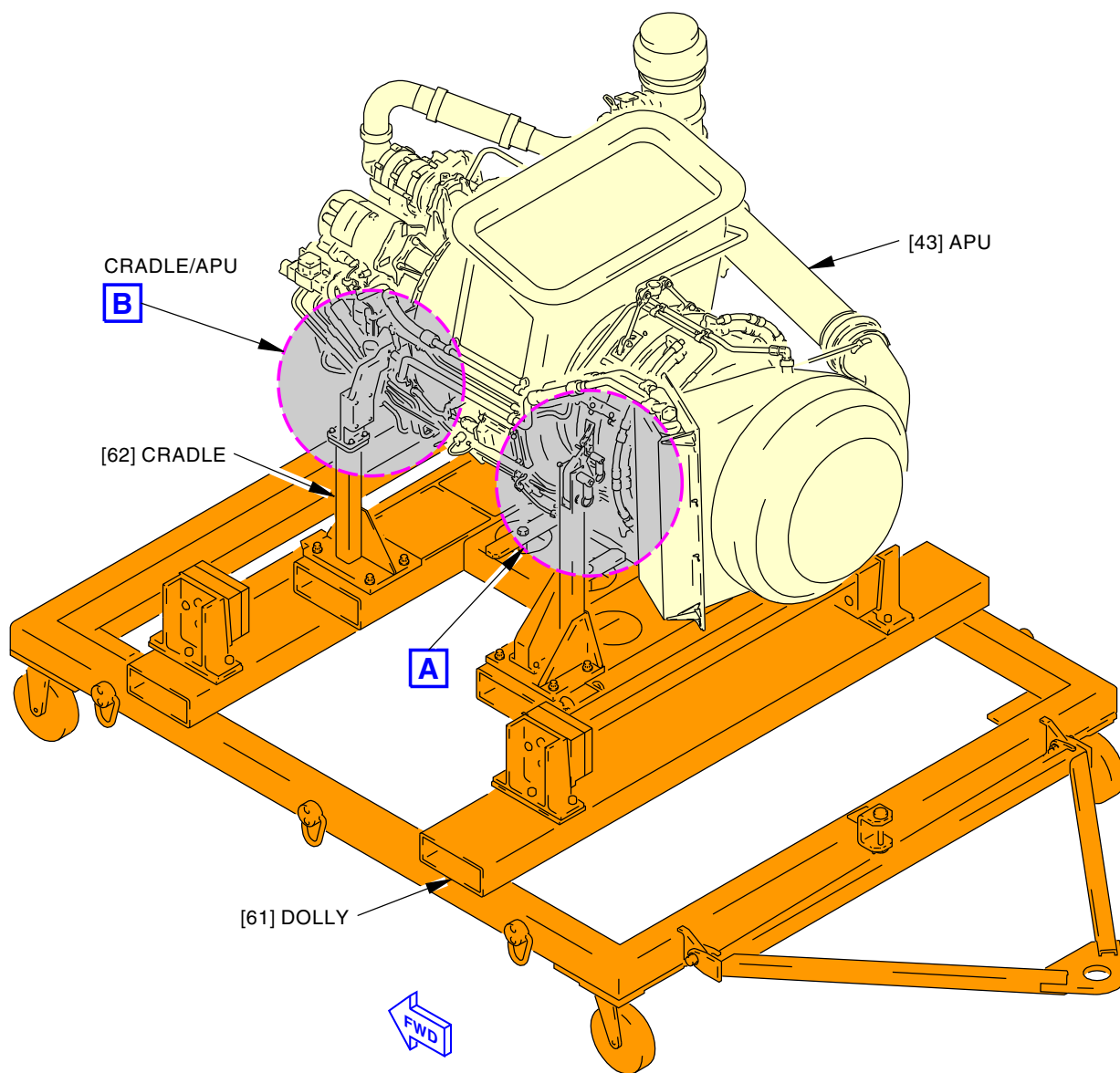
**APU Mount Connections (Fishpole Hoist Procedure)
Figure 411/49-11-01-990-810 (Sheet 4 of 4)**

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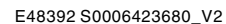
APU Cradle/Dolly Interface (Fishpole Hoist Procedure)
Figure 412/49-11-01-990-812 (Sheet 1 of 4)

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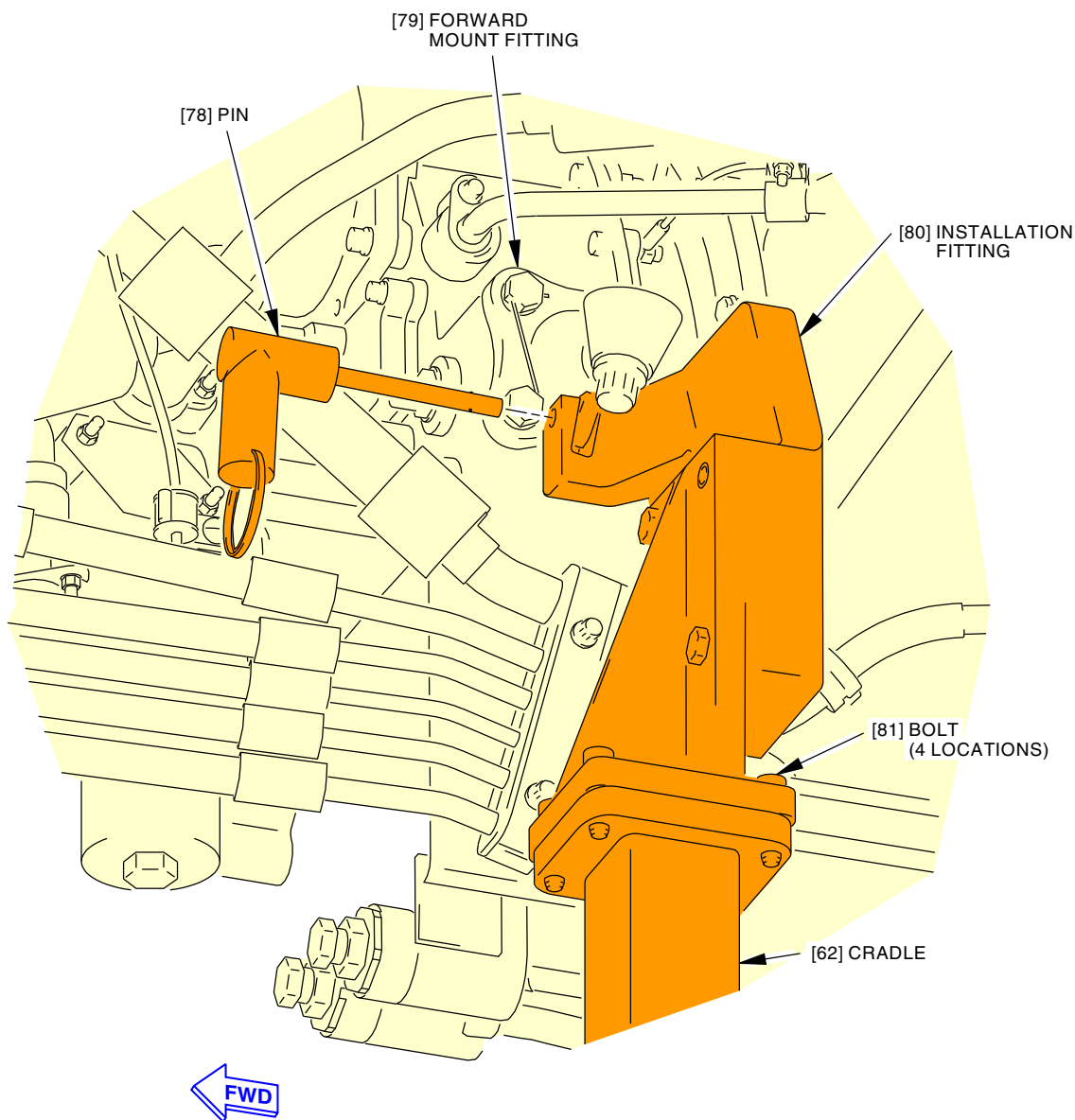


APU Cradle/Dolly Interface (Fishpole Hoist Procedure)
Figure 412/49-11-01-990-812 (Sheet 2 of 4)

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CRADLE/APU
(INSTALLATION CONFIGURATION)

B

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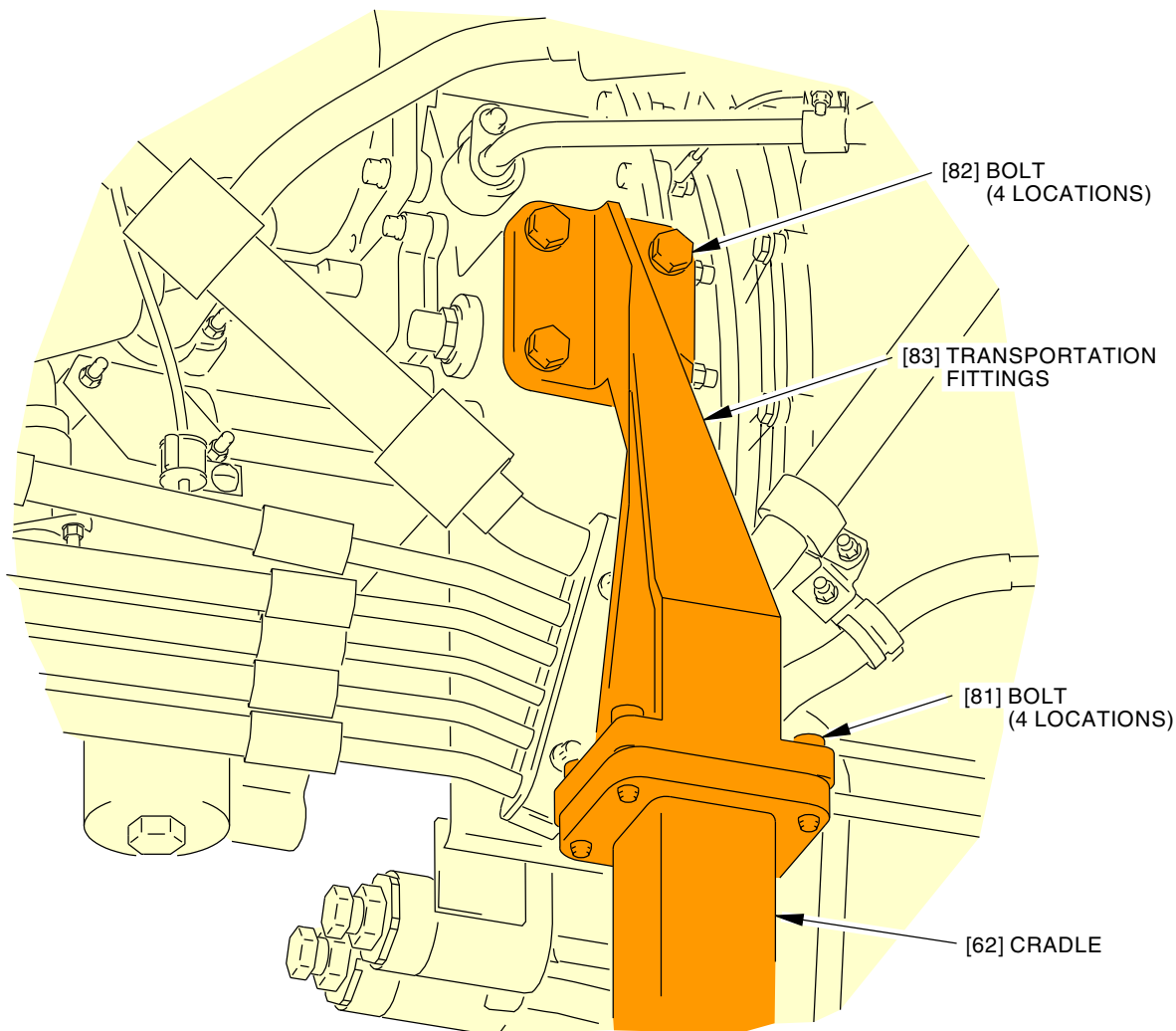
APU Cradle/Dolly Interface (Fishpole Hoist Procedure)
Figure 412/49-11-01-990-812 (Sheet 3 of 4)

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**CRADLE/APU
(TRANSPORTATION CONFIGURATION)**

B

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**APU Cradle/Dolly Interface (Fishpole Hoist Procedure)
Figure 412/49-11-01-990-812 (Sheet 4 of 4)**

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TASK 49-11-01-400-805

5. Auxiliary Power Unit Installation (Fishpole Hoist Procedure)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task contains the steps to install the APU into the tailcone.
- (2) The Fishpole Hoists can have either cables or chains. A different procedure is provided where necessary for the cable type hoist and the chain type hoist.

B. References

Reference	Title
12-13-04	AUXILIARY POWER UNIT REPLENISHING
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-13-04-400-801	Forward Mount Fitting Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meters - 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 #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain Part #: AP6108 Supplier: 4Y309
SPL-1963	Ballast - Fishpole Installation, APU Generator Part #: J49001-9 Supplier: 81205
SPL-1966	Equipment - Hoist, APU Installation/Removal (cable fishpole hoist) Part #: J49003-43 Supplier: 81205
SPL-1974	Cradle - APU, For Use with Transportation Dolly Part #: J49006-67 Supplier: 81205
SPL-4254	Equipment - Hoist, APU Installation/Removal (Chain Fishpole hoist) Part #: J49003-47 Supplier: 81205
STD-583	Mallet - Non-metallic

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D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
92	Nut	49-11-01-01-125	ARO ALL
97	Nut	49-11-01-01-125	ARO ALL
99	Nut	49-11-01-01-125	ARO ALL

F. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

G. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

H. Prepare for the Auxiliary Power Unit Installation

SUBTASK 49-11-01-480-020

(1) If the new APU does not have a generator installed, do the steps that follow:

- (a) Put the generator ballast on the APU generator mount pad.
 - 1) APU generator fishpole installation ballast, SPL-1963.
- (b) Turn the generator ballast clockwise to engage the studs.
- (c) Tighten the nuts.
- (d) Attach a REMOVE BEFORE FLIGHT tag on the generator ballast.

NOTE: The generator ballast must be removed and the APU generator must be installed before the next flight.

I. Auxiliary Power Unit Installation

SUBTASK 49-11-01-420-007

(1) Raise the APU into the tailcone:

- (a) Do the steps that follow to connect the APU [43] to the cable fishpole hoist, COM-1563 or chain fishpole hoist, COM-1592:
 - 1) Put the forward bracket assembly [129] on the APU so the bolts [128] align with the forward lift lugs [130] (Figure 409) (View B).
 - a) Tighten the bolts [128] to 240-276 pound-inches.
 - 2) Connect the aft lift assembly [134] to the top hole of the right lift flange [135] with the pin [136] (Figure 409).
 - 3) Connect the aft lift assembly [134] to the top hole of the left lift flange [138] with the pin [137] (Figure 409).
- (b) Do the steps that follow to connect the APU [43] to the APU installation/removal cable fishpole hoist equipment, SPL-1966 or APU installation/removal chain fishpole hoist equipment, SPL-4254:

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- 1) Put the forward bracket assembly [148] on the APU so the bolts [147] align with the forward lift lugs [149] (Figure 410) (View B).
 - a) Tighten the bolts [147] to 240-276 pound-inches.
 - 2) Connect the lower beam assembly [153] to the top hole of the right lift flange [155] with the pin [156] (Figure 410).
 - 3) Connect the lower beam assembly [153] to the top hole of the left lift flange [157] with the pin [158] (Figure 410).
- (c) Do the steps that follow to disconnect the APU [43] from the cradle [62] (Figure 412):
- 1) Tighten the cables for the fishpole hoists [121] and [122], or the chains for the fishpole hoists [140] and [141].
 - 2) Remove the 2 pins [76] that attach the APU [43] to the aft support arms [74] of the cradle [62].
 - 3) Remove the 2 pins [77] that lock the aft support arms in its position (Figure 412).
 - 4) Turn the aft support arms [74] away from the APU [43].

NOTE: The aft support arms [74] must be moved to provide clearance between the APU [43] and the cradle [62].
 - 5) Remove the bolts [81] that attach the installation fittings [80] or the transportation fittings [83] to the cradle [62] (Figure 412).
 - 6) If the cradle is in the installation configuration, remove the 2 pins [78] that attach the installation fittings [80] to the forward mount fittings [79].
 - 7) If the cradle is in the transportation configuration, remove the bolts [82] that attach the transportation fittings [83] to the APU [43].
 - 8) Remove the installation fittings [80] or the transportation fittings [83] from the APU.
 - 9) Install the transportation fittings [83] or the installation fittings [80] on the cradle [62].
 - 10) Install the bolts [81].
- (d) If you used the APU cradle, SPL-1974 in the transportation configuration, install the forward mount fittings:
- 1) To install the forward mount fittings on the APU, do this task: Forward Mount Fitting Installation, TASK 49-13-04-400-801.
- (e) Lift the APU [43] into position:
- 1) Slowly lift the APU [43] into the tail cone with the cable type fishpole hoists [121] and [122], or chain type fishpole hoists [140] and [141].

NOTE: To control the forward movement of the APU [43], raise the aft end of the APU [43] higher than the forward end.
 - 2) Lift the APU until the inlet seal is engaged.
 - 3) Make sure the clearance between the APU inlet plenum and the inlet duct is 0.20 in. (5.08 mm) or more on all sides.



CAUTION

MAKE SURE THE AIR TURBINE STARTER DUCT DOES NOT HIT THE RIGHT FORWARD MOUNT [91]. THIS CAN CAUSE DAMAGE TO THE APU [43].

- 4) Make sure the forward shockmounts [91] and [95] engage at the same time.

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- 5) Tighten the fishpole hoists until the cone bolts for the shockmounts [91] and [95] show.

NOTE: When the cone bolts show, the APU mounts are engaged.

- a) Remove the thread protectors from the two forward cone bolts.



YOU MUST USE DYE-PENETRANT INSPECTED NUTS [92], [97] OR USE NEW NUTS FOR THE APU INSTALLATION ON THE TWO CONE BOLTS. THE USE OF CRACKED OR DAMAGED NUTS ON THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (f) Install the washer [93], washer [98] and the nut [92], nut [97] on the two forward cone bolts [104].

- 1) Lift the aft mount yoke [102] to the cone bolt on the aft shockmount [101].

NOTE: You can raise or lower the aft end of the APU [43] so the aft mount yoke [102] will engage the cone bolt.

- a) Remove the thread protector from the aft cone bolt.



YOU MUST USE A DYE-PENETRANT INSPECTED NUT [99] OR USE A NEW NUT FOR THE APU INSTALLATION ON THE CONE BOLT. THE USE OF A CRACKED OR DAMAGED NUT ON THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (g) Install the washer [100] and the nut [99] on the aft cone bolt [104].

- (h) Do the torque limit test for the nut [92], nut [97], new nut [99]:

- 1) Tighten the three nuts to a run-on torque of not more than 150 inch-pounds (17.0 newton-meters) until you can see one to two full threads and the cone bolt chamfer extends below each nut.

NOTE: Use an open-end wrench on the flats of the cone bolt to hold the cone bolt in position while you tighten each nut.

- 2) Make sure the three washers [93], [98], [100] do not touch the bottom surface of the structure.
- 3) Make sure the break-away torque necessary to turn the three nuts from this position is more than 18 inch-pounds (2.0 newton-meters).
- 4) Replace the nut(s) that do not meet these torque limits.
- 5) If the nut(s) were replaced, do the torque limit test again for the new nut(s).

- (i) Tighten the nut [92], nut [97], nut [99] to 800-900 inch-pounds (90.4-101.7 newton-meters).

J. APU Hoist Equipment Removal (cable type hoist)

SUBTASK 49-11-01-800-002

- (1) The APU hoist APU installation/removal cable fishpole hoist equipment, SPL-1966 has these parts:

- (a) Aft lift assembly
- (b) Aft spreader assembly
- (c) Forward Fishpole assembly
- (d) Forward bracket assembly
- (e) Installation rod

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(f) Pins.

SUBTASK 49-11-01-080-014

- (2) Do the steps that follow to remove the forward hoist equipment from the APU compartment:
- (a) Remove the pin [127] that attaches the fishpole hoist cable to the forward fishpole assembly [126].
 - 1) Wind the cable into the forward fishpole cable fishpole hoist, COM-1563 [121].
 - (b) Remove the pin [125] that attaches the forward fishpole assembly [126] to the forward fishpole cable fishpole hoist, COM-1563 [121] or hoist, 10/3641 [121].
 - 1) Remove the forward fishpole cable fishpole hoist, COM-1563 [121] or hoist, 10/3641 [121].
 - (c) Lift the installation rod [123] up to disengage the forward fishpole assembly [126] from the forward keyhole slot [124].
 - (d) Loosen the 3 bolts [128] that attach the forward bracket assembly [129] to the gearbox [27].
 - (e) Remove the forward bracket assembly [129].

SUBTASK 49-11-01-080-015

- (3) Do the steps that follow to remove the aft hoist equipment from the APU compartment:
- (a) Unwind the aft fishpole cable fishpole hoist, COM-1563 [122] or hoist, 10/3641 [122] until the aft lift assembly [134] rests on the APU [43].
 - (b) Remove the pin [139] that attaches the cable for the aft fishpole cable fishpole hoist, COM-1563 [122] or hoist, 10/3641 [122] to the aft spreader assembly [132].
 - 1) Wind aft fishpole [122] or hoist, 10/3641 [122] until the end of the cable reaches the aft fishpole hoist [122].
 - (c) Remove the pin [133] that attaches the aft fishpole cable fishpole hoist, COM-1563 [122] or hoist, 10/3641 [122] to the aft spreader assembly [132].
 - 1) Remove the aft fishpole cable fishpole hoist, COM-1563 [122] or hoist, 10/3641 [122].
 - (d) Remove the pin [137] that attaches the aft lift assembly [134] to the left lift flange [138].
 - (e) Remove the pin [136] that attaches the aft lift assembly [134] to the right lift flange [135].
 - (f) Remove the aft lift assembly [134].
 - (g) Turn the aft spreader assembly [132] 90° about its axis.
 - (h) Lift the right end of the aft spreader assembly [132] up and disengage it from the right keyhole slot.
 - (i) Lift the left end of the aft spreader assembly [132] up and disengage it from the left keyhole slot.
 - (j) Remove the aft spreader assembly [132].

K. Fishpole Hoist Removal (chain type fishpole hoist)

SUBTASK 49-11-01-800-004

- (1) The APU fishpole hoist APU installation/removal chain fishpole hoist equipment, SPL-4254 has these parts:
- (a) Upper beam assembly
 - (b) Lower beam assembly
 - (c) Forward bracket assembly

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- (d) Forward fishpole hoist assembly
- (e) Installation rod
- (f) Pins.

SUBTASK 49-11-01-080-016

- (2) Do the steps that follow to remove the forward fishpole hoist equipment and chain fishpole hoist, COM-1592 from the APU compartment:
 - (a) Remove the pin [146] that attaches the forward fishpole [140] to the forward bracket assembly [148].
 - (b) Wind the chain into the forward fishpole hoist [140].
 - (c) Remove the pin [145] that attaches the forward fishpole hoist [140] to the forward fishpole hoist assembly [144].
 - (d) Remove the forward fishpole hoist [140].
 - (e) Lift the installation rod [142] up to disengage the forward fishpole hoist assembly [144] from the forward keyhole slot [143].
 - (f) Loosen the 3 bolts [147] that attach the forward bracket assembly [148] to the APU [43].
 - (g) Remove the forward bracket assembly [148].

SUBTASK 49-11-01-080-017

- (3) Do the steps that follow to remove the aft fishpole hoist equipment from the APU compartment:
 - (a) Unwind the aft fishpole [141] until the lower beam assembly [153] rests on the APU [43].
 - (b) Remove the pin [154] that attaches the chain for the aft fishpole hoist [141] to the lower beam assembly [153].
 - 1) Wind aft fishpole hoist [141] until the end of the chain reaches the aft fishpole hoist [141].
 - (c) Remove the pin [152] that attaches the aft fishpole hoist [141] to the upper beam assembly [151].
 - 1) Remove the aft fishpole hoist [141].
 - (d) Remove the pin [158] that attaches the lower beam assembly [153] to the left lift flange [157].
 - (e) Remove the pin [156] that attaches the lower beam assembly [153] to the right lift flange [155].
 - (f) Remove the lower beam assembly [153].
 - (g) Turn the upper beam assembly [151] 90° about its axis.
 - (h) Lift the right end of the upper beam assembly [151] up and disengage it from the right keyhole slot.
 - (i) Lift the left end of the upper beam assembly [151] up and disengage it from the left keyhole slot.
 - (j) Remove the upper beam assembly [151].

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L. Electrical, Pneumatic, Fuel Connections, and Oil Replenishing

SUBTASK 49-11-01-420-008



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the plugs from the fuel supply line [23] and the APU [43] (Figure 407).
 - (a) Connect the fuel supply line [23] to the APU [43].
 - (b) Hold the reducer with a wrench and tighten the coupling nut for the fuel supply line [23] to 665-735 pound-inches (75.15-83.06 newton-meters).

SUBTASK 49-11-01-420-009

- (2) Connect the ducts (Figure 408):
 - (a) Install the clamp [42] that connects the bleed duct [41] to the APU [43].
 - 1) Tighten the clamp [42] to 55-75 pound-inches (6.2-8.5 newton-meters).
 - (b) Move the exhaust duct [45] so that it is aligned with the APU [43].

NOTE: The exhaust duct [45] is held to the exhaust duct panel with a leaf spring.
 - (c) Install the exhaust duct clamp [44].
 - 1) Tighten the nuts on the exhaust duct clamp [44] to 70-90 pound-inches (7.9-10.1 newton-meters).
 - 2) Lightly hit the edge of the exhaust duct clamp [44] with a non-metallic mallet, STD-583.
 - 3) Continue to tighten the nuts and hit the clamp until the torque value stays constant.

SUBTASK 49-11-01-420-010

- (3) Connect the electrical and tubing connections:
 - (a) Do the steps that follow to connect the ground jumper [26] to the gearbox [27] (Figure 407) (View F).
 - 1) Remove the nuts [25] and the washers [24] from the gearbox [27].
 - 2) Clean the surface of the gearbox [27] around the studs for the ground jumper [26]:
 - a) Apply the solvent, B00083 to a bristle brush or a cleaning cloth.
 - b) Use a small amount of pressure on the brush or the cleaning cloth while you clean the gearbox [27].
 - c) Continue to clean the gearbox until there is no visible residue on the gearbox [27].
 - 3) Connect the ground jumper [26] to the gearbox [27].
 - 4) Install the washers [24] and the nuts [25].
 - 5) Tighten the nuts [25] to 480-520 pound-inches.
 - 6) With an intrinsically safe approved bonding meter, COM-1550, make sure the resistance from the gearbox [27] to the ground jumper [26] is less than 0.5 milliohm.
 - (b) Do the steps that follow to connect the leads [18] and [20] to the electric starter motor [17] (Figure 407) (View E).
 - 1) Remove the terminal block cover [19] from the electric starter motor [17].
 - 2) Thread the leads [18] and [20] through the terminal block cover [19].

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- 3) Remove the nut [21].
 - 4) Connect the positive lead [18] to the electric starter motor [17].
 - 5) Install the nut [21].
 - a) Tighten the nut [21] to 140-160 pound-inches.
 - 6) Remove the nut [22].
 - 7) Connect the negative lead [20] to the electric starter motor [17].
 - 8) Install the nut [22].
 - a) Tighten the nut [22] to 140-160 pound inches.
 - 9) Move the terminal block cover [19] over the terminals for the electric starter motor [17].
- (c) Install the APU drain tube assembly [47].
- 1) Tighten the coupling nuts [46].
- (d) Do the steps that follow to connect the APU wire harness:
- 1) Remove the caps from the electrical connector and the electrical receptacles.
 - 2) Connect the APU wire harness to the strut [13] with the clamps [16] (Figure 407) (View D).
 - 3) Connect the APU wire harness to the firewall with the clamps [14] (Figure 407) (View D).
 - 4) Remove the caps from the electrical connectors.
 - 5) Connect the APU wire harness connector, D49001P [1] to the firewall receptacle (Figure 407) (View B).
 - 6) Connect the APU wire harness connector, D49002P [2] to the firewall receptacle (Figure 407) (View B).
 - 7) Connect the APU wire harness connector, D49003P [4] to the firewall receptacle (Figure 407) (View B).
 - 8) Connect the APU wire harness connector, D49004P [3] to the firewall receptacle (Figure 407) (View B).
- (e) Do the steps that follow to connect the electrical connectors and the leads to the generator [10] (Figure 407) (View C):
- 1) Remove the bolts [12] and the washers [11] that connect the terminal block cover [5] to the generator [10].
 - 2) Remove the terminal block cover [5] from the generator [10].
 - 3) Remove the captive washer nuts [6].
 - 4) Connect the leads [7] to the generator [10].
 - a) Make sure the labels (N, T1, T2, and T3) on the leads [7] agree with the terminal labels.
 - 5) Install the 4 captive washer nuts [6].
- NOTE:** For the 6-point Spiralock (Belleville) nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.
- a) Tighten the nuts to 12 ft-lb (16 N·m) – 14 ft-lb (19 N·m).
 - 6) Install the terminal block cover [5] on the generator [10].



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- 7) Install the washers [11] and the bolts [12].
 - a) Tighten the bolts to 20-22 pound-inches (2.3-2.5 newton-meters).
- 8) Remove the caps from the electrical connectors.
- 9) Connect the electrical connector, DM24003B [9] to the generator [10].
- 10) Connect the electrical connector, DM24003A [8] to the generator [10].

SUBTASK 49-11-01-610-002

- (4) Replenish the APU with oil:
 - (a) Do this task: AUXILIARY POWER UNIT REPLENISHING, SUBJECT 12-13-04.

M. Auxiliary Power Unit (APU) Installation Test

SUBTASK 49-11-01-860-007

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-11-01-860-017

- (2) Make sure the EICAS message FUEL VALVE APU does not show on the EICAS display.

SUBTASK 49-11-01-860-008

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-11-01-410-005

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
313AL	Controls Bay Access Door

SUBTASK 49-11-01-790-002

- (5) Do the steps that follow to do the installation test for the APU:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 1) Examine the APU for leakage.

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- 2) Make sure these EICAS status messages do not show:
 - a) APU
 - b) APU DOOR
 - c) APU START SYSTEM
 - d) APU AIR TURBINE STARTER
 - e) APU LIMIT
 - f) APU CONTROL.

(b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

N. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-002

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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APU ACCESS DOORS - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) APU Access Doors (Open)
 - (2) APU access Doors (Close)

ARO 001-010; AIRPLANES WITH APU VENT DOORS

- B. Service Bulletin 777-52-0049 provides instructions on how to deactivate the APU vent doors. The vent door actuators are removed, and replaced with tie rods. This will prevent unscheduled removal of airplanes from service for replacement of failed APU vent door actuators.

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TASK 49-11-02-010-801

2. APU Access Doors (Open)

(Figure 201 or Figure 202)

A. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

B. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
315BL	APU Compartment Vent Door
316AR	Auxiliary Power Unit (APU) Access Door, Right
316BR	APU Compartment Vent Door

C. **Procedure**

SUBTASK 49-11-02-860-001

- (1) In the Left Systems Cardfile (P85), set the power switches (S6 and S7) for the APU Fire Detection Card (A9) to the OFF position.

SUBTASK 49-11-02-860-003

- (2) In the Left Systems Cardfile (P85), set the power switch (S1) for the Left Engine Fire Detection Card (A10) to the OFF position.

NOTE: If this switch is not set, the Left Engine Fire Warning light (and associated status message) will be displayed.

ARO 005-999; ARO 001-004 POST SB 777-52-0049

SUBTASK 49-11-02-010-002

- (3) Wait 3-5 minutes after APU shutdown before you open the APU compartment doors.

NOTE: This will allow time for the pressure inside and outside the APU compartment to equalize when the APU vent doors have been deactivated.

ARO 001-010; AIRPLANES WITH APU VENT DOORS

SUBTASK 49-11-02-010-001

- (4) Do these steps to open the APU access doors (Figure 201):

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ARO ALL

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ARO 005-010; ARO 001-004 POST SB 777-52-0049

- (a) Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

ARO 001-004 PRE SB 777-52-0049

- (b) Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
315BL	APU Compartment Vent Door
316AR	Auxiliary Power Unit (APU) Access Door, Right
316BR	APU Compartment Vent Door



WARNING

BE CAREFUL WHEN YOU RELEASE THE LATCH ON THE TWO VENT DOORS. THE TWO VENT DOORS ARE SPRING-LOADED. THEY OPEN QUICKLY WHEN YOU RELEASE THE LATCH. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (c) Release the latch [3] that holds the two vent doors [2], [4] closed.

ARO 001-010; AIRPLANES WITH APU VENT DOORS

- (d) Release the latches [5] that hold the two APU access doors [1], [6] closed.
- (e) Push the right access door up and pull the hook aft until the right access door disengages.
- 1) Let the right access door open.
- (f) Push the left access door up and pull the hook aft until the left access door disengages.
- 1) Let the left access door open.
- (g) Push the two APU access doors fully open and turn the two collars [8] for the two hold-open rods [7] till the pins are engaged.

ARO 011-999; AIRPLANES WITHOUT APU VENT DOORS

SUBTASK 49-11-02-010-003

- (5) Do these steps to open the APU access doors (Figure 202):

- (a) Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

- (b) Release the latches [2] that hold the two APU access doors [1], [3] closed.
- (c) Push the right access door up and pull the hook aft until the right access door disengages.
- 1) Let the right access door open.
- (d) Push the left access door up and pull the hook aft until the left access door disengages.
- 1) Let the left access door open.

EFFECTIVITY
ARO ALL

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ARO 011-999; AIRPLANES WITHOUT APU VENT DOORS (Continued)

- (e) Push the two APU access doors fully open and turn the two collars [5] for the two hold-open rods [4] till the pins are engaged.

———— **END OF TASK** ————

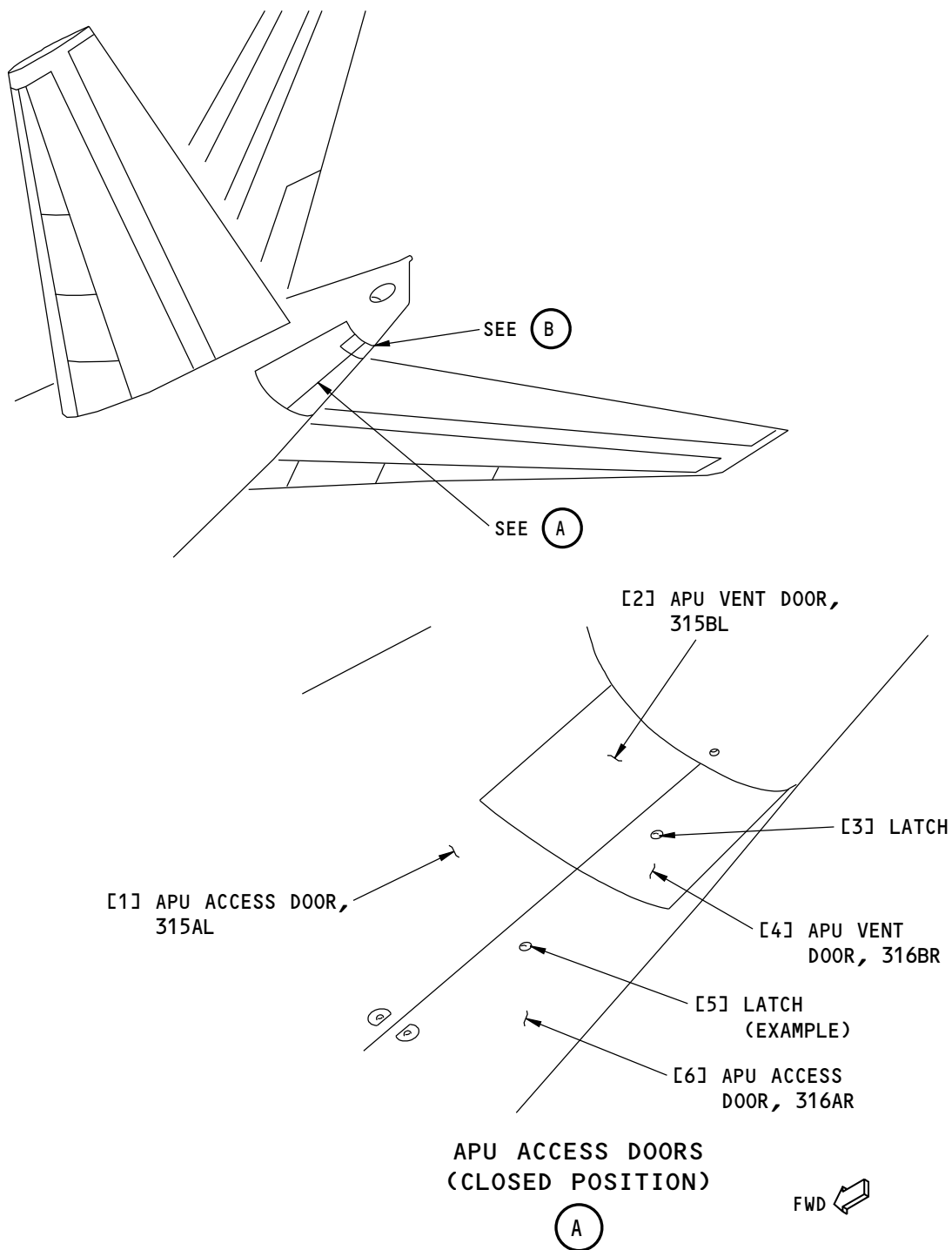
EFFECTIVITY
ARO ALL

D633W101-ARO

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D12092 S0006423687_V1

APU Access Doors
Figure 201/49-11-02-990-801 (Sheet 1 of 3)

EFFECTIVITY
ARO 001-010; AIRPLANES WITH APU VENT DOORS

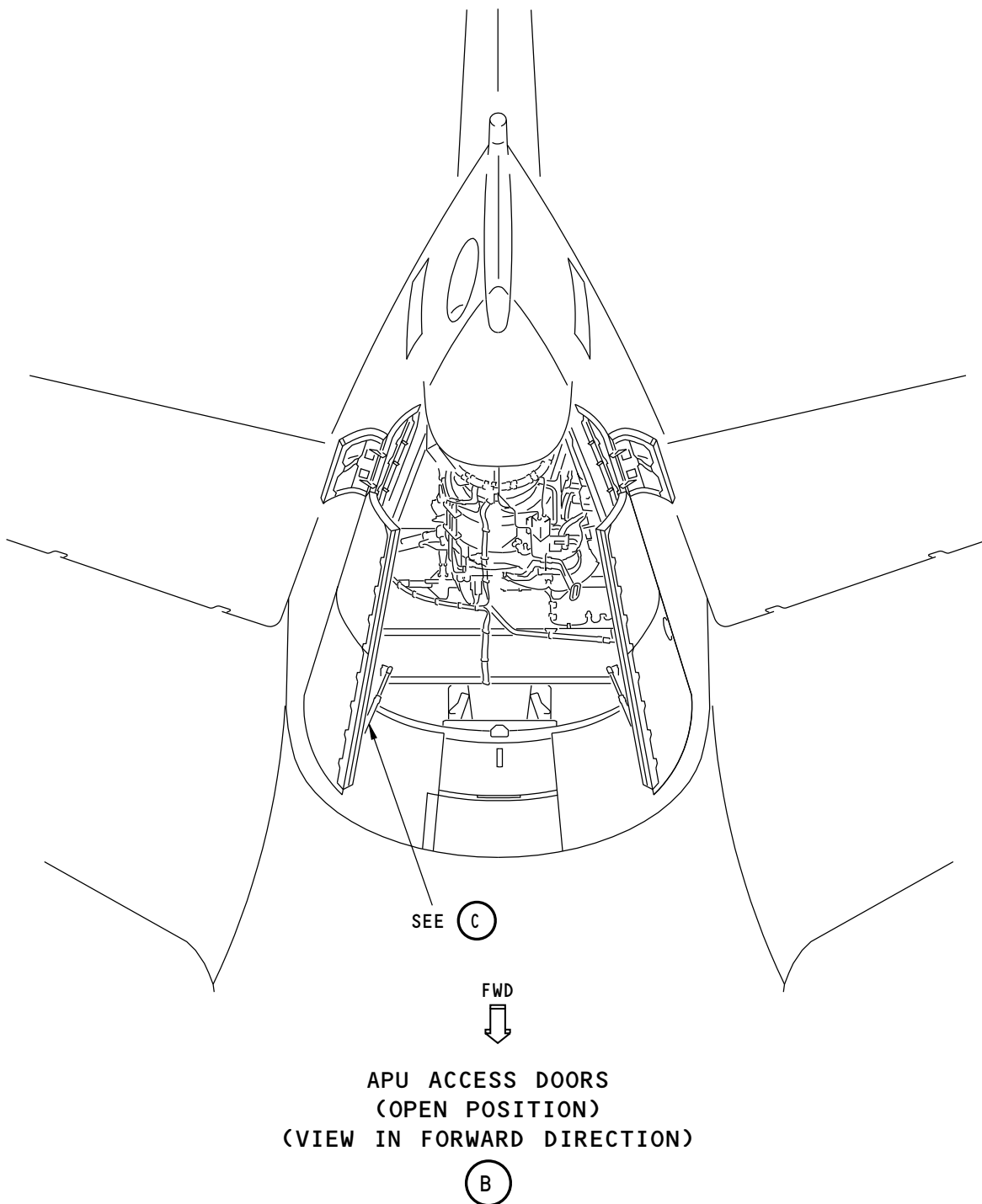
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D12041 S0006423688_V1

APU Access Doors
Figure 201/49-11-02-990-801 (Sheet 2 of 3)

EFFECTIVITY
ARO 001-010; AIRPLANES WITH APU VENT DOORS

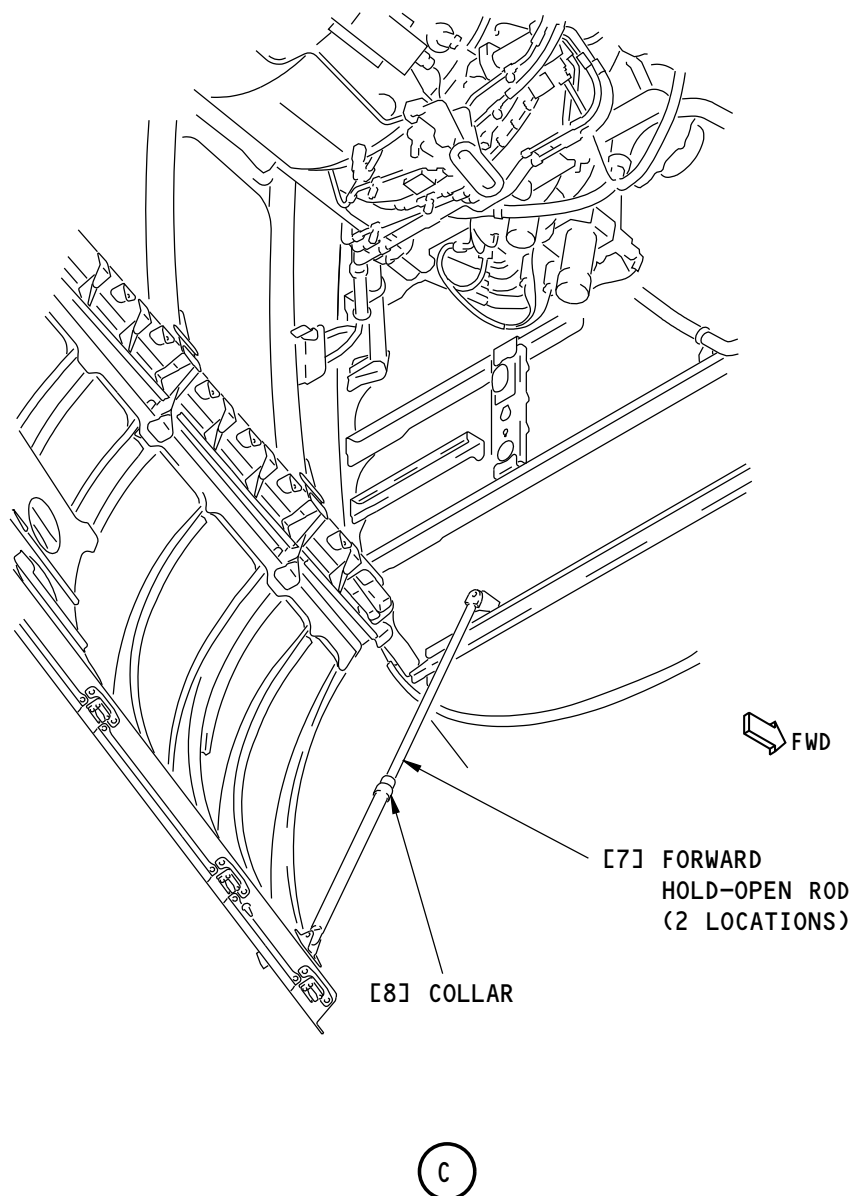
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D12079 S0006423689_V1

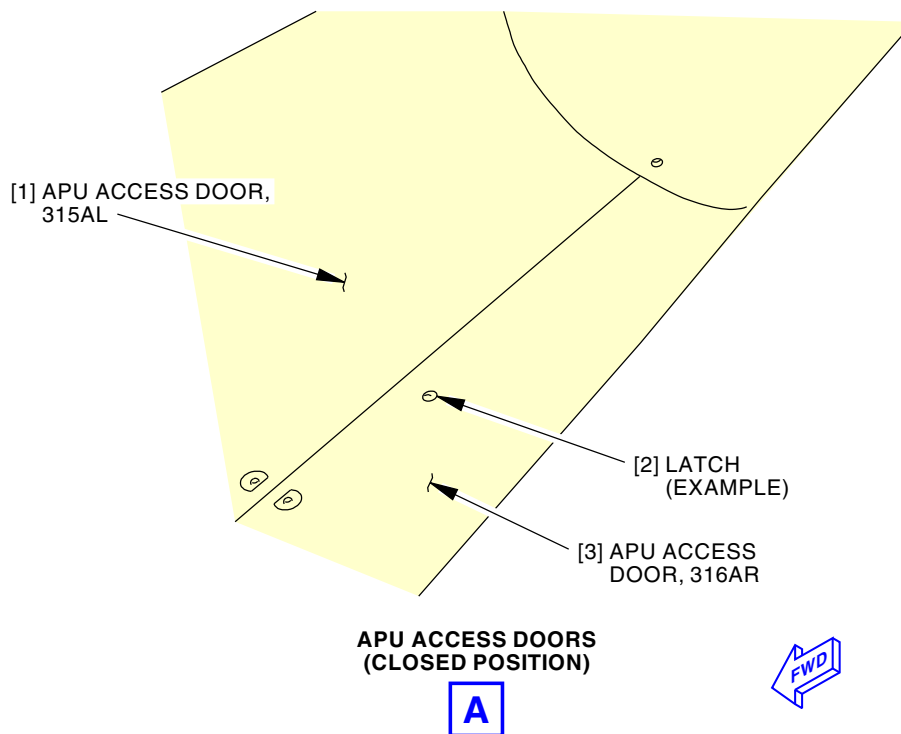
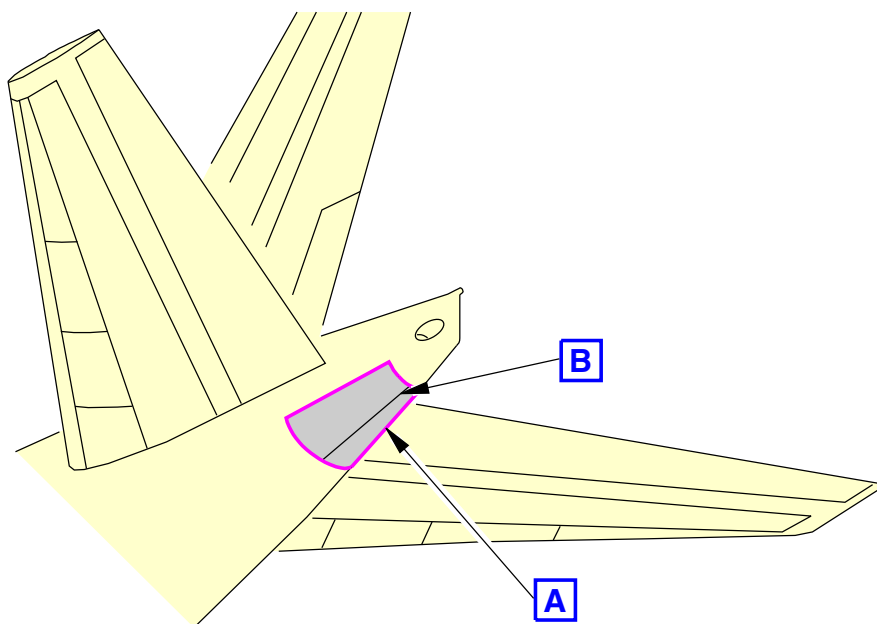
APU Access Doors
Figure 201/49-11-02-990-801 (Sheet 3 of 3)

EFFECTIVITY
ARO 001-010; AIRPLANES WITH APU VENT DOORS

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2328217 S0000529017_V2

APU Access Doors
Figure 202/49-11-02-990-802 (Sheet 1 of 3)

EFFECTIVITY
ARO 011-999; AIRPLANES WITHOUT APU VENT
DOORS

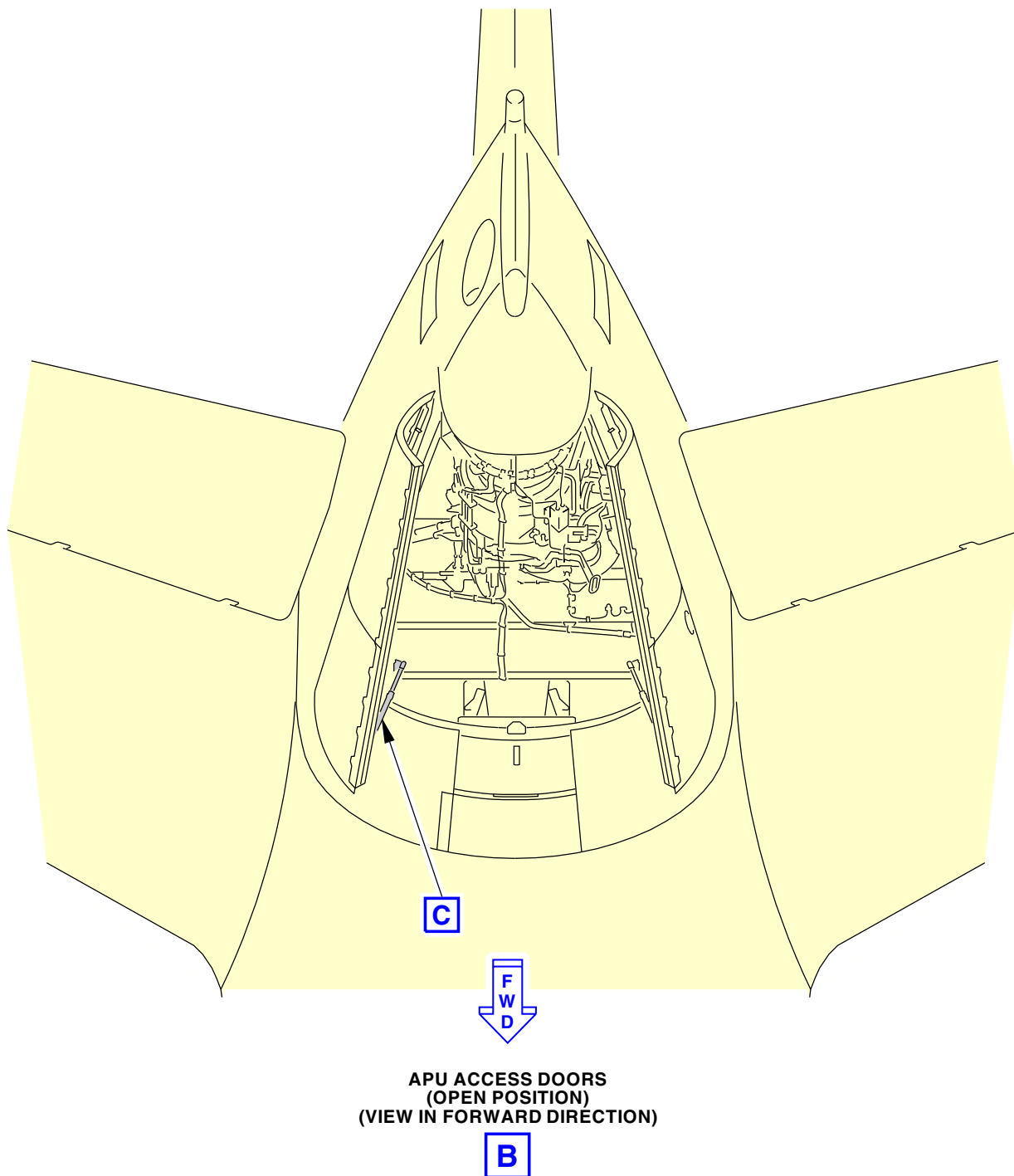
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2328228 S0000529018_V2

APU Access Doors
Figure 202/49-11-02-990-802 (Sheet 2 of 3)

EFFECTIVITY
ARO 011-999; AIRPLANES WITHOUT APU VENT
DOORS

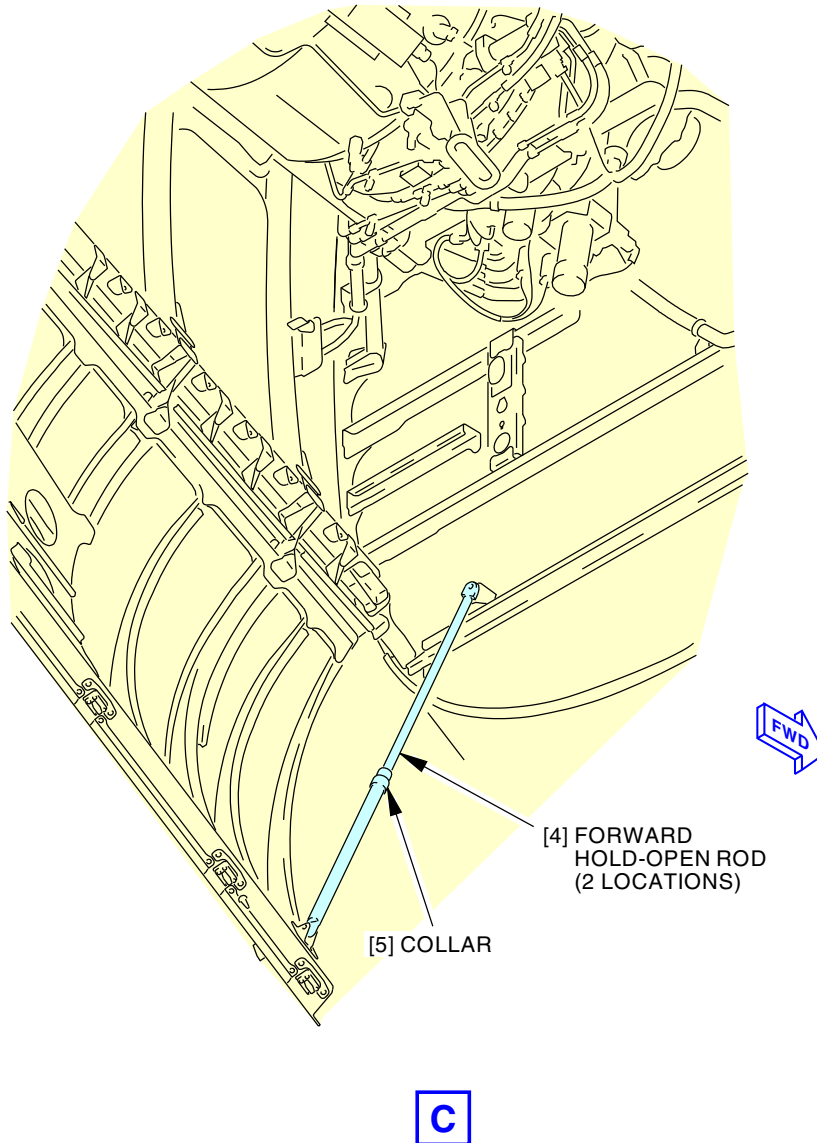
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2328231 S0000529019_V2

APU Access Doors
Figure 202/49-11-02-990-802 (Sheet 3 of 3)

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ARO 011-999; AIRPLANES WITHOUT APU VENT
DOORS

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TASK 49-11-02-410-801

3. APU Access Doors (Close)

(Figure 201 or Figure 202)

A. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

B. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
315BL	APU Compartment Vent Door
316AR	Auxiliary Power Unit (APU) Access Door, Right
316BR	APU Compartment Vent Door

C. Procedure

ARO 001-010; AIRPLANES WITH APU VENT DOORS

SUBTASK 49-11-02-410-001

(1) Do the steps that follow to close the APU access doors:

ARO 001-004 PRE SB 777-52-0049

(a) Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
315BL	APU Compartment Vent Door
316AR	Auxiliary Power Unit (APU) Access Door, Right
316BR	APU Compartment Vent Door

ARO 005-010; ARO 001-004 POST SB 777-52-0049

(b) Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

ARO 001-010; AIRPLANES WITH APU VENT DOORS

(c) Turn the collars [8] for the hold-open rods [7] until the pins disengage.

(d) Close the right APU access door [6].

NOTE: The hook will hold the right APU access door [6].

(e) Close the left APU access door [1] closed.

NOTE: The hook will hold the left APU access door [1].

(f) Push the access doors [1] and [6] up and engage the latches [5].

ARO 001-004 PRE SB 777-52-0049

(g) Hold the APU vent door [2] and the APU vent door [4] closed while you engage the latch [3].

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ARO 011-999; AIRPLANES WITHOUT APU VENT DOORS

SUBTASK 49-11-02-410-002

(2) Do the steps that follow to close the APU access doors:

(a) Close the access doors that follow:

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

315AL	Auxiliary Power Unit (APU) Access Door, Left

316AR	Auxiliary Power Unit (APU) Access Door, Right

(b) Turn the collars [5] for the hold-open rods [4] until the pins disengage.

(c) Close the right APU access door [3].

NOTE: The hook will hold the right APU access door [6].

(d) Close the left APU access door [1] closed.

NOTE: The hook will hold the left APU access door [1].

(e) Push the access doors [1] and [6] up and engage the latches [5].

ARO ALL

SUBTASK 49-11-02-860-002

(3) In the Left Systems Cardfile (P85), set the power switches (S6 and S7) for the APU Fire Detection Card (A9) to the ON position.

SUBTASK 49-11-02-860-004

(4) In the Left Systems Cardfile (P85), set the power switch (S1) for the Left Engine Fire Detection Card (A10) to the ON position.

————— **END OF TASK** —————

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APU FORWARD SUPPORT AND VIBRATION ISOLATION MOUNT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU forward supports.
- (2) An installation of the APU forward supports.
- (3) A removal of the APU forward vibration isolators.
- (4) An installation of the APU forward vibration isolators.

TASK 49-13-01-000-801

2. APU Forward Support Removal

(Figure 401)

A. **General**

- (1) This task has the steps to remove the forward supports for the forward APU mounts.
- (2) You must remove the APU to get access to the forward supports.

B. **References**

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Prepare for the Removal**

SUBTASK 49-13-01-010-005

- (1) If the APU is installed, remove the APU. To remove it, do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

E. **Procedure**

SUBTASK 49-13-01-020-013

- (1) Do the steps that follow to remove the fire detector loops from the left forward supports (Figure 401).
 - (a) Remove the nut [28], the washer [27], and the screw [26] that attach the fire detector assembly ground wire, and the fire detector loop 1 and 2 ground wires to the fire detector element support tube [29].
 - (b) Remove the nuts [23], the washers [24], and the screws [25] that attach the fire detector loops 1 and 2 to the fire detector elements.
 - (c) Remove the nuts [2] and washers [1] that attach the fire detector element support tube [29] to the vertical support.
 - (d) Remove the fire detector element support tube [29] and assembly.

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- (e) Remove the nuts [20], the washers [19], and screws [18] from the clamps [21] that attaches the ground jumpers [16] and the fire detector assembly ground wire [22] to the lateral support.

- 1) Let the ground jumpers [16] and the fire detector assembly ground wire [22] hang freely.

NOTE: If the position of the clamps [17] and [21] are incorrect, the ground jumper cables [16] will be too short to connect to the lateral support.



CAUTION

DO NOT TWIST OR PULL ON THE LOOSE FIRE DETECTOR WIRES. DAMAGE TO THE FIRE DETECTOR WIRES CAN OCCUR IF THEY ARE TWISTED OR PULLED.

- (f) Remove the nuts [4] from the clamp [6] that attaches the saddle clamp [3] to the aft end of the left axial support.
- (g) Remove the nuts [13] from the clamp [15] that attaches the saddle clamp [14] to the forward end of the left axial support.
- (h) Remove the nuts [8] from the clamp [7] and saddle clamp [11] that attach the fire detector wires [10] to the bracket [9] on the middle of the left axial support.
- 1) Let the fire detector wires [10] hang freely.

SUBTASK 49-13-01-020-001

- (2) Do the steps that follow to remove the lateral support [52] from the left vibration isolator (Figure 402):
- (a) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the left vibration isolator [41].
- (b) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the firewall [51].
- (c) Remove the lateral support [52].
- (d) Make sure the lateral support [52] hangs freely without causing damage to other parts of the installation.

SUBTASK 49-13-01-020-002

- (3) Do the steps that follow to remove the axial support [50] (Figure 401, Figure 402):
- (a) Remove the bolts [47], the washers [43], the bushings [48], the washers [45], and the nuts [46] that attach the left axial support [50] to the left vibration isolator [41].
- (b) Remove the bolts [47], the washers [43], the bushings [48], the washers [45], and the nuts [46] that attach the left axial support [50] to the firewall [51].
- (c) Remove the left axial support [50] through the fire detector wires [10] and the saddle clamps [3] and [14].
- NOTE:** Make sure the left axial support [50] does not pull on the fire detector loop 1 or 2.

SUBTASK 49-13-01-020-003

- (4) Do the steps that follow to remove the left vertical support [49] (Figure 402):
- (a) Remove the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the left vertical support [49] to the left vibration isolator [41].
- (b) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the left vertical support [49] to the firewall [51].
- (c) Remove the left vertical support [49].

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CAUTION

DO NOT TWIST OR PULL ON THE LOOSE FIRE DETECTOR WIRES. DAMAGE TO THE FIRE DETECTOR WIRES CAN OCCUR IF THEY ARE TWISTED OR PULLED.

- (d) Let the left vertical support hang freely.

NOTE: Make sure the lateral support hangs freely without causing damage to other parts of the installation.

SUBTASK 49-13-01-020-004

- (5) Do the steps that follow to remove the axial support [73] (Figure 403):

- (a) Remove the nuts [76] from the clamps [75] that attaches the wire harness to the right axial support [73].
- (b) Remove the bolts [42], the washers [43], the bushings [44], the washers [45], and the nuts [46] that attach the right axial support [73] to the right vibration isolator [72].

NOTE: Make sure the right axial support [73] hangs freely without causing damage to other parts of the installation.

- (c) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the right axial support [73] to the firewall [51].
- (d) Remove the right axial support [73].

SUBTASK 49-13-01-020-005

- (6) Do the steps that follow to remove the right vertical support [71] (Figure 403):

- (a) Remove the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the right vertical support [71] to the right vibration isolator [72].

NOTE: Make sure the right vertical support [71] hangs freely without causing damage to other parts of the installation.

- (b) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the right vertical support [71] to the firewall [51].
- (c) Remove the right vertical support [71].

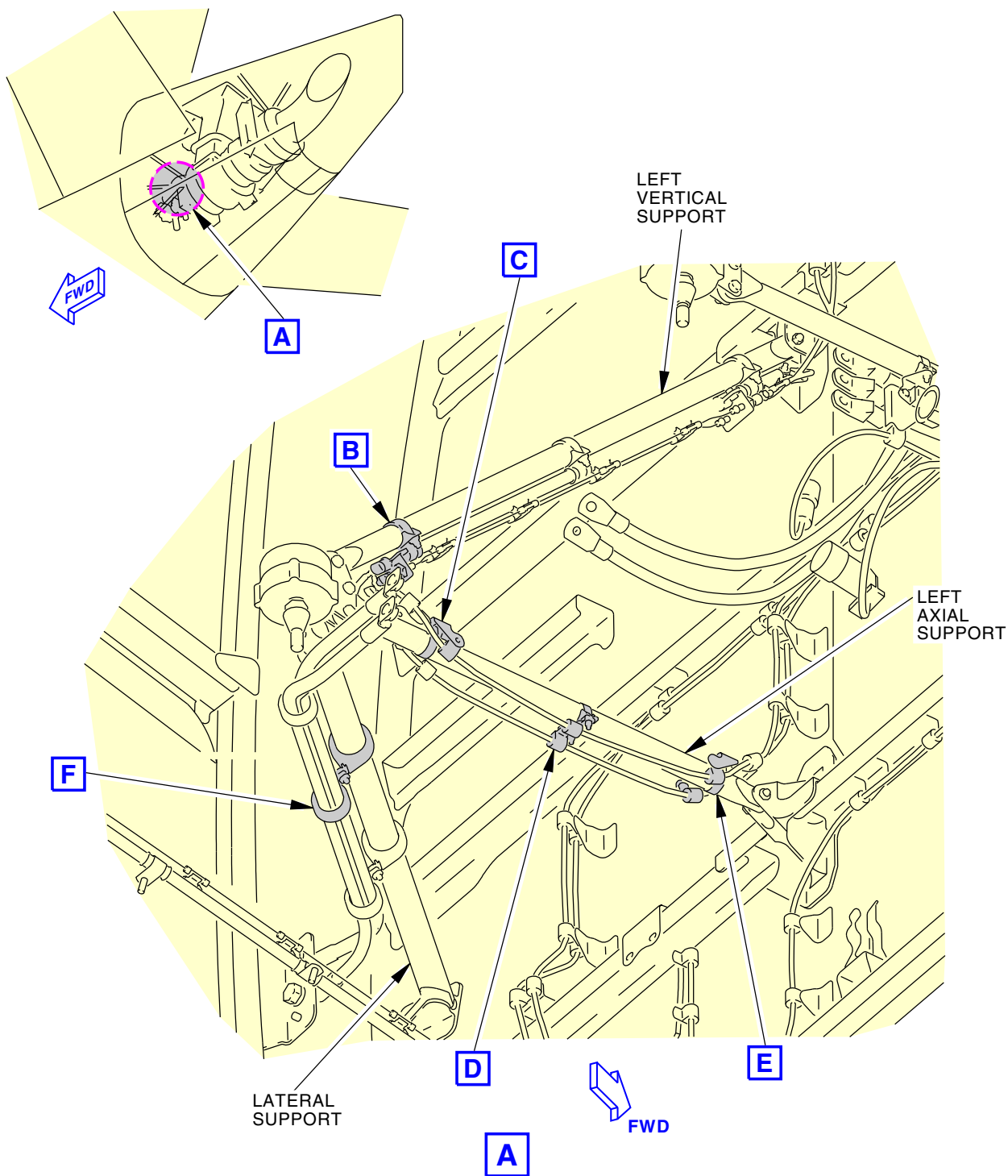
———— **END OF TASK** ————

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E68927 S0006423695_V2

Wire Installation (APU Forward Support)
Figure 401/49-13-01-990-801 (Sheet 1 of 4)

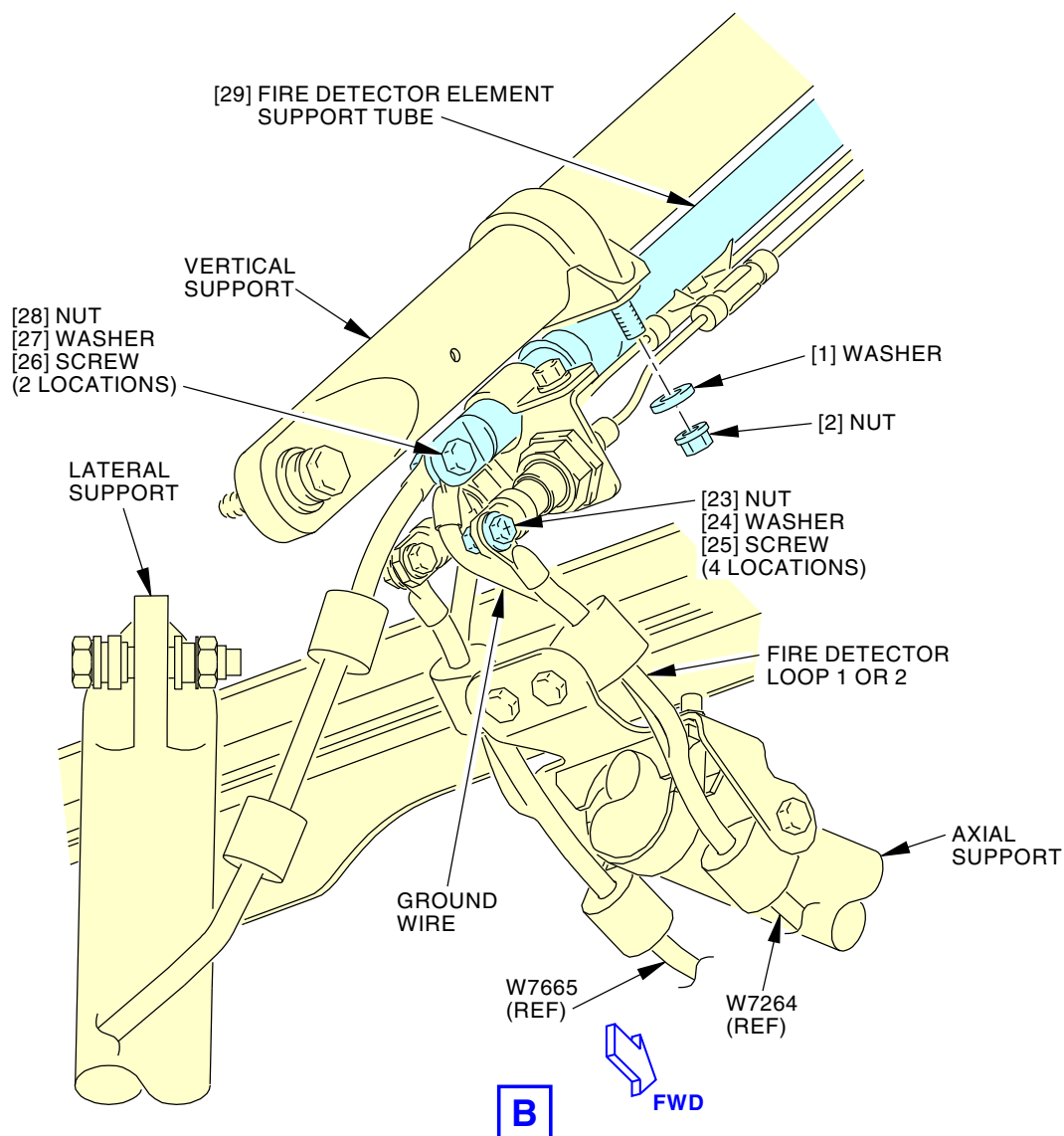
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NOTE:
VIBRATION ISOLATOR REMOVED
FOR CLARITY.

E70130 S0006423696_V2

Wire Installation (APU Forward Support)
Figure 401/49-13-01-990-801 (Sheet 2 of 4)

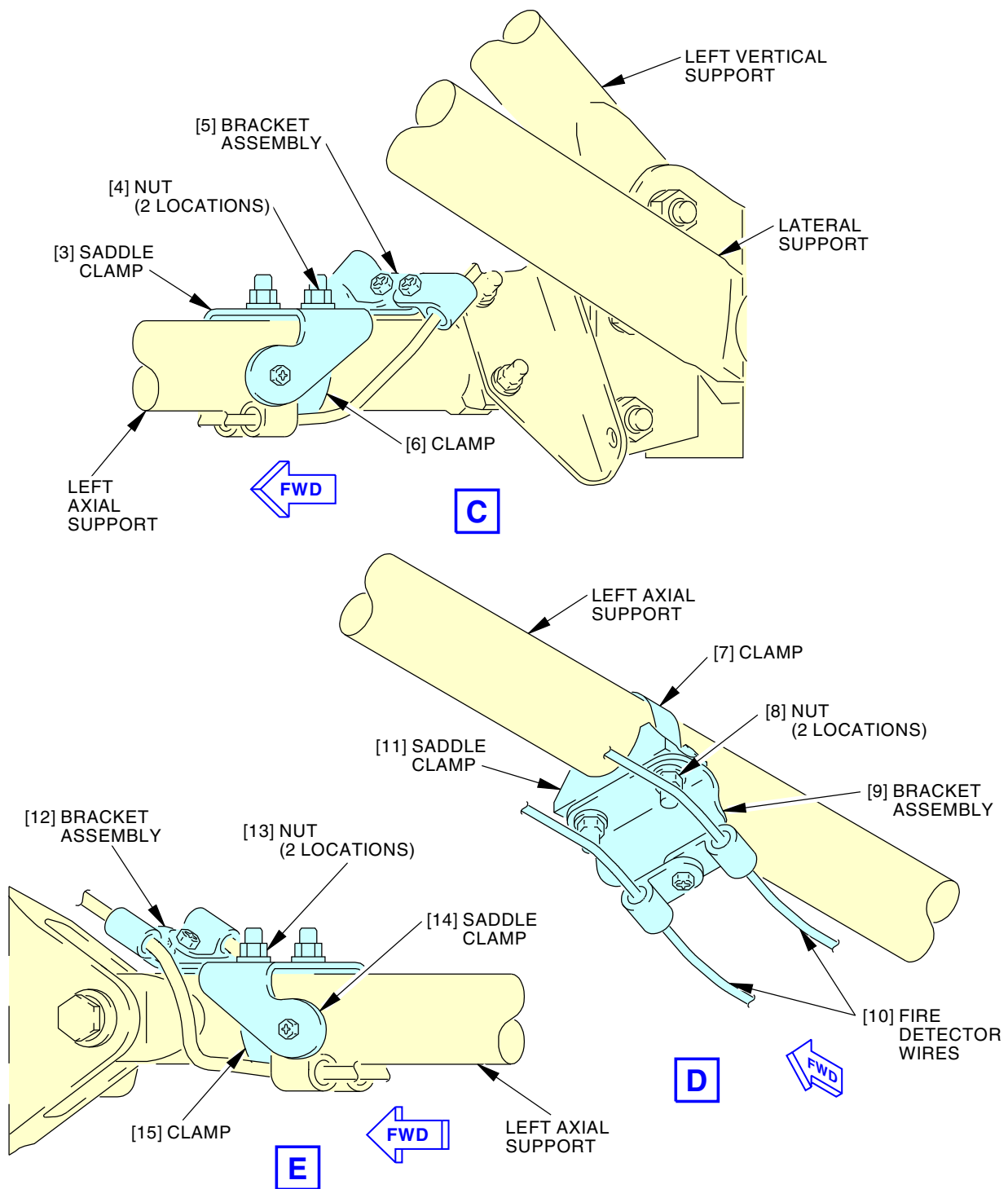
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E70140 S0006423697_V2

**Wire Installation (APU Forward Support)
Figure 401/49-13-01-990-801 (Sheet 3 of 4)**

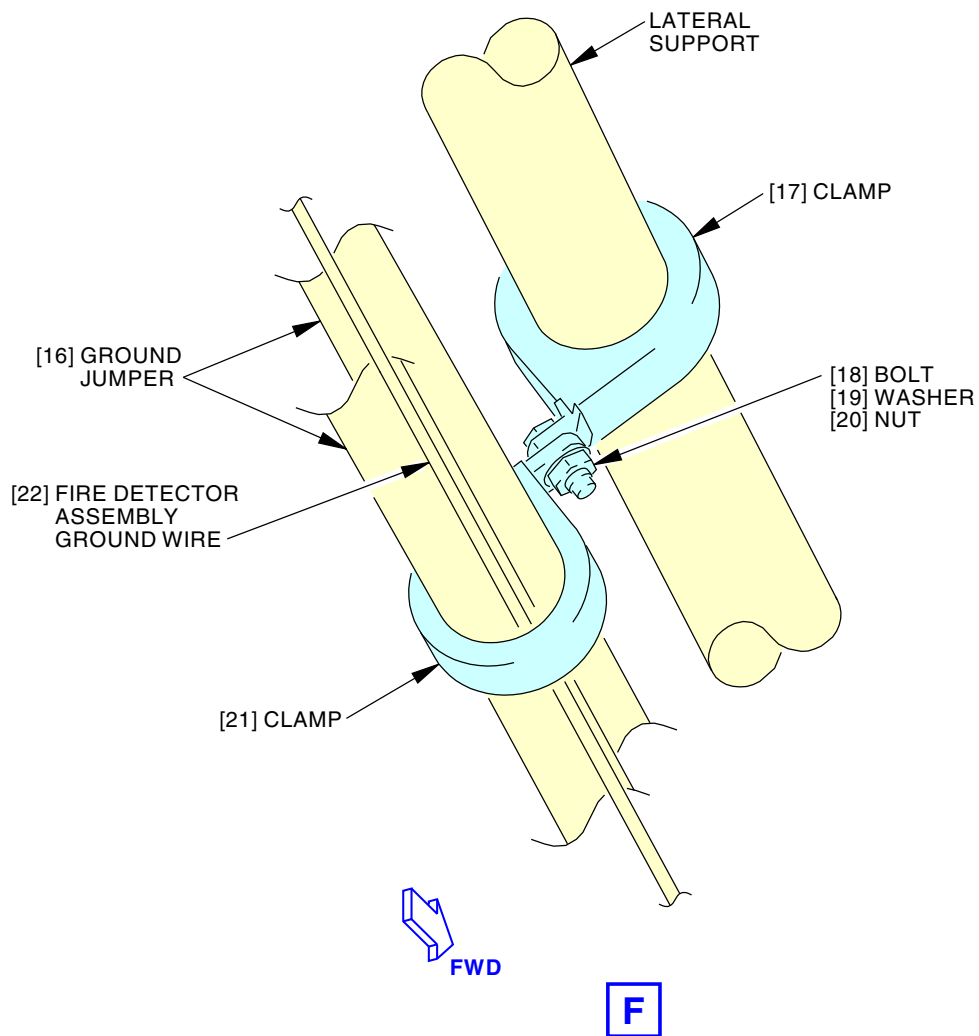
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E70145 S0006423698_V2

Wire Installation (APU Forward Support)
Figure 401/49-13-01-990-801 (Sheet 4 of 4)

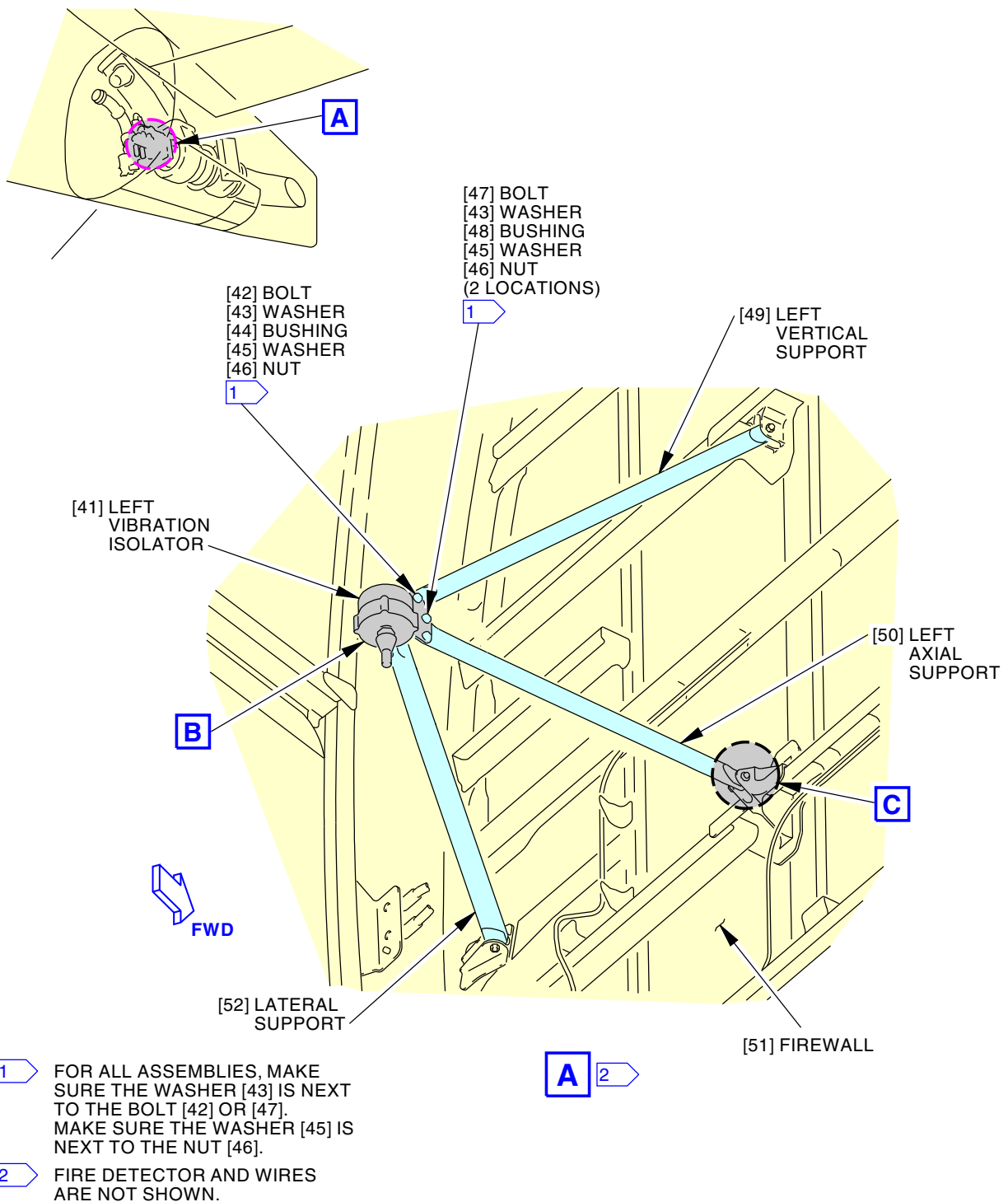
EFFECTIVITY
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C81546 S0006423699_V2

Left Forward Support and Vibration Isolator Installation
Figure 402/49-13-01-990-804 (Sheet 1 of 2)

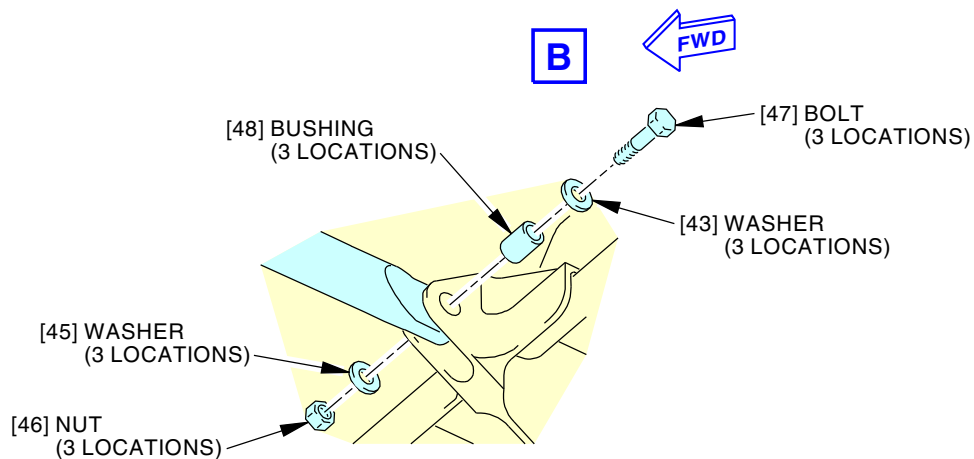
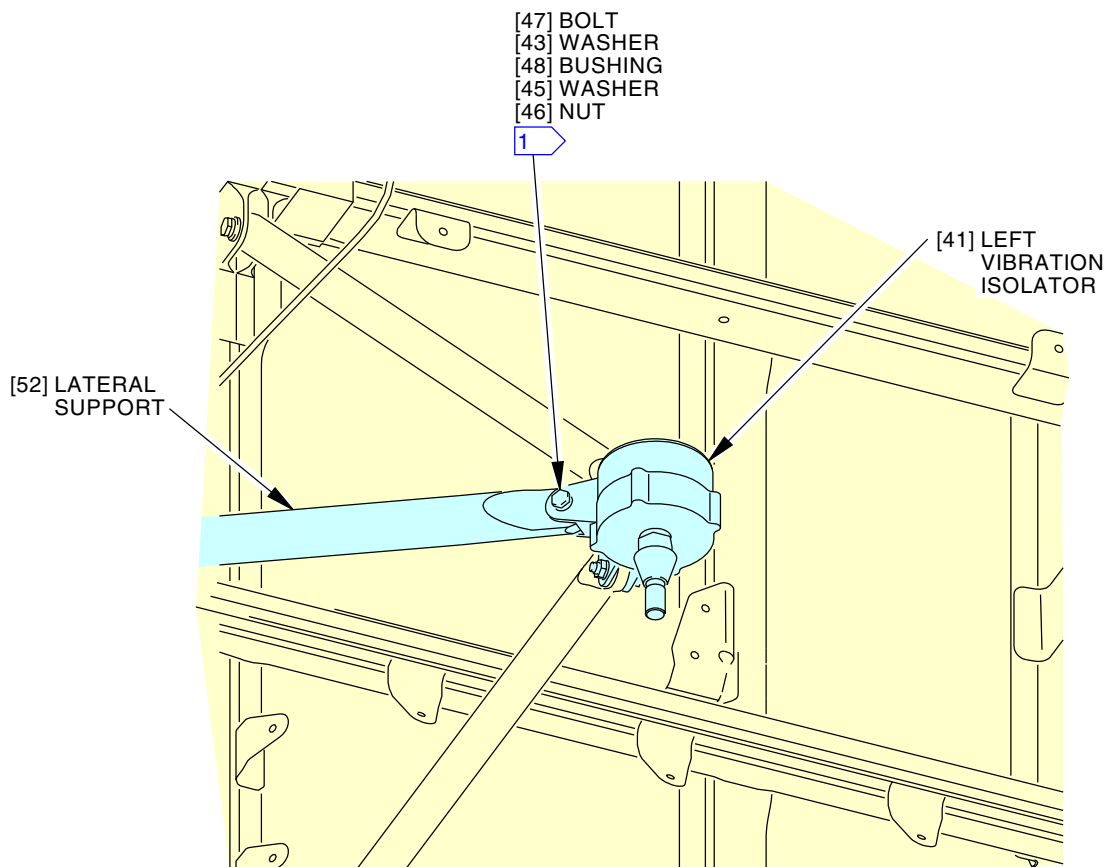
EFFECTIVITY
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(EXAMPLE)

C 1

C81964 S0006423700_V2

Left Forward Support and Vibration Isolator Installation
Figure 402/49-13-01-990-804 (Sheet 2 of 2)

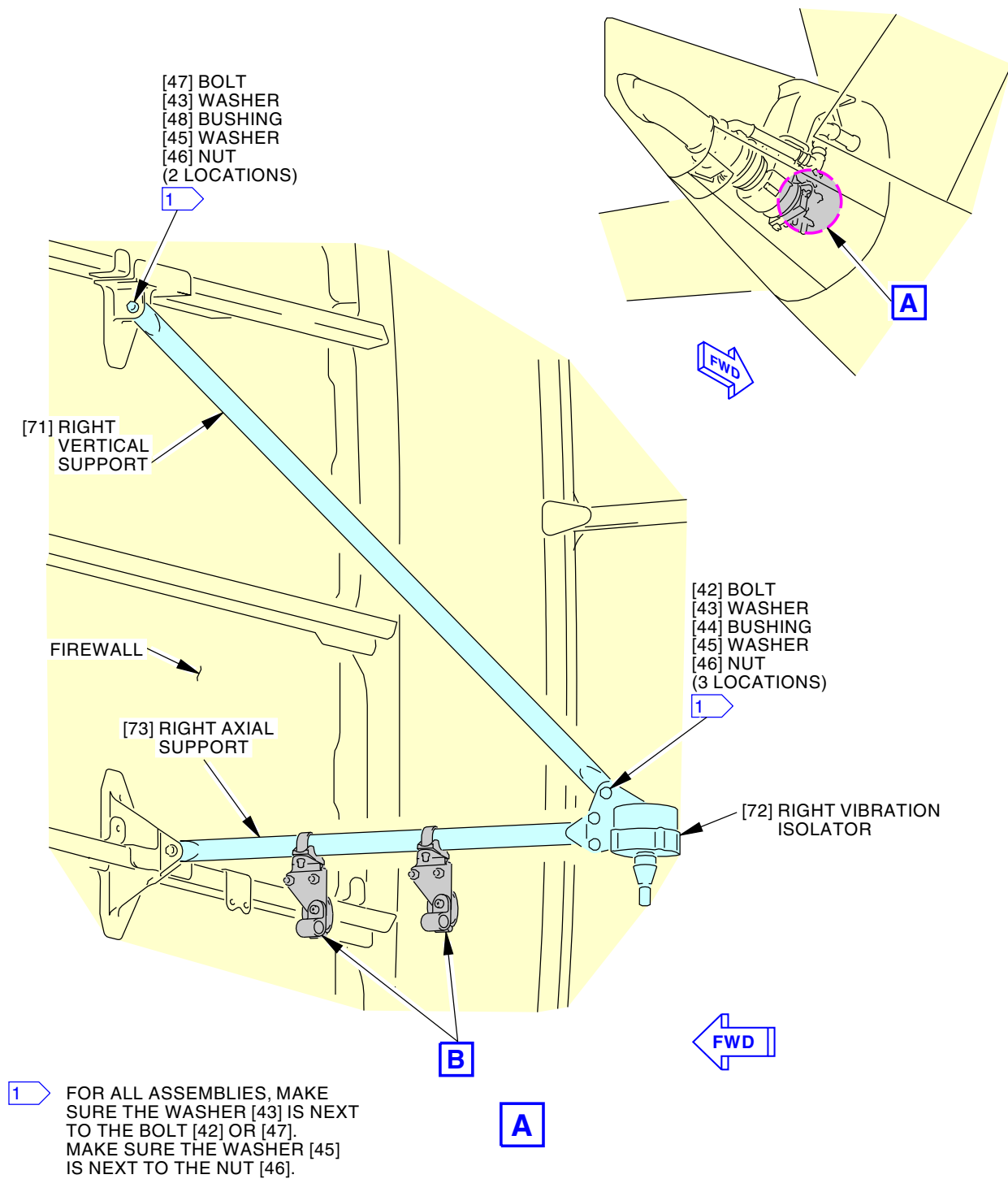
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C81975 S0006423701_V2

**Right Forward Support and Vibration Isolator Installation
Figure 403/49-13-01-990-805 (Sheet 1 of 2)**

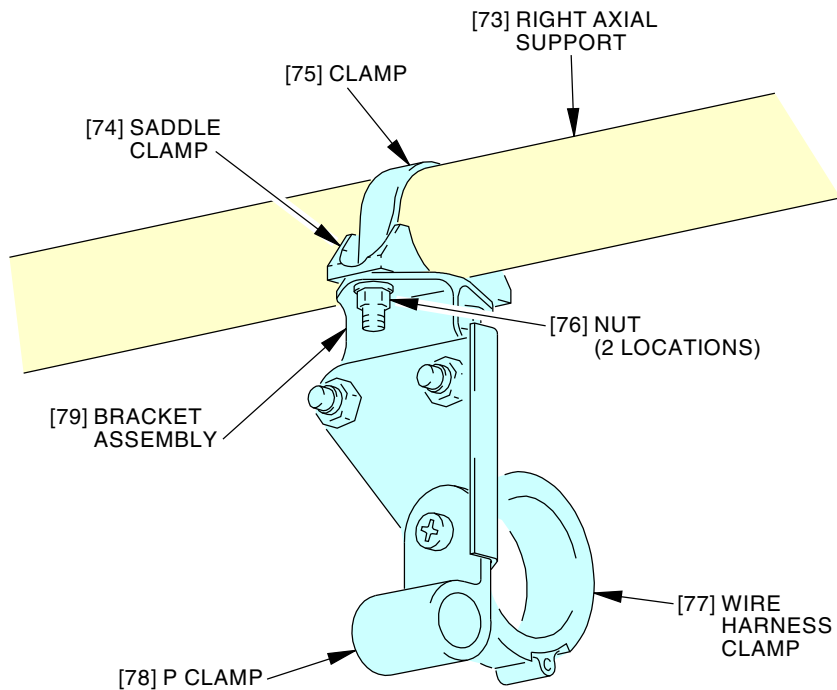
EFFECTIVITY
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B 2

2 FIRE DETECTOR AND WIRES
 ARE NOT SHOWN.

E70157 S0006423702_V2

Right Forward Support and Vibration Isolator Installation
Figure 403/49-13-01-990-805 (Sheet 2 of 2)

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TASK 49-13-01-400-801

3. APU Forward Support Installation

(Figure 401)

A. General

- (1) This task has the steps to install the forward supports.
- (2) After you do this task, you must install the APU.

B. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
49	Left vertical support	49-13-01-03-110	ARO ALL
50	Axial support	49-13-01-03-105	ARO ALL
52	Lateral support	49-13-01-03-100	ARO ALL
71	Right vertical support	49-13-01-03-200	ARO ALL
73	Axial support	49-13-01-03-195	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Procedure

SUBTASK 49-13-01-420-003

- (1) Do the steps that follow to install the right vertical support [71] to the right vibration isolator [72] (Figure 403):
 - (a) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the right vertical support [71] to the firewall [51].
 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).
 - (b) Install the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the right vertical support [71] to the right vibration isolator [72].

NOTE: The countersunk side of the washer [43] must face the bolt head.

NOTE: Make sure the right vertical support [71] does not hit other parts of the installation.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-004

- (2) Do the steps that follow to install the right axial support [73] (Figure 403):
 - (a) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the right axial support [73] to the firewall [51].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

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ARO ALL

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- (b) Install the nuts [76] and the clamps [75] on the right axial support [73].
- (c) Install the bolts [42], the washer [43], the bushing [44], the washers [45], and the nuts [46] that attach the right axial support [73] to the right vibration isolator [72].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-005

- (3) Do the steps that follow to install the left vertical support [49] (Figure 402):

- (a) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the left vertical support [49] to the firewall [51].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

- (b) Install the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the left vertical support [49] to the left vibration isolator [41].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-006

- (4) Do the steps that follow to install the axial support [50] (Figure 401, Figure 402):

- (a) Install the axial support [50] through the fire detector wires [10] and the saddle clamps [3] and [14].

NOTE: Make sure the axial support [50] does not pull the fire detector loop 1 or 2.

- (b) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the axial support [50] to the firewall [51].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

- (c) Install the bolts [47], the washers [43], the bushings [48], the washers [45], and the nuts [46] that attach the axial support [50] to the left vibration isolator [41].

NOTE: The countersunk side of the washers [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-007

- (5) Do the steps that follow to install the lateral support [52] (Figure 402):

- (a) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the firewall [51].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

- (b) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the left vibration isolator [41].

NOTE: The countersunk side of the washer [43] must face the bolt head.

- 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-008

- (6) Do the steps that follow to install the fire detector elements and fire detector loops on the left forward supports (Figure 401, Figure 402):

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CAUTION

DO NOT TWIST OR PULL ON THE LOOSE FIRE DETECTOR WIRES. DAMAGE TO THE FIRE DETECTOR WIRES CAN OCCUR IF THEY ARE TWISTED OR PULLED.

- (a) Install the nuts [8] and the clamp [7] and saddle clamp [11] that attach the fire detector wires [10] and the bracket assembly [9] to the middle of the left axial support.
- (b) Install the nuts [13] on the clamp [15] that attaches the saddle clamp [14] to the forward end of the left axial support.
- (c) Install the nuts [4] on the clamp [6] that attaches the saddle clamp [3] to the aft end of the left axial support.
- (d) Install the nuts [20], the washer [19], and screws [18] on the clamps [21] that attach the ground jumper [16] and fire detection assembly ground wire [22] to the lateral support.
NOTE: If the position of the clamps [17] and [21] are incorrect, the ground jumper [16] will be too short to connect to the lateral support.
- (e) Install the Fire Detector Element Support Tube [29] and Assembly.
 - 1) Install the nuts [2] and washers [1] that attach the fire detector assembly to the vertical support.
 - 2) Install the nuts [23], the washers [24], and the screws [25] that attach the fire detector loops 1 and 2 to the fire detector elements.
 - 3) Install the nuts [28], the washers [27], and the screws [26] that attach the fire detector assembly ground wire, and the fire detector loop 1 and 2 ground wires to the fire detector element support tube [29].

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-01-410-001

- (1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— END OF TASK —————

TASK 49-13-01-000-802

4. Forward Vibration Isolator Removal

(Figure 401)

A. General

- (1) This task has the steps to remove the forward vibration isolators for the forward APU mounts.
- (2) You must remove the APU to get access to the forward vibration isolators.

B. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

C. Location Zones

Zone	Area
315	APU Compartment, Left

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(Continued)

Zone	Area
316	APU Compartment, Right

D. Procedure

SUBTASK 49-13-01-010-004

- (1) If the APU is installed, remove the APU. To remove it, do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

SUBTASK 49-13-01-020-011

- (2) Do the steps that follow to remove the left vibration isolator [41] (Figure 402):
 - (a) Remove the bolts [47], the washers [43], the bushings [48], the washers [45], and the nuts [46] that attach the axial support [50] to the left vibration isolator [41].
 - (b) Remove the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the left vertical support [49] to the left vibration isolator [41].
 - (c) Remove the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the left vibration isolator [41].

SUBTASK 49-13-01-020-012

- (3) Do the steps that follow to remove the right vibration isolator [72] (Figure 403):
 - (a) Remove the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the right vertical support [71] to the right vibration isolator [72].
 - (b) Remove the bolts [42], the washers [43], the bushings [44], the washer [45], and the nut [46] that attach the axial support [73] to the right vibration isolator [72].

————— END OF TASK —————

TASK 49-13-01-400-802

5. Forward Vibration Isolator Installation

(Figure 401)

A. General

- (1) This task has the steps to install the forward vibration isolators.
- (2) After you do this task, you must install the APU.

B. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
41	Left vibration isolator	49-13-01-03-115	ARO ALL
72	Right vibration isolator	49-13-01-03-205	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left

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(Continued)

Zone	Area

316	APU Compartment, Right

E. Procedure

SUBTASK 49-13-01-420-001

- (1) Do the steps that follow to install the left vibration isolator [41] (Figure 402):
 - (a) Install the bolts [47], the washer [43], the bushings [48], the washers [45], and the nuts [46] that attach the axial support [50] to the left vibration isolator [41].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).
 - (b) Install the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the left vertical support [49] to the left vibration isolator [41].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).
 - (c) Install the bolt [47], the washer [43], the bushing [48], the washer [45], and the nut [46] that attach the lateral support [52] to the left vibration isolator [41].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-01-420-002

- (2) Do the steps that follow to install the right vibration isolator [72] (Figure 403):
 - (a) Install the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the right vertical support [71] to the right vibration isolator [72].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).
 - (b) Install the bolt [42], the washer [43], the bushing [44], the washer [45], and the nut [46] that attach the axial support [73] to the right vibration isolator [72].

NOTE: The countersunk side of the washer [43] must face the bolt head.

 - 1) Tighten the nut [46] to 107-113 pound-inches (12.1-12.8 newton-meters).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-01-410-002

- (1) Install the APU. To install it, do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— END OF TASK —————

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APU FORWARD SUPPORT AND VIBRATION ISOLATION MOUNT - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the APU forward support and vibration isolation mount. You can do the inspection of the APU forward mount fittings at the same time.

TASK 49-13-01-200-801

2. Forward Support and Vibration Isolation Mount Inspection

(Figure 601)

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-13-01-000-801	APU Forward Support Removal (P/B 401)
49-13-01-400-801	APU Forward Support Installation (P/B 401)
49-13-04-000-801	Forward Mount Fitting Removal (P/B 401)
49-13-04-400-801	Forward Mount Fitting Installation (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **APU Forward Support and Vibration Isolation Mount Inspection**

SUBTASK 49-13-01-010-003

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

SUBTASK 49-13-01-210-001

- (2) Visually examine these parts for corrosion, cracks or wear damage:
- (a) The left and the right vertical supports
 - (b) The left and the right horizontal supports
 - (c) The lateral support
 - (d) The left and the right cone bolts
 - (e) The cone bolts nuts and washers.

SUBTASK 49-13-01-900-001

- (3) If you find corrosion, cracks or wear damage on the APU forward mount fittings, replace the forward mount fitting(s).

These are the tasks:

Forward Mount Fitting Removal, TASK 49-13-04-000-801,

Forward Mount Fitting Installation, TASK 49-13-04-400-801.

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SUBTASK 49-13-01-220-001

(4) If there are signs of wear, do the steps that follow:

Table 601/49-13-01-993-803

			DESIGN LIMITS		WEAR LIMITS		
INDEX NO.	PART NAME	DIM.	DIAMETER		Allowed WEAR DIM.	MAX CLEAR-ANCE	REPAIR
			MIN	MAX			
1	BUSHING	ID	0.2500	0.2515	0.2600	0.0135	*[1]
	ATTACH BOLT	OD	0.2485	0.2495	0.2465		*[1]
2	BUSHING	ID	0.3781	0.3796	0.3860	0.014	*[1]
	BUSHING	OD	0.3756	0.3761	0.3720		*[1]
3	BEARING BALL	ID	0.2495	0.2500	0.2550	0.0085	*[1]
	ATTACH BOLT	OD	0.2485	0.2495	0.2465		*[1]
4	BEARING RACE	ID	---	---	---	*[2]	
	BEARING	OD	0.5260	0.5260	0.5210		*[1]

*[1] REPLACE WHEN WORN

*[2] THE MAXIMUM AXIAL GAP IS 0.008 AND THE MAXIMUM RADIAL GAP IS 0.005

APU Forward Support and Vibration Isolation Mount Inspection

- (a) Remove the vertical support rods, the axial support rods, the lateral support rods, and the related parts. To remove the forward supports, do this task: APU Forward Support Removal, TASK 49-13-01-000-801.
 - 1) Examine the support rods for cracks, corrosion, or damage.
 - 2) Replace all of the supports that have cracks, corrosion, or damage.
- (b) Do a check of the bolts and bushings.
 - 1) Examine the bushings and the bolts for wear.
 - 2) Replace all the parts that have more than the permitted quantity of wear shown in (Table 601).
- (c) Install the vertical support rods, the axial support rods, the lateral support rods and the related parts. To install the forward supports, do this task: APU Forward Support Installation, TASK 49-13-01-400-801.

SUBTASK 49-13-01-410-003

- (5) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

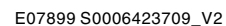
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APU Forward Support and Vibration Isolator Inspection
Figure 601/49-13-01-990-802 (Sheet 1 of 6)

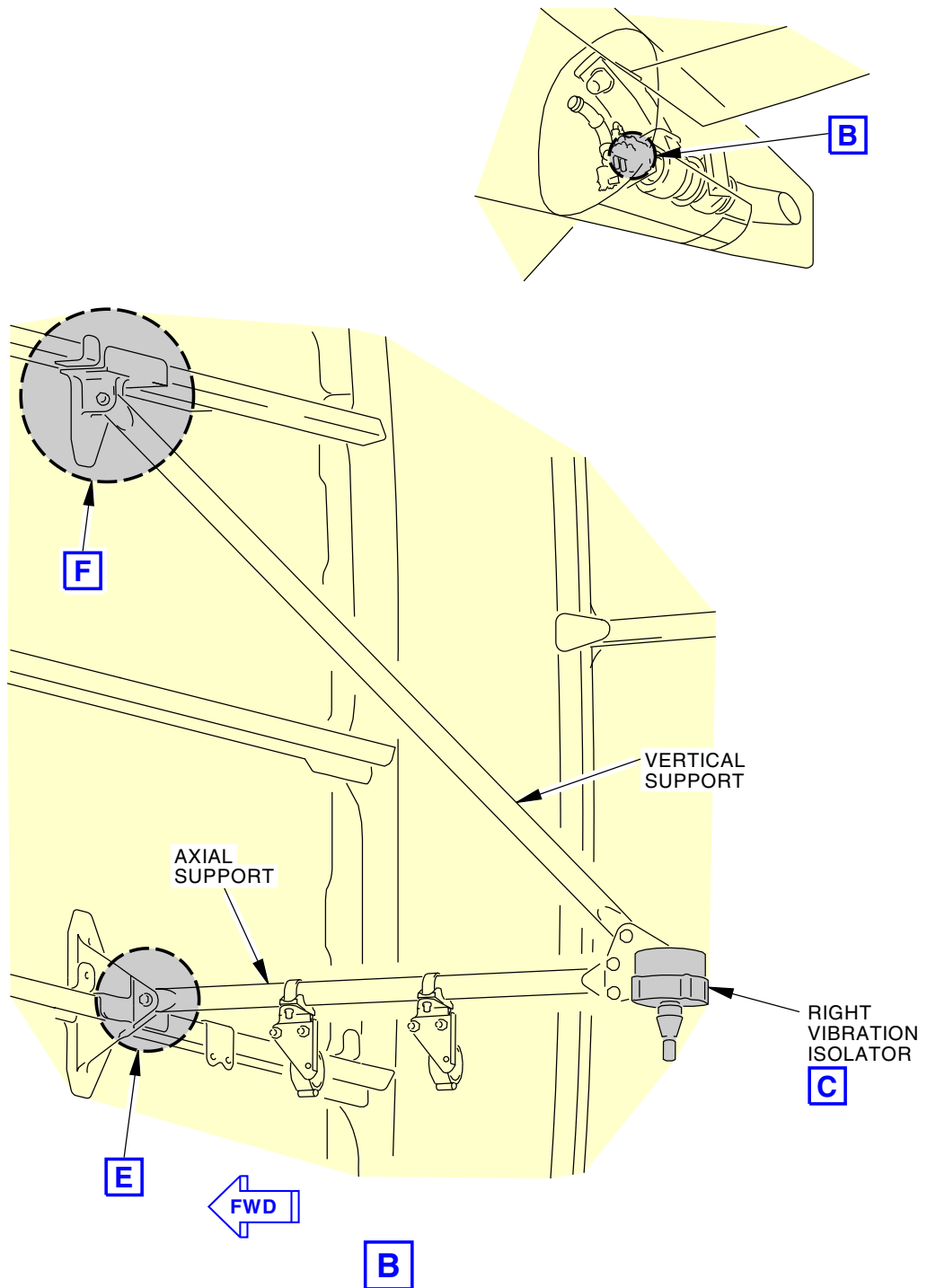
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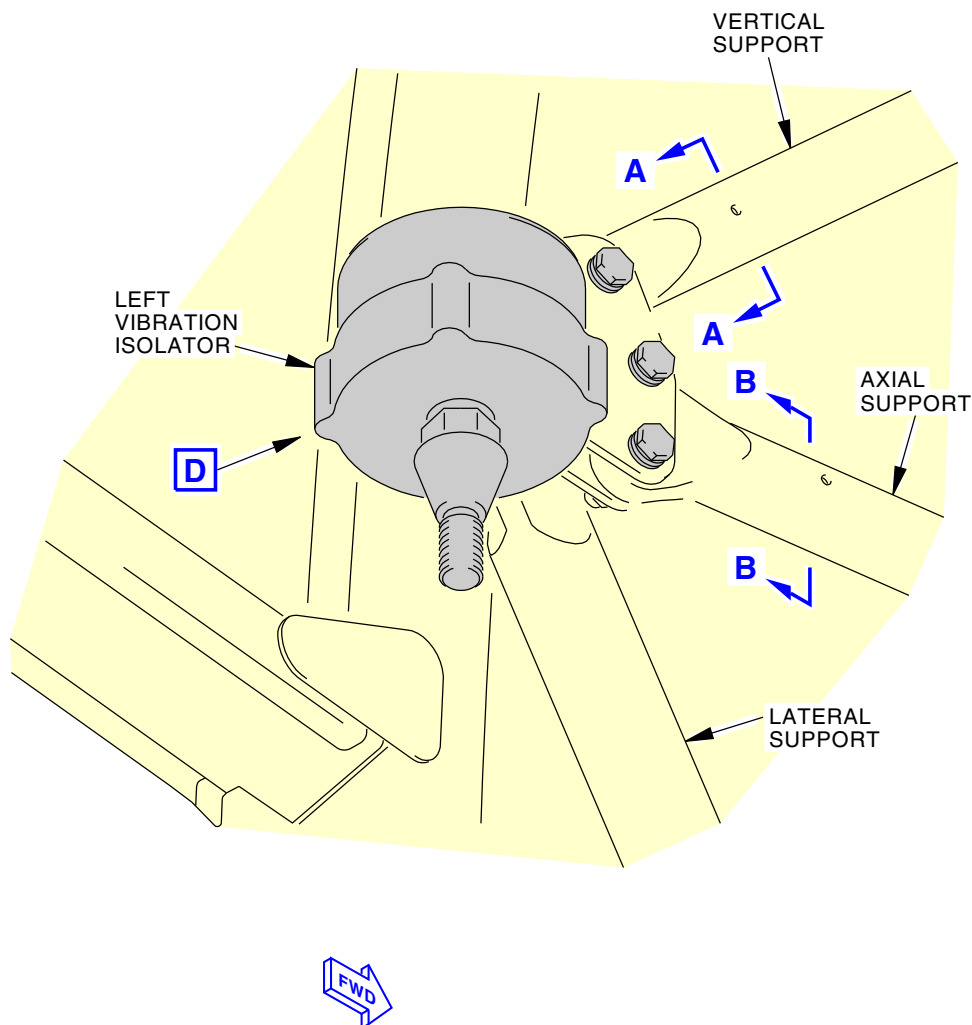
APU Forward Support and Vibration Isolator Inspection
Figure 601/49-13-01-990-802 (Sheet 2 of 6)

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**LEFT VIBRATION ISOLATOR
(RIGHT VIBRATION ISOLATOR IS ALMOST THE SAME)**

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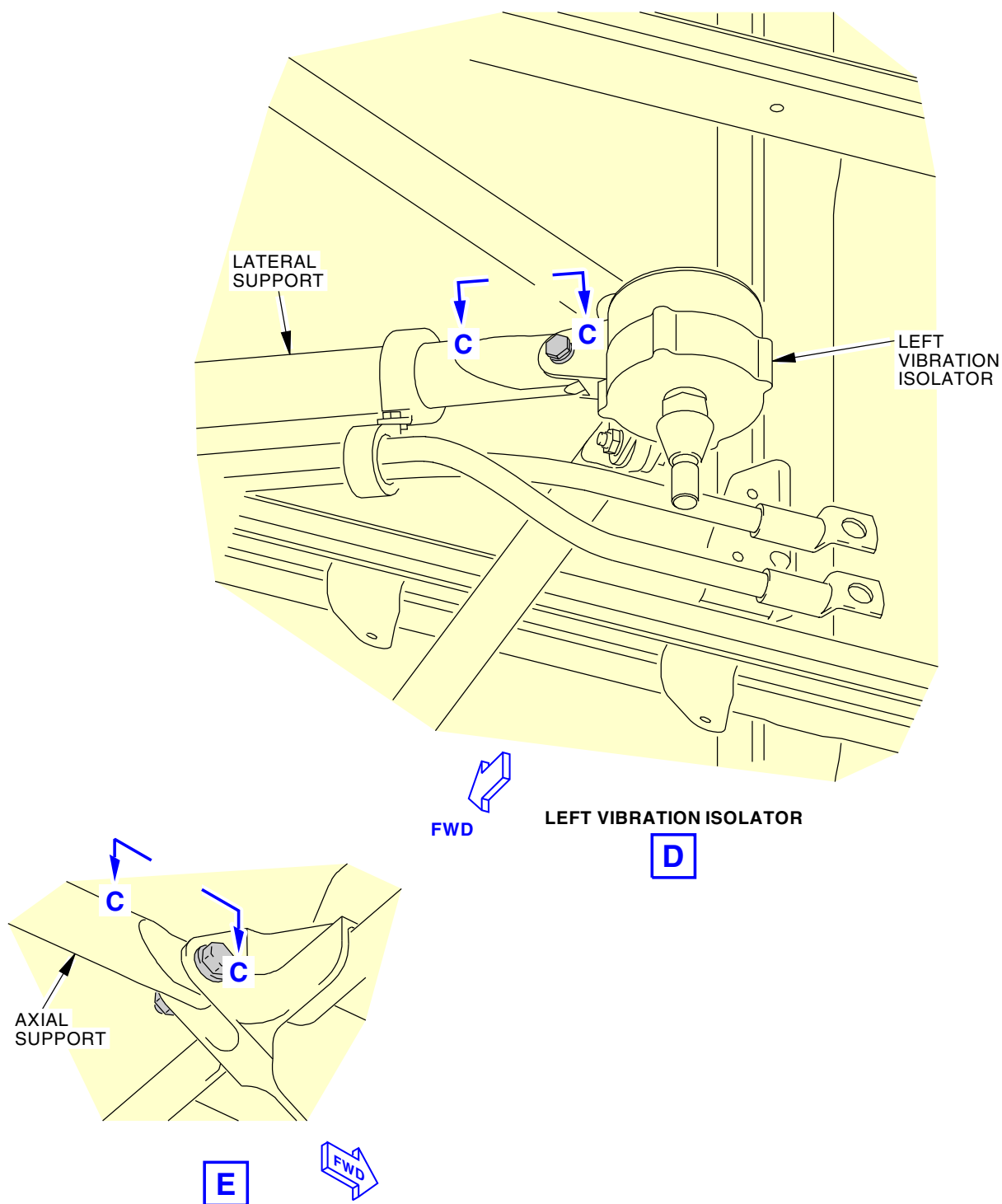
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**APU Forward Support and Vibration Isolator Inspection
Figure 601/49-13-01-990-802 (Sheet 3 of 6)**

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APU Forward Support and Vibration Isolator Inspection
Figure 601/49-13-01-990-802 (Sheet 4 of 6)

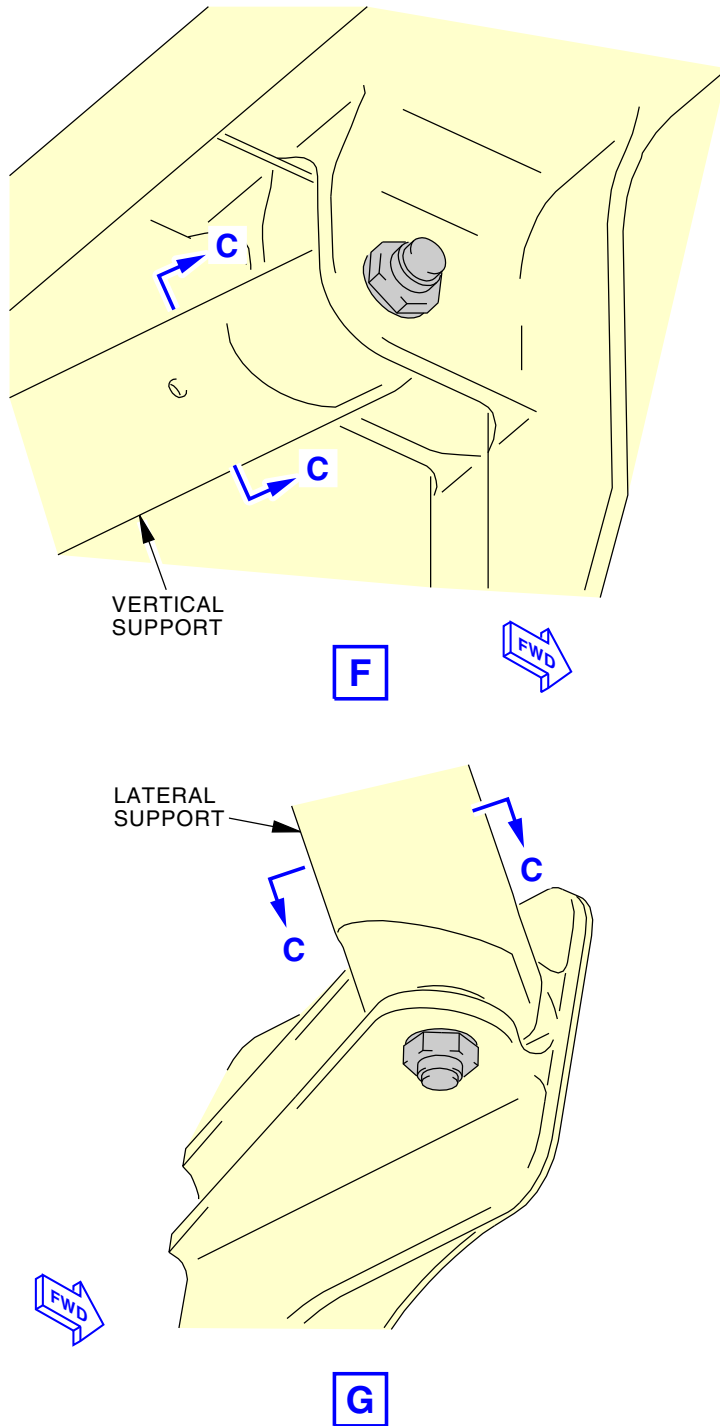
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APU Forward Support and Vibration Isolator Inspection
Figure 601/49-13-01-990-802 (Sheet 5 of 6)

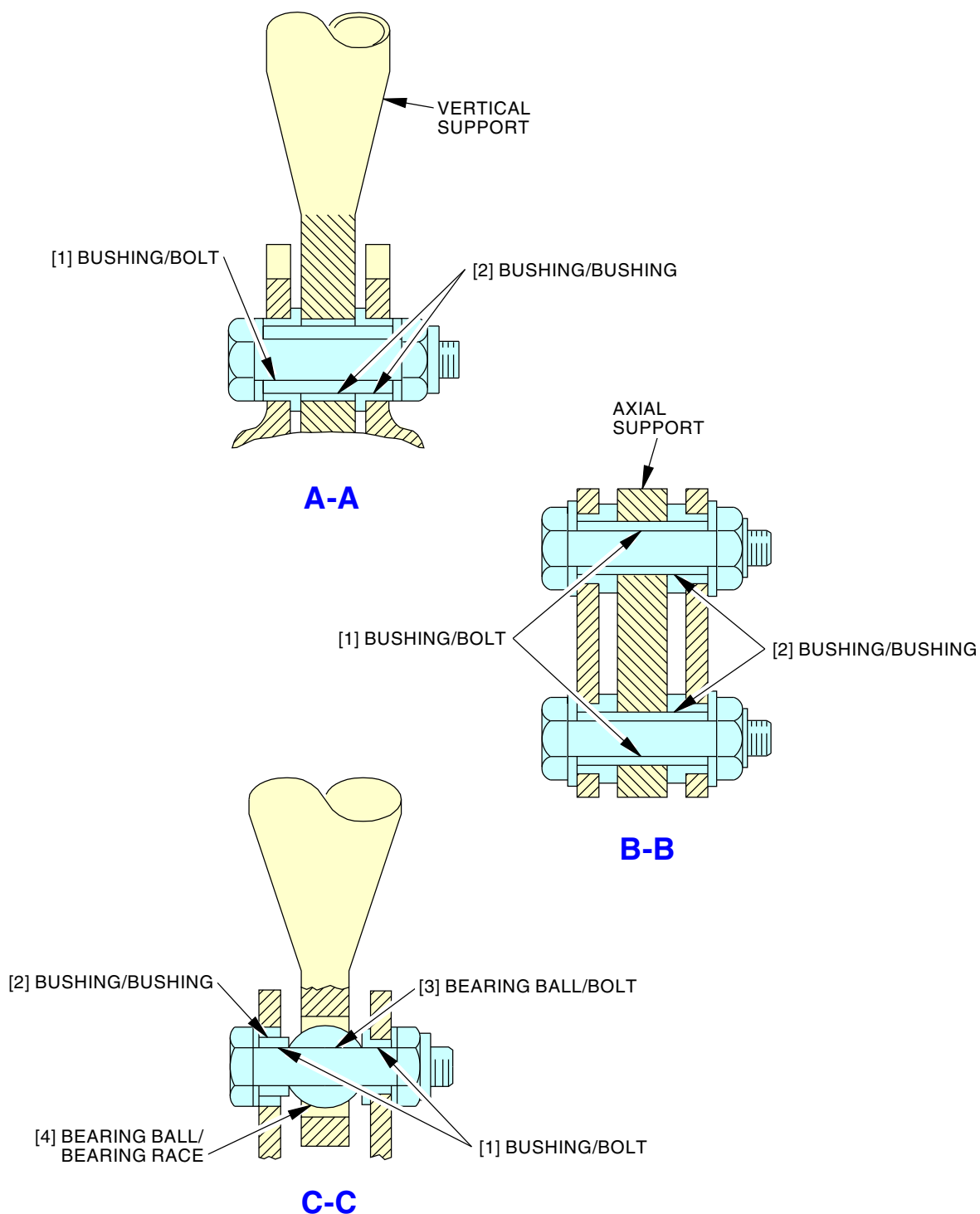
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**APU Forward Support and Vibration Isolator Inspection
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APU AFT SUPPORT AND VIBRATION ISOLATION MOUNT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the aft support
 - (2) An installation of the aft support
 - (3) A removal of the aft vibration isolator
 - (4) An installation of the aft vibration isolator

TASK 49-13-02-000-801

2. APU Aft Support Removal

(Figure 401)

A. **General**

- (1) This task has the steps to remove the aft supports for the APU. You must remove the APU to get access to the aft supports.

B. **References**

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Prepare for the Removal**

SUBTASK 49-13-02-010-001

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

E. **Procedure**

SUBTASK 49-13-02-020-001

- (1) Do the steps that follow to remove the left aft support [1]:
 - (a) Remove the bolts [9], the washers [3], the bushings [10], the washers [5], and the nuts [6] that attach the left aft support [1] to the aft vibration isolator [8].
 - (b) Remove the bolt [2], the washer [3], the bushing [4], and the washer [5], and the nut [6] that attach the left aft support [1] to the structure.
 - (c) Remove the left aft support [1].

SUBTASK 49-13-02-020-002

- (2) Do the steps that follow to remove the right aft support [1]:
 - (a) Remove the bolts [2], washers [3], bushings [11], washers [5], and the nuts [6] that attach the right aft support [7] to the aft vibration isolator [8].
 - (b) Remove the bolt [2], the washer [3], the bushing [4], and the washer [5], and the nut [6] that attach the right aft support [7] to the structure.

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- (c) Remove the right aft support [7].

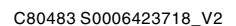
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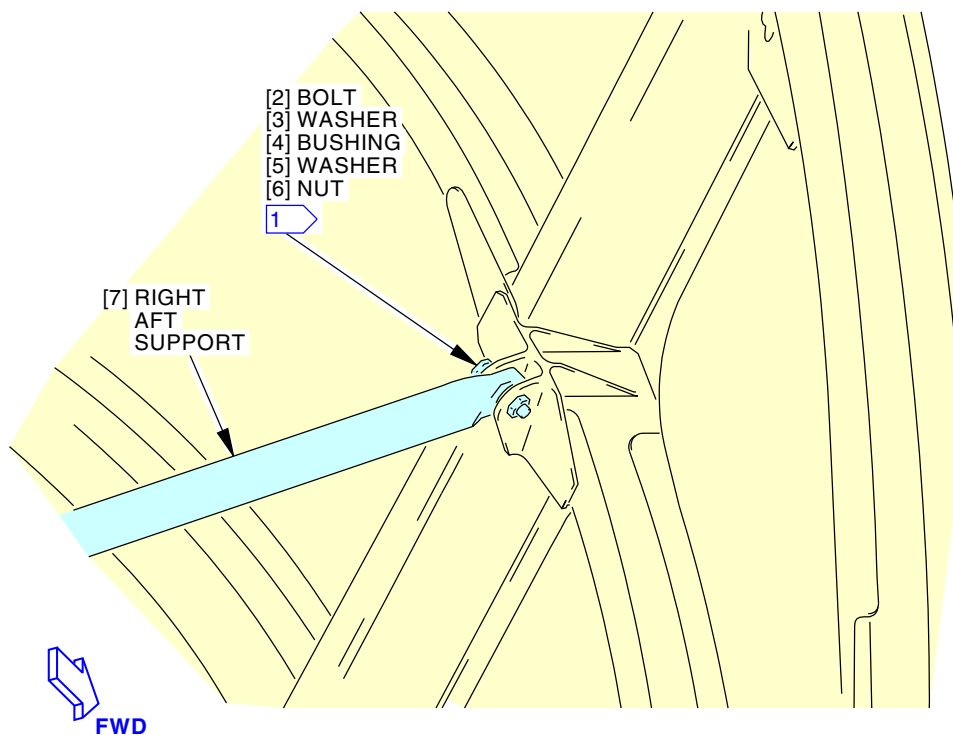
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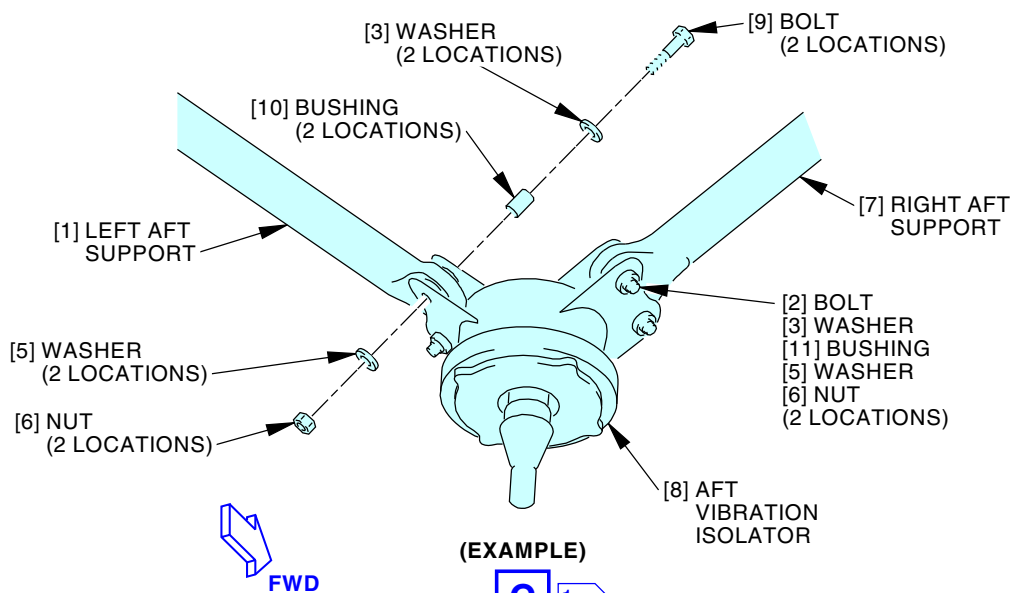
APU Aft Mount and Vibration Isolator Installation
Figure 401/49-13-02-990-801 (Sheet 1 of 2)

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**APU Aft Mount and Vibration Isolator Installation
Figure 401/49-13-02-990-801 (Sheet 2 of 2)**

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TASK 49-13-02-400-801

3. APU Aft Support Installation

(Figure 401)

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Left aft support	49-13-02-03-075	ARO ALL
7	Right aft support	49-13-02-03-070	ARO ALL
8	Aft vibration isolator	49-13-02-03-080	ARO ALL

C. Procedure

SUBTASK 49-13-02-420-001

(1) Do the steps that follow to install the left aft support [1]:

- Put the left aft support [1] into its position.
- Install the bolt [2], the washer [3], the bushing [4], and the washer [5], and the nut [6] that attach the left aft support [1] to the structure.

NOTE: The countersink side of the washer [3] must face the bolt head.

- 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).

- Install the bolts [9], the washers [3], the bushings [10], the washers [5], and the nuts [6] that attach the aft vibration isolator [8] to the left aft support [1].

NOTE: The countersink side of the washers [3] must face the bolt head.

- 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).

SUBTASK 49-13-02-420-002

(2) Do the steps that follow to install the right aft support [7]:

- Put the right aft support [7] into its position.
- Install the bolt [2], the washer [3], the bushing [4], and the washer [5], and the nut [6] that attach the right aft support [7] to the structure.

NOTE: The countersink side of the washer [3] must face the bolt head.

- 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).

- Install the bolts [2], the washers [3], the bushings [11], the washers [5], and the nuts [6] that attach the right aft support [7] to the aft vibration isolator [8].

NOTE: The countersink side of the washers [3] must face the bolt head.

- 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).

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D. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-02-410-001

- (1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— END OF TASK —————

TASK 49-13-02-000-802

4. APU Aft Vibration Isolator Removal

(Figure 401)

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

B. Prepare for the Removal

SUBTASK 49-13-02-010-002

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

C. Procedure

SUBTASK 49-13-02-020-003

- (1) Do the steps that follow to remove the aft vibration isolator [8]:
 - (a) Remove the bolts [9], the washers [3], the bushings [10], the washers [5], and the nuts [6] that attach the left aft support [1] to the aft vibration isolator [8].
 - (b) Remove the bolts [2], the washers [3], the bushings [11], the washers [5], and the nuts [6] that attach the right aft support [7] to the aft aft vibration isolator [8].
 - (c) Remove the aft vibration isolator [8].

————— END OF TASK —————

TASK 49-13-02-400-802

5. APU Aft Vibration Isolator Installation

(Figure 401)

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Aft vibration isolator	49-13-02-03-080	ARO ALL

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C. Procedure

SUBTASK 49-13-02-420-003

- (1) Do the steps that follow to install the aft vibration isolator [8]:
 - (a) Put the aft vibration isolator [8] into its position.
 - (b) Install the bolts [2], the washers [3], the bushings [11], the washers [5], and the nuts [6] that attach the right aft support [7] to the aft vibration isolator [8].

NOTE: The countersink side of the washers [3] must face the bolt head.

 - 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).
 - (c) Install the bolts [9], the washers [3], the bushings [10], the washers [5], and the nuts [6] that attach the aft vibration isolator [8] to the left aft support [1].

NOTE: The countersink side of the washers [3] must face the bolt head.

 - 1) Tighten the nut [6] to 107-113 pound-inches (12.1-12.8 newton-meters).

D. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-02-410-002

- (1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— END OF TASK —————

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APU AFT SUPPORT AND VIBRATION ISOLATION MOUNT - INSPECTION/CHECK

1. General

A. This procedure has these tasks:

- (1) A visual check of the APU aft support and vibration isolation mount
- (2) An inspection of the APU aft support and vibration isolation mount.

TASK 49-13-02-200-801

2. Aft Support and Vibration Isolation Mount Inspection

(Figure 601)

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-13-02-000-801	APU Aft Support Removal (P/B 401)
49-13-02-400-801	APU Aft Support Installation (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Aft Support and Vibration Isolation Mount Dimensions Examination

SUBTASK 49-13-02-010-003

- (1) Remove the APU. To remove it, do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

SUBTASK 49-13-02-210-001

- (2) Visually examine these parts for corrosion, cracks or damage:
 - (a) The aft supports
 - (b) The aft cone bolt
 - (c) The cone bolt nut and washer.

SUBTASK 49-13-02-220-001

- (3) If there are signs of wear, do the steps that follow:
 - (a) Remove the aft support rods and the related parts. To remove the supports, do this task: APU Aft Support Removal, TASK 49-13-02-000-801.
 - 1) Examine the support rods for cracks, corrosion, or damage.
 - 2) Replace the supports that have cracks, corrosion, or damage.
 - (b) Do a check of the bolts and bushings.
 - 1) Examine the bushings and the bolts for wear.

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- 2) Replace all the parts that have more than the permitted quantity of wear shown in (Table 601).
- (c) Install the aft support rods and the related parts. To install the supports, do this task: APU Aft Support Installation, TASK 49-13-02-400-801.

Table 601/49-13-02-993-803 APU Aft Support and Vibration Isolation Mount Inspection

			DESIGN LIMITS		WEAR LIMITS		
INDEX NO.	PART NAME	DIM.	DIAMETER		ALLOWED WEAR DIM.	MAX CLEAR-ANCE	REPAIR
			MIN	MAX			
1	BUSHING	ID	0.2500	0.2515	0.2600	0.0135	*[1]
	BOLT	OD	0.2485	0.2495	0.2465		*[1]
2	BUSHING	ID	0.3781	0.3796	0.3860	0.014	*[1]
	BUSHING	OD	0.3756	0.3761	0.3720		*[1]
3	BEARING BALL	ID	0.2495	0.2500	0.2550	0.0085	*[1]
	BOLT	OD	0.2485	0.2495	0.2465		*[1]
4	BEARING RACE	ID	---	---	---	*[2]	
	BEARING	OD	0.5260	0.5260	0.5310		*[1]

*[1] REPLACE WHEN WORN

*[2] THE MAXIMUM AXIAL GAP IS 0.008 AND THE MAXIMUM RADIAL GAP IS 0.005.

SUBTASK 49-13-02-410-003

- (4) Install the APU. To install it, do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

———— **END OF TASK** ————

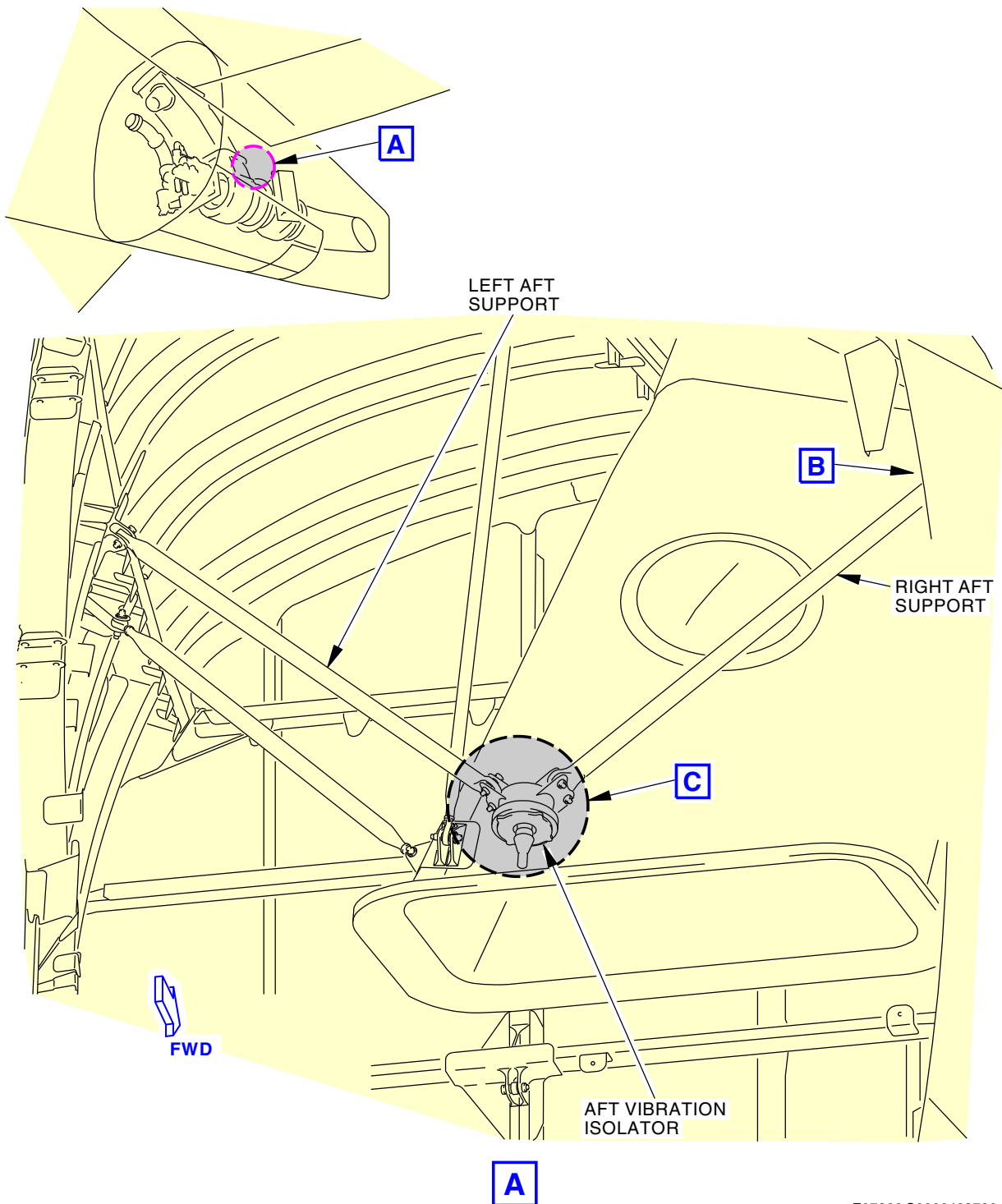
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APU Aft Mount and Vibration Isolator Inspection
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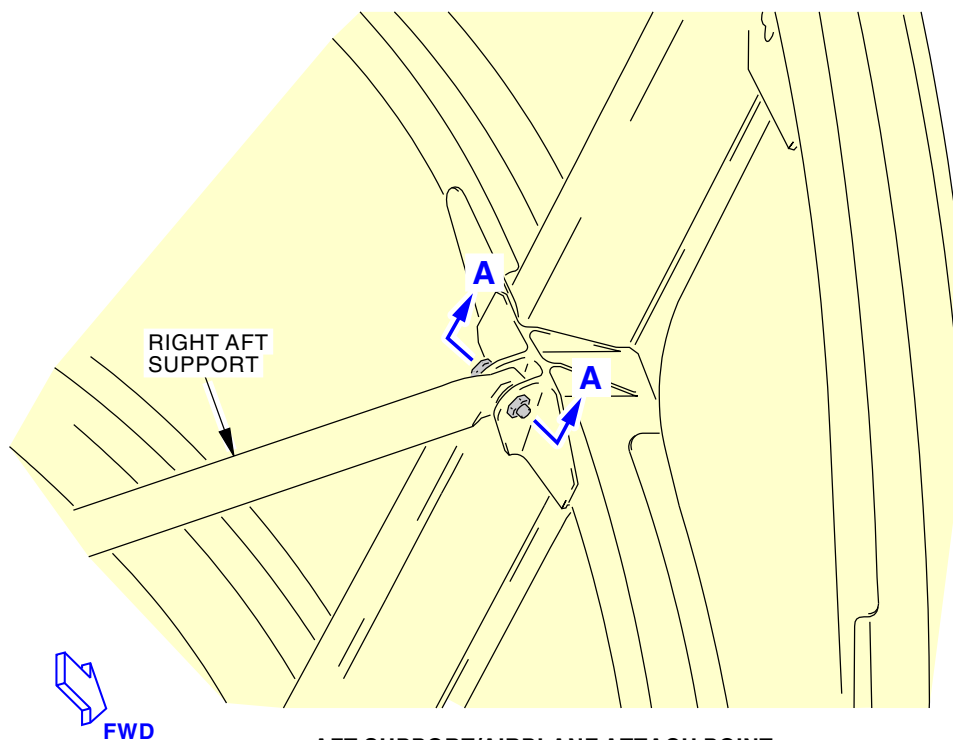
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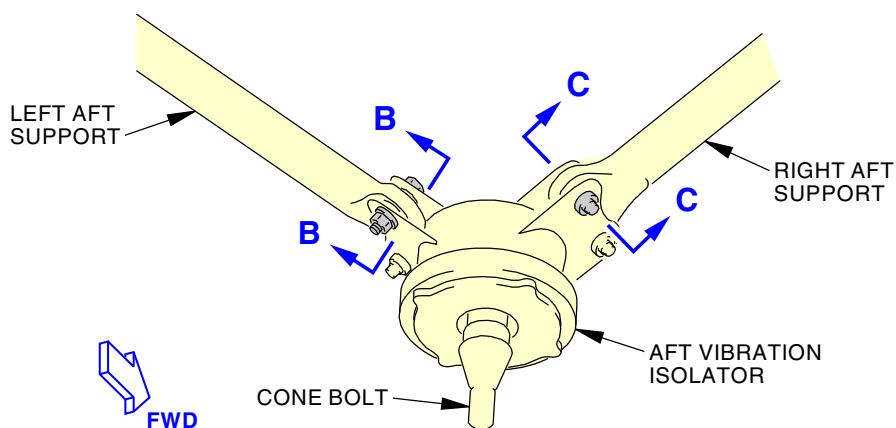
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**AFT SUPPORT/AIRPLANE ATTACH POINT
(EXAMPLE)**

B



AFT SUPPORT/VIBRATION ISOLATOR ATTACH POINT

C

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**APU Aft Mount and Vibration Isolator Inspection
Figure 601/49-13-02-990-802 (Sheet 2 of 3)**

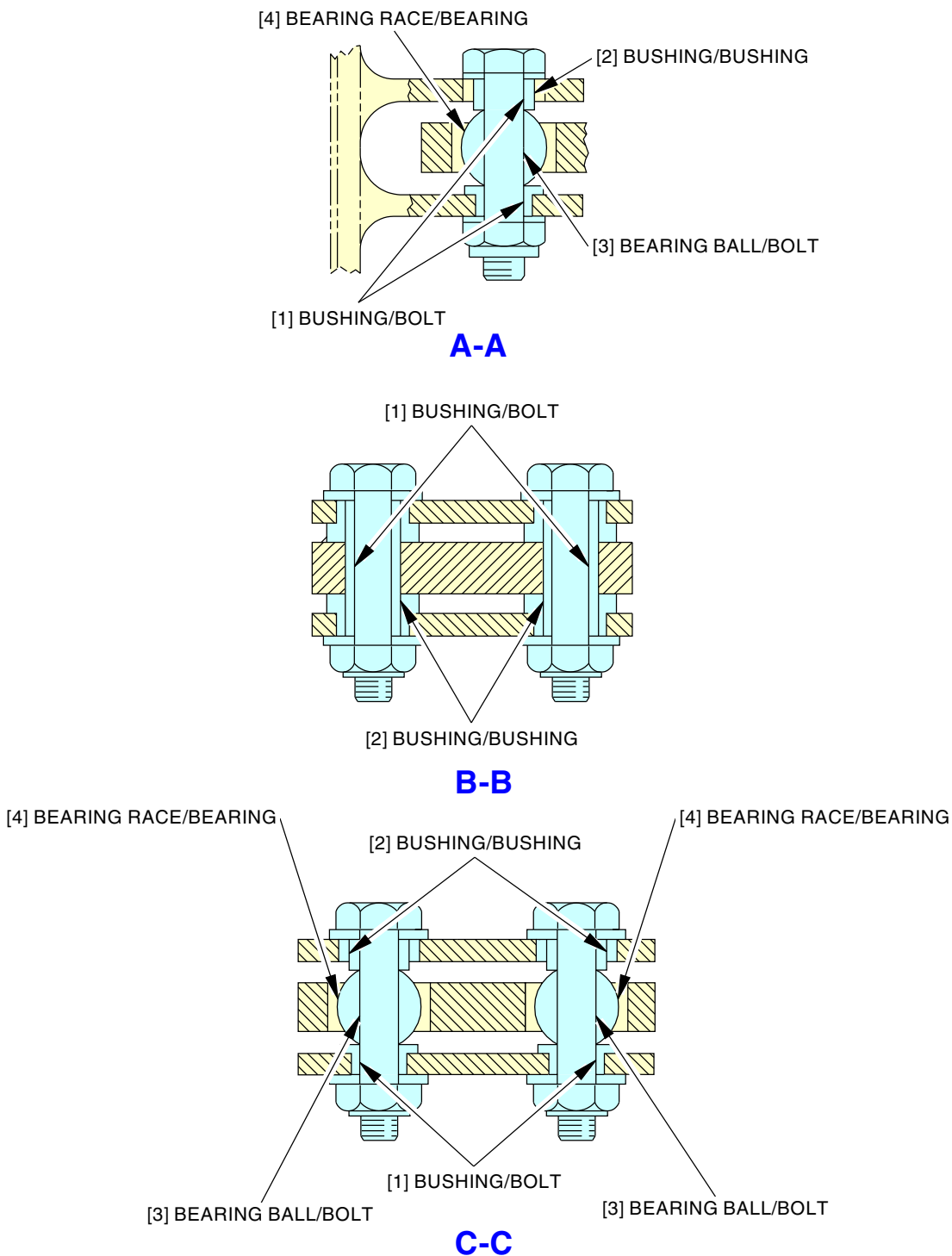
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APU Aft Mount and Vibration Isolator Inspection
Figure 601/49-13-02-990-802 (Sheet 3 of 3)

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APU AFT MOUNT YOKE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU aft mount yoke
- (2) An installation of the APU aft mount yoke.

TASK 49-13-03-000-801

2. Aft Mount Yoke Removal

(Figure 401)

A. **References**

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-13-03-010-001

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

D. **APU Aft Mount Bracket Removal**

SUBTASK 49-13-03-020-001

- (1) Do the steps that follow to remove the aft mount yoke [1] from the APU (Figure 401):
 - (a) Remove the bolts [2], the washers [3], the bushings [4], the washers [5], and the nuts [6] that attach the aft mount links [7] to the APU.
 - (b) Remove the aft mount links [7] and the aft mount yoke [1].

SUBTASK 49-13-03-020-002

- (2) Do the steps that follow to remove the aft mount links [7] from the aft mount yoke [1]:
 - (a) Remove the bolts [2], the washers [8], the bushings [9], the washers [5] and the nuts [6] that attach the aft mount links [7] to the aft mount yoke [1].
 - (b) Remove the aft mount links [7].

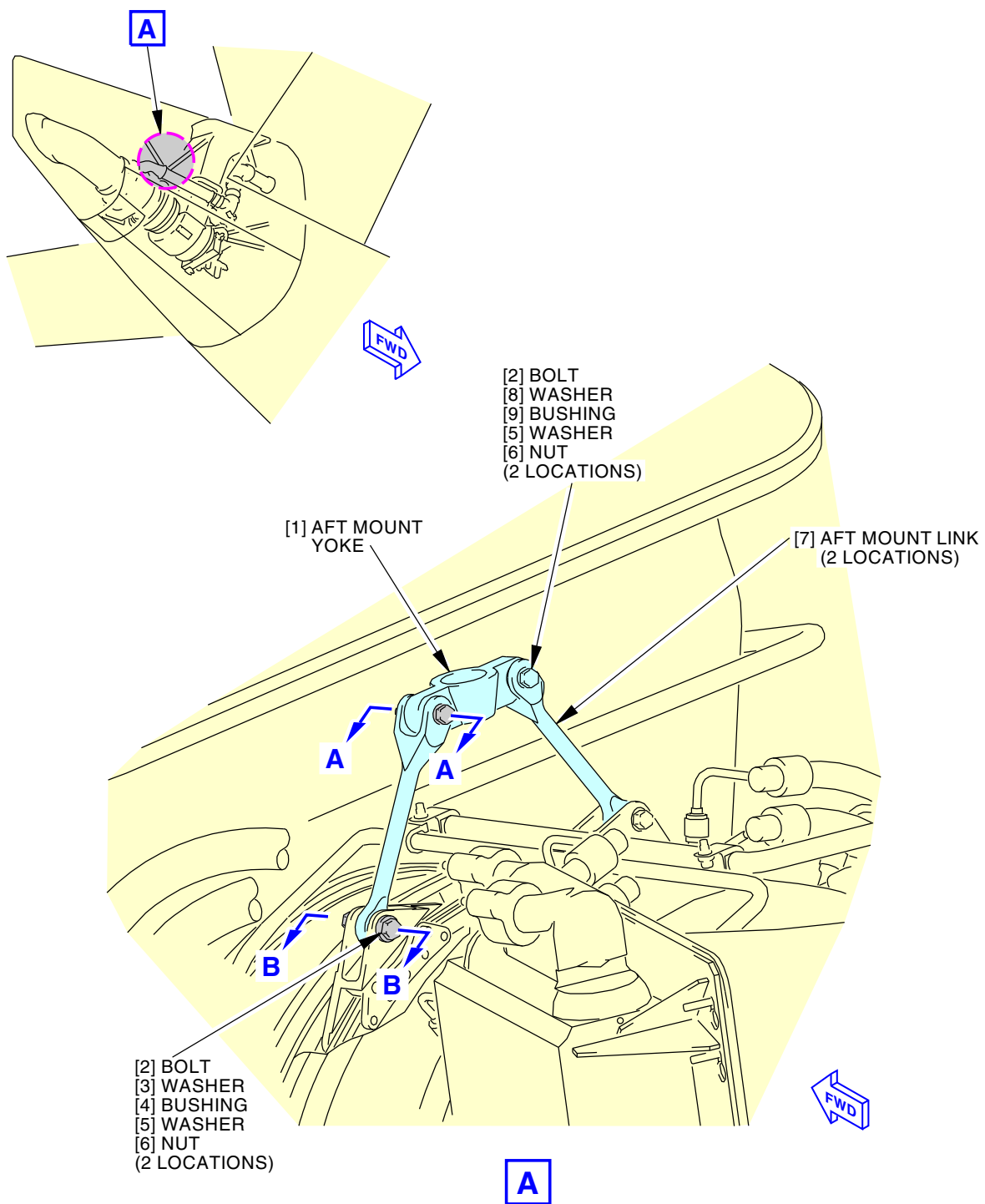
———— **END OF TASK** ————

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**Aft Mount Yoke Installation
Figure 401/49-13-03-990-801 (Sheet 1 of 2)**

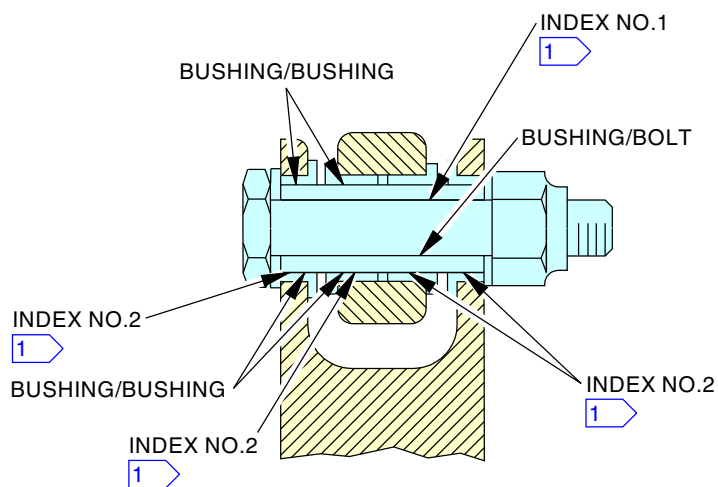
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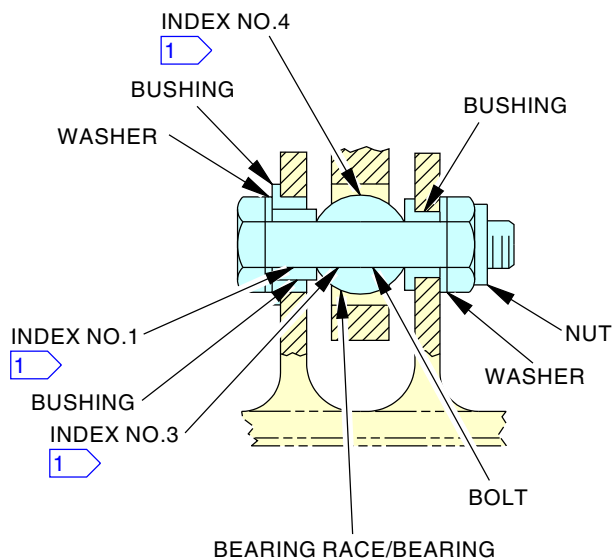
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A-A



B-B

NOTE:

 REFER TO AFT MOUNT YOKE INSPECTION TABLE.

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**Aft Mount Yoke Installation
Figure 401/49-13-03-990-801 (Sheet 2 of 2)**

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TASK 49-13-03-400-801

3. Aft Mount Yoke Installation

(Figure 401)

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-13-03-200-801	Aft Mount Yoke Inspection (P/B 601)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Aft mount link	49-13-02-02-030	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. APU Aft Mount Bracket Installation

SUBTASK 49-13-03-210-002

(1) Do this task: Aft Mount Yoke Inspection, TASK 49-13-03-200-801.

SUBTASK 49-13-03-420-001

(2) Do the steps that follow to connect the aft mount links [7] to the aft mount yoke [1]
(Figure 401):

- (a) Put the aft mount links [7] on the aft mount yoke [1].
- (b) Install the bolts [2], the washers [8], the bushings [9], the washers [5] and the nuts [6] that attach the aft mount links [7] to the aft mount yoke [1].

NOTE: The countersink side of the washers [8] must face the bolt head.

- 1) Tighten the nuts [6] to a torque value of 50-80 pound-inches.

SUBTASK 49-13-03-420-002

(3) Do the steps that follow to install the aft mount yoke [1]:

- (a) Put the aft mount links [7] on the APU and install the bolts [2], the washers [3], the bushings [4], the washers [5], and the nuts [6].

NOTE: The countersink side of the washers [3] must face the bolt head.

- 1) Tighten the nuts [6] to a torque value of 50-80 pound-inches.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-03-410-001

(1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— END OF TASK —————

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APU AFT MOUNT YOKE - INSPECTION/CHECK

1. General

A. This procedure has the task to inspect the aft mount yoke.

TASK 49-13-03-200-801

2. Aft Mount Yoke Inspection

(Figure 601)

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-13-03-000-801	Aft Mount Yoke Removal (P/B 401)
49-13-03-400-801	Aft Mount Yoke Installation (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Aft Mount Yoke Dimensions Examination

SUBTASK 49-13-03-010-002

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

SUBTASK 49-13-03-210-001

- (2) Visually examine these parts for corrosion, cracks or damage:
- (a) The aft mount links
 - (b) The aft mount yoke

SUBTASK 49-13-03-220-001

- (3) If there are signs of wear, do the steps that follow:

Table 601/49-13-03-993-803 Aft Mount Yoke Inspection

			DESIGN LIMITS		WEAR LIMITS		
INDEX NO.	PART NAME	DIM.	DIAMETER		ALLOWED WEAR DIM.	MAX CLEAR-ANCE	REPAIR
			MIN	MAX			
1	BUSHING	ID	0.2500	0.2515	0.2600	0.0135	*[1]
	ATTACH BOLT	OD	0.2485	0.2495	0.2465		*[1]
2	BUSHING	ID	0.3781	0.3796	0.3860	0.014	*[1]
	BUSHING	OD	0.3756	0.3761	0.3720		*[1]

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Table 601/49-13-03-993-803 Aft Mount Yoke Inspection (Continued)

			DESIGN LIMITS		WEAR LIMITS		
INDEX NO.	PART NAME	DIM.	DIAMETER		ALLOWED WEAR DIM.	MAX CLEAR-ANCE	REPAIR
			MIN	MAX			
3	BEARING BALL	ID	0.2495	0.2500	0.2550	0.0085	*[1]
	ATTACH BOLT	OD	0.2485	0.2495	0.2465		*[1]
4	BEARING RACE	ID				*[2]	
	BEARING	OD	0.5260	0.5260	0.5310		*[1]

*[1] REPLACE WHEN WORN

*[2] MAXIMUM AXIAL GAP IS 0.008. MAXIMUM RADIAL GAP IS 0.005

(a) Do this task: Aft Mount Yoke Removal, TASK 49-13-03-000-801.

- 1) Examine the aft mount links for cracks, corrosion, or damage.
- 2) Replace the supports that have cracks, corrosion, or damage.

(b) Do a check of the bolts and bushings.

- 1) Examine the bushings and the bolts for wear.
- 2) Replace all the parts that have more than the permitted quantity of wear shown in (Table 601).

(c) Do this task: Aft Mount Yoke Installation, TASK 49-13-03-400-801.

SUBTASK 49-13-03-410-002

- (4) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

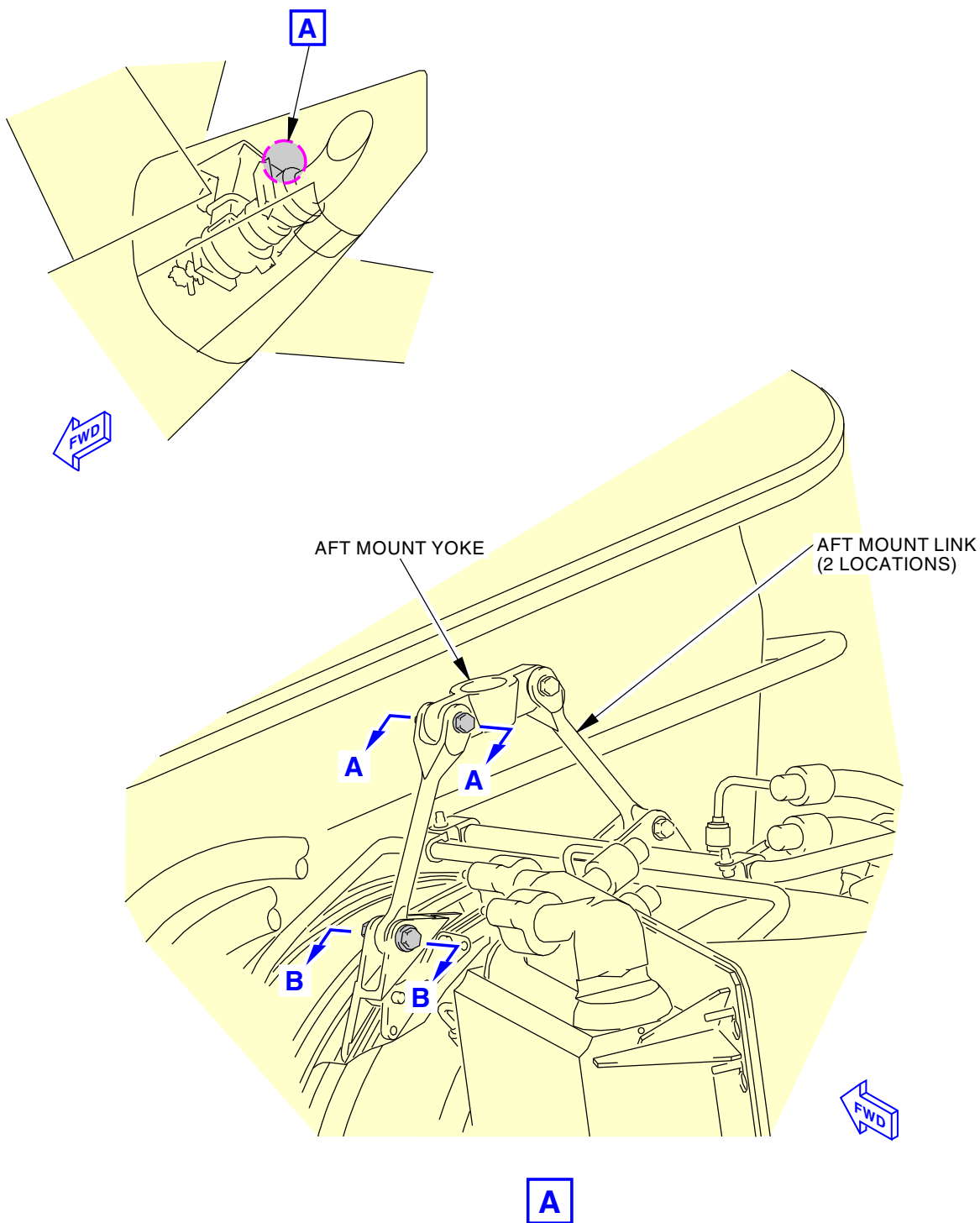
————— END OF TASK —————

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Aft Mount Yoke Inspection
Figure 601/49-13-03-990-802 (Sheet 1 of 2)

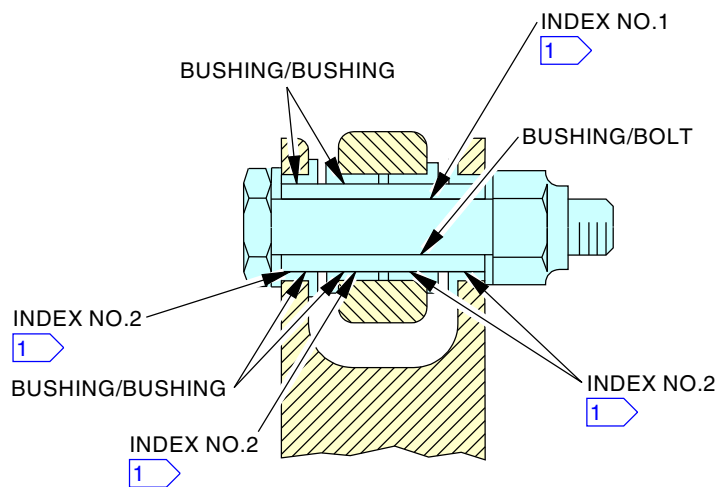
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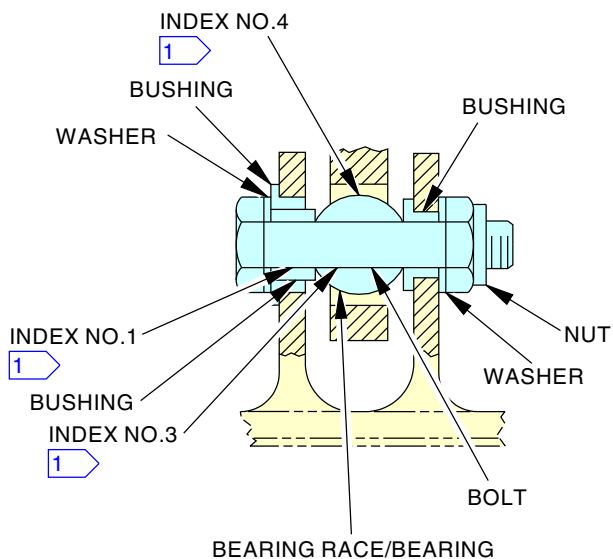
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A-A



B-B

NOTE:

 REFER TO AFT MOUNT YOKE INSPECTION TABLE.

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**Aft Mount Yoke Inspection
Figure 601/49-13-03-990-802 (Sheet 2 of 2)**

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APU FORWARD MOUNT FITTINGS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU forward mount fittings.
 - (2) An installation of the APU forward mount fittings.

TASK 49-13-04-000-801

2. Forward Mount Fitting Removal

(Figure 401)

A. **References**

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-13-04-010-001

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

D. **APU Forward Mount Fittings Removal**

SUBTASK 49-13-04-020-001

- (1) Do the steps that follow to remove the forward mount fittings from the APU:
 - (a) Remove the bolts [1] and washers [2] that attach the forward mount fitting [3], mount fitting [4] to the APU.
 - (b) Remove the forward mount fitting [3], mount fitting [4].

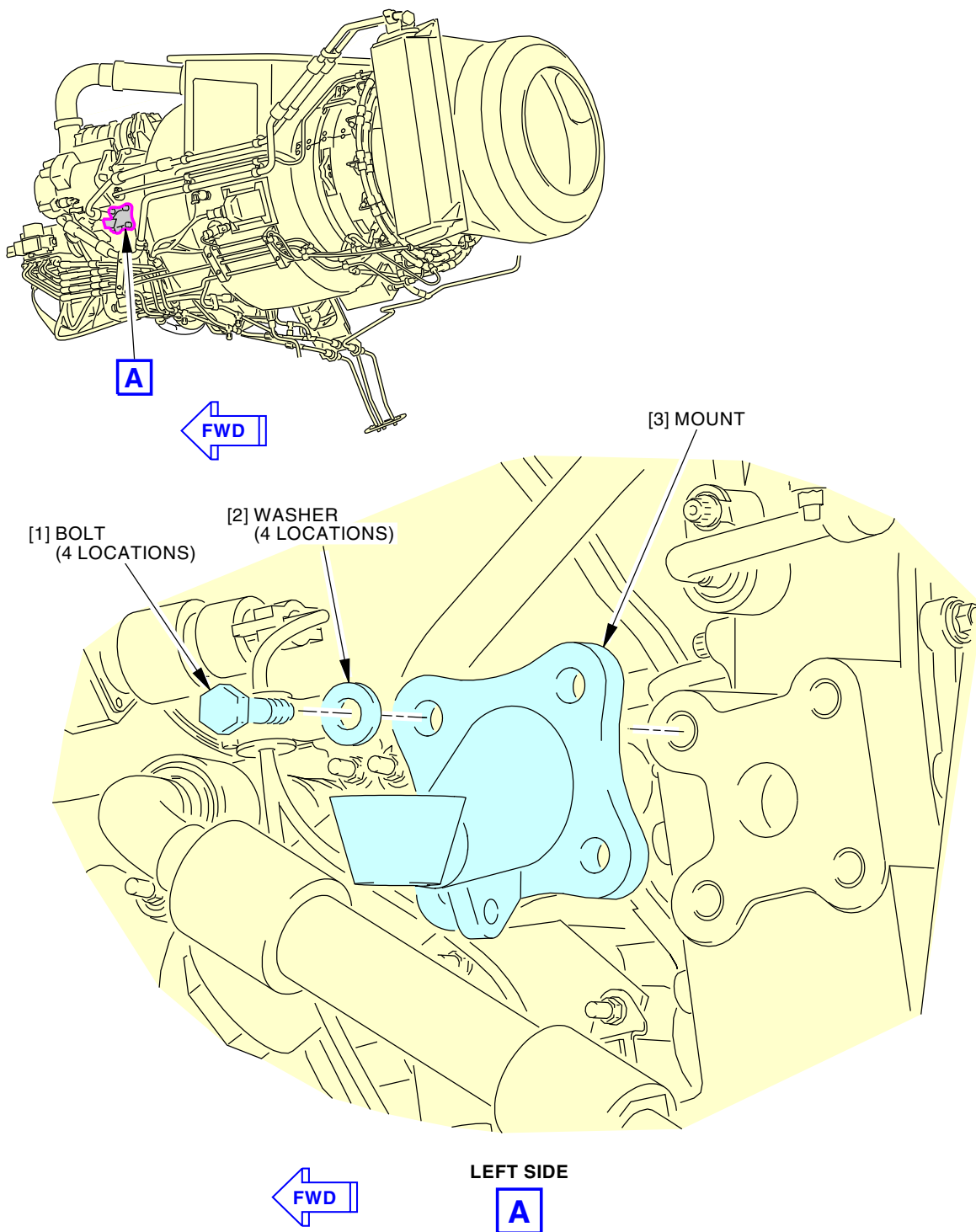
———— **END OF TASK** ————

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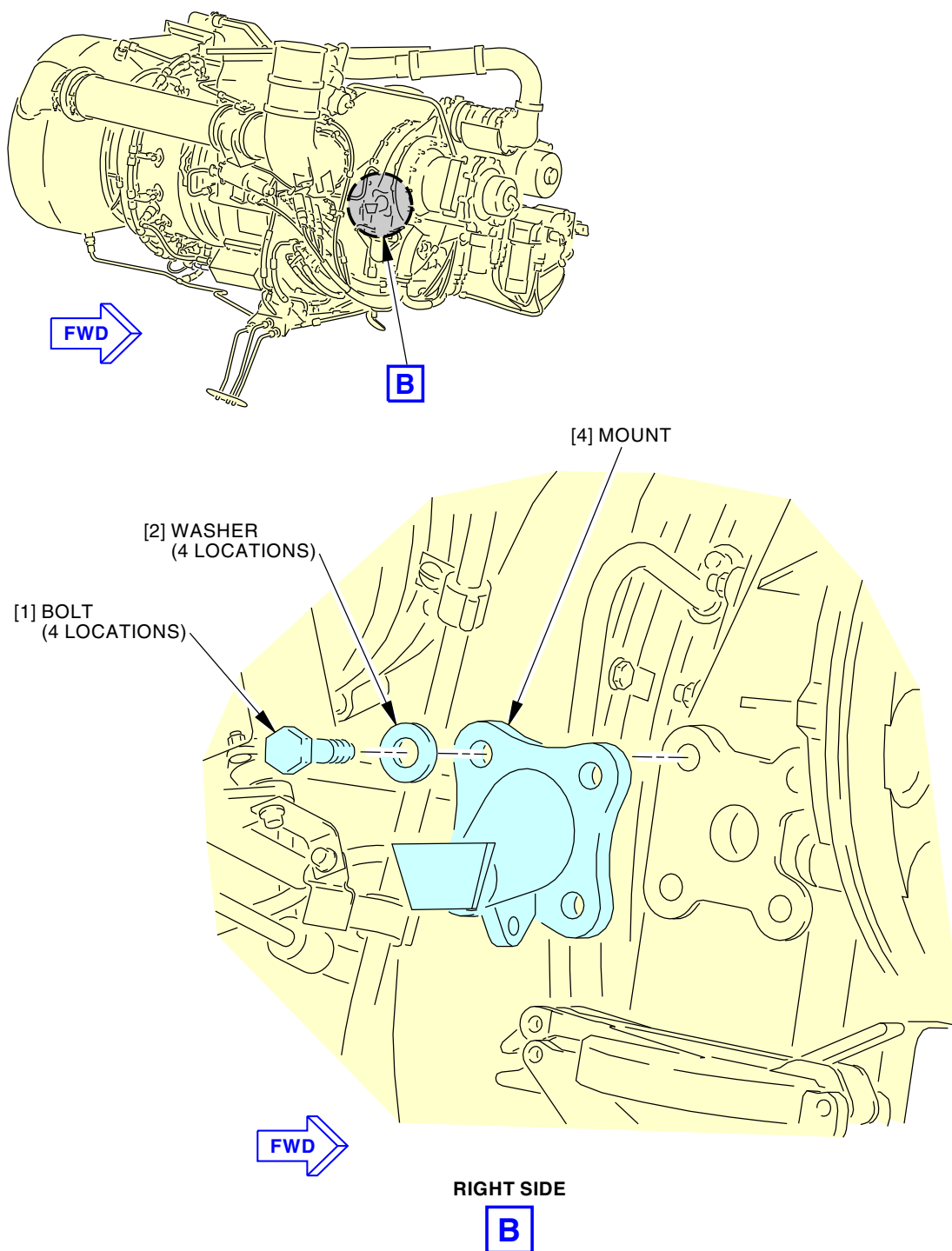
**Forward Mount Fitting Installation
Figure 401/49-13-04-990-801 (Sheet 1 of 2)**

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**Forward Mount Fitting Installation
Figure 401/49-13-04-990-801 (Sheet 2 of 2)**

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TASK 49-13-04-400-801

3. Forward Mount Fitting Installation

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

B. Consumable Materials

Reference	Description	Specification
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Mount fitting	49-13-01-02-005	ARO ALL
4	Mount fitting	49-13-01-02-010	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. APU Forward Mount Fitting Installation

SUBTASK 49-13-04-420-001

- (1) Do the steps that follow to install the forward mount fittings:
 - (a) Install the forward mount fitting [3], mount fitting [4] on the APU with wet primer, C00259 on the unfinished faying surface.
 - 1) Install the bolts [1] and washers [2].
 - 2) Tighten the bolts [1] to a torque value of 250-300 pound-inches (28.25-33.90 newton-meters).
 - 3) Install lockwire on the bolts.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-04-410-001

- (1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— **END OF TASK** —————

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APU HARNESS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU harness
 - (2) An installation of the APU harness.

TASK 49-14-00-000-801

2. APU Wire Harness Removal

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-14-00-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-14-00-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-14-00-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Harness Removal

SUBTASK 49-14-00-020-001

- (1) Do the steps that follow to disconnect the APU wire harness [1] from the airplane (Figure 401):

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- (a) Disconnect these APU wire harness connectors from the firewall [3]:
 - 1) D49001P [2]
 - 2) D49002P [4]
 - 3) D49003P [6]
 - 4) D49004P [5].
- (b) Disconnect the wire harness [1] from the firewall [3] and the strut [7].
 - 1) Open the clamps [8] and [9] to release the APU wire harness [1].

SUBTASK 49-14-00-020-002

- (2) Do the steps that follow to disconnect the APU wire harness [1] from the right side of the APU (Figure 402):
 - (a) Disconnect the electrical connector, D49022P [24] from the inlet guide vane actuator [23].
 - (b) Disconnect the electrical connector, D49008P [22] from the ignition unit [21].
 - (c) Disconnect the electrical connector, D49027P [33] from the speed sensor 1 [32].
 - (d) Disconnect the electrical connector, D49021P [31] from the oil quantity/sump temperature sensor [30].
 - (e) Remove the nut [26], the bracket [27], and the ground strap [25] from the gearbox.
 - (f) Replace the bracket [27] and the nut [26] on the gearbox.
 - (g) Loosen the bolts [29] and open the clamps [28] to release the APU wire harness [1].
 - (h) Disconnect the electrical connector, D49026P [44] from the surge control valve [45].
 - (i) Disconnect the electrical connector, D49023P [43] from the inlet pressure sensor [34].
 - (j) Disconnect the electrical connector, D49024P [42] from the total pressure sensor [35].
 - (k) Disconnect the electrical connector, D49025P [41] from the differential pressure sensor [40].
 - (l) Disconnect the electrical connector, D49019P [37] from the air turbine starter control valve [36].
 - (m) Loosen the bolts [39] and open the clamps [38] to release the APU wire harness [1].

SUBTASK 49-14-00-020-003

- (3) Do the steps that follow to disconnect the APU wire harness [1] from the front of the APU (Figure 403):
 - (a) Disconnect the electrical connector, D49014P [66] from the oil temperature sensor [67].
 - (b) Disconnect the electrical connector, D49031P [63] from the bracket [62].

NOTE: The bracket [62] holds the electrical connectors D49031P [63] and D49031J [61] together.
 - (c) Disconnect the electrical connector, D49007P [72] from the bracket [62].

NOTE: The bracket [62] holds the electrical connectors D49007P [72] and D49007J [73] together.
 - (d) Disconnect the electrical connector, D49017P [69] from the oil filter bypass valve/switch [68].
 - (e) Disconnect the electrical connector, D49016P [71] from the oil pressure sensor [70].
 - (f) Remove the nut [64] and the ground strap [65] from the gearbox.
 - (g) Replace the nut [64].

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- (h) Disconnect the electrical connector, D49010P [76] from the fuel filter differential pressure switch [77].
- (i) Disconnect the electrical connector, D49032P [78] from the electric starter motor [79].
- (j) Disconnect the electrical connector, D49009P [81] from the fuel temperature sensor [80].
- (k) Disconnect the electrical CONNECTOR, D49018P [83] from the generator filter bypass valve/switch [82].
- (l) Disconnect the electrical connector, D49015P [87] from the low oil pressure switch [84].
- (m) Disconnect the electrical connector, D49011P [88] from the fuel cluster.
- (n) Loosen the bolts [86] and open the clamps [85] to release the APU wire harness [1].
- (o) Do not release the APU wire harness [1] from the clamp [75] at this time.

NOTE: This is the last clamp you will open.

SUBTASK 49-14-00-020-004

- (4) Do the steps that follow to disconnect the APU wire harness [1] from the left side of the APU (Figure 403) (View E):
 - (a) Disconnect the electrical connector, D49029P [89] from the inlet temperature sensor [90].
 - (b) Disconnect the electrical connector, D49012P [91] from the data memory module [92].
 - (c) Disconnect the electrical connector, D49028P [94] from the speed sensor 2 [93].
 - (d) Do the steps that follow to open the clamps [96]:
 - 1) Remove the washers [97] and the bolts [98].
 - 2) Remove the clamps [96] and the pipe clamp inserts [95].
 - 3) Remove the APU wire harness [1] from the pipe clamp insert [95].
 - 4) Replace the bolts [98], the washers [97], the clamps [96] and the pipe clamp inserts [95].
 - 5) Loosen the bolt [100] and open the clamp [99] to release the APU wire harness [1].

SUBTASK 49-14-00-020-005

- (5) Do the steps that follow to disconnect the APU wire harness [1] from the aft end of the APU (Figure 404):
 - (a) Remove the locknuts [122] and the APU wire harness [1] leads from the 4 exhaust gas temperature (EGT) sensors [121].
 - 1) Replace the locknuts [122] on the EGT sensors [121].
 - (b) Loosen the bolts [124] and open the clamps [123] to release the APU wire harness [1].

SUBTASK 49-14-00-020-006

- (6) Loosen the bolt [74] and open the clamp [75] to remove the APU wire harness [1] (Figure 403) View B.

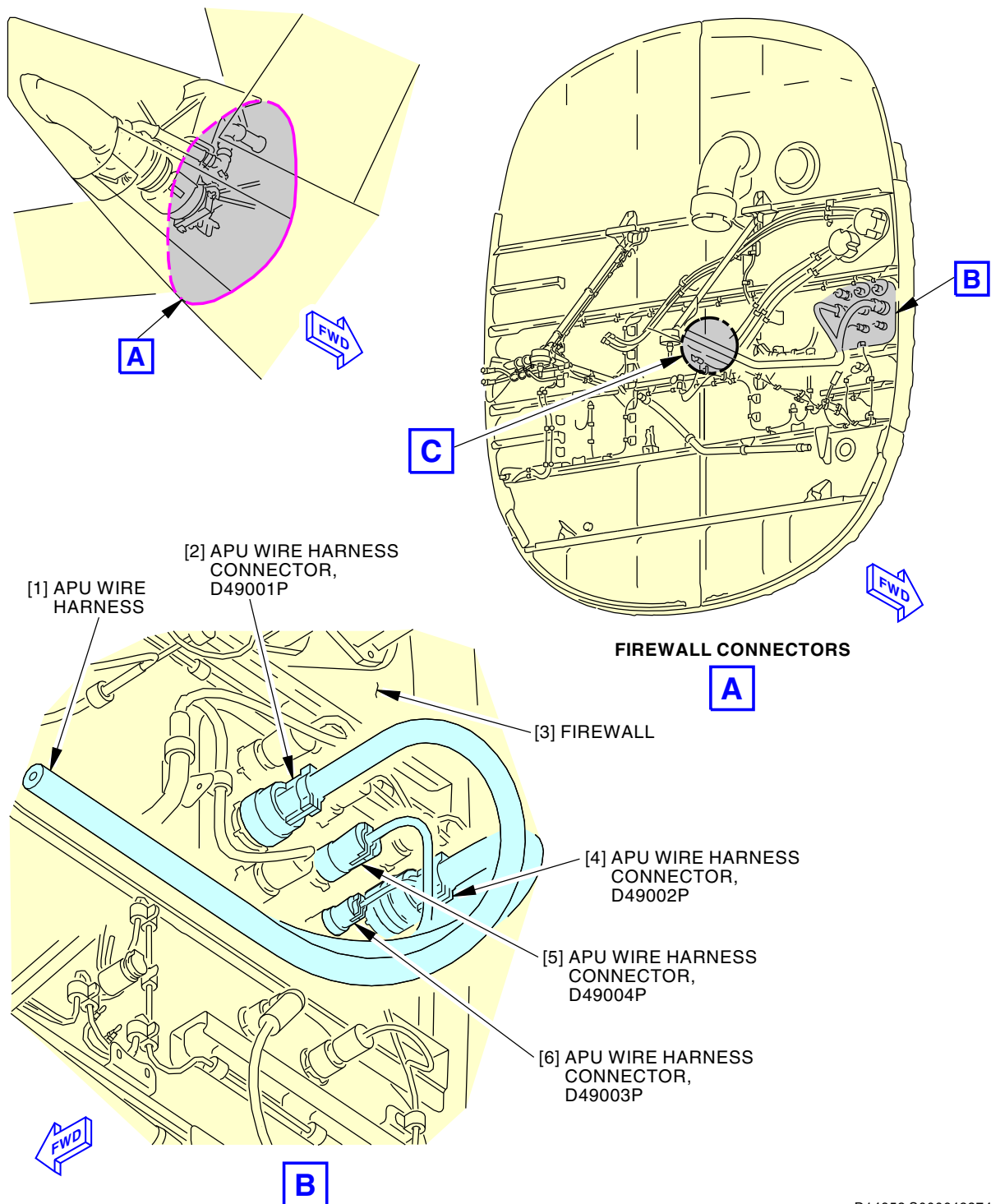
———— **END OF TASK** ————

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D14953 S0006423749_V2

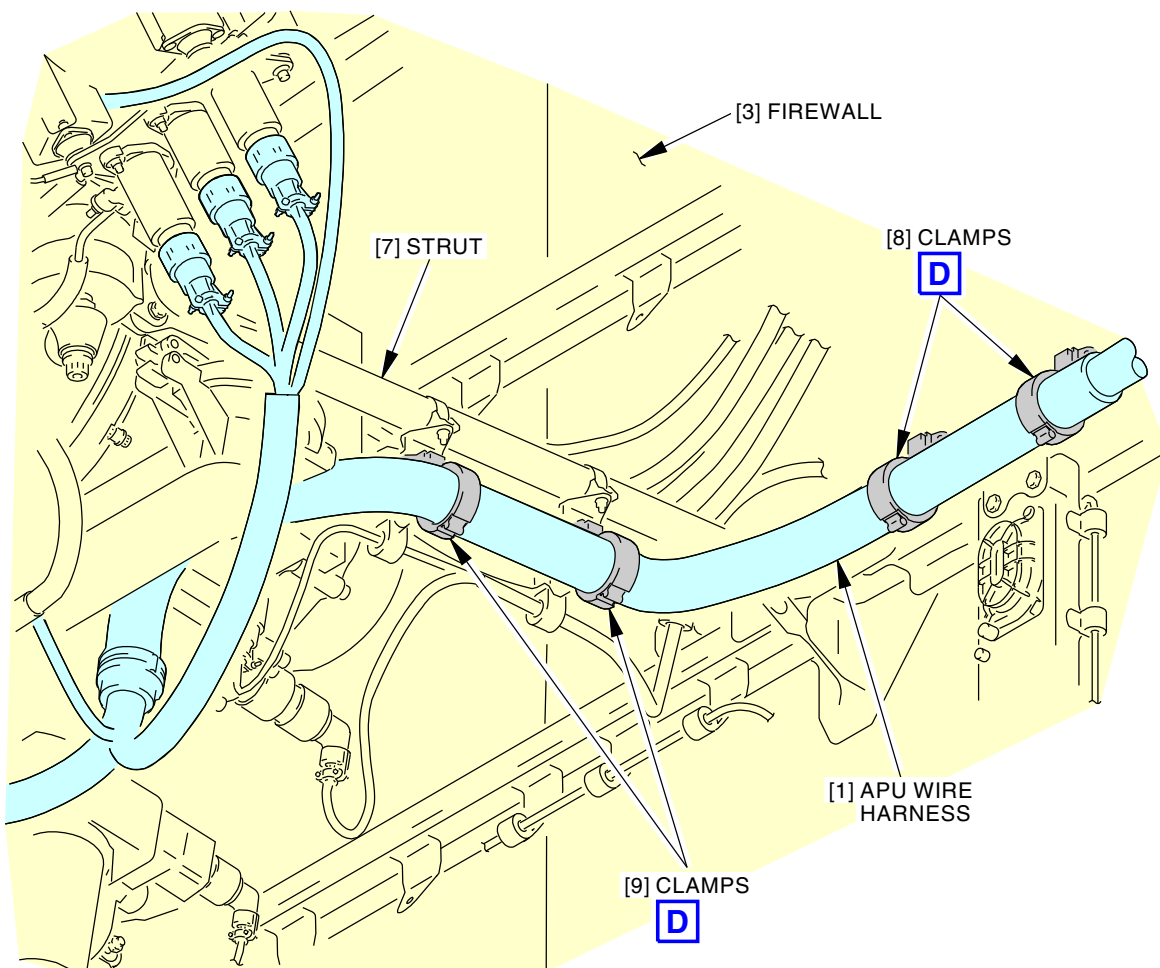
**APU Wire Harness Firewall Connections
Figure 401/49-14-00-990-801 (Sheet 1 of 2)**

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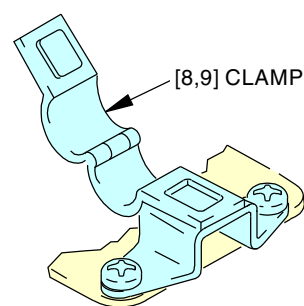
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C



**FIREWALL AND STRUT CLAMP
(EXAMPLE)**

D

D13185 S0006423750_V2

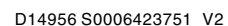
**APU Wire Harness Firewall Connections
Figure 401/49-14-00-990-801 (Sheet 2 of 2)**

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APU Wire Harness (Right Side) Installation
Figure 402/49-14-00-990-802 (Sheet 1 of 3)

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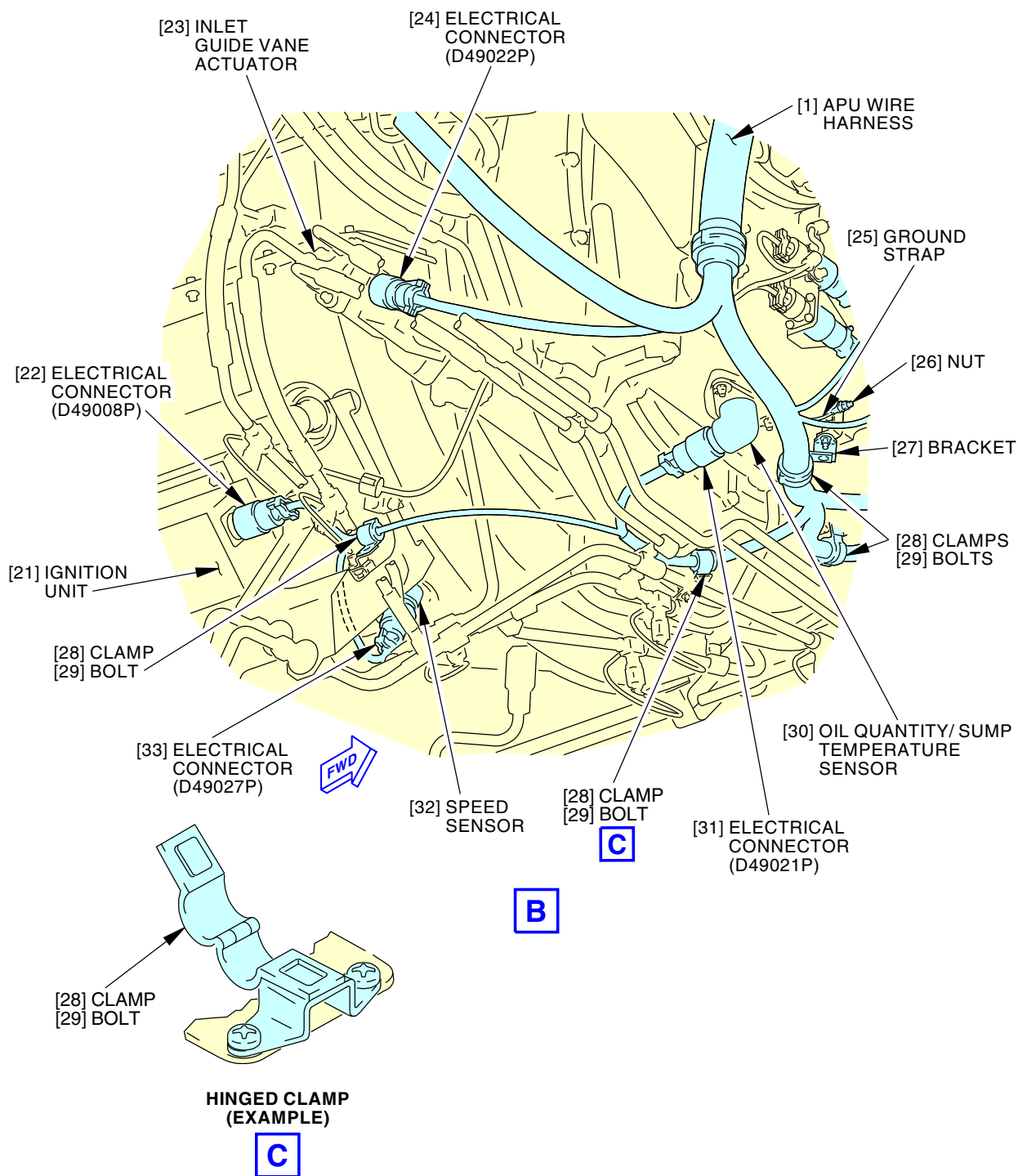
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C88229 S0006423752_V2

**APU Wire Harness (Right Side) Installation
Figure 402/49-14-00-990-802 (Sheet 2 of 3)**

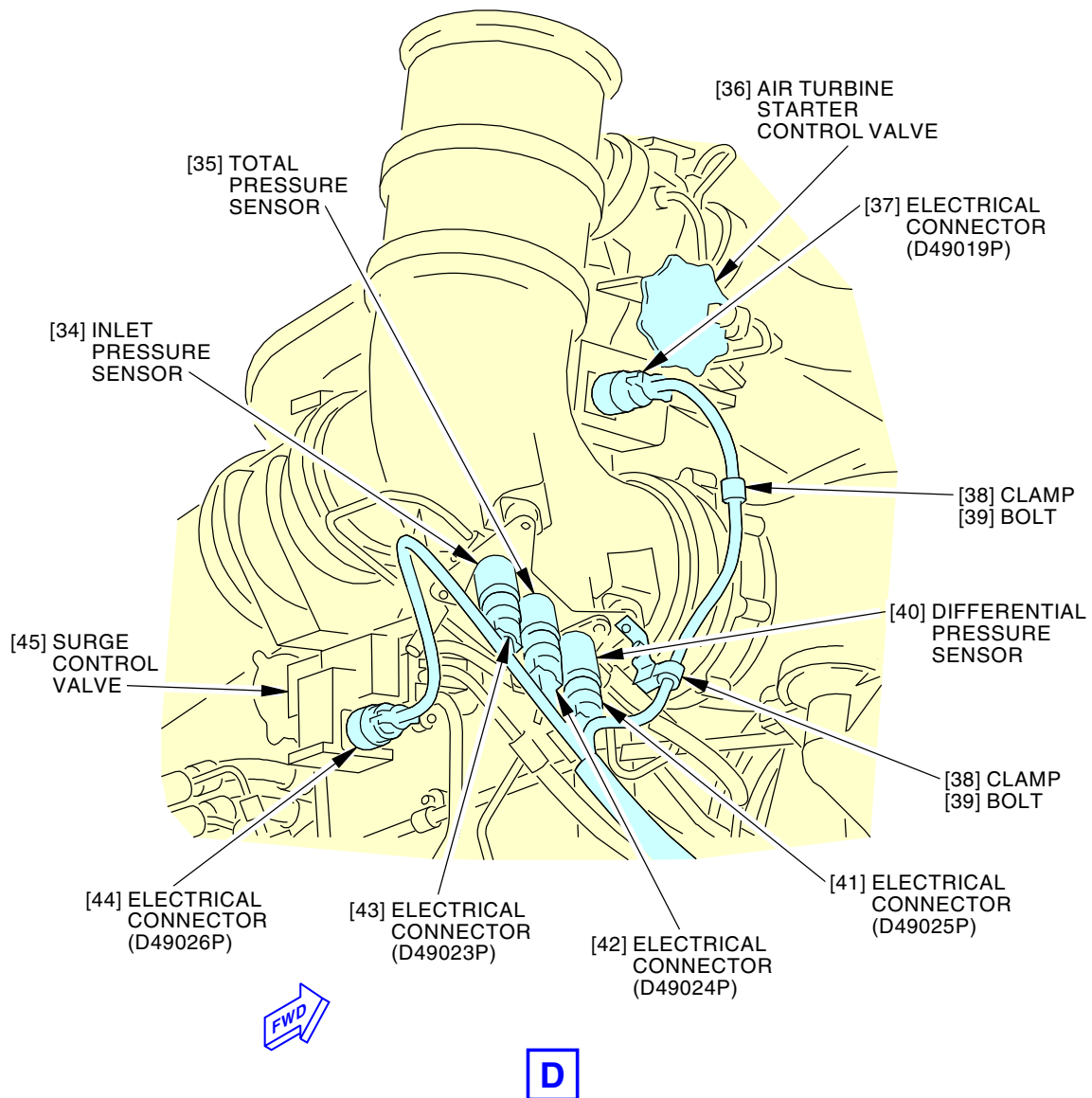
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D12891 S0006423753_V2

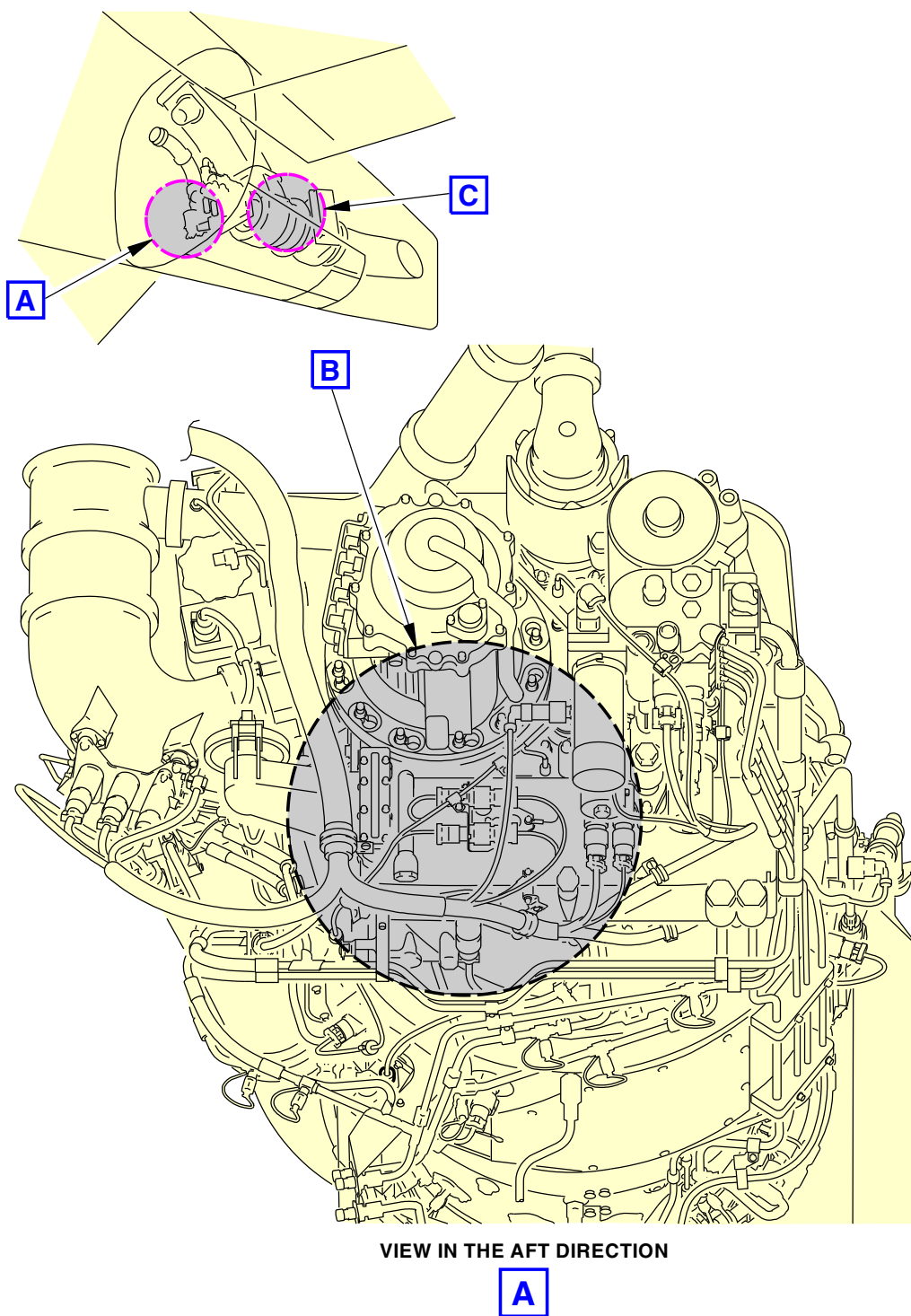
**APU Wire Harness (Right Side) Installation
Figure 402/49-14-00-990-802 (Sheet 3 of 3)**

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D12967 S0006423754_V2

**APU Wire Harness (Gearbox and Left Side Connections)
Figure 403/49-14-00-990-803 (Sheet 1 of 5)**

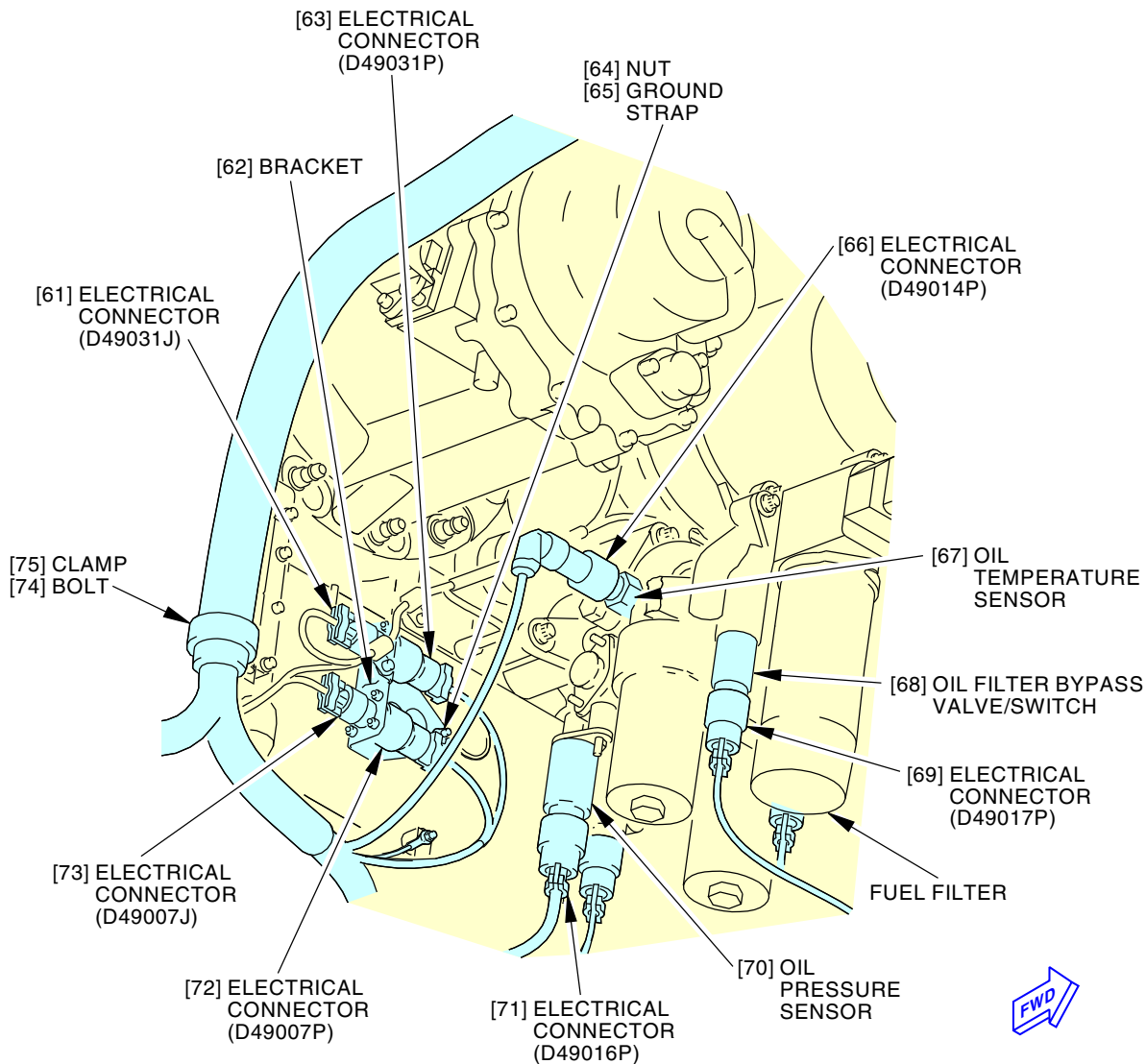
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GEARBOX CONNECTIONS



D13378 S0006423755_V2

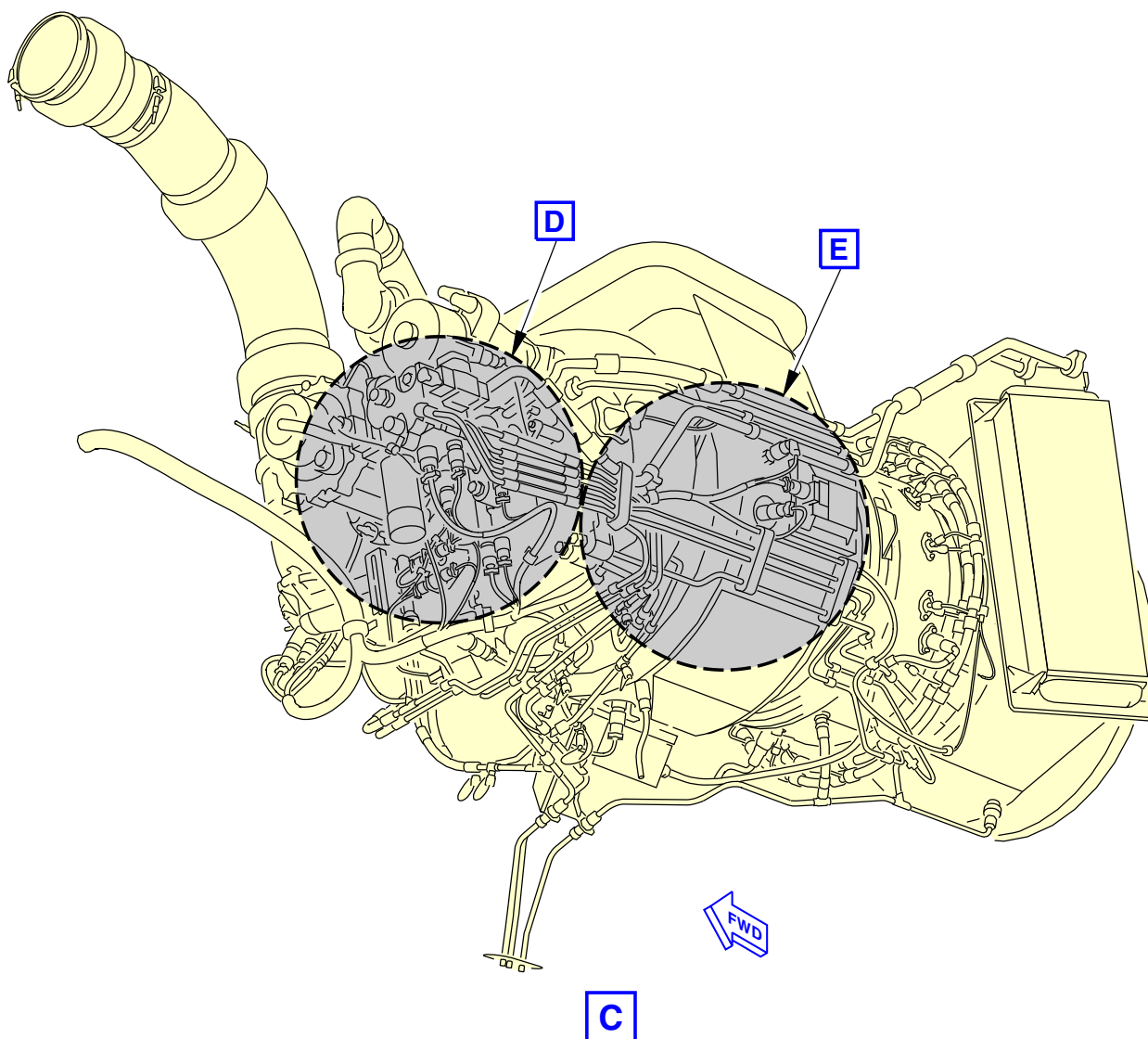
APU Wire Harness (Gearbox and Left Side Connections)
Figure 403/49-14-00-990-803 (Sheet 2 of 5)

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D13426 S0006423756_V2

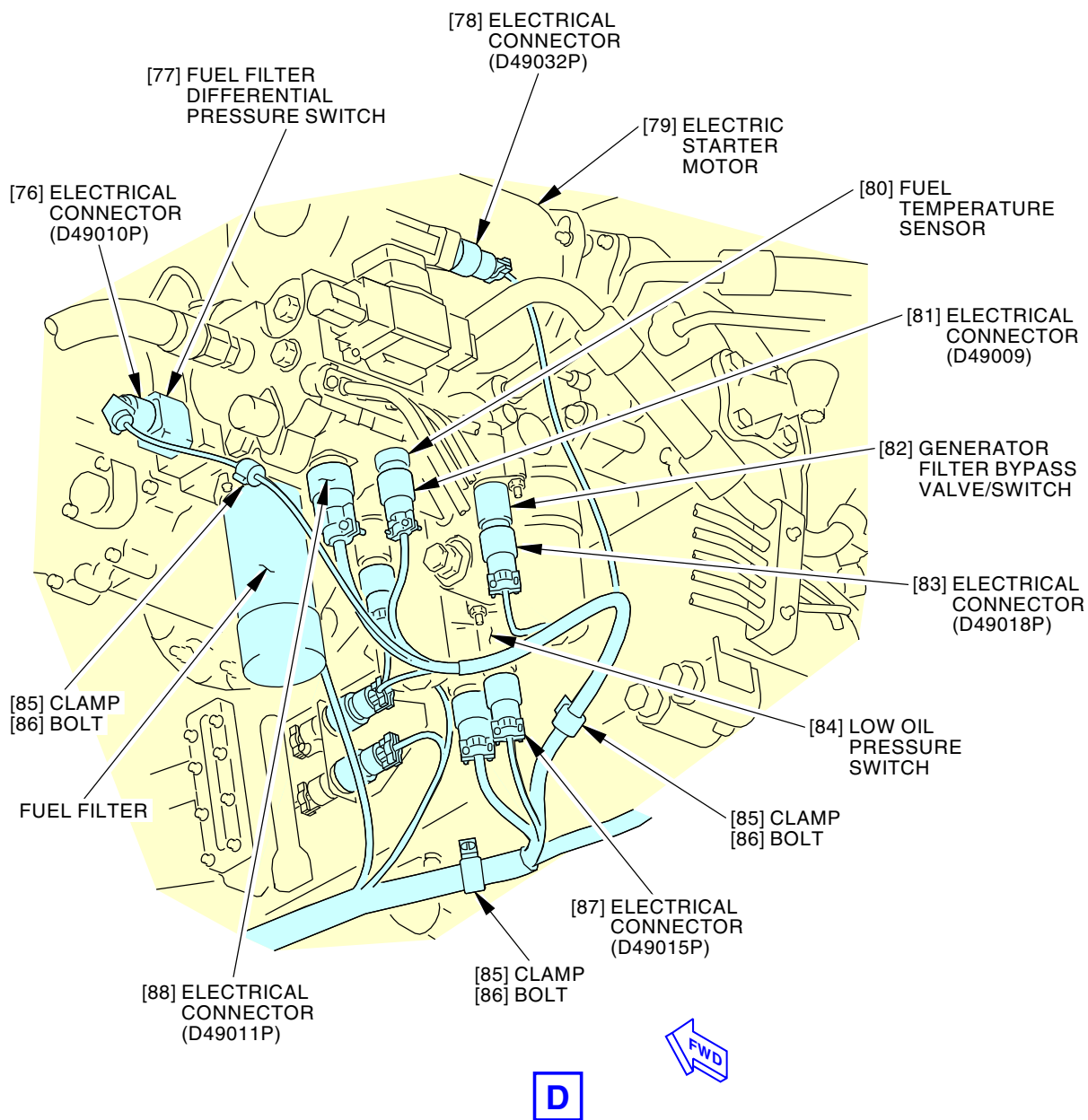
**APU Wire Harness (Gearbox and Left Side Connections)
Figure 403/49-14-00-990-803 (Sheet 3 of 5)**

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D13698 S0006423757_V2

**APU Wire Harness (Gearbox and Left Side Connections)
Figure 403/49-14-00-990-803 (Sheet 4 of 5)**

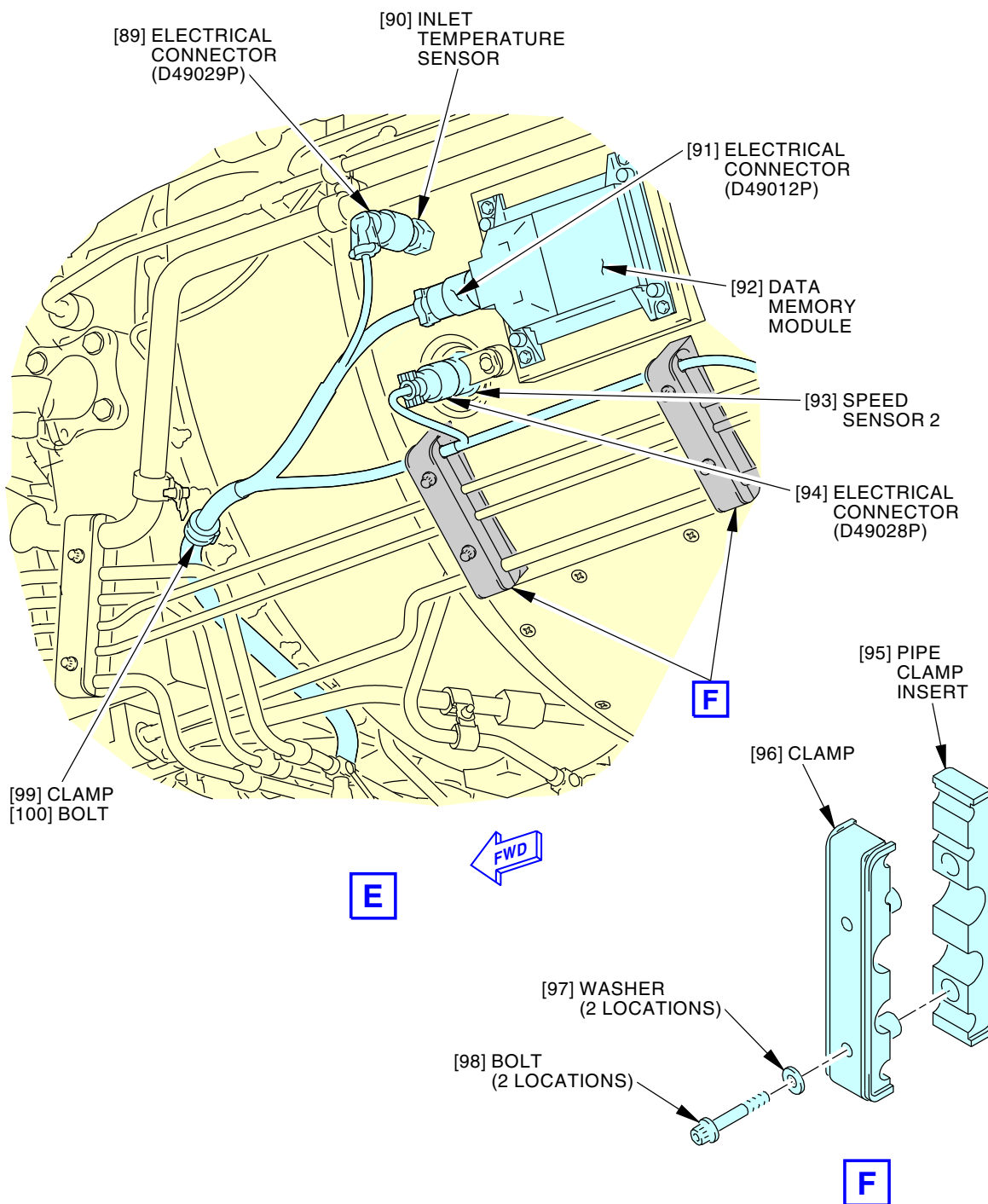
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C88443 S0006423758_V2

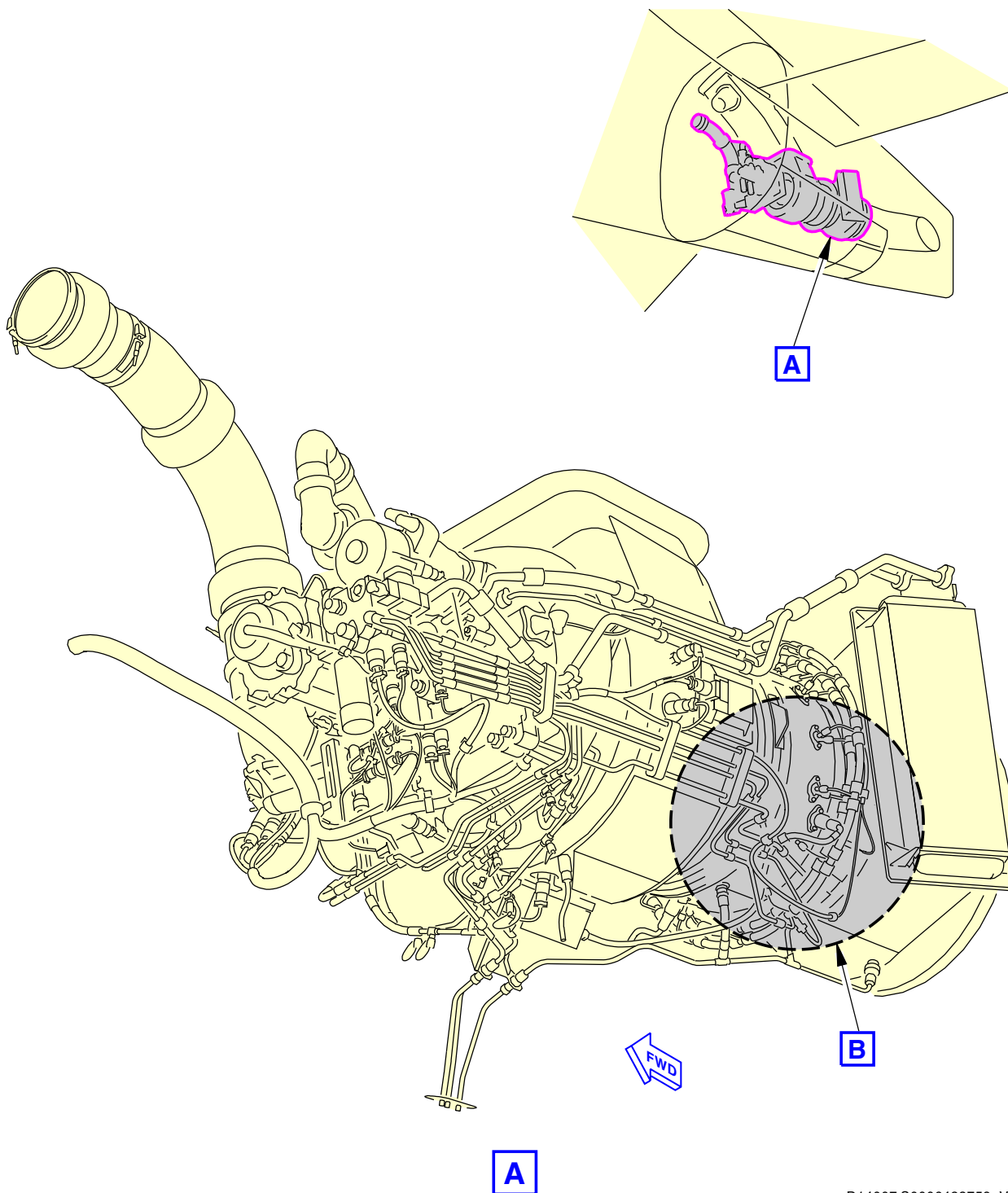
APU Wire Harness (Gearbox and Left Side Connections)
Figure 403/49-14-00-990-803 (Sheet 5 of 5)

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D14007 S0006423759_V2

**APU Wire Harness (EGT Sensor Connections)
Figure 404/49-14-00-990-804 (Sheet 1 of 5)**

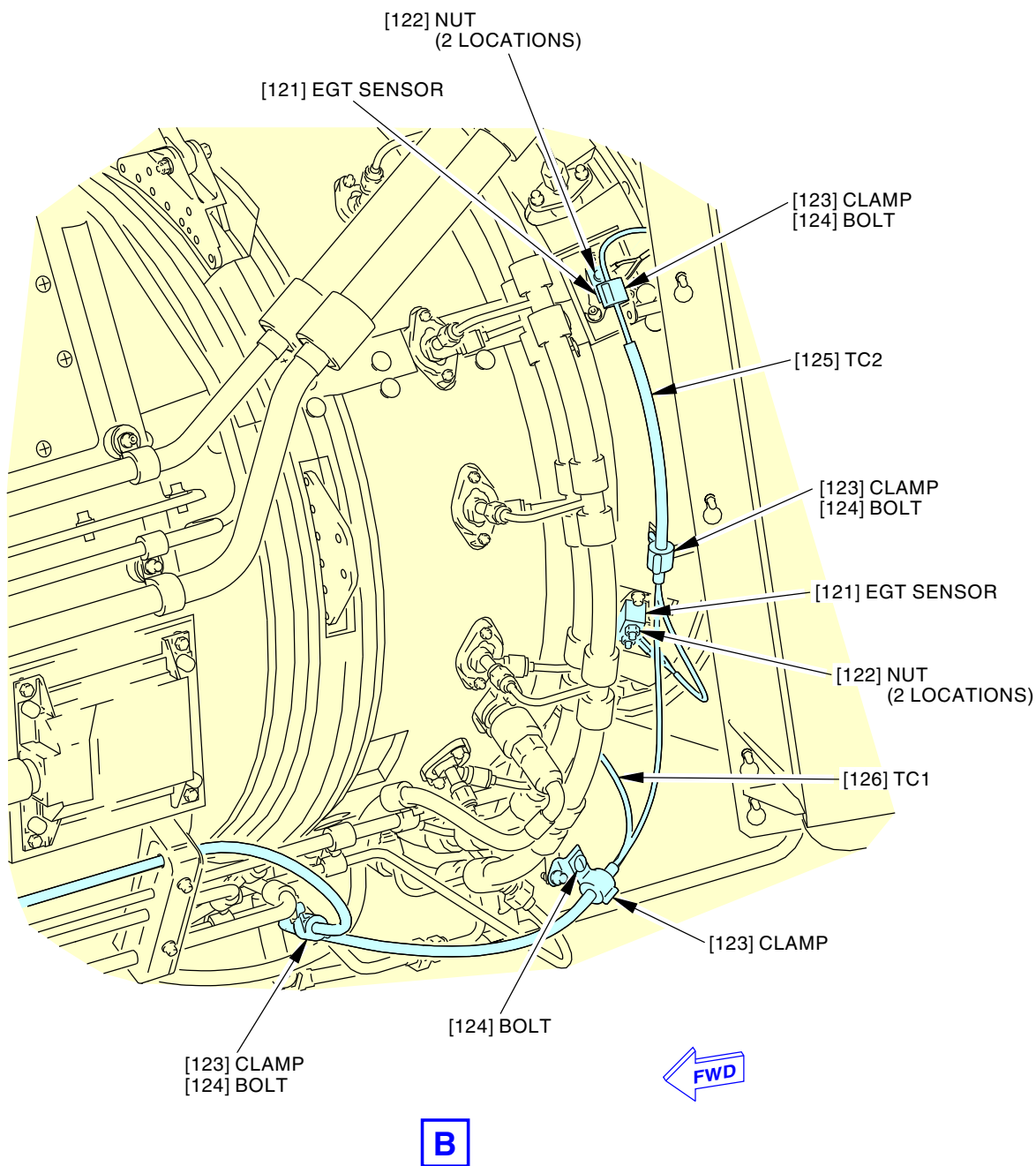
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C88445 S0006423760_V2

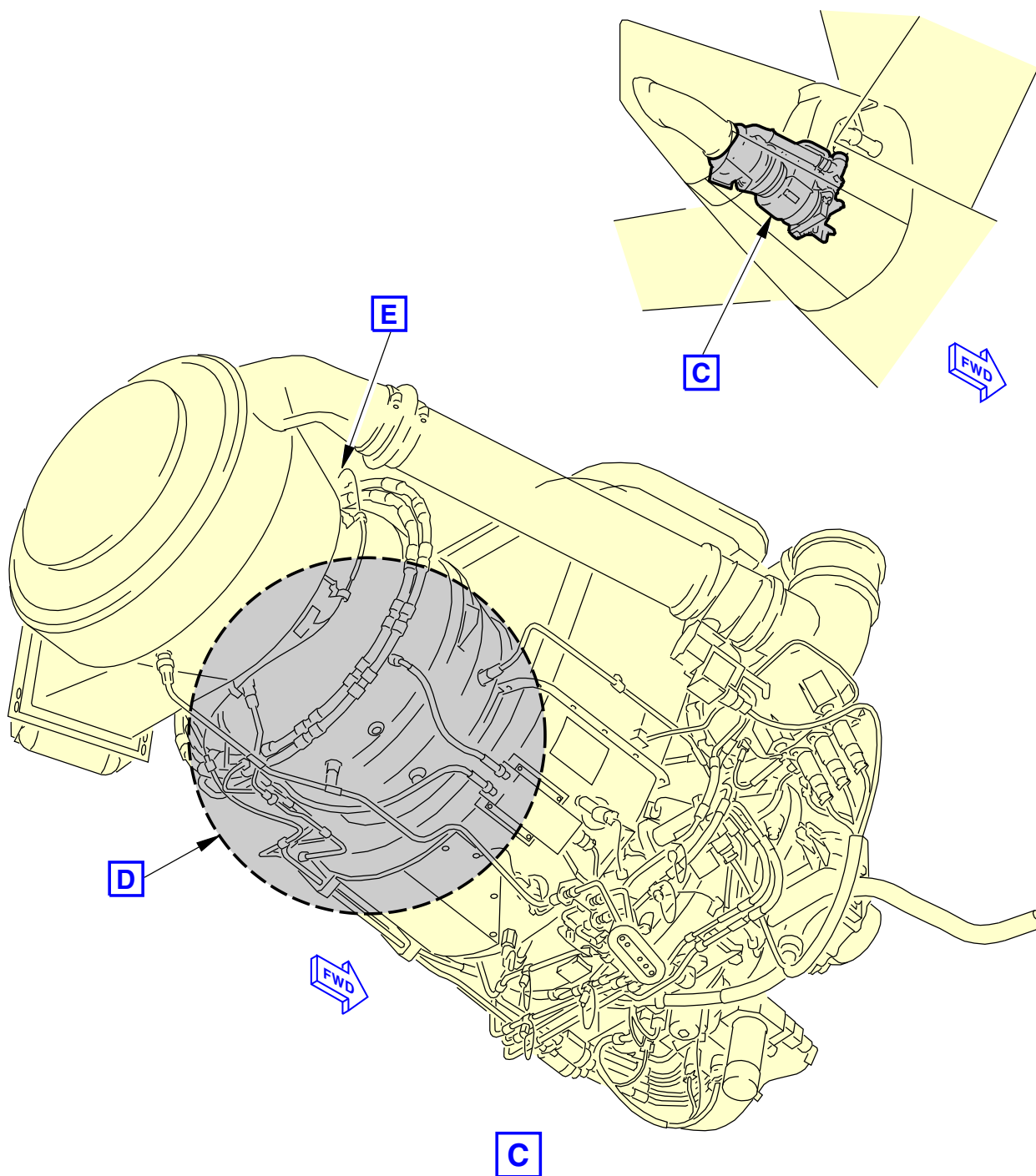
APU Wire Harness (EGT Sensor Connections)
Figure 404/49-14-00-990-804 (Sheet 2 of 5)

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D14103 S0006423761_V2

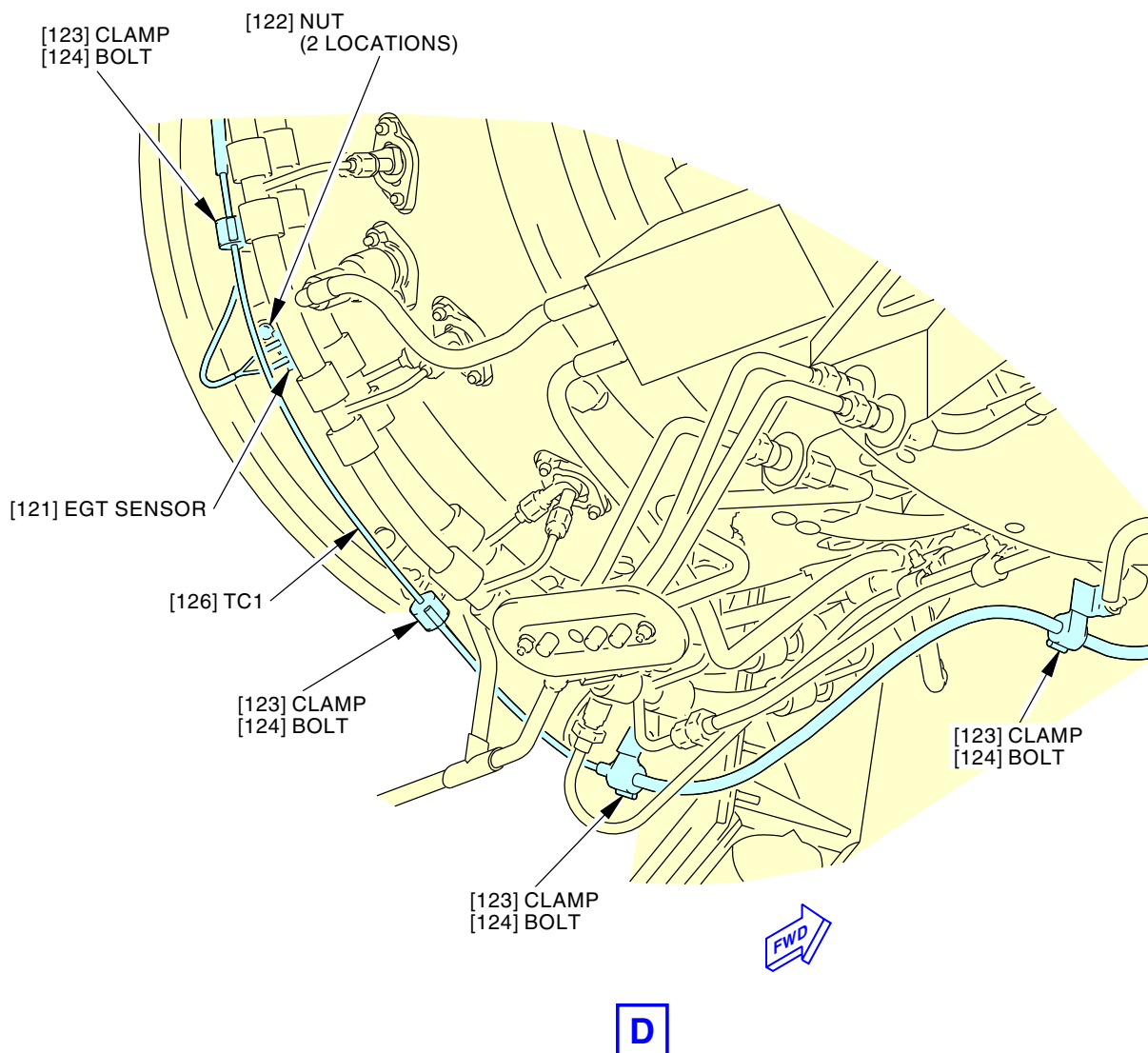
APU Wire Harness (EGT Sensor Connections)
Figure 404/49-14-00-990-804 (Sheet 3 of 5)

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C88302 S0006423762_V2

**APU Wire Harness (EGT Sensor Connections)
Figure 404/49-14-00-990-804 (Sheet 4 of 5)**

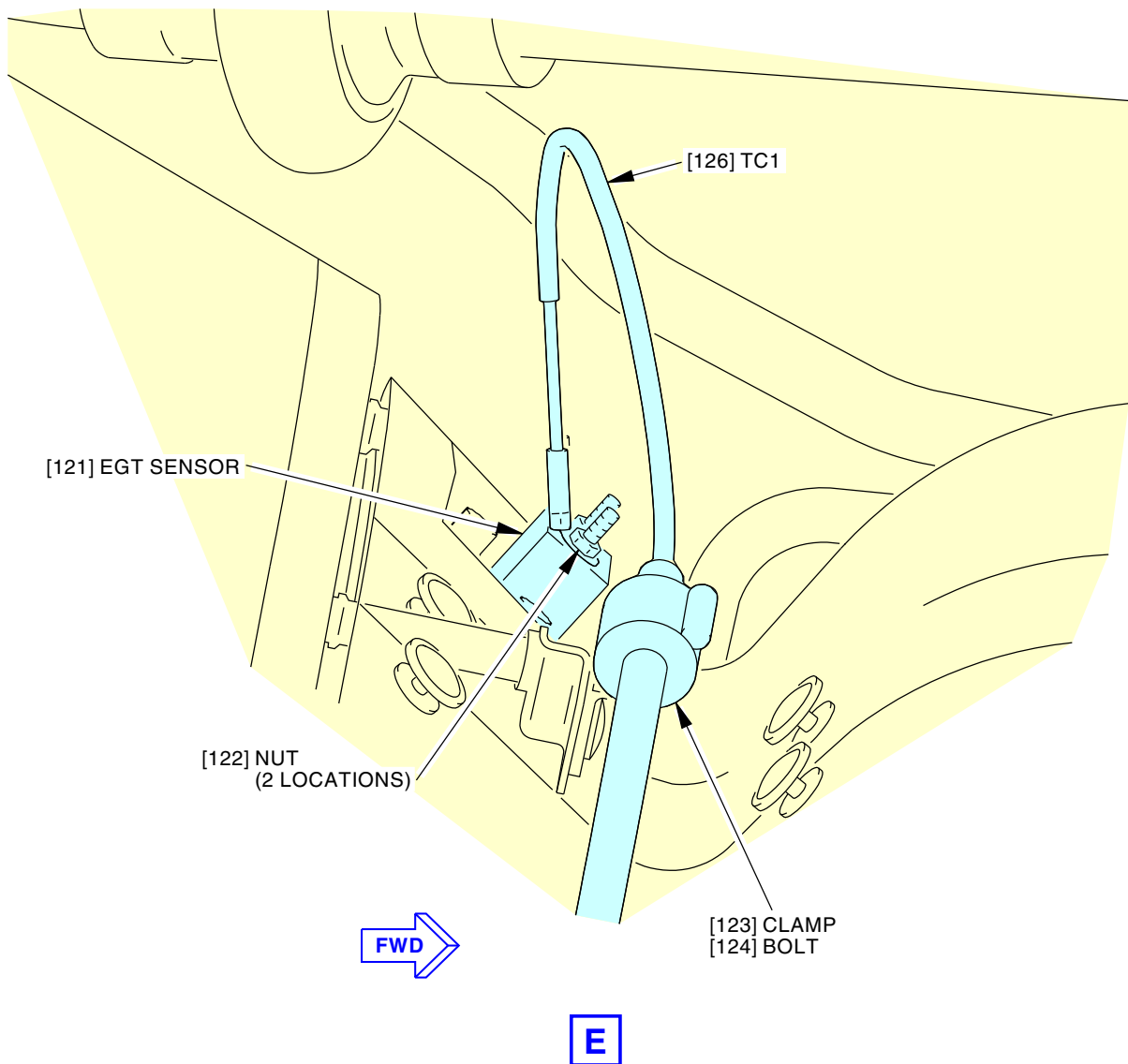
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C88553 S0006423763_V2

APU Wire Harness (EGT Sensor Connections)
Figure 404/49-14-00-990-804 (Sheet 5 of 5)

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TASK 49-14-00-400-801

3. APU Wire Harness Installation

A. References

Reference	Title
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Wire harness	49-14-01-01-005	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Harness Installation

SUBTASK 49-14-00-420-001

- (1) Do the steps that follow to attach the APU wire harness [1] to the APU:

NOTE: Table 401 shows the APU electrical connectors, their mating components and the approximate location of the component. Use this table as an aid for the installation of the electrical connectors.

Table 401/49-14-00-993-801

APU WIRE HARNESS CONNECTIONS		
ELECTRICAL CONNECTOR	MATING COMPONENT	APPROXIMATE LOCATION
D49001A	APU FIREWALL	RIGHT SIDE OF THE APU FIREWALL
D49001B	APU FIREWALL	RIGHT SIDE OF THE APU FIREWALL
D49001C	APU FIREWALL	RIGHT SIDE OF THE APU FIREWALL

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Table 401/49-14-00-993-801 (Continued)

APU WIRE HARNESS CONNECTIONS		
ELECTRICAL CONNECTOR	MATING COMPONENT	APPROXIMATE LOCATION
D49001D	APU FIREWALL	RIGHT SIDE OF THE APU FIREWALL
D49008P	IGNITION UNIT, M49001M200	ON THE INLET PLENUM AT THE 4:30 POSITION
D49009P	FUEL TEMPERATURE SENSOR, M49001M101	ON THE BOTTOM OF THE FUEL CLUSTER (GEARBOX)
D49010P	FUEL FILTER DELTA PRESSURE SWITCH, M49001S100	ON THE FRONT OF THE FUEL CLUSTER (GEARBOX)
D49011P	FUEL CLUSTER (FUEL METERING VALVE), M49001M102	FRONT OF THE GEARBOX
D49012P	DATA MEMORY MODULE, M49001M002	ON THE INLET PLENUM AT THE 9:30 POSITION
D49014P	OIL TEMPERATURE SENSOR, M49001M302	RIGHT SIDE OF THE LUBE CLUSTER (GEARBOX)
D49015P	LOW OIL PRESSURE SWITCH, M49001S302	ON THE BOTTOM OF THE LUBE CLUSTER (GEARBOX)
D49016P	OIL PRESSURE SENSOR, M49001M301	ON THE BOTTOM OF THE LUBE CLUSTER (GEARBOX)
D49017P	OIL FILTER BYPASS VALVE/SWITCH, M49001S300	ON THE BOTTOM OF THE LUBE CLUSTER (GEARBOX)
D49018P	GENERATOR FILTER BYPASS VALVE/SWITCH, M49001S301	ON THE BOTTOM OF THE LUBE CLUSTER (GEARBOX)
D49019P	AIR TURBINE STARTER CONTROL VALVE (ATSCV), M49001V001	ON THE TOP PART OF THE GEARBOX
D49021P	OIL QUANTITY/SUMP TEMPERATURE SENSOR, M49001M010	UNDER THE GEARBOX ON THE LEFT SIDE
D49022P	INLET GUIDE VANE ACTUATOR (IGVA) M49001M400	FORWARD OF THE INLET PLENUM AT 3:00 O'CLOCK.
D49023P	INLET PRESSURE SENSOR, M49001M004	ON THE APU BLEED DUCT (PNEUMATIC CLUSTER)
D49024P	TOTAL PRESSURE SENSOR, M49001M400	ON THE APU BLEED DUCT (PNEUMATIC CLUSTER)
D49025P	DIFFERENTIAL PRESSURE SENSOR, M49001M401	ON THE APU BLEED DUCT (PNEUMATIC CLUSTER)
D49026P	SURGE CONTROL VALVE, M49001V400	ON THE APU SURGE DUCT (PNEUMATIC CLUSTER)

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Table 401/49-14-00-993-801 (Continued)

APU WIRE HARNESS CONNECTIONS		
ELECTRICAL CONNECTOR	MATING COMPONENT	APPROXIMATE LOCATION
D49027P	SPEED SENSOR 1, M49001M008	ON THE INLET PLENUM AT THE 5:30 POSITION
D49028P	SPEED SENSOR 2, M49001M009	ON THE INLET PLENUM AT 9:00 O'CLOCK
D49029P	INLET TEMPERATURE SENSOR, M49001M007	ON THE INLET PLENUM AT 9:00 O'CLOCK
D49031P	D49031J (OIL HEATER ASSEMBLY)	ON THE FRONT OF THE GEARBOX

- (a) Lubricate the clamps with Mobil Jet Oil II, D00520.
- (b) Attach the APU wire harness [1] to the gearbox with the clamp [75] (Figure 403) View B.
 - 1) Tighten the bolt [74].
- (c) Attach the APU wire harness [1] to the strut [7] with the clamps [9].
- (d) Attach the APU wire harness [1] to the firewall [3] with the camps [8].
- (e) Do not connect the firewall connectors at this time.

NOTE: The firewall connectors are the last connectors you will connect.

SUBTASK 49-14-00-420-002

- (2) Do the steps that follow to connect the APU wire harness [1] to the right side of the APU (Figure 402):
 - (a) Connect the electrical connector, D49023P [43] to the inlet pressure sensor [34].
 - (b) Connect the electrical connector, D49024P [42] to the total pressure sensor [35].
 - (c) Connect the electrical connector, D49025P [41] to the differential pressure sensor [40].
 - (d) Connect the electrical connector, D49019P [37] to the air turbine starter control valve [36].
 - (e) Connect the electrical connector, D49026P [45] to the surge control valve [45].
 - (f) Put the APU wire harness [1] in the clamps [38].
 - (g) Close the clamps [38] and tighten the bolts [39].
 - (h) Connect the electrical connector, D49022P [24] to the inlet guide vane actuator [23].
 - (i) Connect the electrical connector, D49008P [22] to the ignition unit [21].
 - (j) Connect the electrical connector, D49027P [33] to the speed sensor 1 [32].
 - (k) Connect the electrical connector, D49021P [31] to the oil quantity/temperature sensor [30].
 - (l) Put the APU wire harness [1] in the clamps [28].
 - (m) Close the clamps [28] and tighten the bolts [29].
 - (n) Remove the nut [26] from the gearbox.
 - (o) Install the ground strap [25].
 - (p) Install the nut [26].
 - 1) Tighten the nut [26].

SUBTASK 49-14-00-420-003

- (3) Do the steps that follow to connect the APU wire harness [1] to the gearbox (Figure 403)

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- (a) Remove the nut [64] from the gearbox.
- (b) Install the ground strap [65] and the nut [64].
 - 1) Tighten the nut [64].
- (c) Connect the electrical connector, D49031P [63] to the bracket [62].
- (d) Connect the electrical connector, D49007P [72] to the bracket [62].
- (e) Connect the electrical connector, D49014P [66] to the oil temperature sensor [67].
- (f) Connect the electrical connector, D49017P [69] to the oil filter bypass valve/switch [68].
- (g) Connect the electrical connector, D49016P [71] to the oil pressure sensor [70].
- (h) Connect the electrical connector, D49018P [83] to the generator filter bypass valve/switch [82].
- (i) Connect the electrical connector, D49015P [87] to the low oil pressure switch [84].
- (j) Connect the electrical connector, D49010P [76] to the fuel filter differential pressure switch [77].
- (k) Connect the electrical connector, D49009P [81] to the fuel temperature sensor [80].
- (l) Connect the electrical connector, D49011P [88] to the fuel cluster.
- (m) Connect the electrical connector, D49032P [78] to the electric starter motor [79].
- (n) Put the APU wire harness [1] in the clamps [86].
- (o) Close the clamps [85] and tighten the bolts [86].

SUBTASK 49-14-00-420-004

- (4) Do the steps that follow to connect the APU wire harness [1] to the left side of the APU (Figure 403) View E:
 - (a) Connect the electrical connector, D49029P [89] to the inlet temperature sensor [90].
 - (b) Connect the electrical connector, D49012P [91] to the data memory module [92].
 - (c) Connect the electrical connector, D49028P [94] to the speed sensor 2 [93].
 - (d) Do the steps that follow to install the APU wire harness [1] in the clamps [96]:
 - 1) Pull the wire harness [1] through the tubes (Figure 403) View E.
 - 2) Remove the bolts [98] and the washers [97] from the clamps [96].
 - 3) Remove the clamps [96] and the pipe clamp inserts [95].
 - 4) Install the APU wire harness [1] in the pipe clamp inserts [95].
 - 5) Install the pipe clamp inserts [95] on the APU.
 - 6) Install the clamps [96].
 - 7) Install the bolts [98] and the washers [97].
 - a) Tighten the bolts [98].
 - (e) Put the APU wire harness [1] in the clamps [99].
 - (f) Close the clamps [99] and tighten the bolts [100].

SUBTASK 49-14-00-420-005

- (5) Do the steps that follow to install the APU wire harness on the aft end of the APU (Figure 404):
 - (a) Remove the locknuts [122] from the EGT sensors [121].
 - (b) Connect the APU wire harness [1] to the EGT sensors [121].
 - (c) Install the locknuts [122] on the EGT sensors [121].

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- 1) Tighten the locknuts [122].
- (d) Put the APU wire harness [1] in the clamps [123].
- (e) Close the clamps [123] and tighten the bolts [124].

G. APU Harness Installation Test

SUBTASK 49-14-00-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-14-00-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-14-00-740-001

- (3) Do the steps that follow to do the installation test for the APU wire harness:
 - (a) Make sure the APU BLEED switch is in the AUTO position.
 - (b) Supply pneumatic power with an external source. To supply power, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802
NOTE: You must supply pneumatic power for the APU to do an air turbine start attempt.
 - (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
NOTE: The APU will do an air turbine start.
 - 1) Use the APU air to operate the left and right air conditioning packs. To operate the packs, do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
 - 2) Power the left and the right buss with the APU generator. To supply power, do this task: Supply Electrical Power, TASK 24-22-00-860-805
 - 3) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
 - (e) Push the APU BLEED switch to the OFF position.
 - (f) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
NOTE: The APU will do an electric start attempt.
 - (g) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (h) If maintenance messages show, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (i) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-14-00-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-14-00-860-005

- (2) Remove the pneumatic power if it is not necessary. To remove it, do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801

———— **END OF TASK** ————

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APU WIRE HARNESS - REPAIRS

1. General

A. This procedure has three tasks for temporary repair of the APU wire harness. These tasks are shown below in the sequence that they occur in this procedure:

- (1) Wire harness terminal replacement
- (2) Connector contact replacement
- (3) Connector replacement

TASK 49-14-00-960-801

2. APU Wire Harness Repair

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

C. Procedure

SUBTASK 49-14-00-010-002

- (1) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-14-00-960-001

- (2) If the APU wire harness has a damaged terminal, then, do this task: Wire Harness Terminal Replacement, TASK 49-14-00-960-802.

SUBTASK 49-14-00-960-002

- (3) If a connector on the APU wire harness has a bent or pushed pin, then, do this task: Connector Contact Replacement, TASK 49-14-00-960-803.

SUBTASK 49-14-00-960-003

- (4) If a connector on the APU wire harness has damage and needs to be replaced, then, do this task: Connector Replacement, TASK 49-14-00-960-804.

———— **END OF TASK** ————

TASK 49-14-00-960-802

3. Wire Harness Terminal Replacement

(Figure 801)

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

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B. Tools/Equipment

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

Reference	Description
COM-1594	Kit - Crimp Tool, Electrical/Electronic Part #: DMC977 Supplier: 11851 Part #: G01N3 Supplier: 54443
STD-2489	Cutter - Diagonal, Side-Cushioned

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Procedure

SUBTASK 49-14-00-020-007

- (1) Do the steps that follow to remove the damaged terminal from the wire:
 - (a) Disconnect the damaged terminal from the component or the APU.
 - (b) Cut the wire near the damaged terminal with the side-cushioned diagonal cutter, STD-2489.

SUBTASK 49-14-00-420-006

- (2) Do the steps that follow to install the new terminal on the wire:
 - (a) Remove 0.2 to 0.3 inch of insulation from the wire.
 - (b) Put the bare wire in the center of the new terminal.
 - (c) Crimp the new terminal closed with the electrical/electronic crimp tool kit, COM-1594.
 - (d) Pull on the wire to make sure the terminal is attached correctly.

SUBTASK 49-14-00-410-002

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

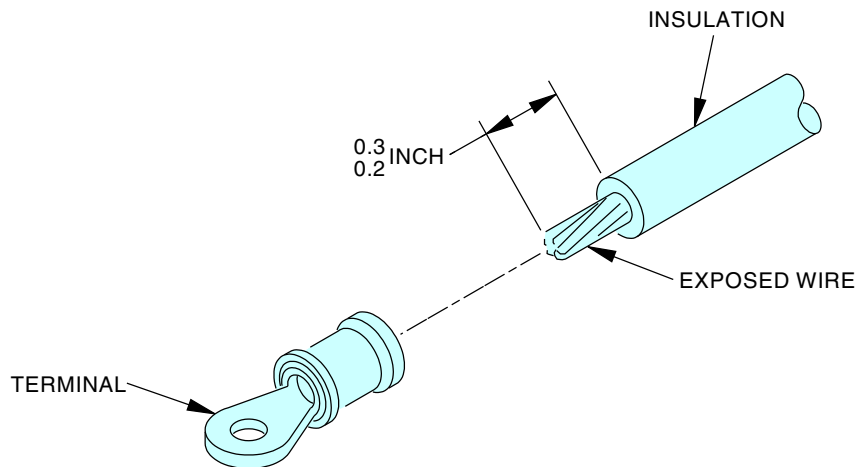
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WIRE/TERMINAL CONNECTION

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APU Wire Harness Repair (Terminals)
Figure 801/49-14-00-990-805

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TASK 49-14-00-960-803

4. Connector Contact Replacement

(Figure 802)

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

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

Reference	Description
COM-1594	Kit - Crimp Tool, Electrical/Electronic Part #: DMC977 Supplier: 11851 Part #: G01N3 Supplier: 54443

C. Consumable Materials

Reference	Description	Specification
G00150	Tape - Nitto P-421 NAT (Formerly Permacel) PTFE Film Tape	
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-14-00-020-008

- (1) Do the steps that follow to remove damaged connector contacts.
 - (a) Disconnect the connector from the component.
 - (b) Cut the lockwire from the backshell.
 - (c) Loosen the saddle clamps on the connector backshell.
 - (d) Move the backshell away from the connector.
 - (e) Remove the teflon tape from the wires.
 - (f) Remove the damaged contact from the connector with the contact removal/installation tool.
 - (g) Cut the wires as close as possible to the damaged contact.

SUBTASK 49-14-00-420-007

- (2) Do the steps that follow to install a new connector contact:
 - (a) Remove 0.125 inch of insulation from the end of the wire.
 - (b) Put the bare wire into the new contact until the bare wire touches the bottom of the barrel of the contact.
 - (c) Crimp the new contact closed with the electrical/electronic crimp tool kit, COM-1594.
 - (d) Put the new contact into the connector with the contact insertion/removal tool.

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- 1) Pull on the wire to make sure the contact is correctly installed.
- (e) Move the backshell until it touches the connector.
- (f) Tighten the backshell coupling collar finger tight.
- (g) Wind the Nitto P-421 tape, G00150 around the wires that are in the saddle clamp area.
- (h) Tighten the saddle clamps on the backshell.
- (i) Install the MS20995NC20 lockwire, G02166 on the backshell.
- (j) Connect the connector to the APU.

SUBTASK 49-14-00-410-003

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

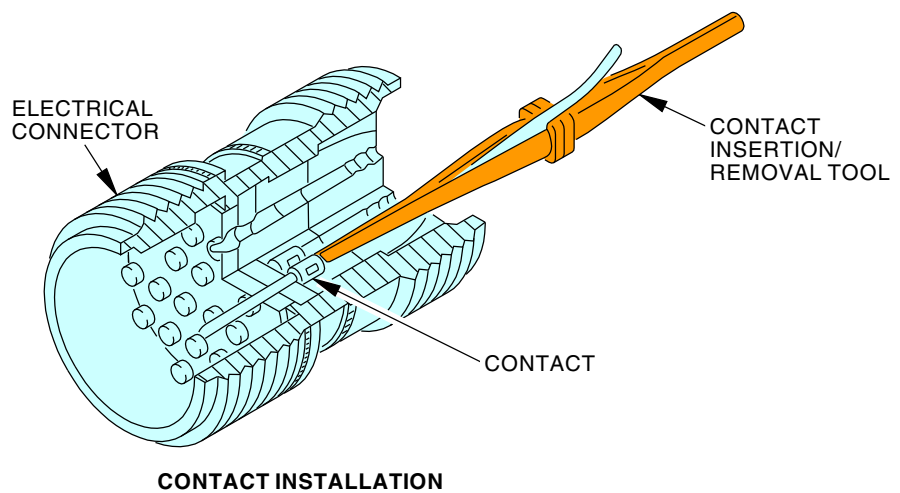
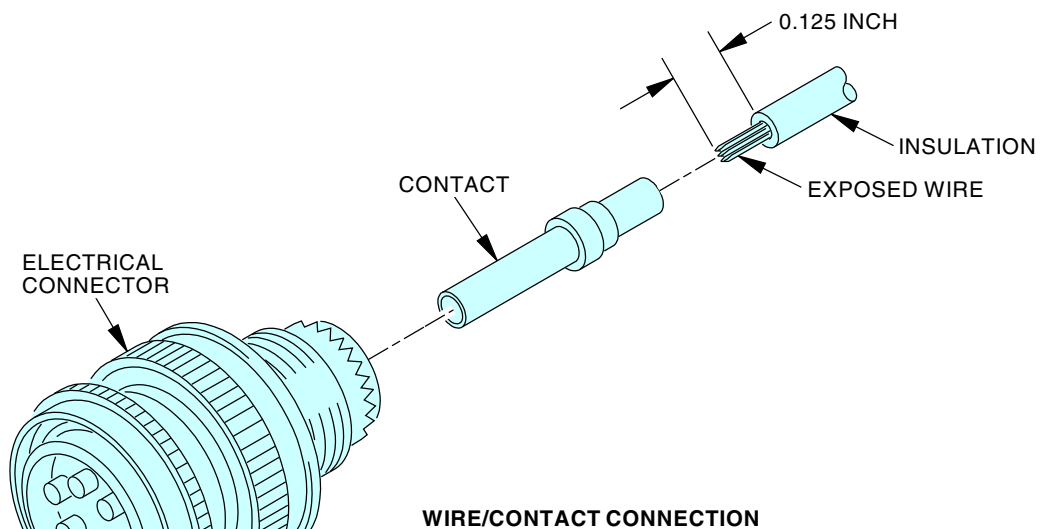
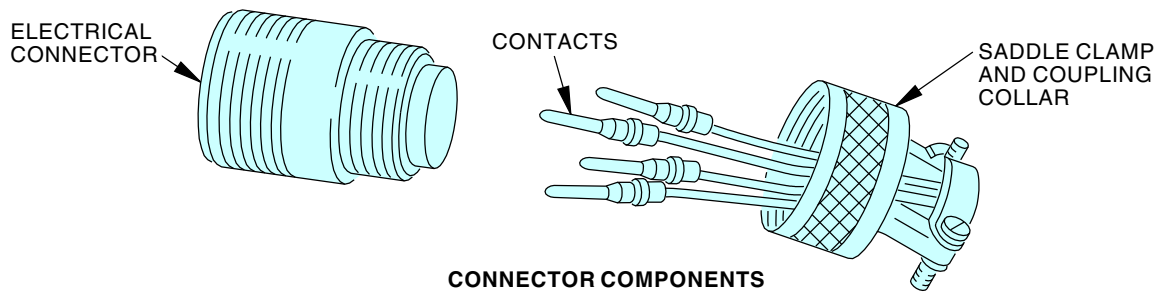
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APU Wire Harness Repair (Connectors)
Figure 802/49-14-00-990-806

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TASK 49-14-00-960-804

5. Connector Replacement

(Figure 802)

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Procedure

SUBTASK 49-14-00-900-001

- (1) Do the steps that follow to replace the damaged connector.
 - (a) Disconnect the damaged connector from the component.
 - (b) Cut the lockwire from the backshell.
 - (c) Remove the saddle clamps from the backshell.
 - (d) Remove the backshell coupling collar.
 - (e) Move the backshell away from the connector.
 - (f) Remove the teflon tape from the wires.
 - (g) Remove one contact from the connector with the contact removal/installation tool.
 - (h) Install the contact in the new connector at the correct pin number location.
 - 1) Pull on the wire to make sure the contact is correctly installed.
 - (i) Continue to remove and install one contact until all the contacts are in the new connector.
 - (j) Move the backshell until it touches the connector.
 - (k) Tighten the backshell coupling collar finger tight.
 - (l) Wind the teflon tape around the wires that are in the saddle clamp area.
 - (m) Tighten the saddle clamps on the backshell.
 - (n) Install the MS20995NC20 lockwire, G02166 on the backshell.
 - (o) Connect the connector to the APU.

SUBTASK 49-14-00-410-004

- (2) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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INLET DOOR POSITION SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the inlet door position switch
 - (2) An installation of the inlet door position switch.
- B. The inlet door position switch is referred to as the position switch.

TASK 49-15-02-000-801

2. Inlet Door Position Switch Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-15-02-860-001

- (1) Do the steps that follow to open the APU inlet door:
- (a) Move the APU selector to the ON position.
 - (b) Wait 45 seconds.
NOTE: The APU inlet door will open in about 45 seconds.
 - (c) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

- (d) Move the APU selector on the P5 overhead panel to OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-02-010-001

- (2) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Inlet Door Position Switch Removal

SUBTASK 49-15-02-020-001

- (1) Do the steps that follow to remove the position switch:
 - (a) Cut the wires [2] for the position switch [1] at the splice.
 - (b) Remove the lockwire.
 - (c) Loosen the nut [3].
 - (d) Remove the position switch [1] from the boss [4].

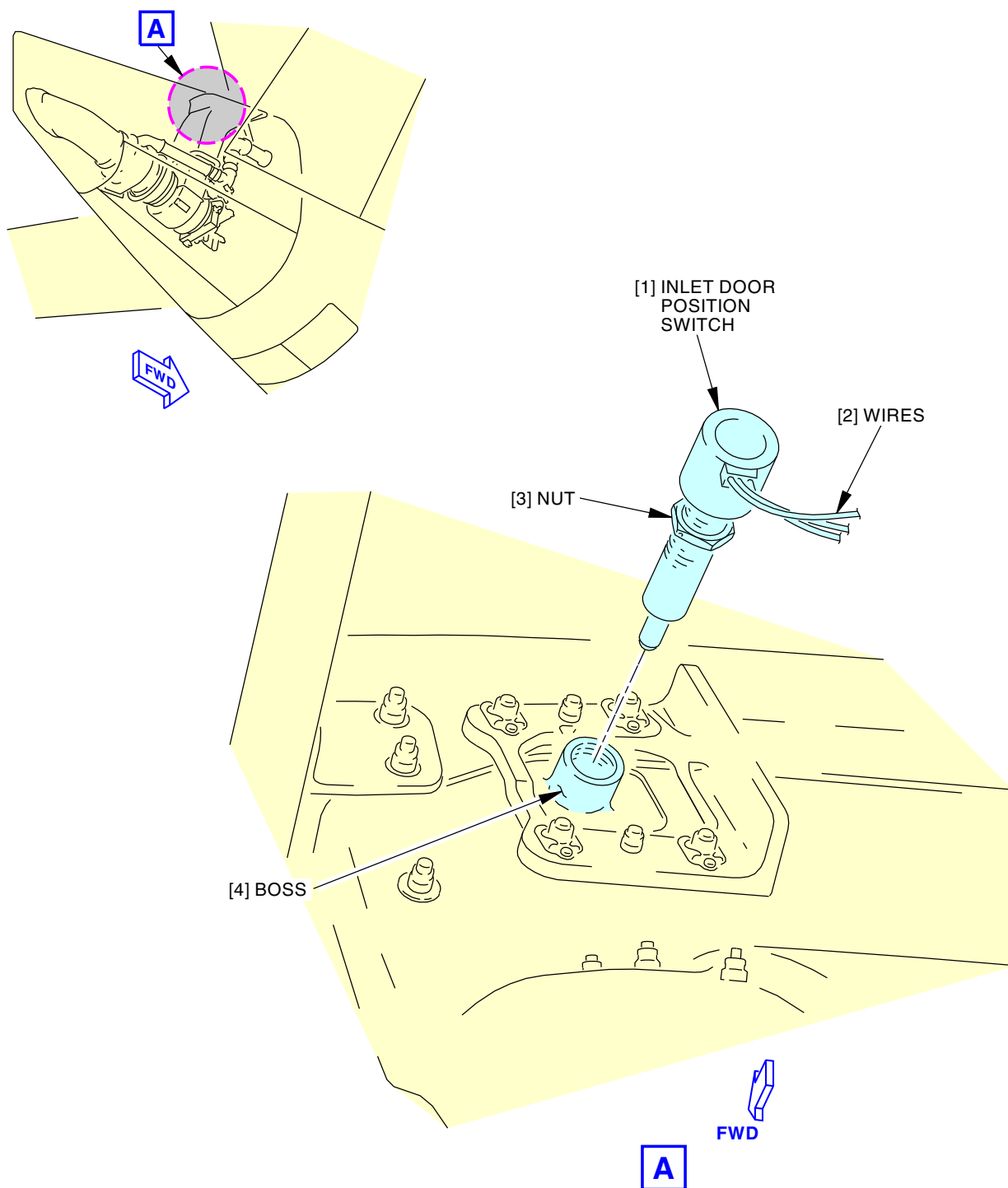
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**APU Air Inlet Door Position Switch Installation
Figure 401/49-15-02-990-801**

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TASK 49-15-02-400-801

3. Inlet Door Position Switch Installation

(Figure 401)

A. General

- (1) After the position switch is installed, you must adjust it.
- (2) The inlet door actuator must be adjusted before you adjust the position switch.

B. References

Reference	Title
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-15-06-820-801	Inlet Door Actuator Adjustment (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Position switch	49-15-02-01-010	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Air Inlet Door Position Switch Installation

SUBTASK 49-15-02-420-001

- (1) Install the position switch [1] into the boss [4].

SUBTASK 49-15-02-820-001

- (2) Make sure the actuator for the air inlet door is adjusted correctly. To adjust it, (TASK 49-15-06-820-801).

SUBTASK 49-15-02-820-002

- (3) Do the steps that follow to adjust the position switch for the air inlet door:
 - (a) Do a continuity check between wires 1 and 3.



CAUTION

THERE MUST BE NO CONTINUITY BETWEEN THE WIRES BEFORE YOU ADJUST THE POSITION SWITCH. IF THE SWITCH IS NOT ADJUSTED CORRECTLY, IT CAN BE DAMAGED THE NEXT TIME THE INLET DOOR IS OPENED.

- (b) If there is continuity; turn the position switch counterclockwise until there is no continuity between the wires.
- (c) Turn the position switch clockwise until there is continuity between wires 1 and 3.
- (d) Turn the position switch clockwise 2.5 turns.
- (e) Tighten the nut [3] to 50 - 70 pound inches (5.7 - 7.9 newton-meters).
- (f) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

NOTE: The APU inlet door will close.

- (h) Make sure there is no continuity between wires 1 and 3.
(i) Install the lockwire on the nut [3].

SUBTASK 49-15-02-420-002

- (4) Do the steps that follow to connect the wires [2] for the position switch [1]:
- Connect the wire No. 1 from the position switch to the wire 2101R-20 from connector D7958P with a splice.
 - Make sure the wire No. 2 is capped and stowed.
 - Connect the wire No. 3 from the position switch to the wire 2101B-20 from connector D7958P with a splice.

G. APU Air inlet Door Position Switch Installation Test

SUBTASK 49-15-02-710-001

- (1) Do the steps that follow to do the installation test for the position switch.
- Move the APU selector to the ON position.
NOTE: The inlet door will open.
 - Look at the APU maintenance page. To show the maintenance page, (TASK 31-61-00-800-804).
 - Make sure the INLET DOOR CMD display shows OPEN.
 - Make sure the INLET DOOR POS display shows OPEN.
 - Move the APU selector to the OFF position.
NOTE: The inlet door will close.
 - Look at the APU maintenance page.
 - Make sure the INLET DOOR CMD display shows CLOSED.
 - Make sure the INLET DOOR POS display shows CLOSED.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-02-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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————— END OF TASK —————

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APU AIR INLET PLENUM FLANGE SEAL - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU air inlet plenum flange seal
- (2) An installation of the APU air inlet plenum flange seal

B. For this procedure, the APU air inlet plenum flange seal is referred to as the inlet seal.

TASK 49-15-04-000-801

2. APU Air Inlet Plenum Flange Seal Removal

(Figure 401)

A. **References**

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-15-04-410-001

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

D. **APU Air Inlet Plenum Flange Seal Removal**

SUBTASK 49-15-04-020-001

- (1) Do the steps that follow to remove the inlet seal [4]:
 - (a) Remove the bolts [2] and the washers [3] that attach the inlet seal [4] to the APU inlet duct [1].
 - (b) Remove the inlet seal [4].
 - (c) If necessary, remove any remaining sealant from the inlet duct.

————— **END OF TASK** —————

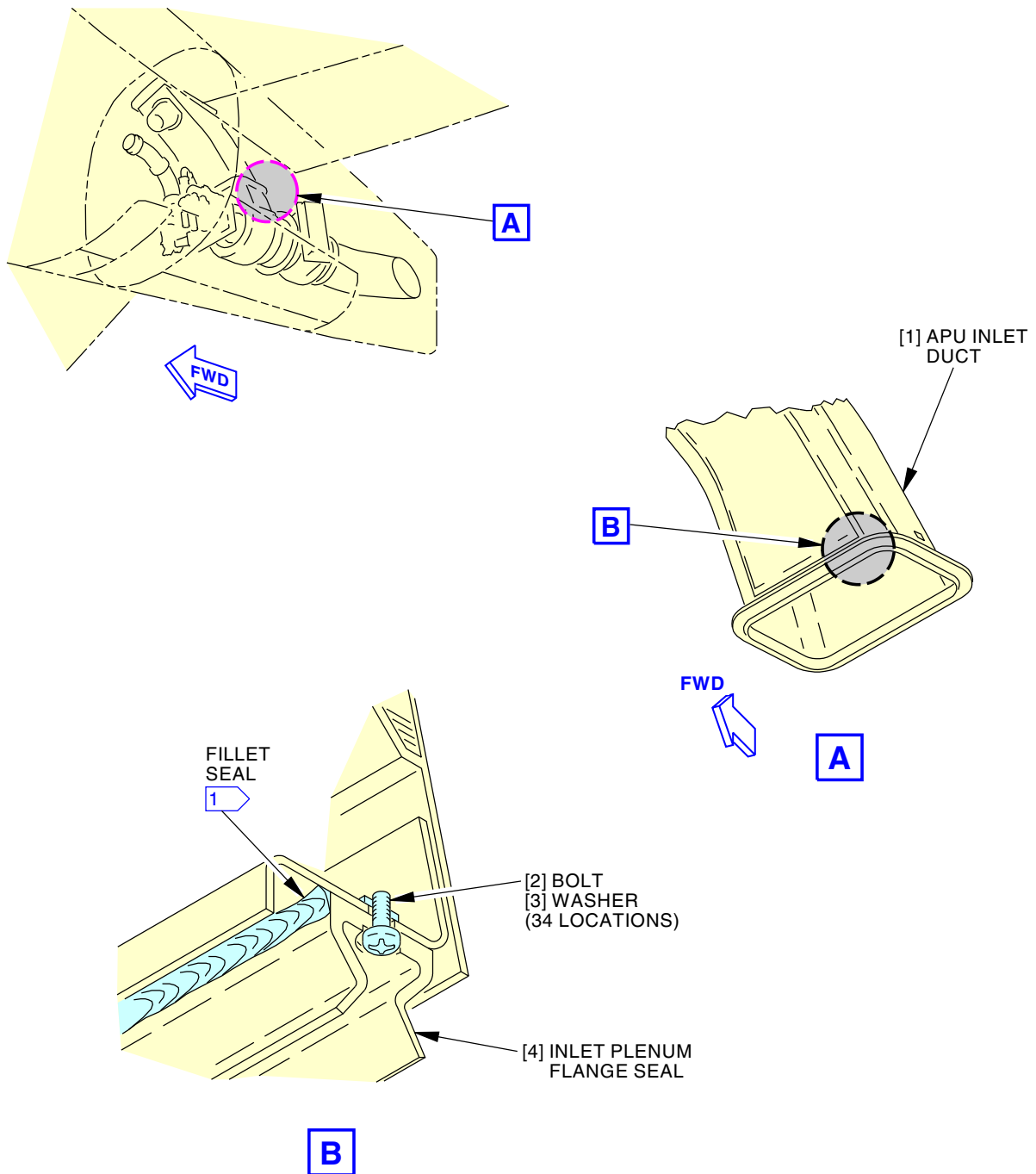
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1 IF INSTALLED

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APU Air Inlet Duct Seal Installation
Figure 401/49-15-04-990-801

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TASK 49-15-04-400-801

3. APU Air Inlet Plenum Flange Seal Installation

(Figure 401)

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Inlet seal	49-15-04-01-005	ARO 001-004
		49-15-04-01A-010	ARO 005-999

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. APU Air Inlet Plenum Flange Seal Installation

SUBTASK 49-15-04-400-001

- (1) Do the steps that follow to install the inlet seal [4]:
- (a) Hold the inlet seal [4] to the APU inlet duct [1] while you install the washers [3] and bolts [2].

E. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-04-410-002

- (1) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

————— **END OF TASK** —————

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APU AIR INLET DOOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU air inlet door
 - (2) An installation of the APU air inlet door.
- B. For this procedure the APU air inlet door is referred to as the inlet door.

TASK 49-15-05-000-801

2. APU Air Inlet Door Removal

(Figure 401)

A. **References**

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-15-05-860-001

- (1) Remove the hydraulic power from the left system, the right system, and the center system. To remove it, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 49-15-05-860-002

- (2) Set these switches on the FLT control HYD power panel, P61, to the SHUTOFF position:
- (a) L TAIL
 - (b) R TAIL
 - (c) C TAIL

SUBTASK 49-15-05-860-003

- (3) Set the STAB C and the STAB R switches on the control stand to the CUTOUT position.

SUBTASK 49-15-05-860-007

- (4) Move the APU selector on the P5 overhead panel to the ON position.

NOTE: If the inlet door actuator does not have a problem, the inlet door will open.

SUBTASK 49-15-05-860-008

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-15-05-860-009

- (6) Move the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-05-010-001

- (7) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Air Inlet Door Removal

ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3

SUBTASK 49-15-05-860-010

- (1) If the inlet door is not open, do the steps that follow to open the inlet door:

- (a) Remove access cover from the actuator assembly.

NOTE: Access cover is held in place with retaining spring and remains attached to canister with lanyard.



CAUTION

DO NOT APPLY MORE THAN 10 POUND-INCHES (1.1 NEWTON-METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (b) Turn the transfer cover socket on the inlet door actuator counterclockwise.

NOTE: The transfer cover will move and the manual drive socket will show. The actuator will be in the manual mode.

- (c) Make sure the transfer cover is fully in the manual position "MAN".



CAUTION

DO NOT APPLY MORE THAN 65 POUND-INCHES (7.3 NEWTON-METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- (d) Turn the manual drive socket counterclockwise until the torque value suddenly increases.

NOTE: The inlet door is open.

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ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3 (Continued)



CAUTION

DO NOT APPLY MORE THAN 10 POUND-INCHES (1.1 NEWTON-METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (e) Turn the transfer cover socket clockwise until ELEC shows in the forward window of the transfer cover.

NOTE: The actuator will be in the electrical mode.

- (f) Make sure the transfer cover is fully in the electric position.

NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.

ARO ALL; AIRPLANES WITH ACTUATOR P/N 734-07390-01

SUBTASK 49-15-05-860-012

- (2) If the inlet door is not open, do the steps that follow to open the inlet door:

- (a) Remove access cover from the actuator assembly.

NOTE: Access cover is held in place with retaining spring and remains attached to canister with lanyard.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (b) Turn the transfer cover socket on the inlet door actuator counterclockwise.

NOTE: The transfer cover will move and the manual drive socket will show. The actuator will be in the manual mode.

- (c) Make sure the transfer cover is fully in the manual position "M".



CAUTION

DO NOT APPLY MORE THAN 100 POUND INCHES (11.3 NEWTON METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- (d) Turn the manual drive socket counterclockwise until the torque value suddenly increases.

NOTE: The inlet door is open.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (e) Turn the transfer cover socket clockwise until transfer cover position mark aligns with the electric position "E".

NOTE: The actuator will be in the electrical mode (E).

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ARO ALL; AIRPLANES WITH ACTUATOR P/N 734-07390-01 (Continued)

- (f) Make sure the transfer cover is fully in the electric position.

NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.

ARO ALL; AIRPLANES WITH COMPOSITE DOOR

SUBTASK 49-15-05-020-001

- (3) Do the steps that follow to remove the inlet door [2] (Figure 401):
 - (a) Remove the bolt [18], washer [21], and bushing [19] that attach the rod for the inlet door actuator [20] to the inlet door [2].
 - (b) Remove the 10 bolts [3] that attach the access panel [1] to the airplane.
 - 1) Remove the access panel [1].
 - (c) Remove the screw [9], the washer [8], and the nut [7] that attach the ground jumper [15] to the inlet duct assembly.
 - (d) Remove the bolt [17], the washer [4], the bushing [5], the washer [6] and the nut [16] that attach the inlet door [2] to the left hinge.
 - (e) Remove the cotter pin [14], the bolt [10], the washer [11], the washer [12], and the nut [13] that attach the inlet door [2] to the right hinge.
 - (f) Remove the inlet door [2].

ARO ALL; AIRPLANES WITH ALUMINUM AND FIBERGLASS COMPOSITE DOOR

SUBTASK 49-15-05-020-002

- (4) Do the steps that follow to remove the inlet door [22] (Figure 402):
 - (a) Remove the bolt [18], washer [21], and bushing [19] that attach the rod for the inlet door actuator [20] to the inlet door [22].
 - (b) Remove the 10 bolts [3] that attach the access panel [1] to the airplane.
 - 1) Remove the access panel [1].
 - (c) Remove the screw [9], the washers [8], and the nut [7] that attach the ground jumper [15] to the inlet duct assembly per SWPM 20-20-10 Category 2 Fay Sealed Direct Ground Stud.
 - (d) Remove the bolt [17], the washer [4], the bushing [5], the washer [6] and the nut [16] that attach the inlet door [22] to the left hinge.
 - (e) Remove the cotter pin [14], the bolt [10], the washer [11], the washer [12], and the nut [13] that attach the inlet door [22] to the right hinge.
 - (f) Remove the inlet door [22].

————— END OF TASK —————

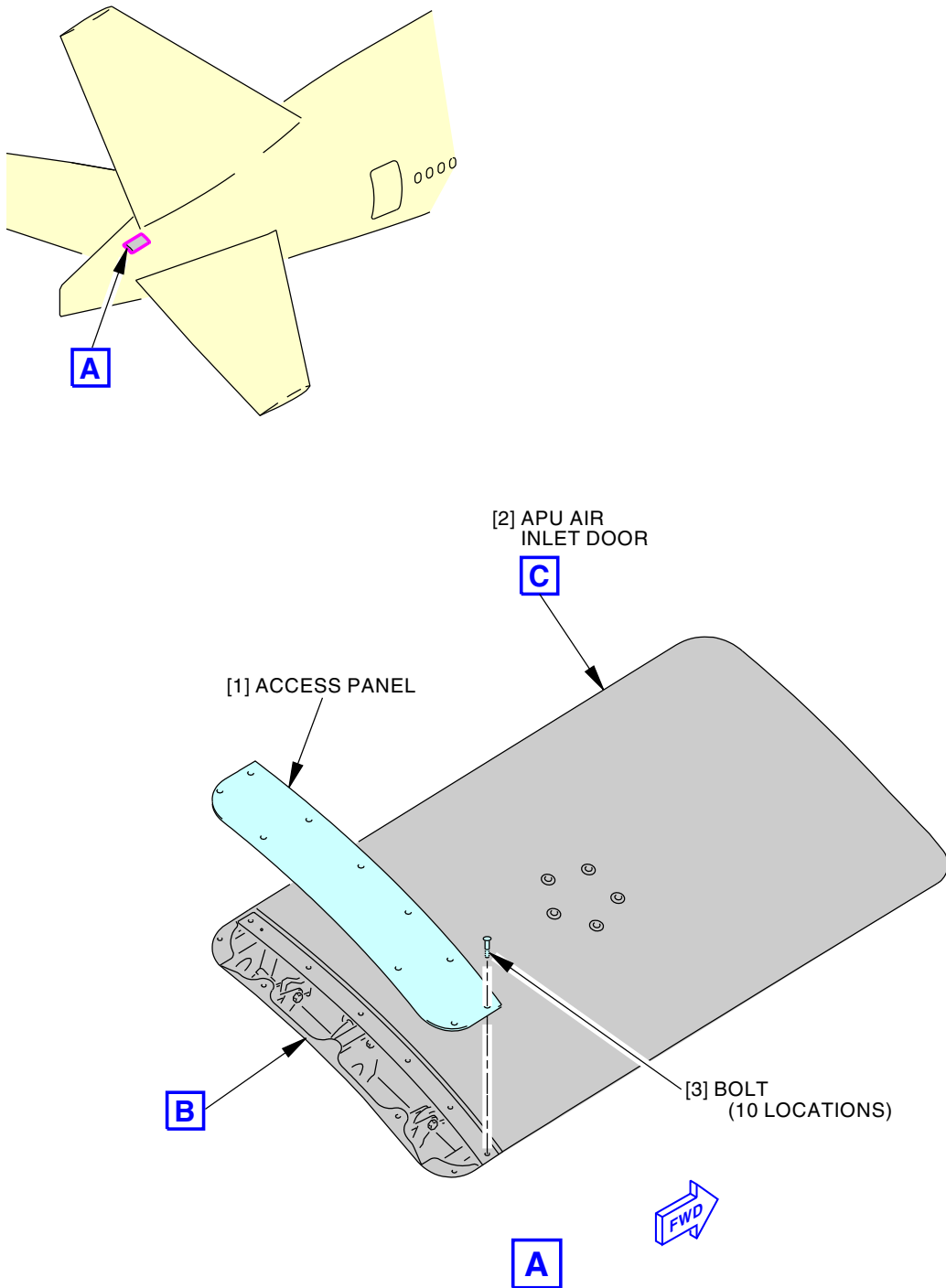
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C45583 S0006423787_V2

APU Air Inlet Door Installation
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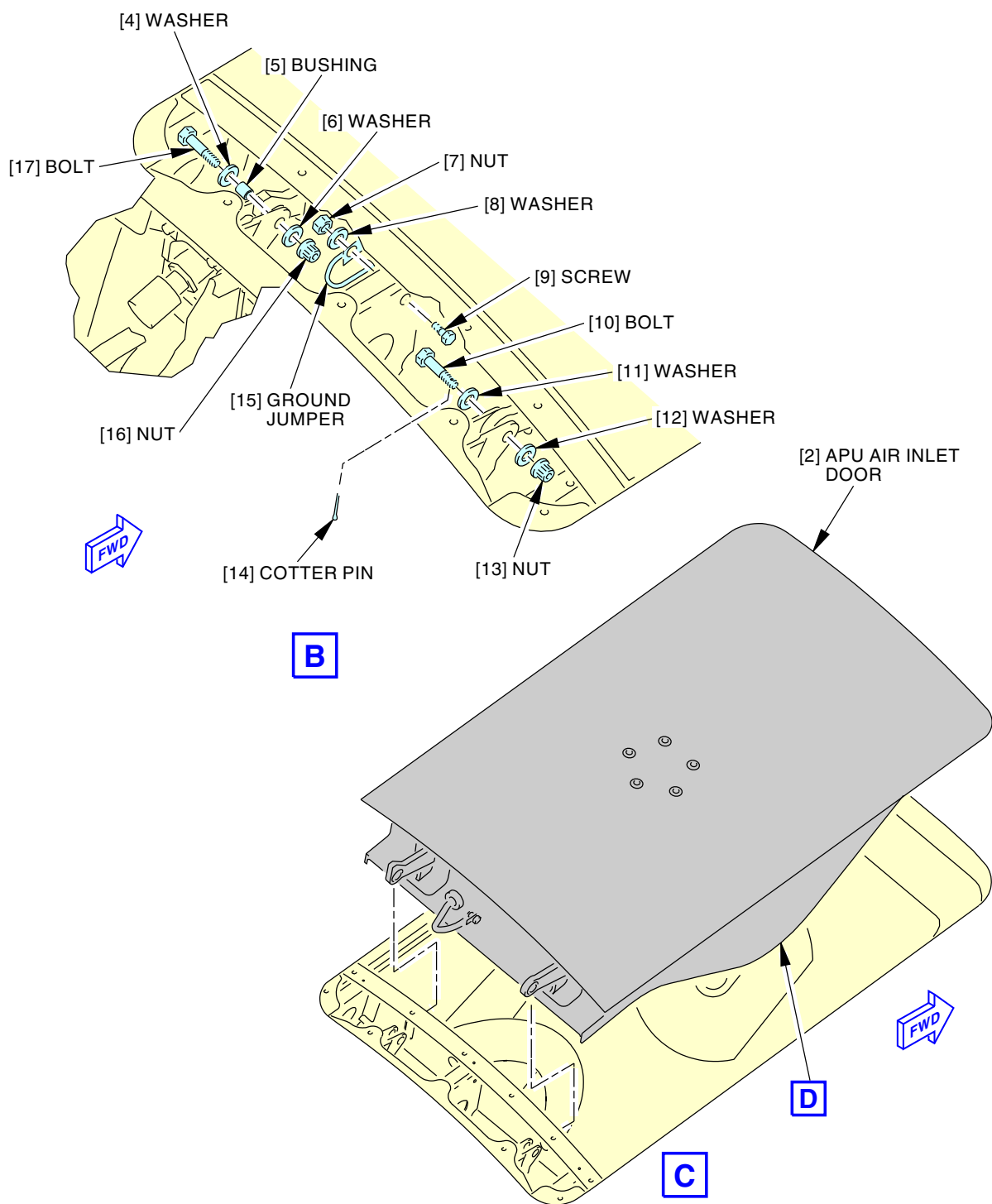
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C45648 S0006423788_V3

**APU Air Inlet Door Installation
Figure 401/49-15-05-990-801 (Sheet 2 of 3)**

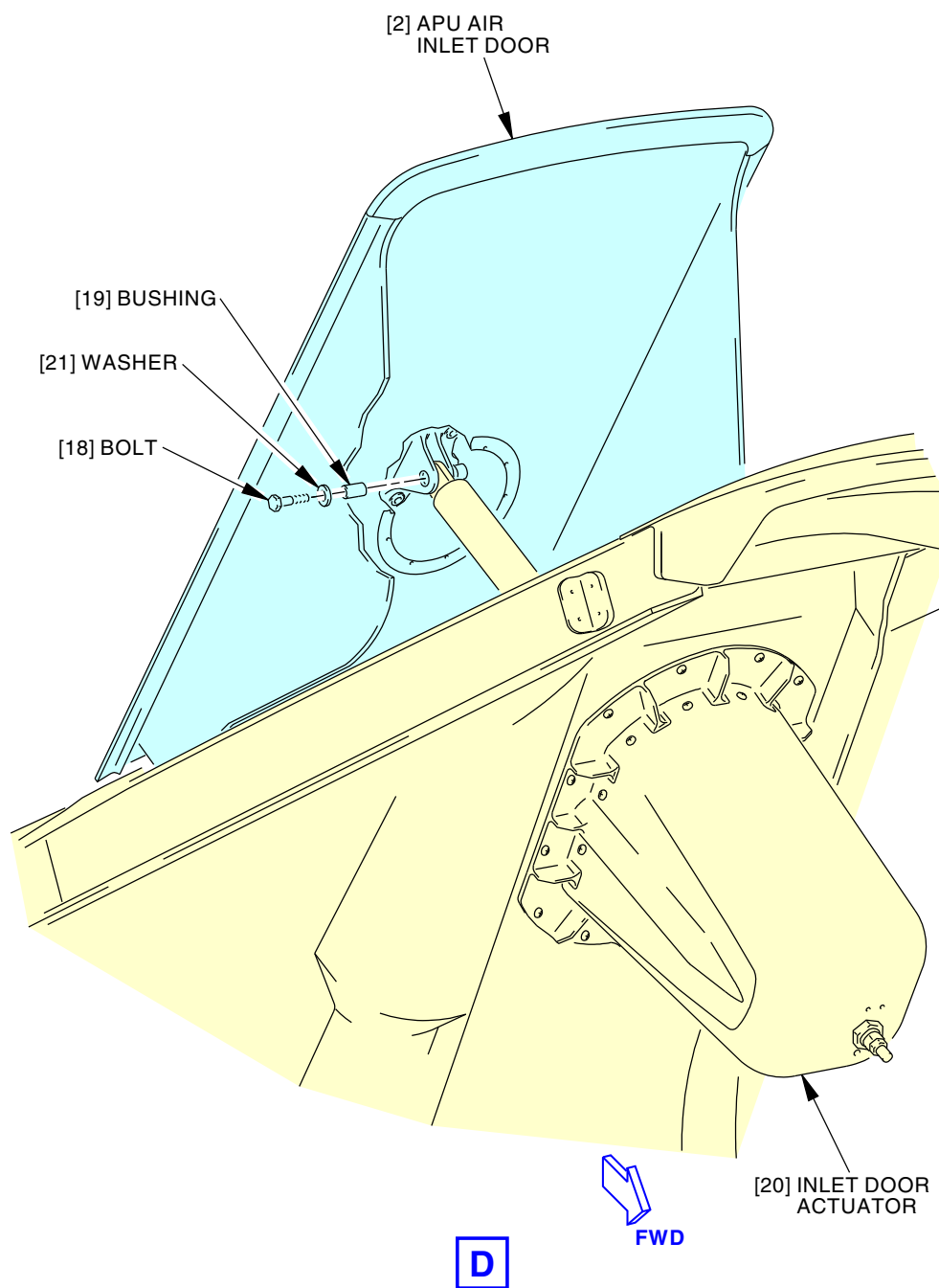
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E34087 S0006423789_V2

APU Air Inlet Door Installation
Figure 401/49-15-05-990-801 (Sheet 3 of 3)

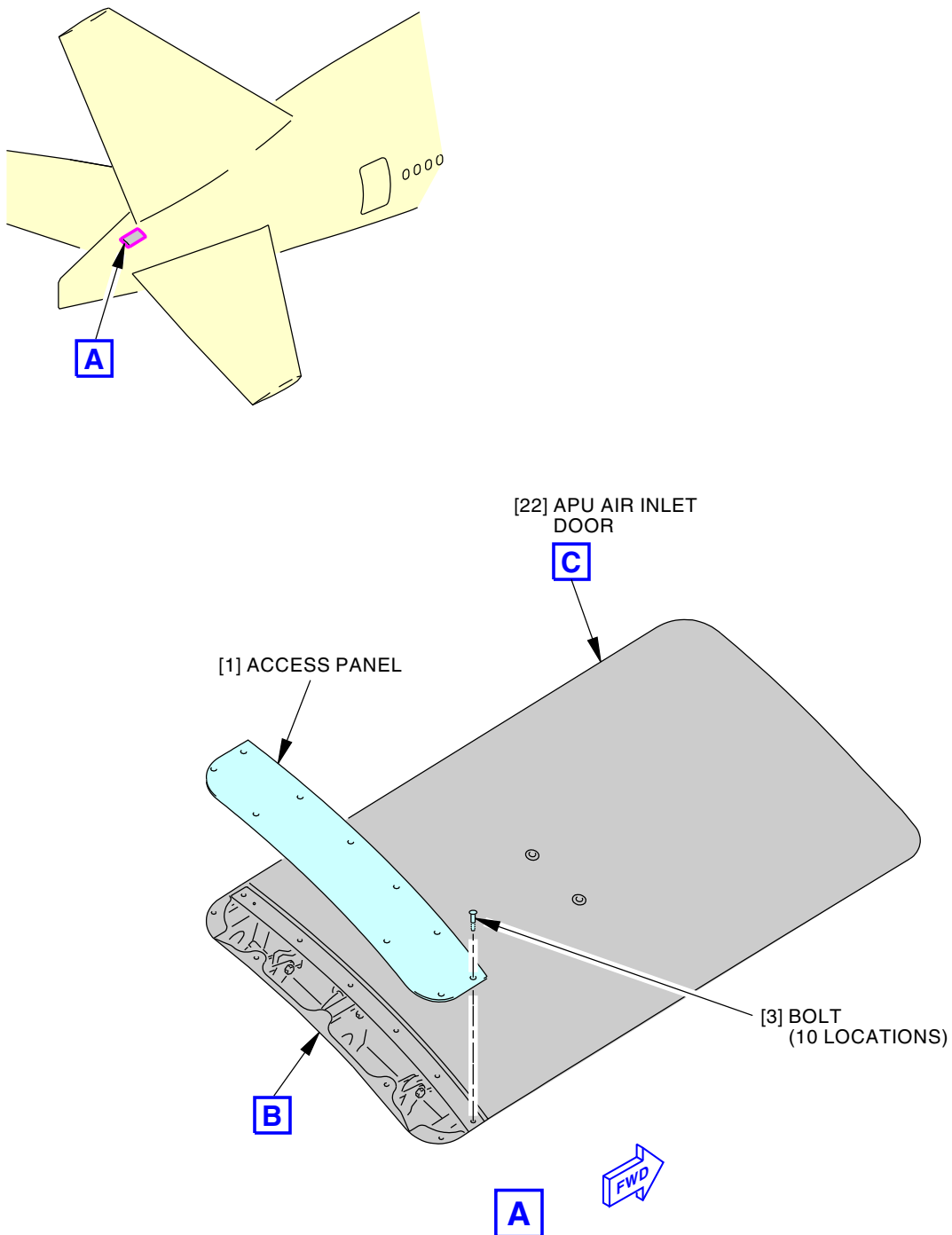
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2440995 S0000566977_V2

APU Air Inlet Door Installation
Figure 402/49-15-05-990-804 (Sheet 1 of 3)

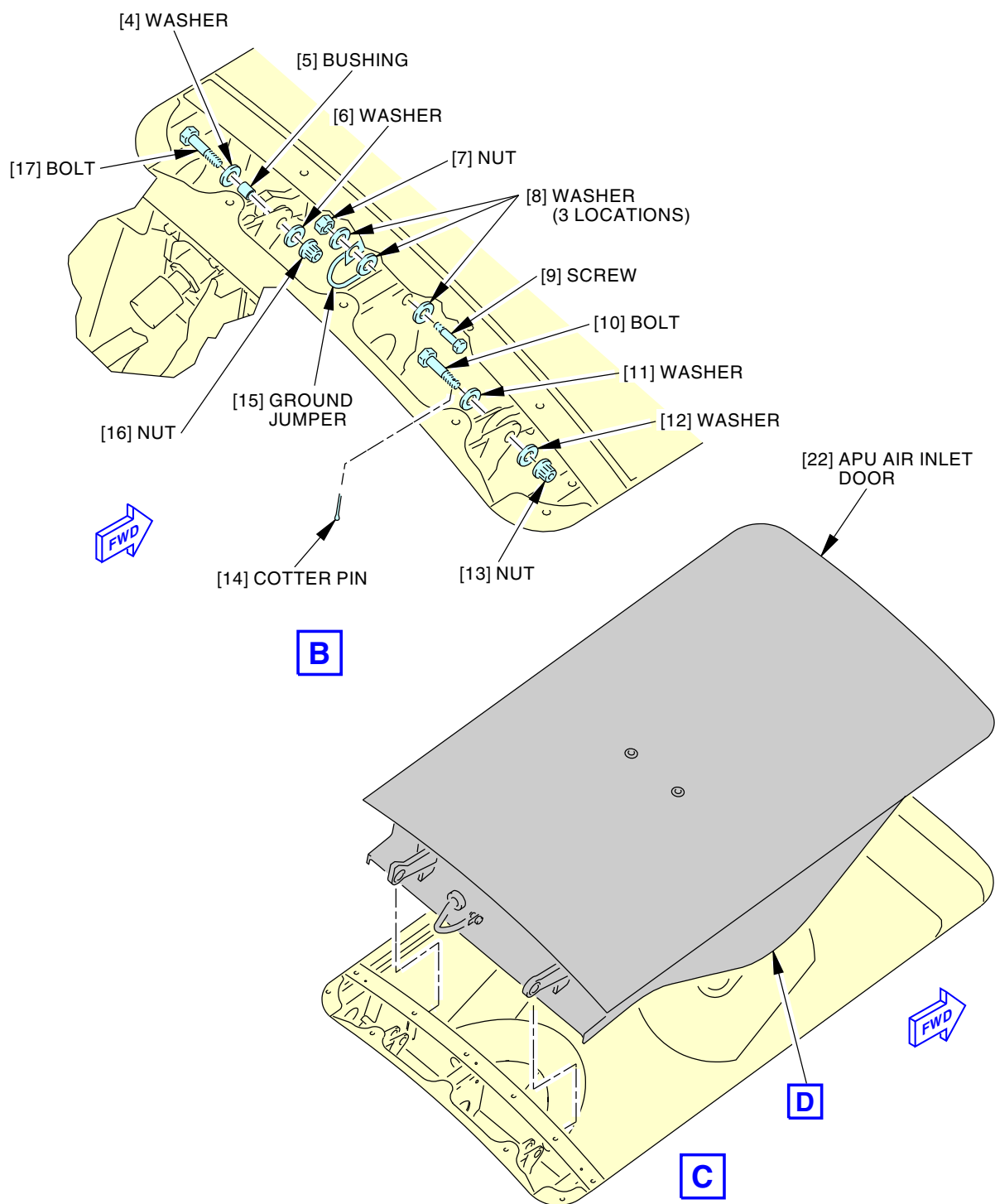
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2441002 S0000566978_V2

**APU Air Inlet Door Installation
Figure 402/49-15-05-990-804 (Sheet 2 of 3)**

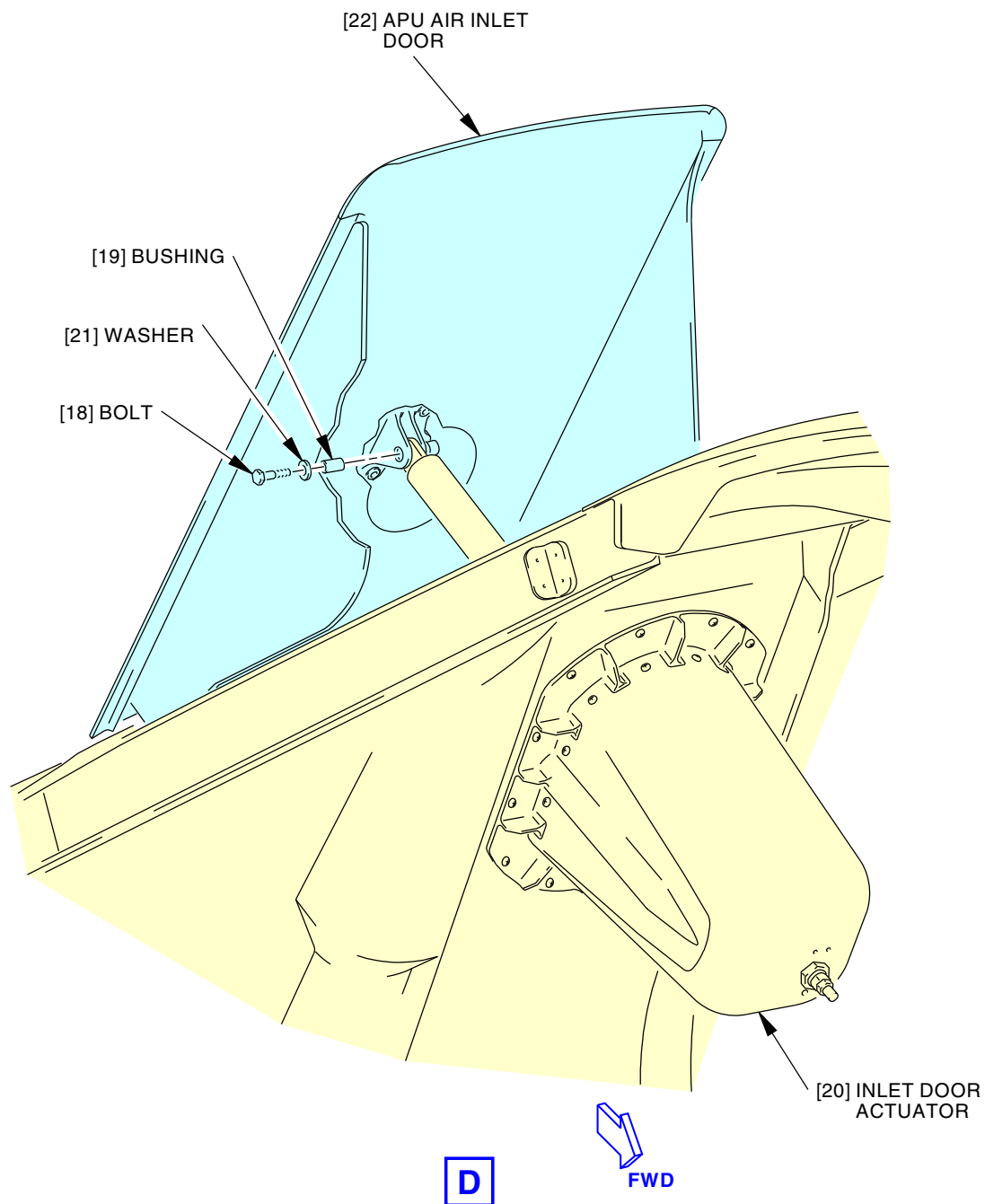
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2441006 S0000566979_V2

APU Air Inlet Door Installation
Figure 402/49-15-05-990-804 (Sheet 3 of 3)

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TASK 49-15-05-400-801

3. APU Air Inlet Door Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-15-06-820-801	Inlet Door Actuator Adjustment (P/B 501)

B. Consumable Materials

Reference	Description	Specification
B50095	Solvent	BAC5750
D50004	Compound - Antiseize	BMS3-28

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Inlet door	49-15-05-01-110	ARO 001-011
14	Cotter pin	49-15-05-01-056	ARO ALL
		49-15-05-01-230	ARO ALL
22	Inlet door	49-15-05-01-300	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Air Inlet Door Installation

ARO ALL; AIRPLANES WITH COMPOSITE DOOR

SUBTASK 49-15-05-420-001

- (1) Do the steps that follow to install the inlet door [2]:
 - (a) Set the inlet door [2] on the airplane.
 - (b) Install the bushing [5], the washer [4], the bolt [17], the washer [6] and the nut [16] that attach the inlet door [2] to the left hinge.
 - 1) Tighten the bolt to 180-220 pound-inches (20.34-24.86 newton-meters).
 - (c) Install the bolt [10], the washer [11], the washer [12], the nut [13], and the cotter pin [14] that attach the inlet door [2] to the right hinge.
 - 1) Tighten the bolt to 75-85 pound-inches (8.48-9.61 newton-meters).
 - (d) Install the ground jumper [15] on the inlet duct assembly.
 - 1) Clean the structure with solvent, B50095.
 - 2) Install the screw [9], the ground jumper [15], the washer [8], and the nut [7] on the inlet duct assembly
 - a) Tighten the nut to 28-35 pound inches (3.16-3.95 newton meters).

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ARO ALL; AIRPLANES WITH COMPOSITE DOOR (Continued)

- 3) Measure the electrical resistance across the bond.
 - a) Make sure that the maximum resistance is 1 milliohm or less.
- (e) Install the access panel [1] on the inlet door [2].
 - 1) Install the 10 bolts [3] that attach the access panel [1] to the inlet door [2].
- (f) Apply a thin layer of compound, D50004 to the bolt [18].
- (g) Install the bolt [18], washer [21] and bushing [19] that attach the rod for the inlet door actuator [20] to the inlet door [2].

ARO ALL; AIRPLANES WITH ALUMINUM AND FIBERGLASS COMPOSITE DOOR

SUBTASK 49-15-05-420-002

- (2) Do the steps that follow to install the inlet door [22]:
 - (a) Set the inlet door [22] on the airplane.
 - (b) Install the bushing [5], the washer [4], the bolt [17], the washer [6] and the nut [16] that attach the inlet door [22] to the left hinge.
 - 1) Tighten the bolt to 180-220 pound-inches (20.34-24.86 newton-meters).
 - (c) Install the bolt [10], the washer [11], the washer [12], the nut [13], and the cotter pin [14] that attach the inlet door [22] to the right hinge.
 - 1) Tighten the bolt to 75-85 pound-inches (8.48-9.61 newton-meters).
 - (d) Install the screw [9], the washers [8], the ground jumper [15], the washer [8], and the nut [7] on the inlet duct assembly per SWPM 20-20-10 Category 2 Fay Sealed Direct Standard Ground Stud.
 - (e) Install the access panel [1] on the inlet door [22].
 - 1) Install the 10 bolts [3] that attach the access panel [1] to the inlet door [22].
 - (f) Apply a thin layer of compound, D50004 to the bolt [18].
 - (g) Install the bolt [18], washer [21] and bushing [19] that attach the rod for the inlet door actuator [20] to the inlet door [22].

ARO ALL

SUBTASK 49-15-05-820-001

- (3) Make sure the inlet door actuator is adjusted correctly. To adjust it, do this task: Inlet Door Actuator Adjustment, TASK 49-15-06-820-801.

SUBTASK 49-15-05-410-001

- (4) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-05-860-004

- (5) If it is necessary, supply the hydraulic power to the left system, the right system, and the center system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

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SUBTASK 49-15-05-860-011

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-15-05-860-005

- (7) Set these switches on the FLT control HYD power panel, P61, to the NORM position:

- (a) L TAIL
- (b) R TAIL
- (c) C TAIL

SUBTASK 49-15-05-860-006

- (8) Set the STAB C and the STAB R switches on the control stand to the NORM position.

————— END OF TASK —————

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APU AIR INLET DOOR - INSPECTION/CHECK

1. General

- A. This procedure has these tasks:
- (1) A visual check of the APU air inlet door
 - (2) An inspection of the APU air inlet door.

TASK 49-15-05-200-801

2. Air Inlet Door Inspection

A. References

Reference	Title
49-15-05-000-801	APU Air Inlet Door Removal (P/B 401)
49-15-05-400-801	APU Air Inlet Door Installation (P/B 401)
49-15-06-000-801	Inlet Door Actuator Removal (P/B 401)
49-15-06-400-801	APU Air Inlet Door Actuator Installation (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Inlet Door Actuator Fork Fitting Dimension Examination

SUBTASK 49-15-05-010-002

- (1) Do this task: Inlet Door Actuator Removal, TASK 49-15-06-000-801.

SUBTASK 49-15-05-210-001

- (2) Examine the fork fitting for corrosion, cracks or damage (Figure 601).
- (a) If there is signs of damage, replace the fork fitting.

SUBTASK 49-15-05-220-001

- (3) If the fork fitting has signs of wear, do the steps that follow:
- (a) Do this task: Inlet Door Actuator Removal, TASK 49-15-06-000-801.
 - (b) Remove the fork fitting and the related parts from the canister assembly.
 - (c) Do a check of the bolt and the bushings.
 - 1) Examine the bushings and the bolt for wear.
 - 2) Replace all the parts that have more than the permitted quantity of wear shown in (Table 601).

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Table 601/49-15-05-993-804 Fork Fitting Assembly Wear Limits

			DESIGN LIMITS		WEAR LIMITS		
INDEX NO.	PART NAME	DIM.	DIAMETER		ALLOWED WEAR DIM.	MAX CLEAR-ANCE	REPAIR
			MIN	MAX			
1	FORK FITTING ASSEMBLY	ID	0.4373	0.4379			*[1]
	BUSHING	OD	0.4381	0.4386			*[1]
2	BUSHING	ID	0.3125	0.3140	0.3203	0.015	*[1]
	BOLT	OD	0.3115	0.3120	0.3053		*[1]

*[1] REPLACE WHEN WORN

(d) Do this task: APU Air Inlet Door Actuator Installation, TASK 49-15-06-400-801.

SUBTASK 49-15-05-210-002

(4) Examine the air inlet door (Figure 602).

(a) If the air inlet door has signs or wear, do the steps that follow:

- 1) Do this task: APU Air Inlet Door Removal, TASK 49-15-05-000-801.
- 2) Make sure the hinge components do not have worn areas.
- 3) Make sure the attach point for the inlet door actuator does not have worn areas or cracks.
- 4) Make sure the nut plate is in good condition.

(b) Do this task: APU Air Inlet Door Installation, TASK 49-15-05-400-801.

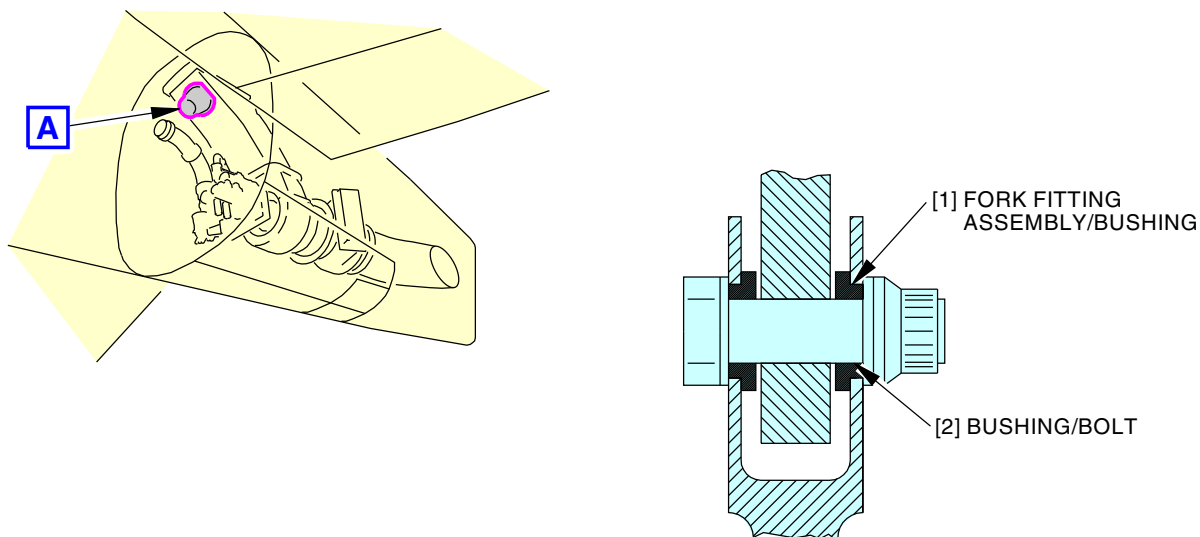
———— **END OF TASK** ————

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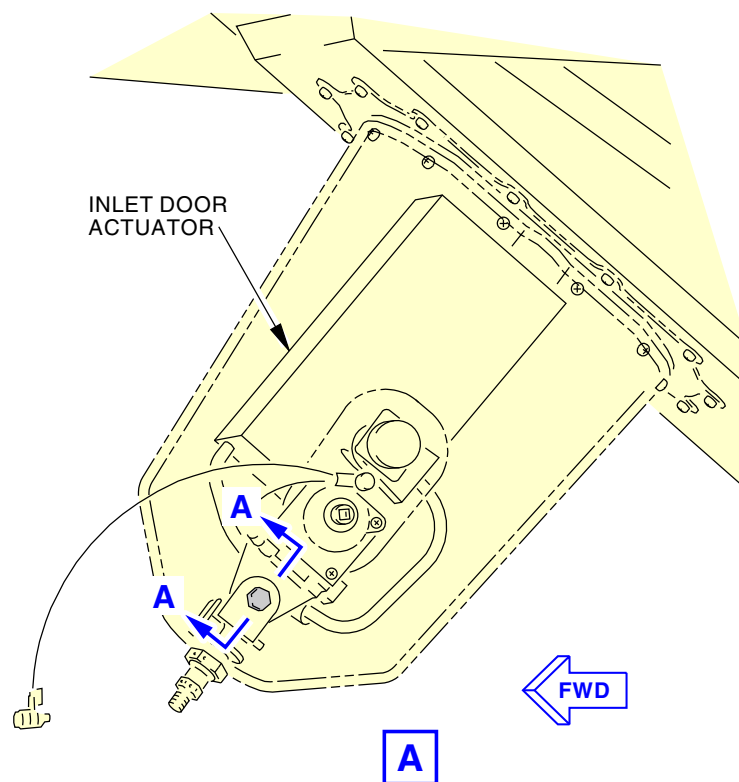
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**FORK FITTING ASSEMBLY
A-A**



E07864 S0006423794_V2

**Fork Fitting Assembly Wear Limits
Figure 601/49-15-05-990-802**

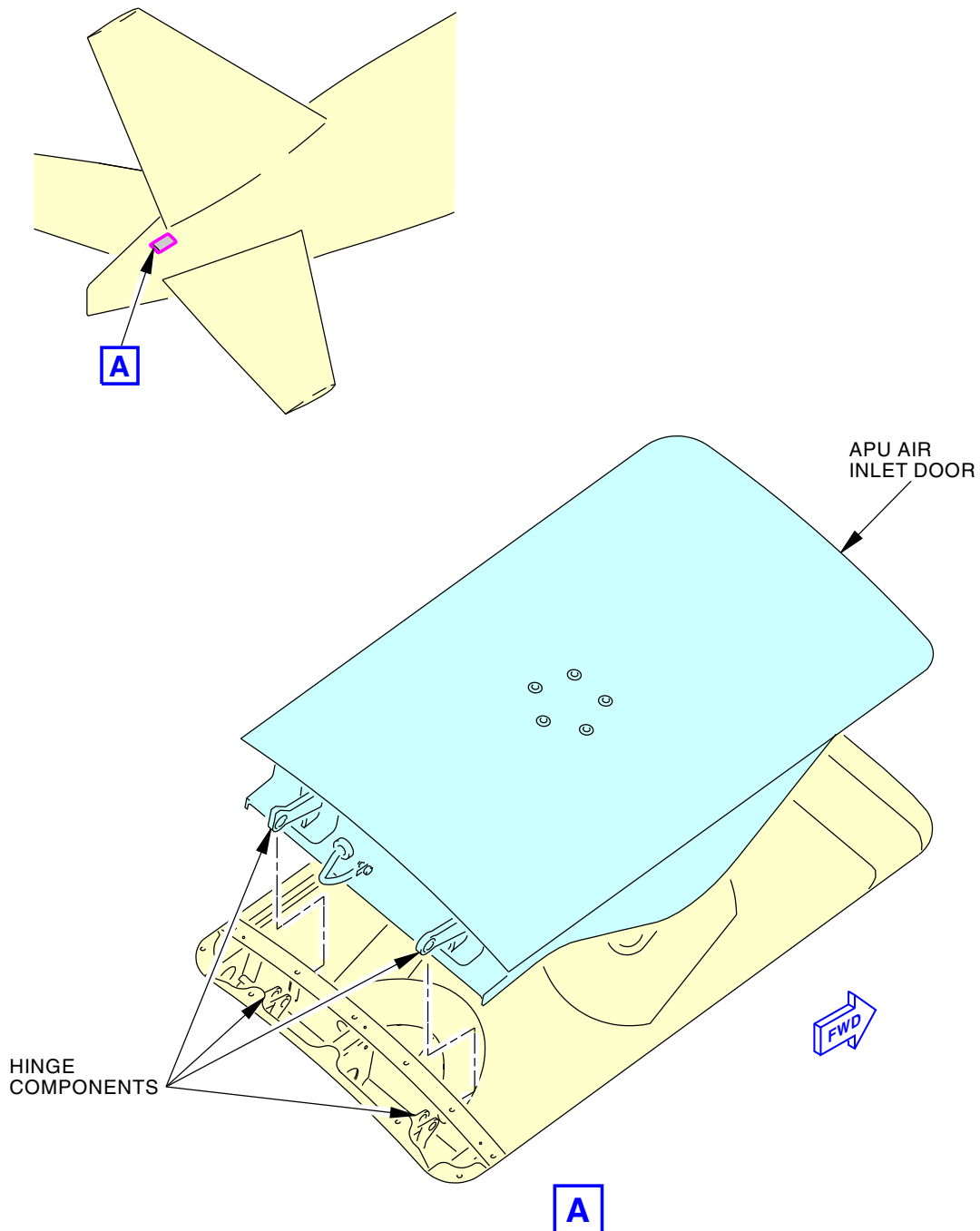
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E07876 S0006423795_V2

APU Air Inlet Door Inspection
Figure 602/49-15-05-990-803

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INLET DOOR ACTUATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the inlet door actuator
 - (2) An installation of the inlet door actuator.
- B. The inlet door actuator is installed in a canister assembly and attached to the inlet duct with a base assembly. These components are removed at the same time. For this procedure, the inlet door actuator, the canister assembly, and the base assembly are referred to as the actuator assembly.

TASK 49-15-06-000-801

2. Inlet Door Actuator Removal

(Figure 401 or Figure 402 or Figure 403)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-15-06-860-001

- (1) Move the APU selector on the P5 overhead panel to the ON position.

NOTE: If the inlet door actuator does not have a problem, the inlet door will open.

SUBTASK 49-15-06-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-15-06-860-003

- (3) Move the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

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SUBTASK 49-15-06-010-001

- (4) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Air Inlet Door Actuator Removal

ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3

SUBTASK 49-15-06-860-004

- (1) If the inlet door is not open, do the steps that follow to open the inlet door:
- (a) Remove the actuator drive access plug [41] (View A, Figure 403) from the actuator assembly [1].

NOTE: Actuator drive access plug is held in place with retaining spring and remains attached to canister with lanyard.



DO NOT APPLY MORE THAN 10 POUND-INCHES (1.1 NEWTON-METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (b) Turn the transfer cover socket [6] on the inlet door actuator counterclockwise.

NOTE: The transfer cover [7] will move and the manual drive socket [8] will show. The actuator will be in the manual mode.

- (c) Make sure the transfer cover [7] is fully in the manual position.



DO NOT APPLY MORE THAN 65 POUND-INCHES (7.3 NEWTON-METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- (d) Turn the manual drive socket [8] counterclockwise until the torque value suddenly increases.

NOTE: The inlet door [13] will open.



DO NOT APPLY MORE THAN 10 POUND-INCHES (1.1 NEWTON-METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (e) Turn the transfer cover socket [6] clockwise until ELEC shows in the forward window of the transfer cover.

NOTE: The actuator will be in the electrical mode.

- (f) Make sure the transfer cover [7] is fully in the electric position.

NOTE: When actuator is in the electrical mode, the actuator will lock its current position.

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SUBTASK 49-15-06-860-019

(2) If the inlet door is not open, do the steps that follow to open the inlet door:

(a) Remove the access cover from the canister.

NOTE: Access cover is held in place with retaining spring and remains attached to canister with lanyard



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

(b) Turn the transfer cover socket [6] on the inlet door actuator counterclockwise until the transfer cover position mark aligns with the manual position [M].

NOTE: The transfer cover [7] will move and the manual drive socket [8] will show. The actuator will be in the manual mode [M].

(c) Make sure the transfer cover [7] is fully in the manual position [M].



CAUTION

DO NOT APPLY MORE THAN 100 POUND INCHES (11.3 NEWTON METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

(d) Turn the manual drive socket [8] counterclockwise until the torque value suddenly increases.

NOTE: The inlet door [13] will open.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

(e) Turn the transfer cover socket [6] clockwise until transfer cover position mark aligns with the electrical position "E".

NOTE: The actuator will be in the electrical mode.

(f) Make sure the transfer cover [7] is fully in the electric position.

NOTE: When actuator is in the electrical mode, the actuator will lock its current position.

ARO ALL

SUBTASK 49-15-06-020-001

(3) Do the steps that follow to remove the actuator assembly [1]:

(a) Disconnect the electrical connector [2].

(b) Remove the nut [3], the washer [4], and the ground jumper [5] from the actuator assembly [1].

(c) Install the nut [3] and the washer [4] on the inlet door actuator assembly [1].

(d) Hold the actuator assembly while you remove the 12 bolts [9].

(e) Slowly lower the actuator assembly [1].

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- (f) Put your hand through the hole in the inlet duct to remove the bolt [11], washer [14] and bushing [12] that attaches the shaft [10] to the inlet door [13].
- (g) Remove the inlet door actuator assembly [1].
- (h) To remove the inlet door actuator from the canister assembly, do this task: APU Air Inlet Door Actuator Disassembly, TASK 49-15-06-020-801.

———— **END OF TASK** ————

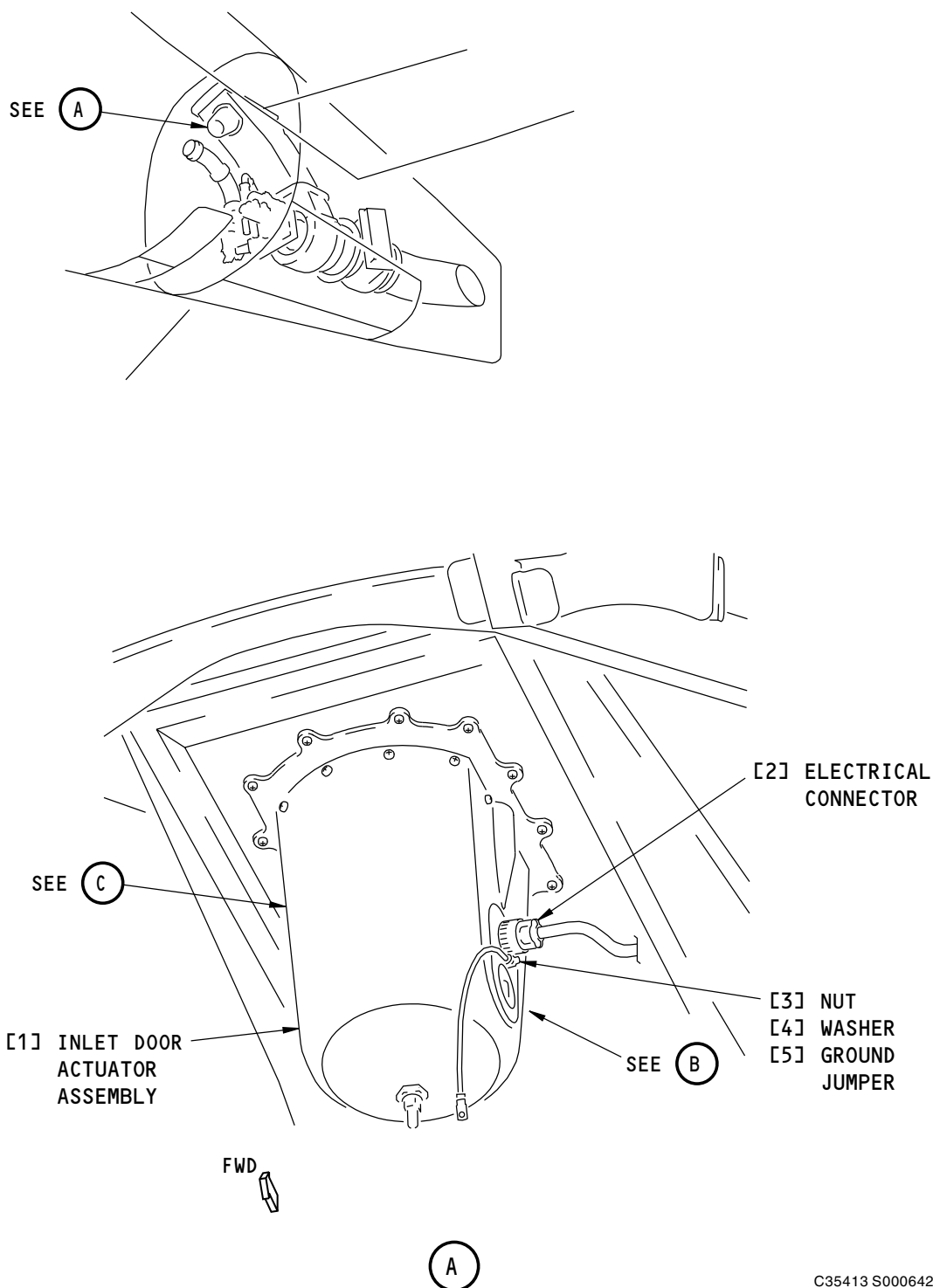
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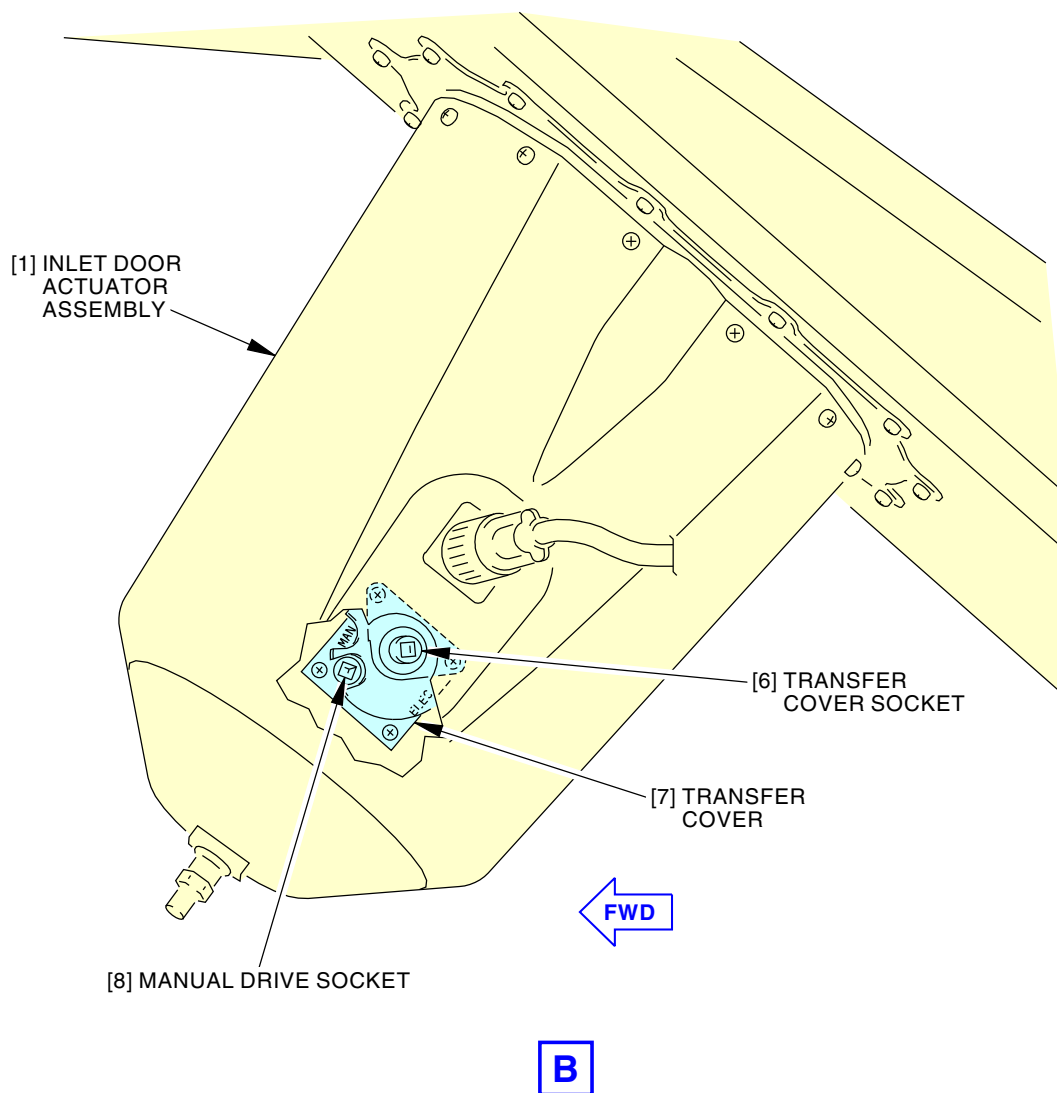
**APU Air Inlet Door Actuator Installation
Figure 401/49-15-06-990-801 (Sheet 1 of 3)**

EFFECTIVITY
ARO ALL; AIRPLANES WITH ACTUATOR P/N
R5365-1, -2, -3

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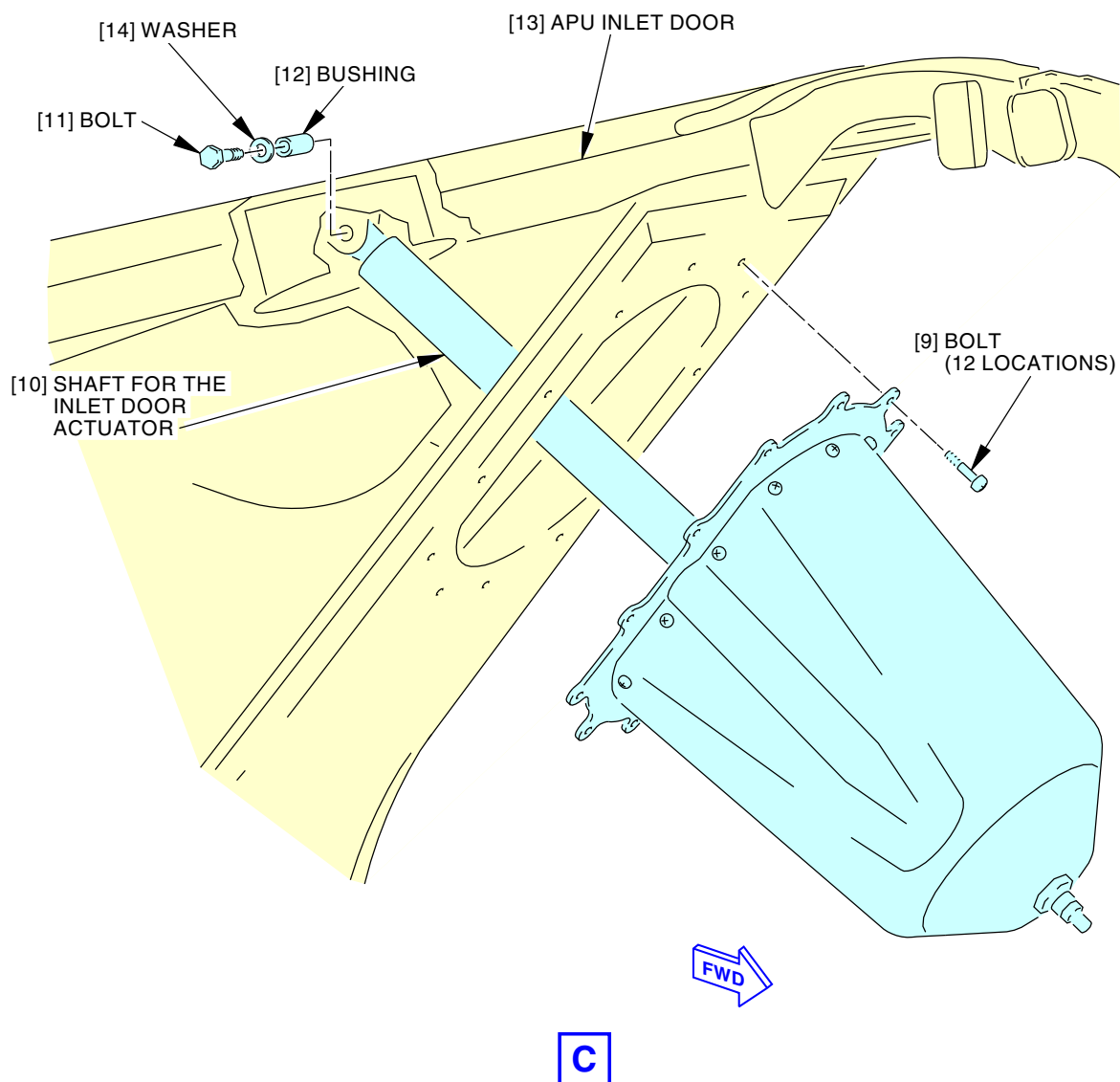
APU Air Inlet Door Actuator Installation
Figure 401/49-15-06-990-801 (Sheet 2 of 3)

EFFECTIVITY
ARO ALL; AIRPLANES WITH ACTUATOR P/N
R5365-1, -2, -3

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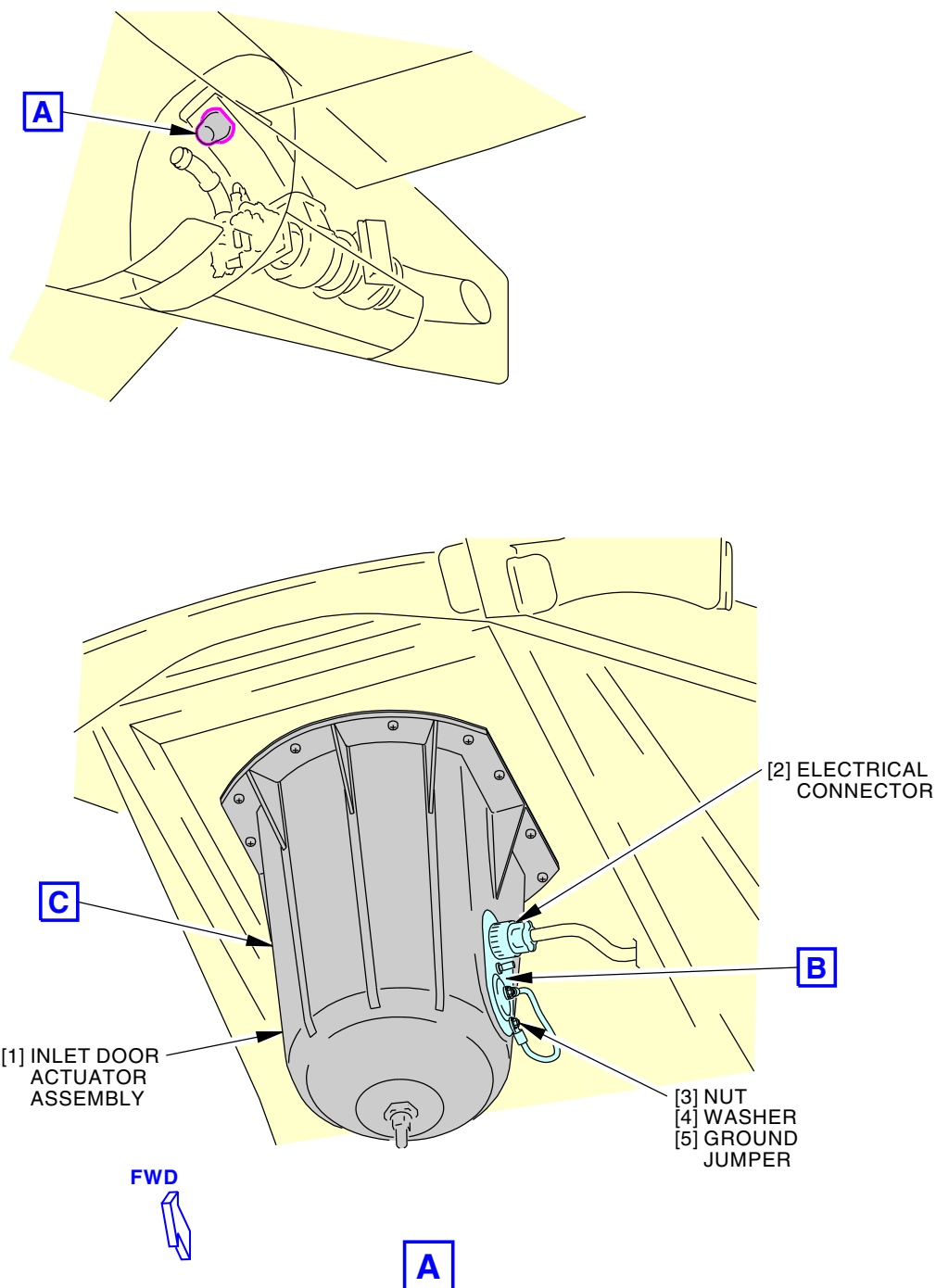
APU Air Inlet Door Actuator Installation
Figure 401/49-15-06-990-801 (Sheet 3 of 3)

EFFECTIVITY
ARO ALL; AIRPLANES WITH ACTUATOR P/N
R5365-1, -2, -3

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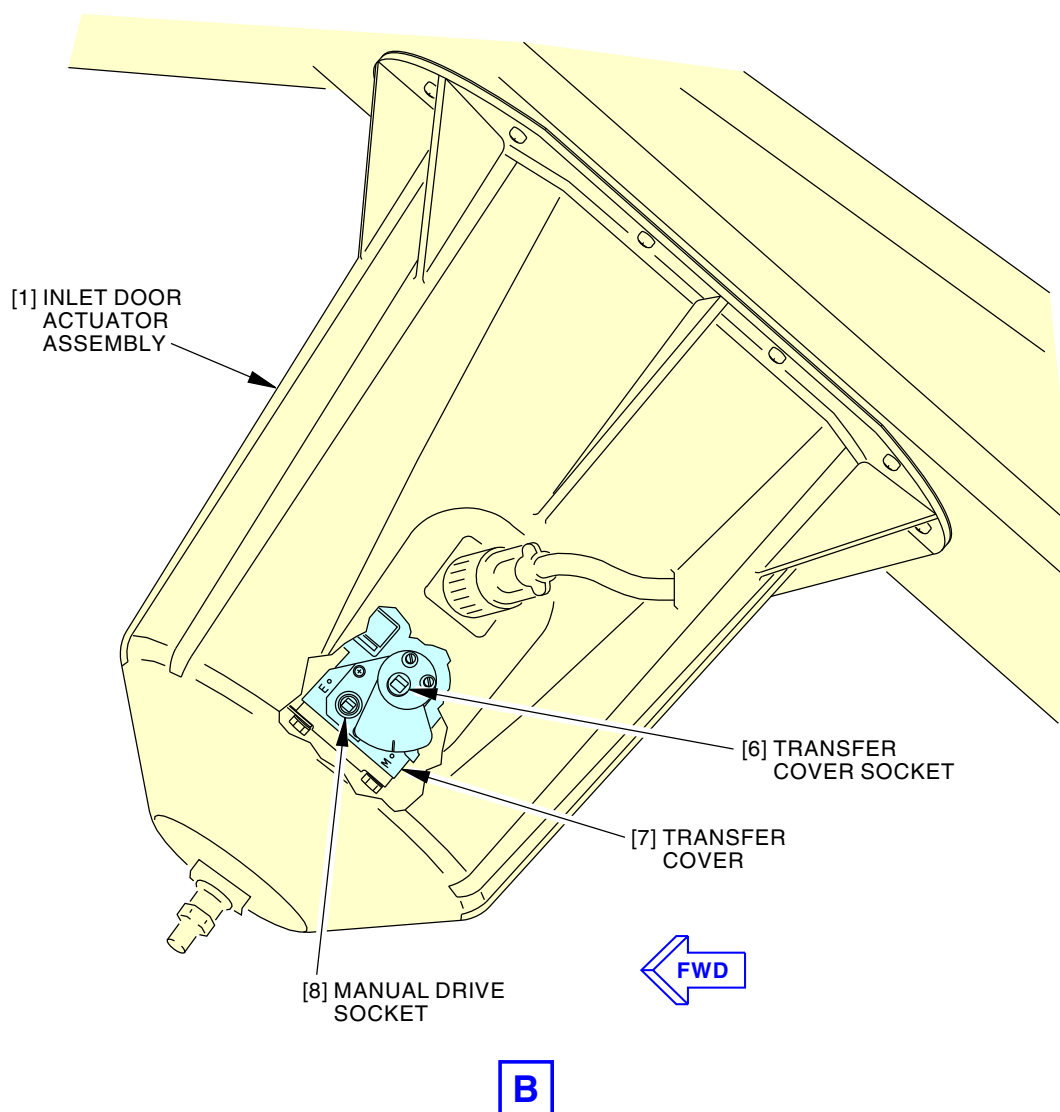
APU Air Inlet Door Actuator Installation
Figure 402/49-15-06-990-805 (Sheet 1 of 3)

EFFECTIVITY
ARO ALL; AIRPLANES WITH ACTUATOR P/N
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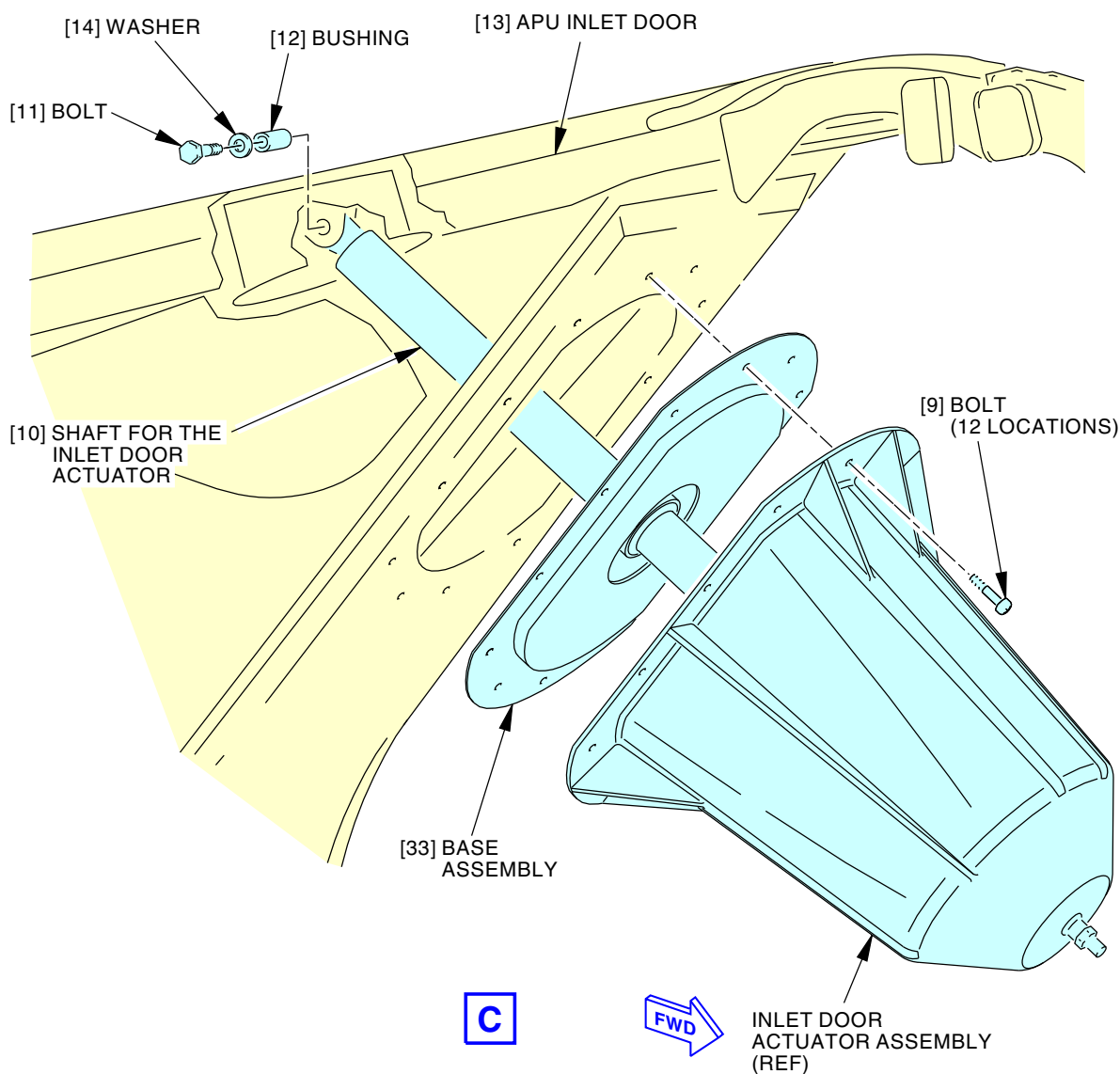
APU Air Inlet Door Actuator Installation
Figure 402/49-15-06-990-805 (Sheet 2 of 3)

EFFECTIVITY
ARO ALL; AIRPLANES WITH ACTUATOR P/N
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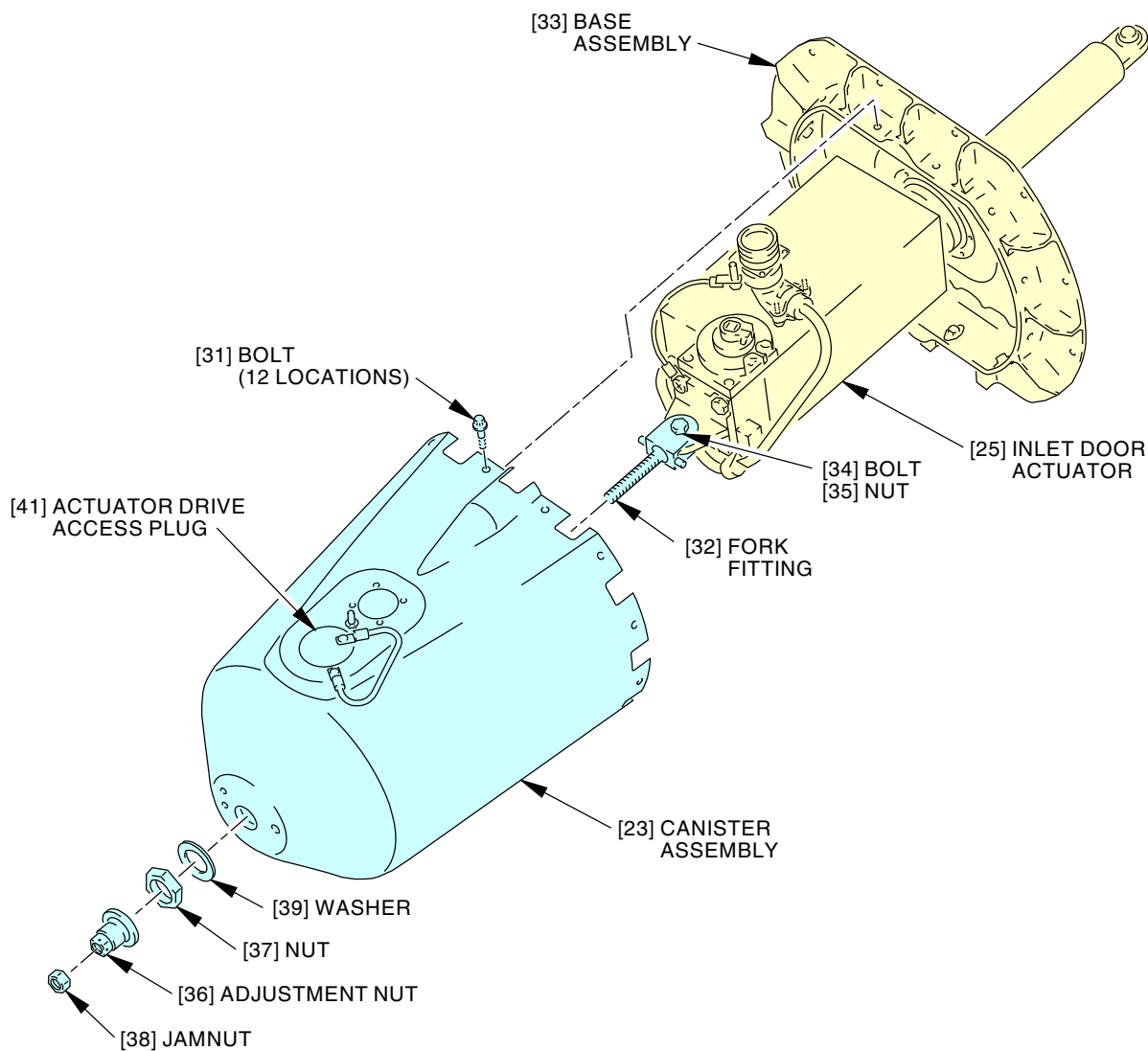
**APU Air Inlet Door Actuator Installation
Figure 402/49-15-06-990-805 (Sheet 3 of 3)**

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APU Air Inlet Door Actuator Installation
Figure 403/49-15-06-990-806

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TASK 49-15-06-020-801

3. APU Air Inlet Door Actuator Disassembly

(Figure 404)

A. General

- (1) This task has the steps to remove the inlet door actuator from the canister.

B. Procedure

SUBTASK 49-15-06-020-002

- (1) Do the steps that follow to disassemble the inlet door actuator assembly.
- (a) Remove the bolts [22] that hold the connector receptacle [21] to the canister assembly [23].
NOTE: The nut plates [24] will fall into the canister assembly [23].
- (b) Remove the nut [26] and the washer [27] that hold the ground jumper [28] to the canister assembly [23].
NOTE: The bolt [30], washer [27] and washer [29] will fall into the canister assembly [23].
- (c) Remove the lockwire from the nut [37], adjustment nut [36] and the jamnut [38].
- (d) Remove the jamnut [38].
NOTE: If you do not have to replace the fork fitting [32], then you do not have to remove the jamnut [38].
- (e) Remove the adjustment nut [36], nut [37] and the washer [39].
- (f) Remove canister assembly [23] (Figure 401 or Figure 402 or Figure 403).
1) Remove bolts [31].
2) Remove canister assembly [23] from base assembly [33].
NOTE: Be careful to not damage actuator seal in base assembly when removing canister assembly and actuator.
- (g) Remove base assembly [33] from actuator shaft.
NOTE: Be careful not to damage actuator seal in base assembly.
- (h) Collect nut plates [24], the bolt [30], washer [27] and the washer [29] from inside the canister assembly [23].
- (i) Remove the nut [35] and the bolt [34] that attach the fork fitting [32] to the inlet door actuator [25].

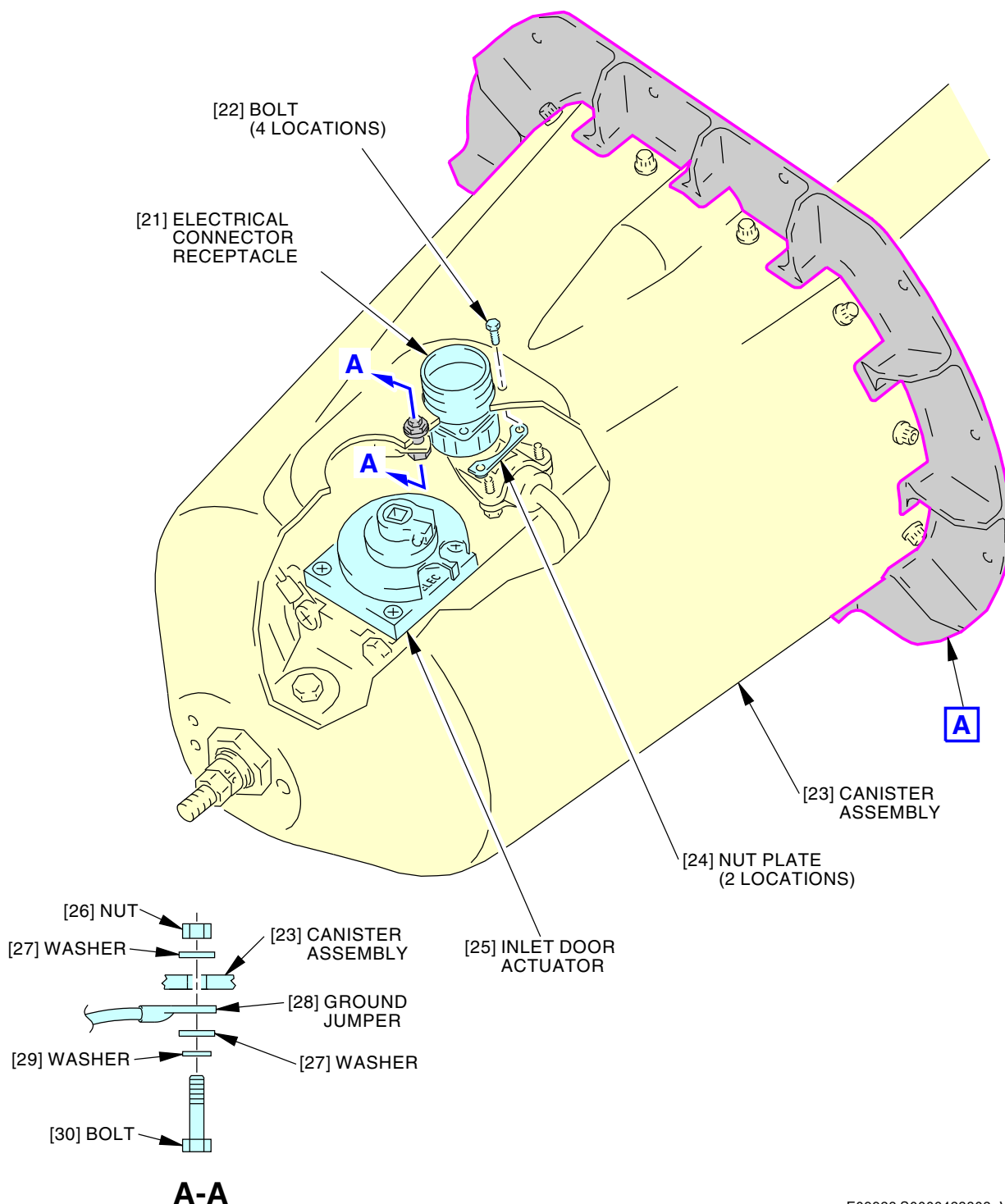
———— **END OF TASK** ————

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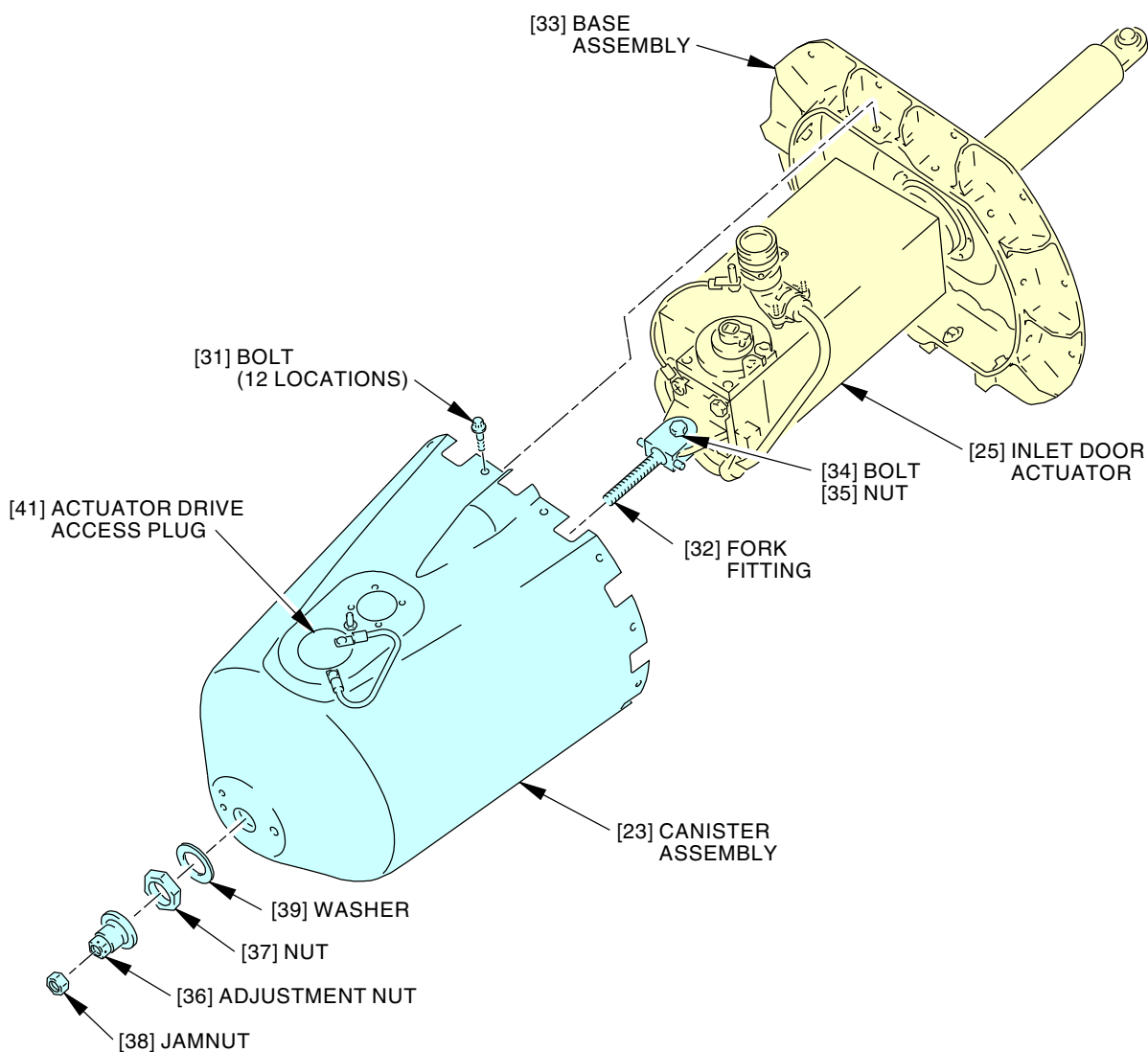
Inlet Door Actuator Assembly
Figure 404/49-15-06-990-802 (Sheet 1 of 2)

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**Inlet Door Actuator Assembly
Figure 404/49-15-06-990-802 (Sheet 2 of 2)**

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TASK 49-15-06-420-801

4. Inlet Door Actuator Assembly

(Figure 404)

A. General

- (1) This task has the steps to assemble the inlet door actuator assembly.

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	Inlet door actuator	49-15-06-01-095	ARO ALL
		49-15-06-01-110	ARO ALL
32	Fork fitting	49-15-06-01-050	ARO ALL

C. Procedure

SUBTASK 49-15-06-420-002

- (1) Do these steps to connect the fork fitting [32] to the inlet door actuator [25].

- Put the fork fitting [32] on the inlet door actuator [25].
- Install the bolt [34] and the nut [35].

SUBTASK 49-15-06-420-003

- (2) Do these steps to connect the electrical connector receptacle [21] and the ground jumper [28] to the canister assembly [23].

- Hold the one nut plate [24] and the connector receptacle [21] in position inside the canister assembly [23].
 - Make sure the holes for the canister assembly [23], the connector receptacle [21], and the nut plate [24] are aligned.
- Install the two bolts [22].
- Hold the other nut plate [24] in its position inside the canister assembly [23].
- Install the two bolts [22].
- Install the washer [29], washer [27] and the ground jumper [28] on the bolt [30].
- Install the bolt [30] and the ground jumper [28] through the canister assembly [23].

NOTE: The bolt is installed from the inside of the canister assembly [23].
- Install the washer [27] and the nut [26].

SUBTASK 49-15-06-420-004

- (3) Do these steps to install the inlet door actuator [25] in the canister assembly [23].

- Put the inlet door actuator in the canister assembly [23].
 - Make sure you can see the transfer cover [7] through the cover (Figure 401 or Figure 402 or Figure 403).
- Install the washer [39], nut [37] and the adjustment nut [36] on the fork fitting [32].
- Loosely install the jamnut [38] on the fork fitting [32].
- Install the lockwire on the nut [37], adjustment nut [36] and the jamnut [38].

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- Install the base assembly [33] (Figure 404).
 - Install the base assembly [33] by carefully inserting the actuator shaft through the round seal in the base assembly [33].

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ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3 (Continued)

- (f) Install the bolts [31].

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- (g) Install base assembly [33] (Figure 401 or Figure 402 or Figure 403).
- 1) Assemble base assembly [33] to canister assembly [23] by carefully inserting actuator shaft through round seal in base assembly [33].
 - 2) Align holes in base assembly [33] with holes in canister.
NOTE: One of the holes is offset so the base assembly cannot be installed backwards.
 - 3) Install bolts [9].

ARO ALL

SUBTASK 49-15-06-420-005

- (4) Install the inlet door actuator assembly. To install it, do this task: APU Air Inlet Door Actuator Installation, TASK 49-15-06-400-801.

END OF TASK

TASK 49-15-06-400-801

5. APU Air Inlet Door Actuator Installation

(Figure 401 or Figure 402 or Figure 403)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-15-06-820-801	Inlet Door Actuator Adjustment (P/B 501)

B. Consumable Materials

Reference	Description	Specification
D50004	Compound - Antiseize	BMS3-28

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Actuator assembly	49-15-06-01-095	ARO ALL
		49-15-06-01-110	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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F. APU Air Inlet Door Actuator Installation

ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3

SUBTASK 49-15-06-420-001

- (1) Do the steps that follow to install the actuator assembly [1].
 - (a) If the new inlet door actuator is retracted, then do these steps to extend the actuator:



DO NOT APPLY MORE THAN 10 POUND-INCHES (1.1 NEWTON-METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- 1) Turn the transfer cover socket [6] on the inlet door actuator counterclockwise.

NOTE: The transfer cover [7] will move and the manual drive socket [8] will show [MAN] in the window of the transfer cover. The actuator will be in the manual mode [MAN].

- 2) Make sure the transfer cover [7] is fully in the manual position.



DO NOT APPLY MORE THAN 65 POUND-INCHES (7.3 NEWTON-METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE ACTUATOR IS FULLY EXTENDED. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- 3) Turn the manual drive socket [8] counterclockwise until the torque value suddenly increases.

NOTE: The actuator will be extended.



DO NOT APPLY MORE THAN 10 POUND INCHES (1.1 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- 4) Turn the transfer cover socket [6] clockwise until ELEC shows in the forward window of the transfer cover.

NOTE: The actuator will be in the electrical mode.

- 5) Make sure the transfer cover [7] is fully in the electric position.

NOTE: When actuator is in the electrical mode, the actuator will lock its current position.

- (b) Hold the actuator assembly [1] while you put your hand through the hole in the inlet duct.
- (c) Apply a thin layer of compound, D50004 to the bolt [11].
- (d) Install the bolt [11], washer [14] and bushing [12] that connects the shaft [10] to the inlet door [13].
- (e) Install the 12 bolts [9] that hold the inlet door actuator to the inlet duct.
- (f) Install the ground jumper [5], the washer [4], and the nut [3] to the actuator assembly [1].
- (g) Connect the electrical connector [2] to the actuator assembly [1].

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ARO ALL; AIRPLANES WITH ACTUATOR P/N R5365-1, -2, -3 (Continued)



CAUTION

YOU MUST ADJUST THE ACTUATOR TRAVEL BEFORE ELECTRICALLY OPERATING THE INLET DOOR ACTUATOR. IF YOU DO NOT, DAMAGE TO THE INLET DUCT CAN OCCUR.

- (h) Do this task: Inlet Door Actuator Adjustment, TASK 49-15-06-820-801.

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SUBTASK 49-15-06-420-012

- (2) Do the steps that follow to install the actuator assembly [1]

- (a) If the new inlet door actuator is retracted, then do these steps to extend the actuator:

- 1) Remove the access cover from the canister.

NOTE: Access cover is held in place with retaining spring and remains attached to canister with lanyard.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- 2) Turn the transfer cover socket [6] on the inlet door actuator counterclockwise.

NOTE: The transfer cover [7] will move and the manual drive socket [8] will show. The actuator will be in the manual mode [M].

- 3) Make sure the transfer cover [7] is fully in the manual position



CAUTION

DO NOT APPLY MORE THAN 100 POUND INCHES (11.3 NEWTON METERS) OF TORQUE ON THE MANUAL DRIVE SOCKET. THE TORQUE THAT IS NECESSARY TO TURN THE CRANK WILL SUDDENLY INCREASE WHEN THE INLET DOOR IS FULLY OPEN. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE MANUAL DRIVE SOCKET.

- 4) Turn the manual drive socket [8] counterclockwise until the torque value suddenly increases.

NOTE: The actuator will be extended.

- 5) Turn the transfer cover socket [6] clockwise until transfer cover position mark aligns with the electrical position "E".

NOTE: The actuator will be in the electrical mode.



CAUTION

DO NOT APPLY MORE THAN 15 POUND INCH (1.7 NEWTON METERS) OF TORQUE ON THE TRANSFER COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- 6) Make sure the transfer cover [7] is fully in the electric position.

NOTE: When actuator is in the electrical mode, the actuator will lock its current position.

- (b) Hold the actuator assembly [1] while you put your hand through the hole in the inlet duct.

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- (c) Apply a thin layer of compound, D50004 to the bolt [11].
- (d) Install the bolt [11], washer [14] and bushing [12] that connects the shaft [10] to the inlet door [13].
- (e) Install the 12 bolts [9] that hold the inlet door actuator to the inlet duct.
- (f) Install the ground jumper [5], the washer [4], and the nut [3] to the actuator assembly [1].
- (g) Connect the electrical connector [2] to the actuator assembly [1].



CAUTION

YOU MUST ADJUST THE ACTUATOR TRAVEL BEFORE ELECTRICALLY OPERATING THE INLET DOOR ACTUATOR. IF YOU DO NOT, DAMAGE TO THE INLET DUCT CAN OCCUR.

- (h) Do this task: Inlet Door Actuator Adjustment, TASK 49-15-06-820-801.

ARO ALL

G. Put The Airplane Back In Its Usual Condition

SUBTASK 49-15-06-410-004

- (1) Close the APU access doors:

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

315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-06-860-021

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

————— END OF TASK —————

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APU AIR INTAKE DOOR ACTUATOR - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
- (1) An adjustment of the inlet door actuator
 - (2) An adjustment of the inlet door position switch.
 - (3) An operational test of the APU air inlet system.
- B. The inlet door actuator must be adjusted when the APU air inlet door is replaced or the inlet door actuator is replaced.
- (1) After the inlet door actuator is adjusted, the inlet door position switch must be adjusted.
 - (2) To adjust the inlet door actuator, you must measure the alignment of the air inlet door.
 - (3) You can get access to the inlet door actuator and the inlet door position switch through the APU access doors.

TASK 49-15-06-820-801

2. Inlet Door Actuator Adjustment

(Figure 501)

A. General



YOU MUST ADJUST THE ACTUATOR TRAVEL BEFORE ELECTRICALLY OPENING OR CLOSING THE INLET DOOR. IF YOU DO NOT, DAMAGE TO THE INLET DUCT CAN OCCUR.

- (1) The inlet door actuator must be adjusted under the conditions that follow:
- (a) The inlet door actuator is replaced
 - (b) The air inlet door is replaced
 - (c) The air inlet door does not align with the fuselage within the tolerance of -0.060 to +0.180 inch (-1.5 mm to +4.6 mm). See figure 501.

NOTE: Air inlet door flushness is measured between the air inlet door skin and the fuselage skin. Ignore the leading edge bullnose.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Prepare for the Adjustment

SUBTASK 49-15-06-860-006

- (1) Remove the hydraulic power from the left system, right system, and center system. To remove the hydraulic power, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 49-15-06-860-007

- (2) Set these switches on the FLT control HYD power panel, P61, to the SHUTOFF position:
 - (a) L TAIL
 - (b) R TAIL
 - (c) C TAIL.

SUBTASK 49-15-06-860-008

- (3) Set the STAB C and STAB R switches on the control stand to the CUTOUT position.

SUBTASK 49-15-06-860-018

- (4) If the inlet door actuator adjustment procedure is being performed because of an inlet door or inlet door actuator replacement, do the steps that follow:
 - (a) Loosen the nut [2] and jamnut [3].
 - (b) Back the adjustment nut [4] toward the end of the fork fitting so that approximately 0.25 inch (6.35 mm) of the fork fitting is visible beyond the adjustment nut.

SUBTASK 49-15-06-860-009

- (5) Make sure the APU air inlet door is closed.
 - (a) Move the APU selector to the ON position.
NOTE: The inlet door will open in 5 to 45 seconds.
 - (b) Move the APU selector to the OFF position.
NOTE: The inlet door will close in 5 to 45 seconds.

SUBTASK 49-15-06-860-010

- (6) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-06-860-011

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-15-06-010-002

- (8) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Air Intake Door Actuator Adjustment

SUBTASK 49-15-06-820-001

- (1) Do the steps that follow to adjust the inlet door actuator:
 - (a) Measure the alignment of the air inlet door and the fuselage skin.
 - 1) If the alignment is within the tolerance of -0.060 to +0.180 inch (-1.5 to +4.6 mm), no adjustment is necessary.
 - (b) Remove the lockwire from the nut [2], jamnut [3], and adjustment nut [4].
 - (c) Loosen the nut [2] and jamnut [3].
 - (d) Turn the adjustment nut [4] clockwise or counterclockwise until the air inlet door and the fuselage skin are aligned.
 - 1) Make sure the alignment is within the tolerance of -0.060 to +0.180 inch (-1.5 to +4.6 mm).
 - (e) Tighten the nut [2] and jamnut [3] to a torque value of 95-160 pound-inches (10.7-18.1 newton-meters).
 - (f) Install the lockwire to the nut [2], jamnut [3], and adjustment nut [4].
 - 1) Do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801.
 - (g) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

- (h) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.
- (i) Move the APU selector to the ON position.

NOTE: The APU air inlet door will open in 5 to 45 seconds.

 - 1) Make sure the APU air inlet door moves freely.
- (j) Move the APU selector to the OFF position.

NOTE: The APU air inlet door will close in 5 to 45 seconds.

 - 1) Make sure the APU air inlet door moves freely.
 - 2) Make sure the alignment is within the tolerance of -0.060 to +0.180 inch (-1.5 to +4.6 mm).

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SUBTASK 49-15-06-820-002

(2) Do this task: Inlet Door Position Switch Adjustment, TASK 49-15-06-820-802.

———— **END OF TASK** ————

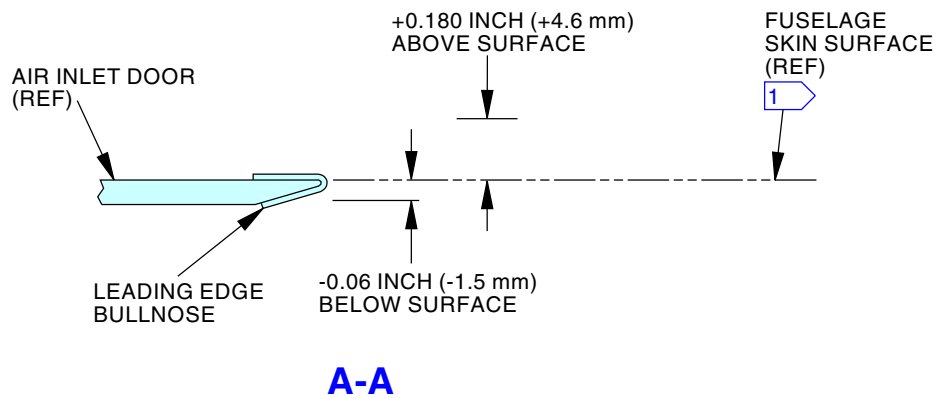
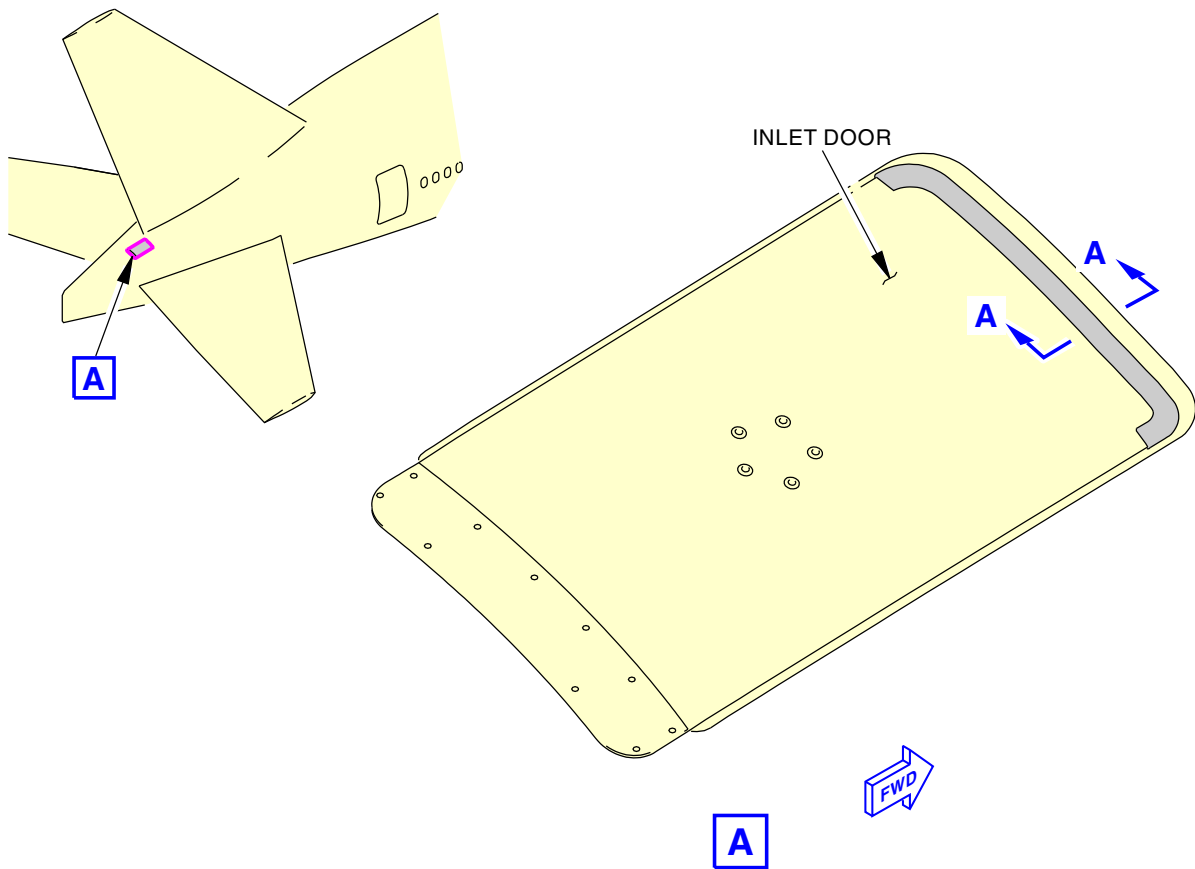
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1 AIR INLET DOOR FLUSHNESS IS MEASURED BETWEEN THE AIR INLET DOOR SKIN AND THE FUSELAGE SKIN; IGNORE THE LEADING EDGE BULLNOSE.

C99170 S0006423809_V2

Inlet Door Actuator Adjustment
Figure 501/49-15-06-990-803 (Sheet 1 of 2)

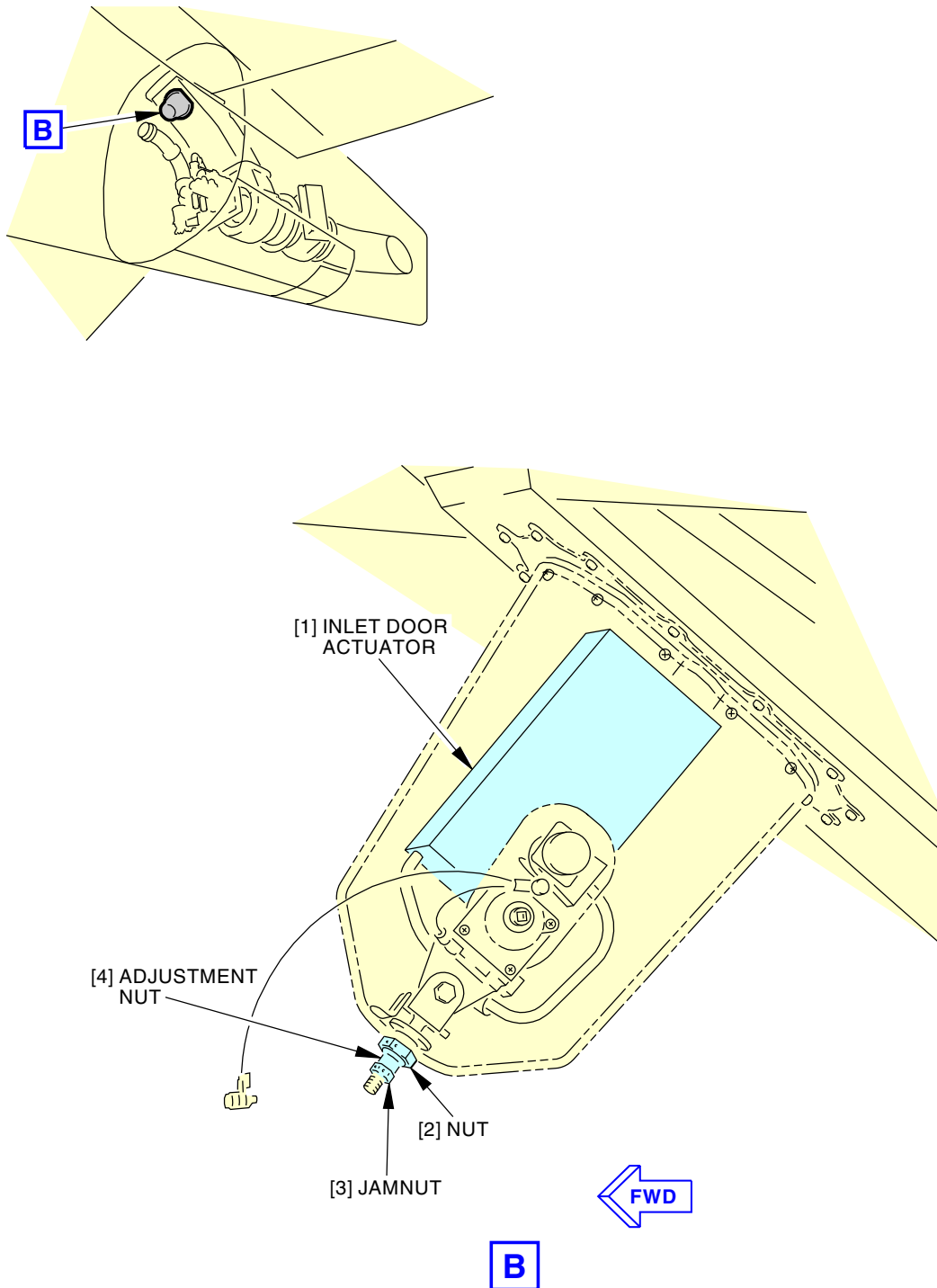
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C44741 S0006423810_V2

Inlet Door Actuator Adjustment
Figure 501/49-15-06-990-803 (Sheet 2 of 2)

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TASK 49-15-06-820-802

3. Inlet Door Position Switch Adjustment

(Figure 502)

A. General

- (1) This task gives the steps to adjust the inlet door position switch.
- (2) You must adjust the inlet door actuator before you adjust the inlet door position switch.
- (3) For this procedure, the inlet door position switch is referred to as the position switch.

B. Procedure

SUBTASK 49-15-06-860-012

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 49-15-06-820-003

- (2) Do the steps that follow to adjust the inlet door position switch:
 - (a) Move the APU selector to the ON position.
NOTE: The APU air inlet door will open in 5 to 45 seconds.
 - (b) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

- (c) Disconnect the electrical connector, D7958P [21] from the APU firewall.
- (d) Remove the lockwire from the nut [23].
- (e) Loosen the nut [23].
- (f) Do a continuity check between pins 7 and 8 on the electrical connector, D7958P [21].
 - 1) If there is continuity between pins 7 and 8, do this step:
 - a) Turn the inlet door position switch [22] counterclockwise until there is no continuity between pins 7 and 8.

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- (g) Slowly turn the position switch [22] clockwise until you measure continuity between pins 7 and 8.
- (h) Turn the position switch clockwise 2.5 turns.
- (i) Tighten the nut [23] 50 - 70 pound inches.
- (j) Install the lockwire on the nut [23].
- (k) Connect the electrical connector, D7958P [21] to the firewall.
- (l) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

- (m) Move the APU selector to the OFF position.

NOTE: The APU inlet door will close in 5 to 45 seconds.

SUBTASK 49-15-06-730-001

- (3) Do this task: APU Air Inlet Operational Test, TASK 49-15-06-700-801.

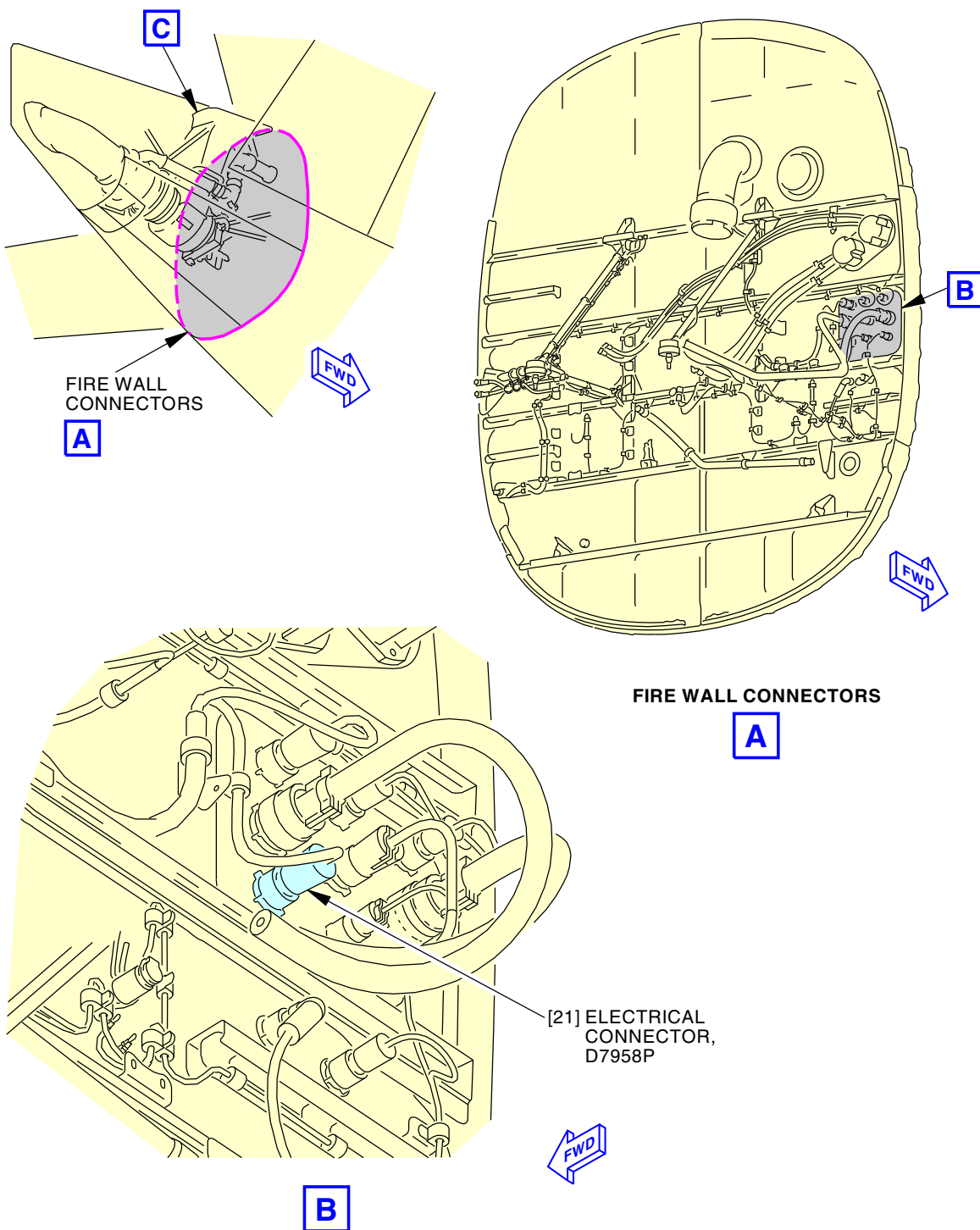
———— **END OF TASK** ————

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**Inlet Door Position Switch Adjustment
Figure 502/49-15-06-990-804 (Sheet 1 of 2)**

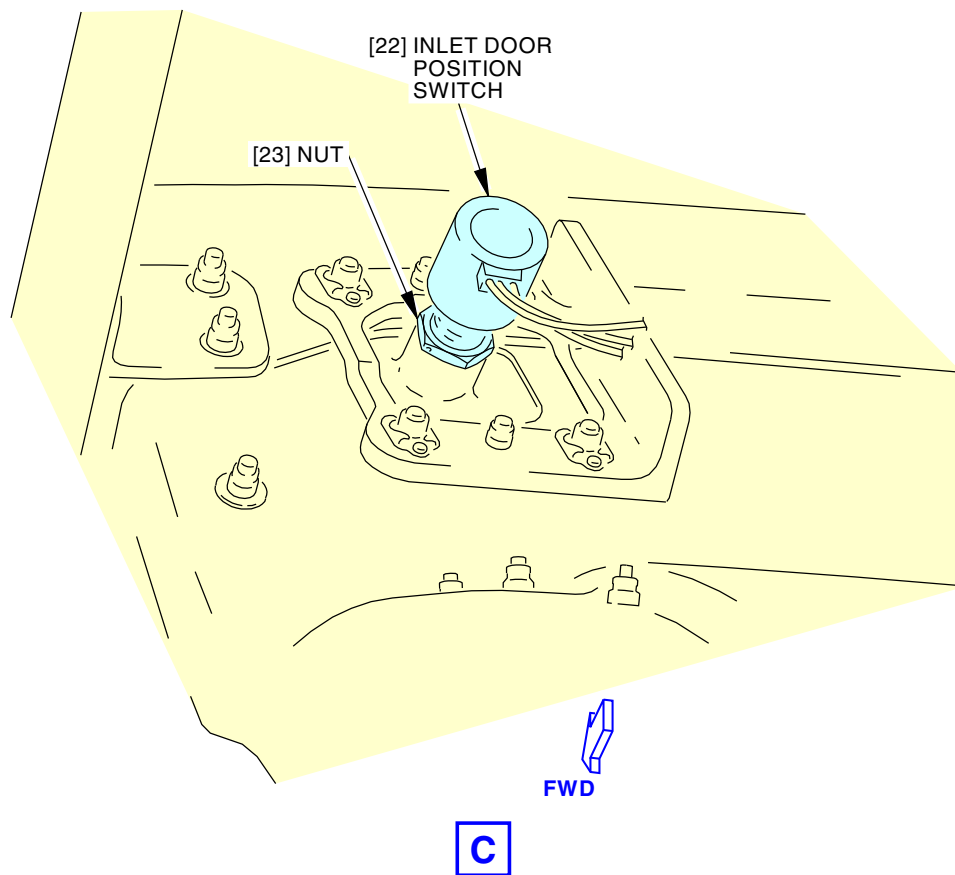
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Inlet Door Position Switch Adjustment
Figure 502/49-15-06-990-804 (Sheet 2 of 2)

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TASK 49-15-06-700-801

4. APU Air Inlet Operational Test

A. References

Reference	Title
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. APU air inlet system test

SUBTASK 49-15-06-710-001

- (1) Do the steps that follow to test the air inlet system:
 - (a) Move the APU MAINT switch on the P61 overhead panel to the TEST position.
 - (b) Look at the APU maintenance page.
 - 1) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - 2) Make sure the INLET DOOR CMD display shows CLOSED.
 - 3) Make sure the INLET DOOR POS display shows CLOSED.
 - (c) Move the APU selector to the ON position.

NOTE: The INLET DOOR CMD display on the APU maintenance page will show OPEN.
The INLET DOOR POS display on the APU maintenance page will show CLOSED for 5 - 45 seconds and then change to OPEN.

 - 1) Make sure the APU inlet door is open.
 - (d) Look at the APU maintenance page.
 - 1) Make sure the INLET DOOR CMD display shows OPEN.
 - 2) Make sure the INLET DOOR POS display shows OPEN.
 - (e) Move the APU selector to the OFF position.

NOTE: The INLET DOOR CMD display on the APU maintenance page will show CLOSED. The INLET DOOR POS display on the APU maintenance page will show OPEN for 5 - 45 seconds and then change to CLOSED.
 - (f) Look at the APU maintenance page.
 - 1) Make sure the INLET DOOR CMD display shows CLOSED.
 - 2) Make sure the INLET DOOR POS display shows CLOSED.
 - (g) Move the APU MAINT switch on the P61 overhead panel to the NORM position.

SUBTASK 49-15-06-410-002

- (2) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

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Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-06-860-015

- (3) If it is necessary, supply the hydraulic power to the left system, the right system, and the center system. To supply hydraulic power, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801

SUBTASK 49-15-06-860-016

- (4) Set these switches on the FLT control HYD power panel, P61, to the NORM position:
- (a) L TAIL
 - (b) R TAIL
 - (c) C TAIL

SUBTASK 49-15-06-860-017

- (5) Set the STAB C and the STAB R switches on the control stand to the NORM position.

————— **END OF TASK** —————

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APU AIR INTAKE DOOR SEAL - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU air intake door seal
- (2) An installation of the APU air intake door seal.

TASK 49-15-07-000-801

2. APU Air Inlet Door Seal Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-15-07-860-001

(1) Do the steps that follow to open the air inlet door:

- (a) Move the APU selector to the ON position.

NOTE: The APU inlet door [5] will be full open in less than 45 seconds.

SUBTASK 49-15-07-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-07-860-003

(3) Move the APU selector to the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-07-860-004

(4) Remove the hydraulic power from the left system, the right system, and the center system. To remove it, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

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SUBTASK 49-15-07-860-005

- (5) Set these switches on the FLT control HYD power panel, P61, to the SHUTOFF position:
- (a) L TAIL
 - (b) R TAIL
 - (c) C TAIL

SUBTASK 49-15-07-860-006

- (6) Set the STAB C and the STAB R switches on the control stand to the CUTOUT position.

SUBTASK 49-15-07-010-001

- (7) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Air Intake Door Seal Removal

SUBTASK 49-15-07-020-001

- (1) Do the steps that follow to remove the air inlet door seal [6] (Figure 401):
- (a) Remove the bolts [1] and the washers [2] that attach the air inlet door seal [6] to the inlet duct [4].
 - (b) Remove the bolts [3] and the washers [2] that attach the air inlet door seal [6] to the inlet duct [4].
 - (c) Remove the air inlet door seal [6].

NOTE: The air inlet door seal [6] is removed from outside the APU compartment.

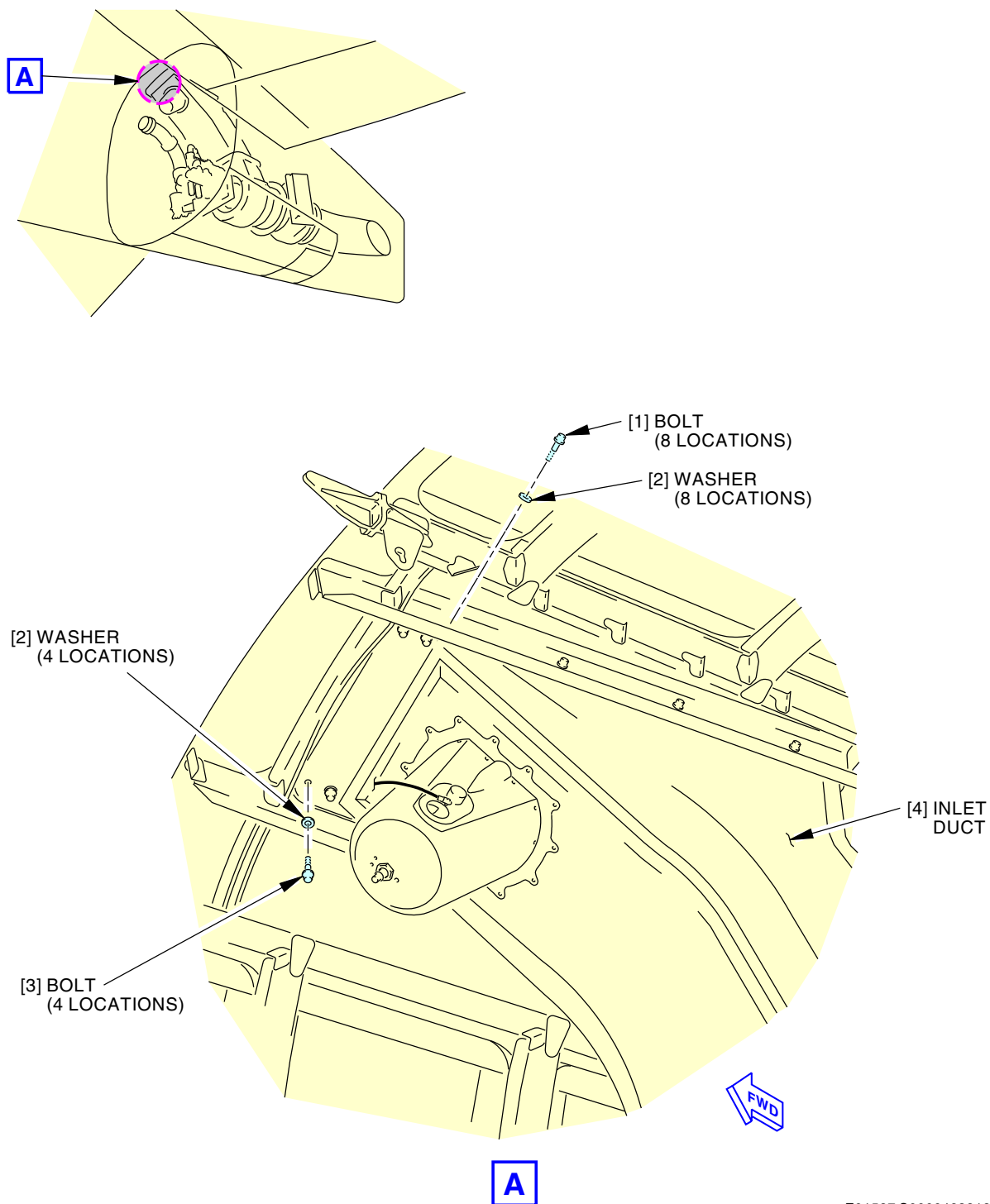
————— END OF TASK —————

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**APU Inlet Door Seal Installation
Figure 401/49-15-07-990-801 (Sheet 1 of 2)**

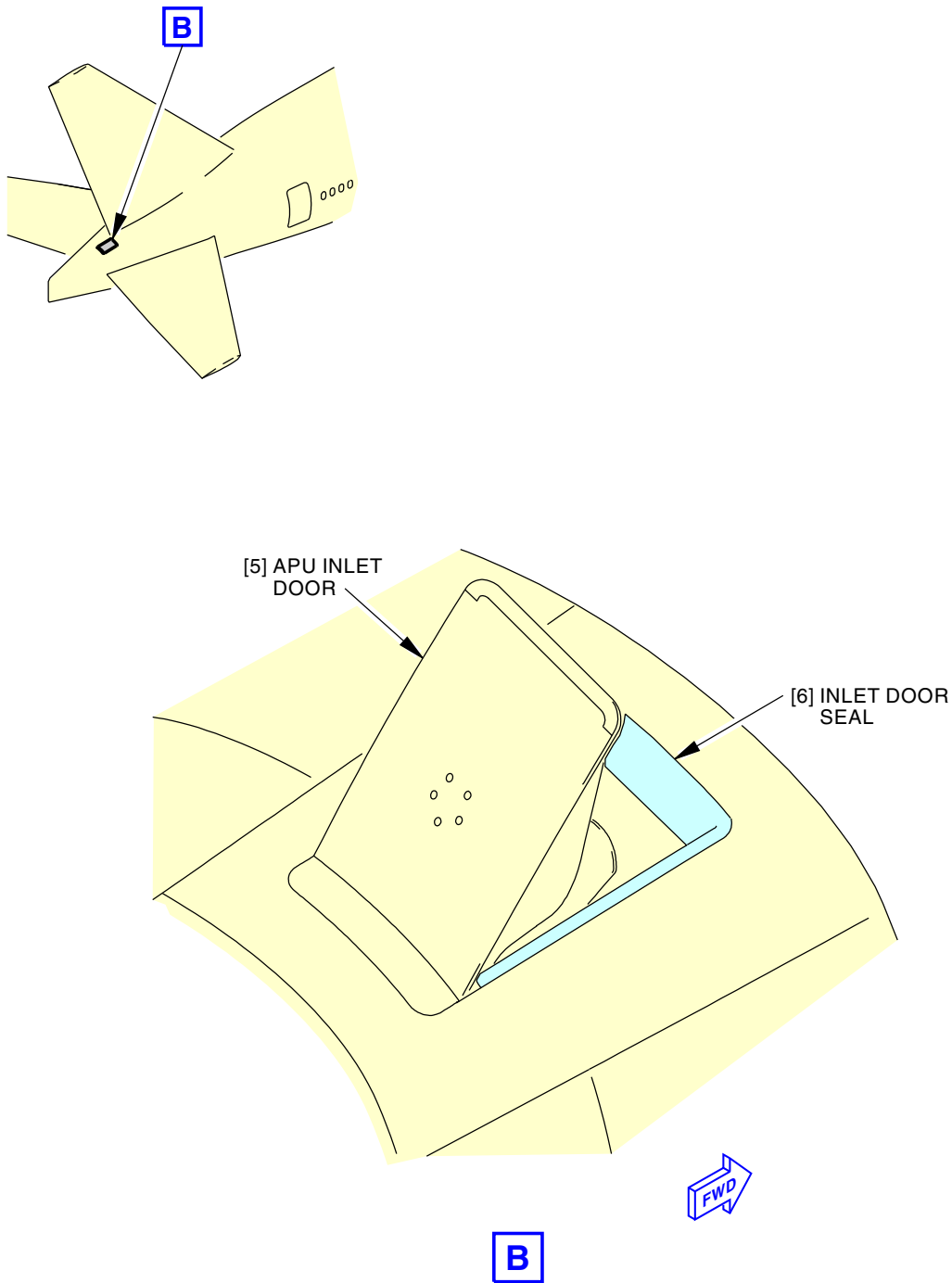
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APU Inlet Door Seal Installation
Figure 401/49-15-07-990-801 (Sheet 2 of 2)

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TASK 49-15-07-400-801

3. APU Air Inlet Door Seal Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-15-06-820-801	Inlet Door Actuator Adjustment (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Air inlet door seal	49-15-07-01-080	ARO ALL

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. APU Air Intake Door Seal Installation

SUBTASK 49-15-07-420-001

- (1) Do the steps that follow to install the air inlet door seal [6] (Figure 401):
 - (a) Put the air inlet door seal [6] on the inlet duct [4].

NOTE: The air inlet door seal [6] is installed from outside of the APU compartment.
 - (b) Install the washers [2] and the bolts [1].

NOTE: The fasteners for the air inlet door seal [6] are installed from inside the APU compartment.

 - 1) Tighten the bolts [1].
 - (c) Install the washers [2] and the bolts [3].
 - 1) Tighten the bolts [3].

SUBTASK 49-15-07-820-001

- (2) Make sure the inlet door actuator is correctly adjusted. To adjust it, do this task: Inlet Door Actuator Adjustment, TASK 49-15-06-820-801.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-07-860-007

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
K	8	C24652	APU CRK CTRL

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SUBTASK 49-15-07-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU selector.

SUBTASK 49-15-07-860-009

- (3) If it is necessary, supply the hydraulic power to the left system, the right system, and the center system. To supply hydraulic power, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801

SUBTASK 49-15-07-860-010

- (4) Set these switches on the FLT control HYD power panel, P61, to the NORM position:
- (a) L TAIL
 - (b) R TAIL
 - (c) C TAIL

SUBTASK 49-15-07-860-011

- (5) Set the STAB C and the STAB R switches on the control stand to the NORM position.

SUBTASK 49-15-07-410-001

- (6) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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APU INLET FLANGE EXTENSION PLATE - REMOVAL/INSTALLATION

1. General

- A. This procedure gives the steps to remove and install the APU Inlet Flange Extension Plate in accordance with Honeywell Service Bulletins 331-49-7611 (Removal) and 331-49-7539 (Installation). Initial installation of the extension plate must be accomplished in concurrence with Honeywell Service Bulletins 331-49-7537 and 331-49-7538. Removal of the extension plate may be accomplished at operator's discretion based on experience and potential exposure to icing conditions.
- B. This procedure has these tasks:
 - (1) A removal of the APU inlet flange extension plate
 - (2) An installation of the APU inlet flange extension plate
- C. For this procedure, the APU inlet flange extension plate is referred to as the extension plate.

TASK 49-15-08-000-801

2. APU Inlet Flange Extension Plate Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-15-08-860-001

- (1) Make sure the APU selector is in the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-08-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-08-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Inlet Flange Extension Plate Removal

SUBTASK 49-15-08-020-001

- (1) Do the steps that follow to remove the extension plate:
 - (a) Remove the APU inlet upper access panel [3] from the left side of the APU inlet.
 - (b) Remove the seven bolts [1] which attach the extension plate [2] to the flange plate.
 - (c) Withdraw the extension plate [2] through the access opening.
 - (d) Re-install the APU inlet upper access panel [3].

SUBTASK 49-15-08-890-001

- (2) Make a record of the service bulletin number (331-49-7611) and/or revision number in the engine log book or equivalent engine records.

SUBTASK 49-15-08-890-002

- (3) Enter Change No. 71 on the APU identification plate adjacent to MOD RECORD.

F. Put the Airplane Back to its Usual Condition.

SUBTASK 49-15-08-010-002

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-08-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-08-860-004

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

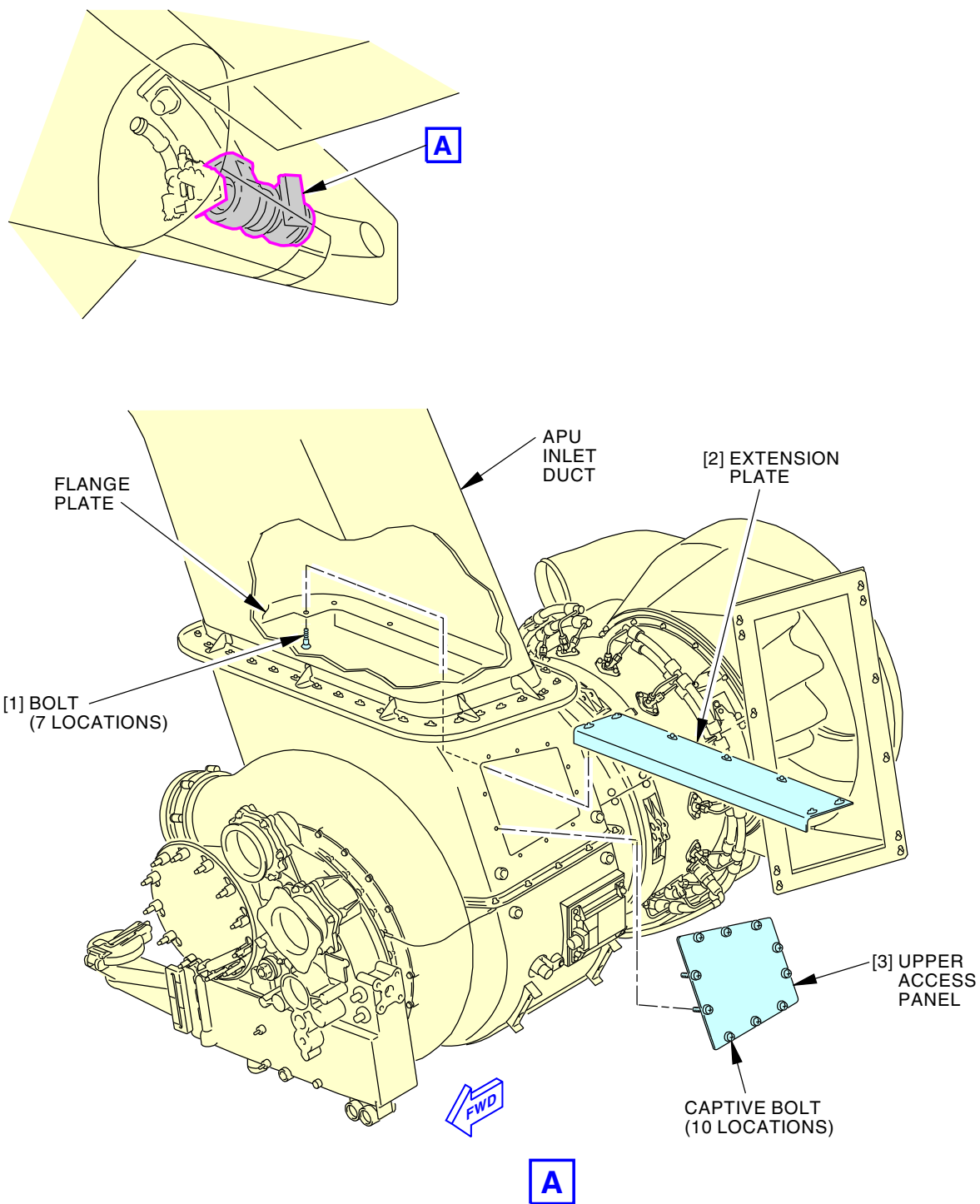
————— END OF TASK —————

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**Inlet Flange Extension Plate Installation
Figure 401/49-15-08-990-801**

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TASK 49-15-08-400-801

3. APU Inlet Flange Extension Plate Installation

(Figure 401)

A. General

- (1) This task can only be accomplished on APUs with Honeywell Service Bulletins 331-49-7537 and 331-49-7538 accomplished previously or concurrently.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Installation

SUBTASK 49-15-08-860-005

- (1) Make sure the APU selector is in the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-08-860-006

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-08-010-003

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access panels that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Inlet Flange Extension Plate Installation

SUBTASK 49-15-08-020-002

- (1) Do the steps that follow to install the extension plate:
 - (a) Remove the APU inlet upper access panel [3] from the left side of the APU inlet.

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- (b) Insert the extension plate [2] through the access opening and position it on the upper surface of the flange plate.

NOTE: The extension plate mounts onto the upper surface of the flange plate with the nutplates oriented upward.

- (c) Lubricate the threads of the attaching bolts [1].
(d) Attach the extension plate [2] to the flange plate with the seven bolts [1].
 1) Tighten the bolts to 55-65 pound-inches (6.21-7.34 newton-meters).
(e) Re-install the APU inlet upper access panel.

SUBTASK 49-15-08-890-003

- (2) Make a record of the service bulletin number (331-49-7539) and/or revision number in the engine log book or equivalent engine records.

SUBTASK 49-15-08-890-004

- (3) Enter Change No. 67 on the APU identification plate adjacent to MOD RECORD.

G. Put the Airplane Back to its Usual Condition.

SUBTASK 49-15-08-010-004

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access panels that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-08-860-007

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-08-860-008

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

———— **END OF TASK** ————

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APU INLET SCREEN - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU inlet screen
 - (2) An installation of the APU inlet screen.

TASK 49-15-51-000-801

2. APU Inlet Screen Removal

Figure 401

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-61-02-000-801	Speed Sensor Removal (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. APU Inlet Screen Removal

SUBTASK 49-15-51-020-001

- (1) Do this task: Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801.

SUBTASK 49-15-51-020-002

- (2) Do these steps to remove the APU inlet screen from the APU compressor inlet:
- (a) Remove the two bolts [1] that attach the gearbox vent tube to the upper inlet plenum.
 - (b) Remove the two nuts [4] that attach the inlet pressure tube [3] to the upper inlet plenum and pneumatic cluster.
 - (c) Disconnect and remove the inlet pressure tube [3] from the upper inlet plenum and pneumatic cluster.
 - 1) Remove and discard the four packings [2].
 - (d) Remove the bolt [5] that attaches the clamp and buffer air tube to the upper inlet plenum.
 - (e) Disconnect the fitting [9] for the buffer air tube from the compressor housing.

NOTE: It is not necessary to remove the buffer air tube from the APU.
 - (f) Do these steps to remove the heater port plug [8] from the lower inlet plenum:
 - 1) Remove the lockwire that attaches the bolt with the heater port plug [8].
 - 2) Remove the heater port plug [8].
 - a) Remove and discard the packing [6].
 - (g) Remove the two bolts [16] that attach the two clamps and oil cooler supply tube to the upper inlet plenum.

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- (h) Do this task: Speed Sensor Removal, TASK 49-61-02-000-801.

NOTE: It is necessary to remove speed sensors 1 and 2.

- (i) Remove the 12 nuts [10], 12 washers [11], 12 spacers [13] and 12 bolts [14] that attach the upper inlet plenum to the lower inlet plenum.

NOTE: The jumper [12] and lanyard [15] will be disconnected from the upper and lower inlet plenums.

- (j) Lift and remove the upper inlet plenum [17] from the lower inlet plenum.

- (k) Loosen the 11 captive screws [22] that attach the lower inlet plenum access door to the lower inlet plenum and remove the access door.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.

- (l) Remove the six nuts [21], 12 washers [20] and six bolts [19] that attach the upper inlet screen [18] and lower inlet screen [23] to the APU compressor inlet.

- (m) Remove the upper inlet screen [18].

- (n) Remove the lower inlet screen [23] by turning the screen around the APU compressor inlet.

NOTE: If it is necessary, carefully push down on the lower inlet plenum to disengage the bolt tabs from the lower inlet screen and the installed baffle.

- (o) Make sure you install all necessary protection covers.

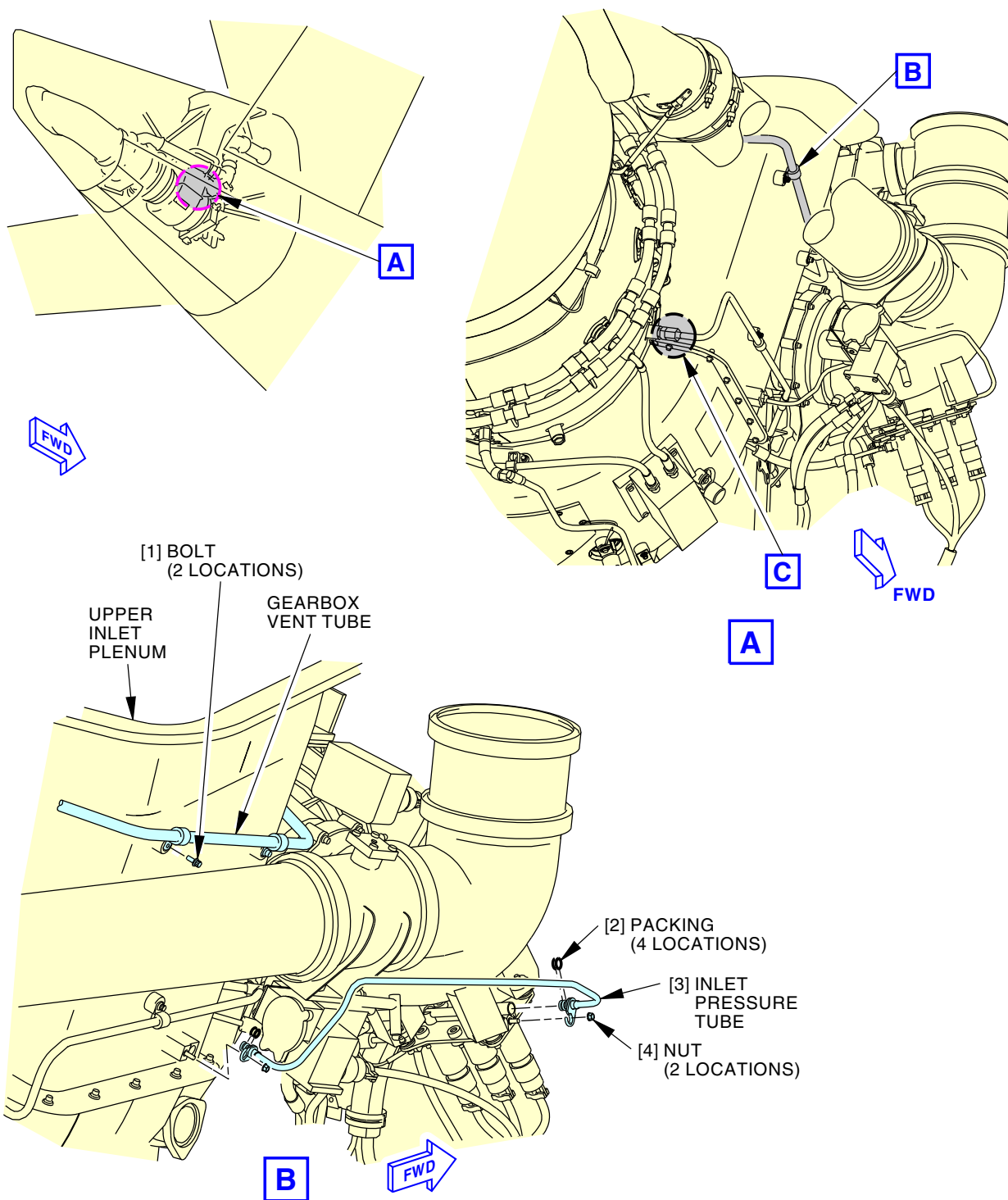
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**APU Inlet Screen Installation
Figure 401/49-15-51-990-801 (Sheet 1 of 5)**

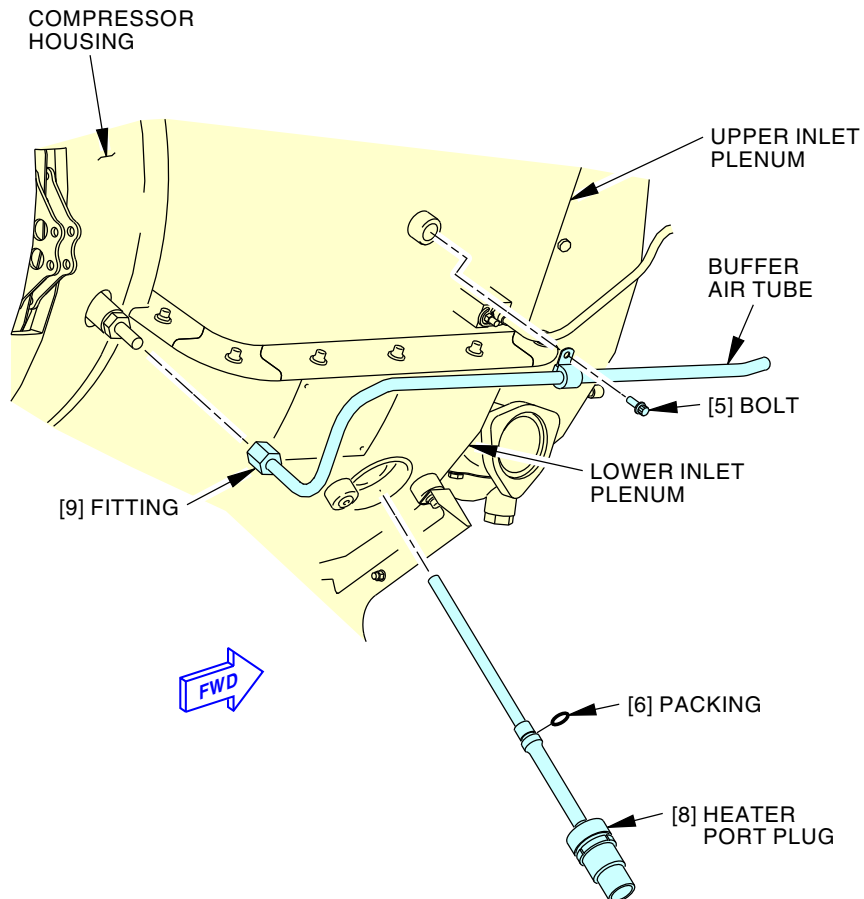
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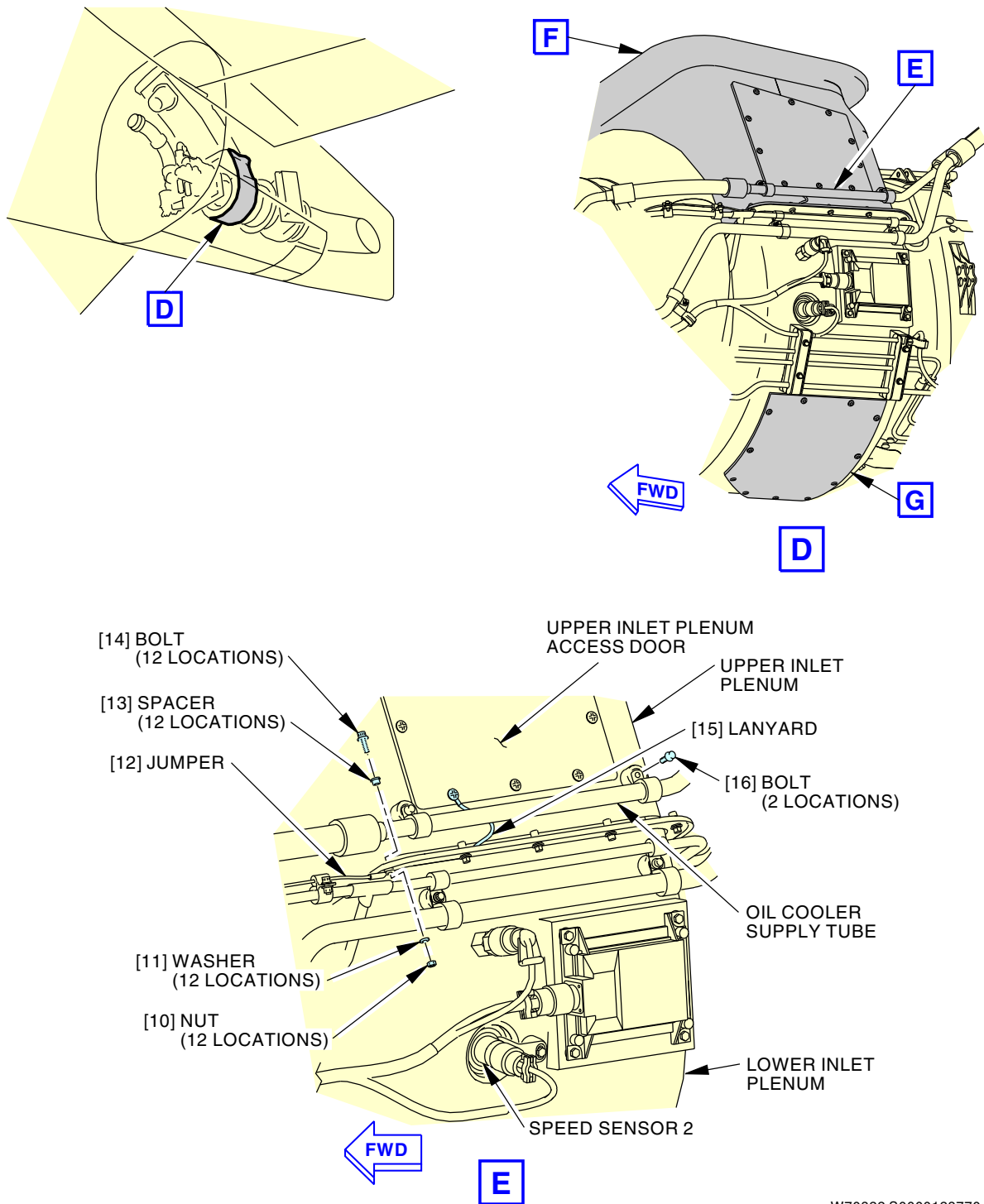
APU Inlet Screen Installation
Figure 401/49-15-51-990-801 (Sheet 2 of 5)

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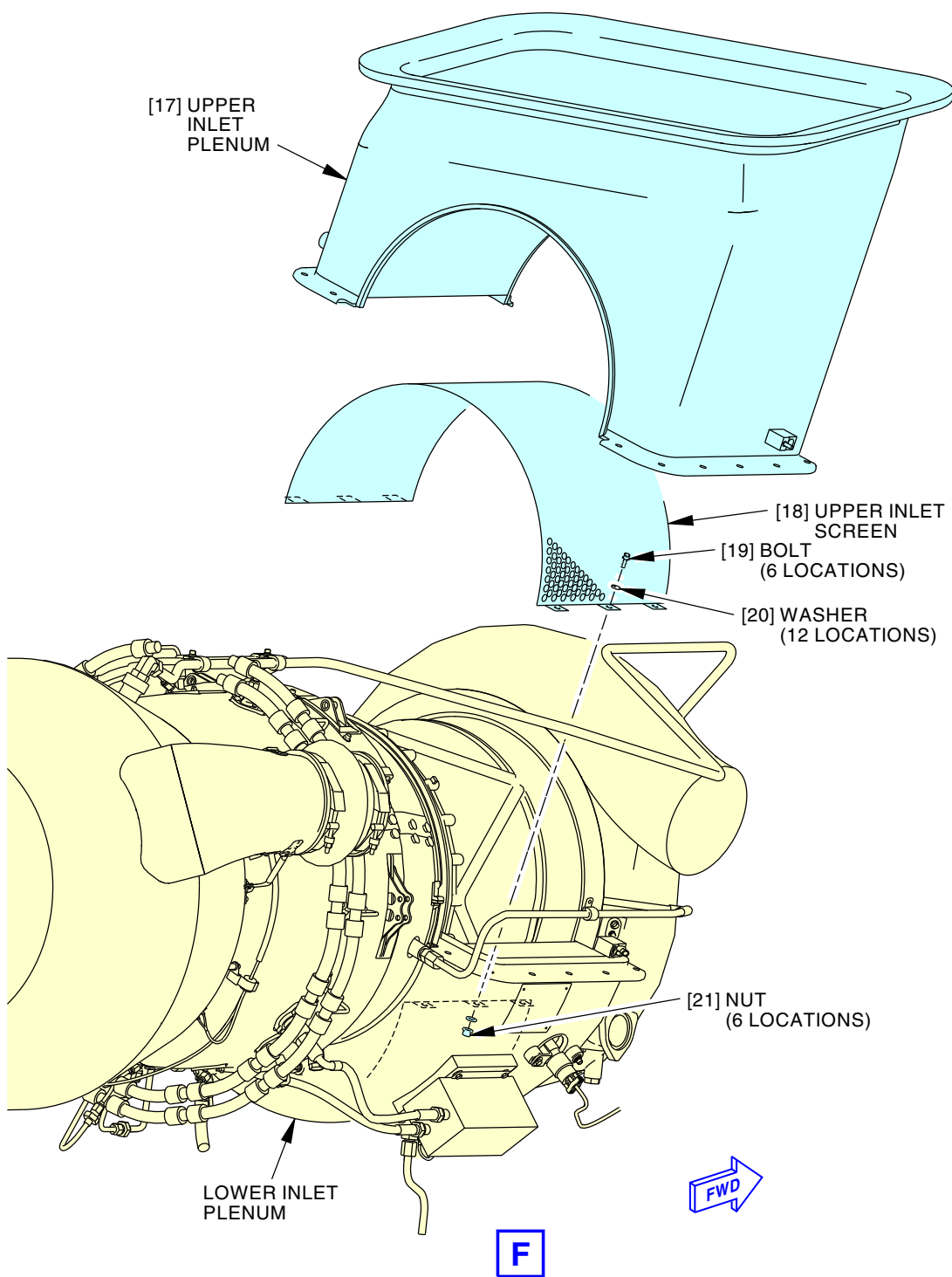
**APU Inlet Screen Installation
Figure 401/49-15-51-990-801 (Sheet 3 of 5)**

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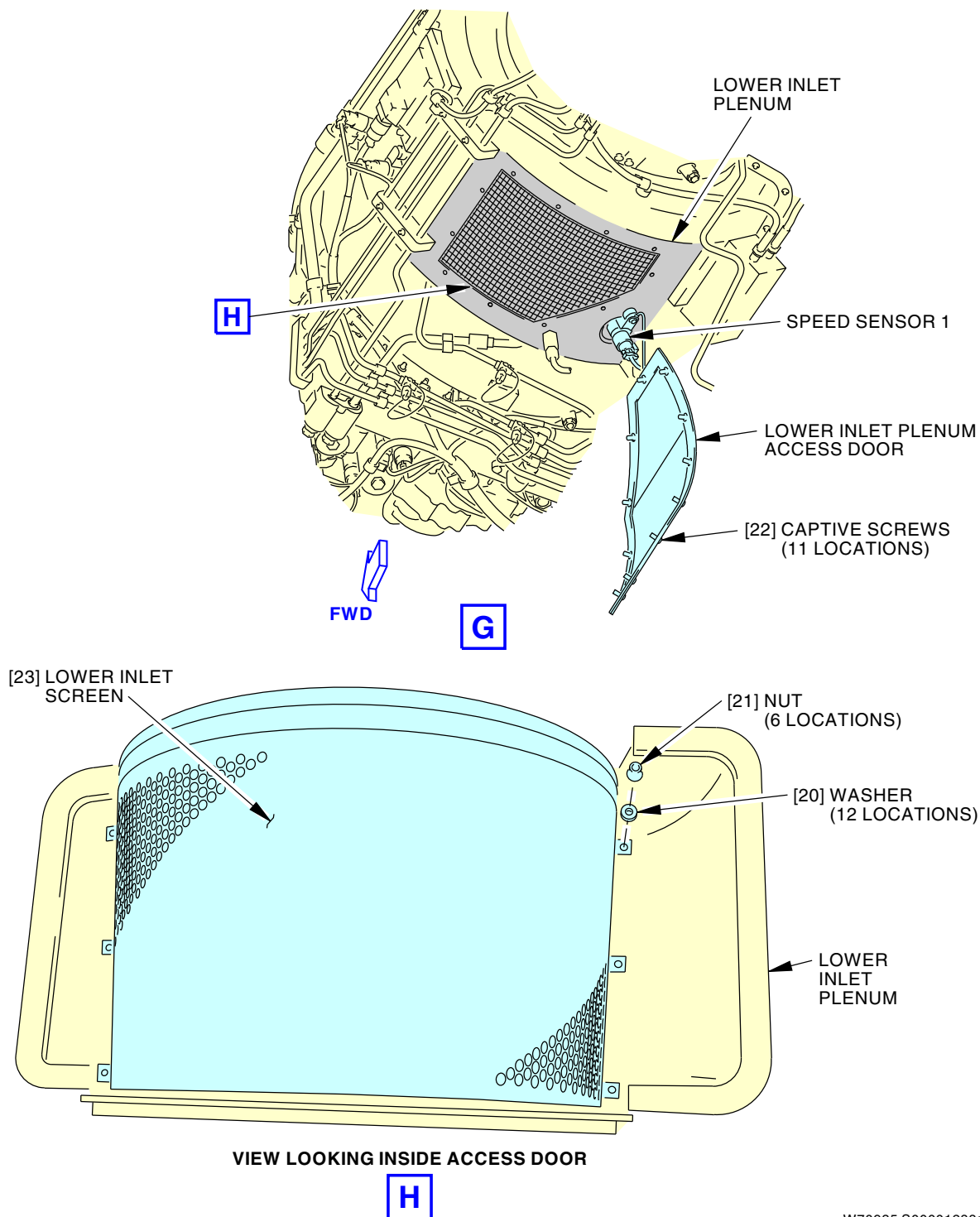
APU Inlet Screen Installation
Figure 401/49-15-51-990-801 (Sheet 4 of 5)

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APU Inlet Screen Installation
Figure 401/49-15-51-990-801 (Sheet 5 of 5)

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TASK 49-15-51-400-801

3. APU Inlet Screen Installation

(Figure 401)

A. References

Reference	Title
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-61-02-400-801	Speed Sensor Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-53-53-01-135	ARO ALL
6	Packing	49-28-01-01-012	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. APU Inlet Screen Installation

SUBTASK 49-15-51-420-001



CAUTION REMOVE THE PROTECTION COVERS FROM ALL OPENINGS. DAMAGE TO THE ENGINE CAN OCCUR.

- (1) Do these steps to install the APU inlet screen on the APU compressor inlet:
 - (a) Put the lower inlet screen [23] in position by turning the screen around the APU compressor inlet.
 - (b) Install the upper inlet screen [18] to the lower inlet screen [23] and align the six bolt holes for the two screens.
 - (c) Install the 12 washers [20], six bolts [19] and six nuts [21] that attach the upper inlet screen [18] and lower inlet screen [23] to the APU compressor inlet.
 - 1) Tighten the six bolts [19] to 50 in-lb (5.6 N·m).
 - (d) Install the lower inlet plenum access door to the lower inlet plenum and tighten the 11 captive screws [22].
 - (e) Install the upper inlet plenum [17] to the lower inlet plenum with the 10 spacers [13], 10 bolts [14], 10 washers [11] and 10 nuts [10].

NOTE: The other two sets of parts attach the jumper [12] and lanyard [15] to the lower inlet plenum.

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- (f) Install the jumper [12] to the lower inlet plenum with the spacer [13], bolt [14], washer [11] and nut [10].
- (g) Install the lanyard [15] to the upper inlet plenum with the spacer [13], bolt [14], washer [11] and nut [10].
- (h) Tighten the 12 nuts [10] to 40 in-lb (4.5 N·m).
- (i) Do this task: Speed Sensor Installation, TASK 49-61-02-400-801.
NOTE: It is necessary to install speed sensors 1 and 2.
- (j) Install the oil cooler supply tube and two clamps to the upper inlet plenum with the two bolts [16].
 - 1) Tighten the two bolts [16] to 40 in-lb (4.5 N·m).
- (k) Lubricate the four new packings [2] and new packing [6] with Mobil Jet Oil II, D00520.
- (l) Do these steps to install the heater port plug [8] to the lower inlet plenum:
 - 1) Install the packing [6] on the heater port plug [8].
 - 2) Lubricate the threads of the heater port plug [8] with the oil.
 - 3) Install the heater port plug [8] in the lower inlet plenum and hand-tighten only.
 - 4) Install the MS20995NC20 lockwire, G02166 on the bolt and heater port plug [8].
- (m) Lubricate the threads of the buffer air tube with the oil and connect the fitting [9] to the compressor housing.
- (n) Install the buffer air tube and clamp to the upper inlet plenum with the bolt [5].
 - 1) Tighten the bolt [5] to 40 in-lb (4.5 N·m).
- (o) Install the two packings [2] on each end of the inlet pressure tube [3].
- (p) Install the inlet pressure tube [3] to the upper inlet plenum and pneumatic cluster with the two nuts [4].
 - 1) Tighten the two nuts [4] to 40 in-lb (4.5 N·m).
- (q) Install the gearbox vent tube and two clamps to the upper inlet plenum with the two bolts [1].
 - 1) Tighten the two bolts [1] to 40 in-lb (4.5 N·m).

SUBTASK 49-15-51-420-002

- (2) Do this task: Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

———— **END OF TASK** ————

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APU INLET SCREEN - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the APU inlet screen.

TASK 49-15-51-200-801

2. APU Inlet Screen Inspection

A. References

Reference	Title
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-15-51-000-801	APU Inlet Screen Removal (P/B 401)
49-15-51-400-801	APU Inlet Screen Installation (P/B 401)
49-21-00-200-801	APU Engine Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Inspection

SUBTASK 49-15-51-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-15-51-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-51-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Inlet Screen Inspection

SUBTASK 49-15-51-010-002

- (1) Loosen the 10 captive screws that attach the upper inlet plenum access door to the upper inlet plenum and remove the access door.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.

SUBTASK 49-15-51-010-003

- (2) Loosen the 11 captive screws that attach the lower inlet plenum access door to the lower inlet plenum and remove the access door.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.

SUBTASK 49-15-51-210-001

- (3) Do these steps to examine the two-piece V-band clamp on the engine compressor inlet bellmouth:

- (a) With a flashlight and the two plenum access doors removed, visually examine the two-piece V-band clamp that attaches the engine compressor inlet bellmouth to the first-stage engine compressor housing if it is tilted or loose.

NOTE: The two-piece V-band clamp is installed in the APU inlet screen.

NOTE: You can use a long screwdriver or a 0.25 in. (6.35 mm) diameter metal rod through the APU inlet screen and push the clamp bolts to see if the V-band clamp moves.

- (b) If the two-piece V-band clamp moves, do these steps:

- 1) Remove the upper and lower APU inlet screens. To remove them, do this task: APU Inlet Screen Removal, TASK 49-15-51-000-801.
- 2) Use oil or thread lubricant on the two clamp bolts and remove the two-piece V-band clamp.
- 3) Examine the two-piece V-band clamp for visual signs of excessive wear on the inner diameter and angled lips.
- 4) Examine the mating flanges on the engine compressor inlet bellmouth and first-stage engine compressor housing for excessive wear.

NOTE: Excessive wear is the smearing of metal on the inner diameter and angled lips of the two-piece V-band clamp, a thinning of the forward or aft lips of the V-band clamp to a sharp knife-edge condition or a thinning of the flanges on the bellmouth or compressor housing to a sharp knife-edge condition.

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- 5) If you find excessive wear on the two-piece V-band clamp or the mating flanges, replace the APU. To replace it, do these tasks:
Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801, Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.
- 6) If you did not find excessive wear on the two-piece V-band clamp or the mating flanges, do these steps:
 - a) Position the two-piece V-band clamp on the engine compressor inlet bellmouth and first-stage engine compressor housing.
 - b) Use oil or thread lubricant on the two clamp bolts and tighten the two-piece V-band clamp to 20 in-lb (2.3 N·m).
 - c) Lightly tap the edge of the two-piece V-band clamp with a rubber mallet, STD-3906.
 - d) Tighten the two-piece V-band clamp to 40 in-lb (4.5 N·m)-44 in-lb (5.0 N·m).
 - e) Lightly tap the edge of the two-piece V-band clamp with a rubber mallet, STD-3906.
 - f) Continue to tighten and tap the two-piece V-band clamp until the torque value stays constant.
 - g) Make sure the two-piece V-band clamp and engine compressor inlet bellmouth are installed tightly by pushing on the bellmouth with your hands.
- 7) Install the upper and lower APU inlet screens. To install them, do this task: APU Inlet Screen Installation, TASK 49-15-51-400-801.

SUBTASK 49-15-51-210-002

- (4) Do these steps to examine the lower APU inlet screen:
 - (a) Visually examine the lower APU inlet screen for missing or loose wires.
NOTE: You find loose wires when the wires are non-parallel to its adjacent wires.
 - (b) Apply a light fingertip pressure on the APU inlet screen to make sure the wire(s) cannot be removed. If there is movement in the wire(s), there is a failure of the APU inlet screen.
 - (c) If the APU inlet screen shows no signs of missing or loose wires, the APU inlet screen is satisfactory.
 - (d) If the APU inlet screen shows signs of loose wires, replace the lower APU inlet screen. To replace it, do these tasks: APU Inlet Screen Removal, TASK 49-15-51-000-801 and APU Inlet Screen Installation, TASK 49-15-51-400-801.
 - (e) If the APU inlet screen is replaced because there were signs of missing wires, do the borescope procedure for the load and power section impeller blades. To do the borescope procedure, do this task: APU Engine Inspection, TASK 49-21-00-200-801.

SUBTASK 49-15-51-410-001

- (5) Install the lower inlet plenum access door to the lower inlet plenum and tighten the 11 captive screws.

SUBTASK 49-15-51-410-002

- (6) Install the upper inlet plenum access door to the upper inlet plenum and tighten the 10 captive screws.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-51-410-003

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-15-51-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-15-51-860-004

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

————— **END OF TASK** —————

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APU INLET DUCT - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the APU inlet duct and intake plenum flange seal for condition and security when the APU is removed.

TASK 49-15-99-210-801

2. APU Inlet Duct and Intake Plenum Flange Seal Inspection

(Figure 601)

A. References

Reference	Title
49-15-06-000-801	Inlet Door Actuator Removal (P/B 401)
49-15-06-400-801	APU Air Inlet Door Actuator Installation (P/B 401)
49-15-99-300-801	APU Inlet Duct Repair (P/B 801)

B. Procedure

SUBTASK 49-15-99-210-001

- (1) Examine the internal and external portion of the APU inlet duct and the intake plenum flange seal for condition and security.

SUBTASK 49-15-99-220-001

- (2) If it is necessary, do these steps to examine the cutout hole for the inlet door actuator for cracks:
- (a) Remove the inlet door actuator. To remove it, do this task: Inlet Door Actuator Removal, TASK 49-15-06-000-801.
 - (b) Examine the area adjacent to the cutout hole for the inlet door actuator for cracks.
 - (c) If you find cracks that are less than 4 in. (10.2 cm) adjacent to the cutout hole and in the sandwich facesheet (core area and not in the solid laminate), you can repair the area. To repair it, do this task: APU Inlet Duct Repair, TASK 49-15-99-300-801.
NOTE: If you find cracks that are more than 4 in. (10.2 cm), contact Boeing Service Engineering for the disposition of the APU inlet duct. Boeing engineering and structural repair personnel will review airline operator-supplied information and provide recommendations on a case-by-case basis.
 - (d) If you do not find cracks or you have repaired the area, install the inlet door actuator. To install it, do this task: APU Air Inlet Door Actuator Installation, TASK 49-15-06-400-801.

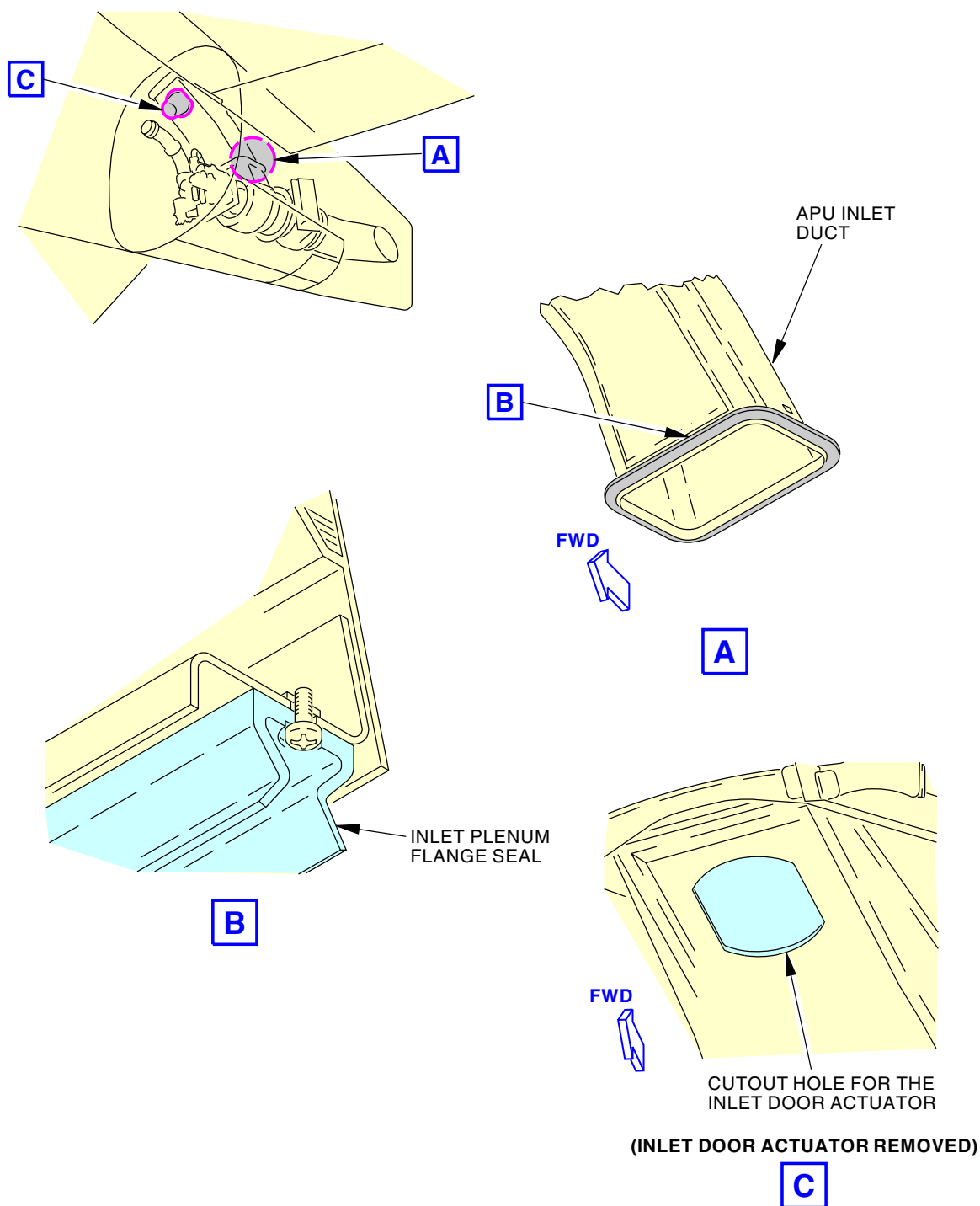
———— **END OF TASK** ————

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APU Inlet Duct Inspection
Figure 601/49-15-99-990-801

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APU INLET DUCT - REPAIRS

1. General

- A. This procedure has the task to repair the APU inlet duct if you find cracks that are less than 4 in. (10.2 cm) in the area adjacent to the cutout hole for the inlet door actuator and when the APU is removed.

TASK 49-15-99-300-801

2. APU Inlet Duct Repair

(Figure 801)

A. References

Reference	Title
49-15-06-000-801	Inlet Door Actuator Removal (P/B 401)
49-15-06-400-801	APU Air Inlet Door Actuator Installation (P/B 401)
SRM 51-70-04	Structural Repair Manual

B. Consumable Materials

Reference	Description	Specification
G02451	Resin - Composite Structural Repair, 2 Part (150F Cure)	BMS8-301 Class 2

C. Procedure

SUBTASK 49-15-99-340-001

- (1) Do these steps to repair the APU inlet duct:

- (a) Make sure the inlet door actuator is removed. If the inlet door actuator is not removed, do this task: Inlet Door Actuator Removal, TASK 49-15-06-000-801.
- (b) Make sure the cracks adjacent to the cutout hole for the inlet door actuator are less than 4 in. (10.2 cm) and show no core disbond in the area.

NOTE: If you find cracks that are more than 4 in. (10.2 cm), contact Boeing Service Engineering for the disposition of the APU inlet duct. Boeing engineering and structural repair personnel will review airline operator-supplied information and provide recommendations on a case-by-case basis.

NOTE: The basic material of the APU inlet duct is fiberglass cloth (BMS 8-139, Type 1581, Class 2) or fiberglass cloth (BMS 8-139, Type 7781, Class 2) (alternative).

- (c) Do the repair procedures for wet layup materials in SRM 51-70-04:

- 1) Look at the cracks in the area to find which applicable repair procedure is necessary.

NOTE: Use the laminating resin, G02451 for the repair procedure. Use the correct structural ply material of BMS 9-3 Type H2 (style 1581) or Type H3 (style 7781).

- 2) The approved repair procedures are identified as follows:

NOTE: In the repair instructions for each repair procedure, replace the applicable data from "one repair ply of fabric for each damaged ply of the panel plus one more additional structural ply" to "one repair ply of fabric for each damaged ply of the panel plus two more additional structural plies". You apply the two more additional structural plies around the cutout hole for the inlet door actuator.

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- a) Repair Number 1: Repair of Damage to One Skin of a Honeycomb Panel.
 - b) Repair Number 2: Repair of Damage that is More Than 0.50 Inch in Diameter to One Skin and the Honeycomb Core.
 - c) Repair Number 3: Repair of Damage to One Skin and the Honeycomb Core.
 - d) Repair Number 4: Repair of Damage to the Two Skins and the Honeycomb Core - Access to the Two Sides of the Panel.
 - e) Repair Number 11: Potted Core Repair.
- 3) Make sure the additional second ply overlaps the additional first ply by a minimum of 0.5 in. (1.3 cm).
- 4) Make sure the width of the two more additional structural plies is the width of the largest repair ply plus the overlap or 2.0 in. (5.1 cm), whichever is the larger of the two measurements.
- (d) Install the inlet door actuator. To install it, do this task: APU Air Inlet Door Actuator Installation, TASK 49-15-06-400-801.

———— **END OF TASK** ————

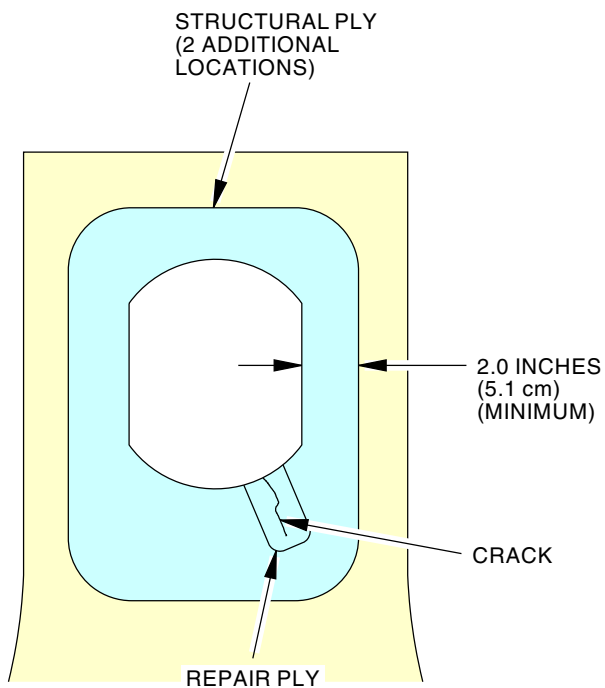
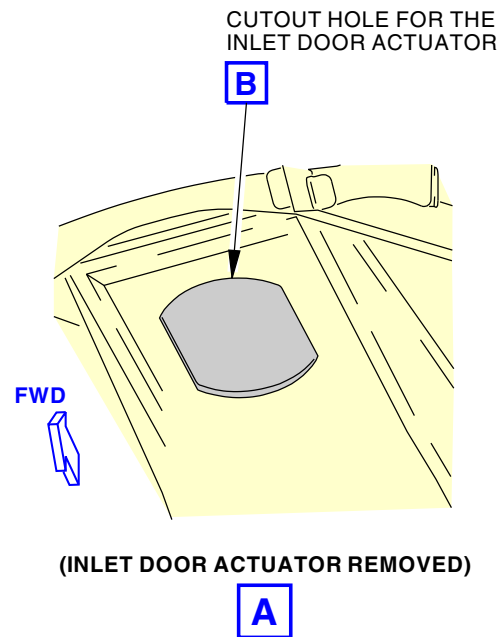
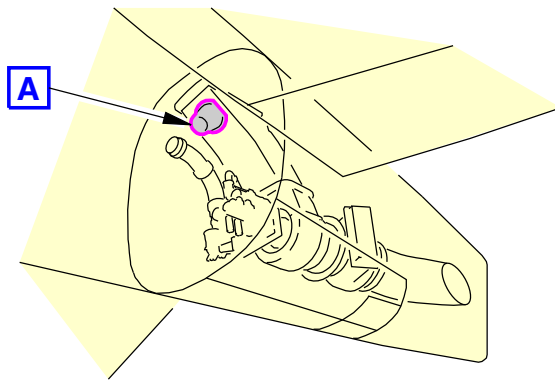
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CUTOUT HOLE FOR THE INLET
DOOR ACTUATOR

B

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APU Inlet Duct Repair
Figure 801/49-15-99-990-802

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APU DRAINS AND VENTS - INSPECTION/CHECK

1. **General**

- A. This procedure has these tasks:
- (1) An inspection of the APU drain system
 - (2) An APU leakage check.
- B. To do the APU leakage check, you must operate the APU and examine the drain mast for drops of fuel and oil.

TASK 49-16-00-200-801

2. **APU Drain System Inspection**

(Figure 601)

A. General

- (1) The drain system inspection visually examines the drain lines and their parts for damage.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-16-00-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-16-00-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-00-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-00-210-001

- (4) Do the steps that follow to visually examine the APU drain lines:
- (a) Examine the tubes for cracks, worn areas, and corrosion.
 - (b) Examine the tube connections for damaged threads and cracks.
 - (c) Examine the clamps and the brackets for distortion and cracks.

SUBTASK 49-16-00-210-002

- (5) Do the steps that follow to make sure the drain mast aligns with the APU access door:
- (a) Hold the right APU access door in the closed position.
 - (b) Make sure the drain tube assembly correctly engages the drain mast.
 - (c) Make sure the right APU access door correctly aligns with the tail cone structure.

SUBTASK 49-16-00-410-001

- (6) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-00-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-00-860-004

- (8) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

————— END OF TASK —————

TASK 49-16-00-200-802

3. APU Drain System Leakage Check

(Figure 601)

A. General

- (1) This task examines the quantity of oil, fuel or other fluids that drains to the APU drain mast.

B. References

<u>Reference</u>	<u>Title</u>
49-11-00-860-804	APU Starting and Operation (P/B 201)

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(Continued)

Reference	Title
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-00-990-802	Figure: Oil Consumption Limit Graph (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-16-01-000-801	Combustor Drain Valve Removal (P/B 401)
49-16-01-400-801	Combustor Drain Valve Installation (P/B 401)
49-27-04-200-801	Magnetic Chip Collector Inspection (P/B 201)
49-27-09-000-801	Air/Oil Cooler Removal (P/B 401)
49-27-09-400-801	Air/Oil Cooler Installation (P/B 401)
49-31-31-000-801	Fuel Cluster Removal (P/B 401)
49-31-31-400-801	Fuel Cluster Installation (P/B 401)
49-52-02-000-801	Inlet Guide Vane (IGV) Actuator Removal (P/B 401)
49-52-02-400-801	Inlet Guide Vane (IGV) Actuator Installation (P/B 401)
49-53-01-000-801	Surge Control Valve Removal (P/B 401)
49-53-01-400-801	Surge Control Valve Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure

SUBTASK 49-16-00-010-002

- (1) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-00-210-003

- (2) Do these steps to examine the three tell-tale drains:
- (a) Remove the cap one at a time from the three tell-tale drains and examine it for fluid.
- 1) If you find fluid in the cap, do these steps:
- a) Identify and make a note of which component the cap has the fluid in it.
- b) Remove the fluid from the cap.

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- 2) If no fluid is found, install the cap on the tell-tale drain.

Table 601/49-16-00-993-802 APU Drain Inspection

COMPONENT	FLUID	LEAKAGE LIMIT	RECOMMENDED ACTION
Fuel Cluster (Tell-Tale Drain)	Fuel or Oil	Less than one drop/minute (2.4 cc/hour)	No action is necessary.
		More than one drop/minute (2.4 cc/hour)	Replace the fuel cluster. To replace it, do these tasks: Fuel Cluster Removal, TASK 49-31-31-000-801 and Fuel Cluster Installation, TASK 49-31-31-400-801.
Surge Control Valve (Tell-Tale Drain)	Fuel	Less than one drop/minute (2.4 cc/hour)	No action is necessary.
		More than one drop/minute (2.4 cc/hour)	Replace the surge control valve. To replace it, do these tasks: Surge Control Valve Removal, TASK 49-53-01-000-801 and Surge Control Valve Installation, TASK 49-53-01-400-801.
Inlet Guide Vane (IGV) Actuator (Tell-Tale Drain)	Fuel	Less than one drop/minute (2.4 cc/hour)	No action is necessary.
		More than one drop/minute (2.4 cc/hour)	Replace the IGV actuator. To replace it, do these tasks: Inlet Guide Vane (IGV) Actuator Removal, TASK 49-52-02-000-801 and Inlet Guide Vane (IGV) Actuator Installation, TASK 49-52-02-400-801.
Combustor Drain Valve (Aft Drain)	Fuel	No leakage limit during an APU starting or after an APU shutdown	No action is necessary.
		Signs of fuel leakage during an APU operation	Replace the combustor drain valve. To replace it, do these tasks: Combustor Drain Valve Removal, TASK 49-16-01-000-801 and Combustor Drain Valve Installation, TASK 49-16-01-400-801.
Bearing Seals	Oil	Less than 10 drops/hour (0.4 cc/hour)	No action is necessary.
		More than 10 drops/hour (0.4 cc/hour)	Do this task: Magnetic Chip Collector Inspection, TASK 49-27-04-200-801. If the magnetic chip collectors are satisfactory, do a FIM check for odor in cabin (FIM 49-10 TASK 808). If there is no odor in cabin, do a check of the oil consumption limit graph (Figure 49-11-00-990-802).

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Table 601/49-16-00-993-802 APU Drain Inspection (Continued)

COMPONENT	FLUID	LEAKAGE LIMIT	RECOMMENDED ACTION
Eductor/Exhaust Duct (Aft Drain)	Oil	Signs of oil leakage during an APU operation or after an APU shutdown	Examine the inner surfaces of the eductor and exhaust duct for signs of oil leakage and find the oil source. If the air/oil cooler is the problem, replace the air/oil cooler. To replace it, do these tasks: Air/Oil Cooler Removal, TASK 49-27-09-000-801 and Air/Oil Cooler Installation, TASK 49-27-09-400-801. If the gearbox vent line or the turbine bearing seal is the problem, do this task: Magnetic Chip Collector Inspection, TASK 49-27-04-200-801. If the magnetic chip collectors are satisfactory, do a check of the oil consumption limit graph (Figure 49-11-00-990-802). If the oil supply, return or scavenge tubes are damaged, replace the APU.

SUBTASK 49-16-00-790-001

- (3) Do these steps for the APU leakage check:
- Put the 1 gallon (4 l) fuel resistant container, STD-4049 and 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the drain tubes.
 - Look at the three tell-tale drains that do not have caps installed.
 - Start and operate the APU at a no load condition for 15 minutes. To start the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - If you see drops of fluid, do these steps:
 - Identify which tell-tale drain or drain tube the fluid comes out.
 - Write the total number of drops of fluid for each component during the APU operation.
 - Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
NOTE: When you shutdown the APU, fuel can come out of the aft drain tube from the combustor drain. This is permitted during shutdown.
 - Use the total APU operation time and the number of drops to find the leakage rate for each component.
 - Make sure the leakage rates are in the leakage limits (Table 601).
 - If the leakage rates are more than the leakage limits, do the recommended action (Table 601).

SUBTASK 49-16-00-410-002

- (4) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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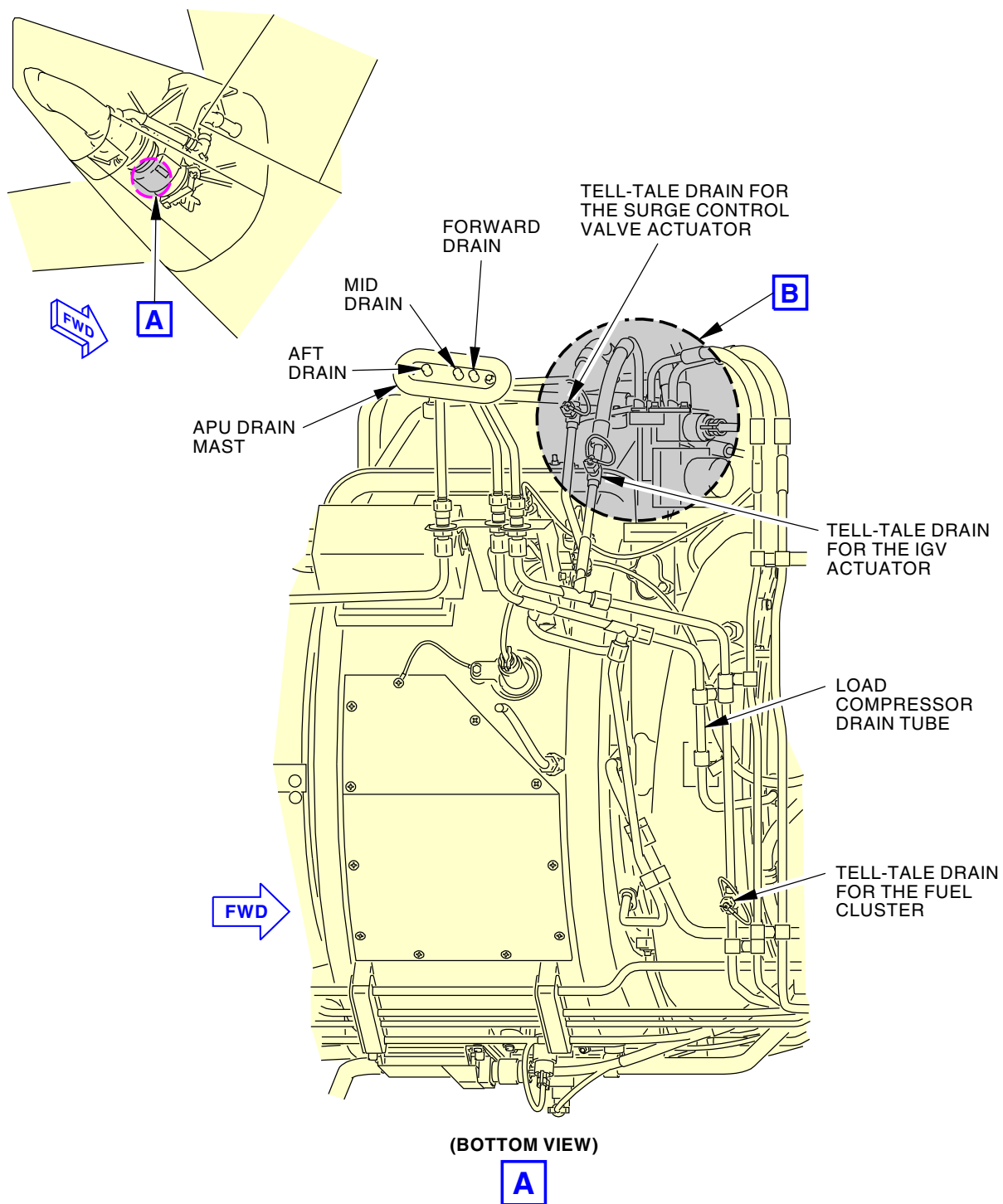
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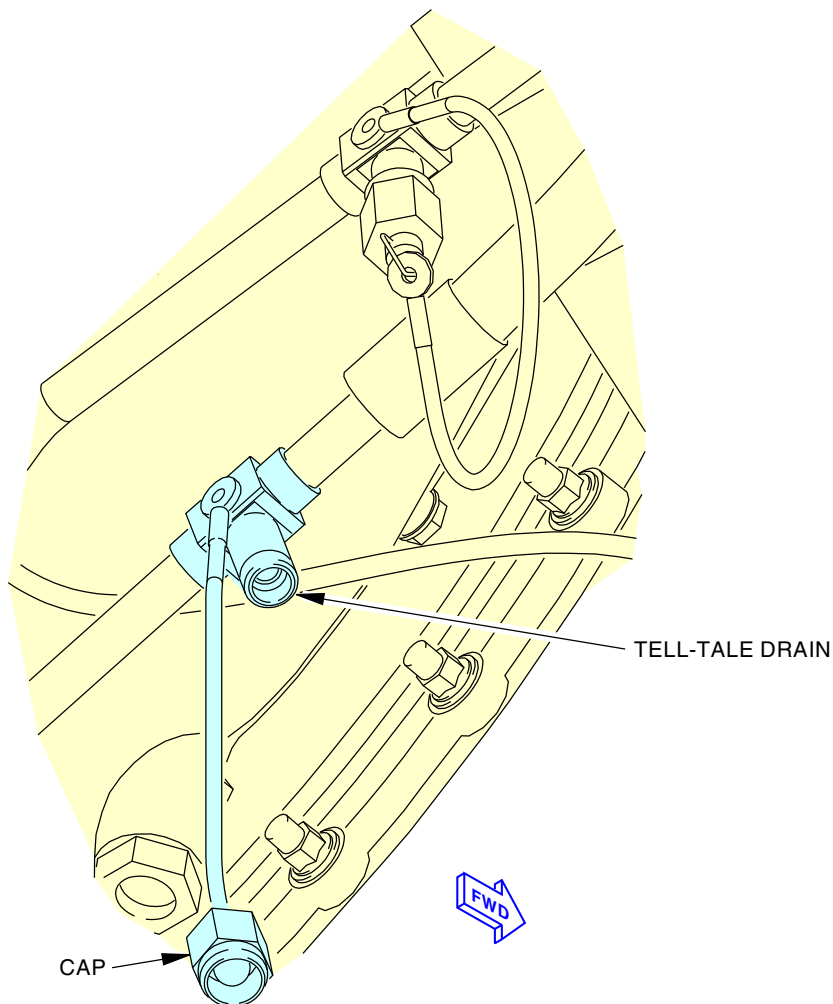
APU Drains Inspection
Figure 601/49-16-00-990-801 (Sheet 1 of 2)

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(EXAMPLE)

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APU Drains Inspection
Figure 601/49-16-00-990-801 (Sheet 2 of 2)

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COMBUSTOR DRAIN VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the combustor drain valve.
 - (2) An installation of the combustor drain valve.

TASK 49-16-01-000-801

2. Combustor Drain Valve Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-16-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-16-01-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-01-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Combustor Drain Valve Removal

SUBTASK 49-16-01-020-001

- (1) Do the steps that follow to remove the combustor drain valve [1]:
 - (a) Loosen the coupling nut [5] and disconnect the drain tube [3] from the drain line.
 - (b) Loosen the coupling nut [4] and disconnect the drain tube [3] from the combustor drain valve [1].
 - (c) Remove the combustor drain valve [1].
 - (d) Remove the gasket [2] from the combustor drain valve [1].
 - 1) Discard the gasket [2].

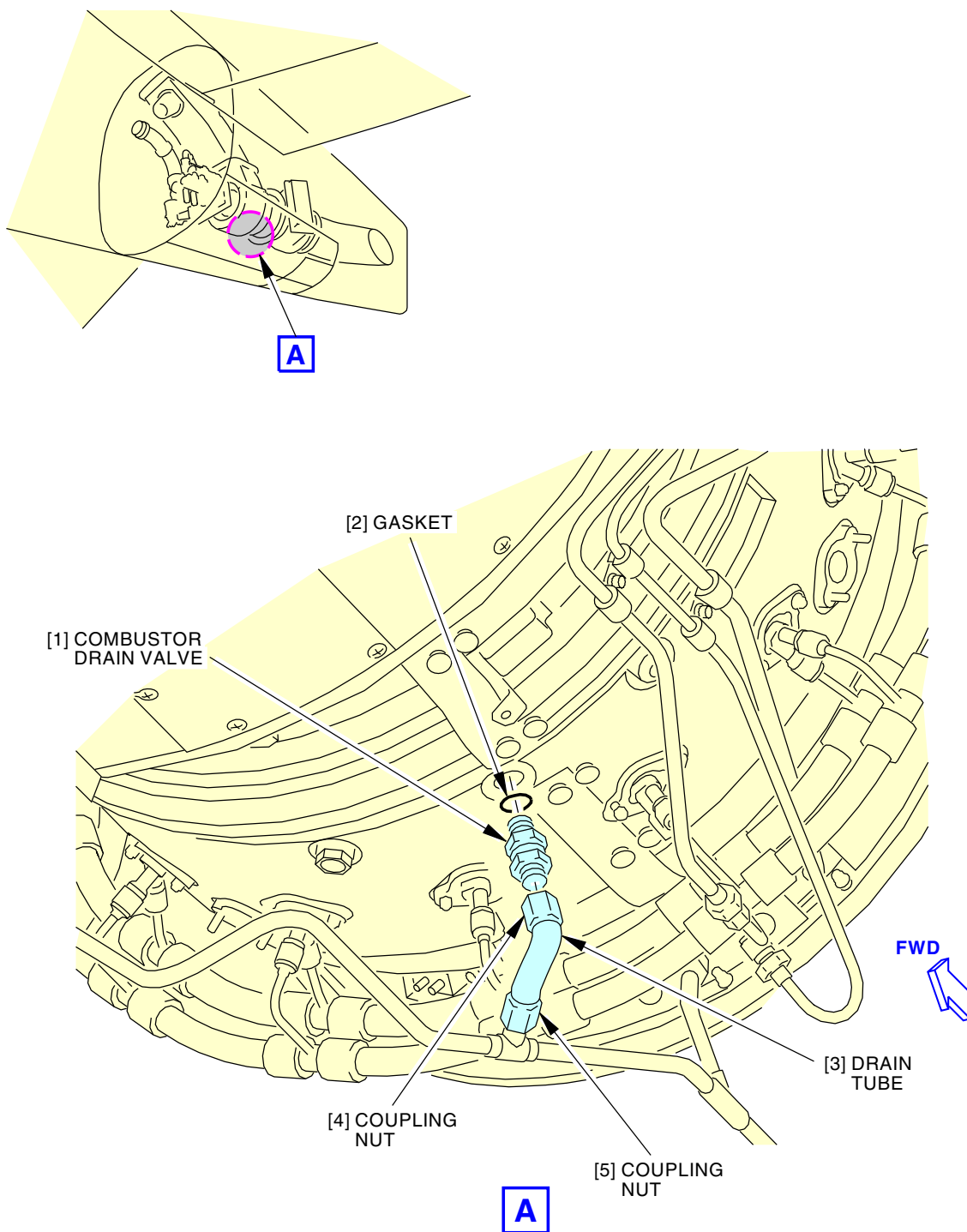
———— **END OF TASK** ————

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**Combustor Drain Valve Installation
Figure 401/49-16-01-990-801**

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TASK 49-16-01-400-801

3. Combustor Drain Valve Installation

(Figure 401)

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Combustor drain valve	49-16-01-01-050	ARO ALL
2	Gasket	49-16-01-01-055	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Combustor Drain Valve Installation

SUBTASK 49-16-01-420-001

- (1) Install the combustor drain valve:
 - (a) Install the gasket [2] on the combustor drain valve [1].
 - (b) Install the combustor drain valve [1].
 - (c) Connect the drain tube [3] to the combustor drain valve [1].
 - 1) Tighten the coupling nut [4].
 - (d) Connect the drain tube [3] to the drain line.
 - 1) Tighten the coupling nut [5].

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-01-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-01-860-004

- (2) Remove the DO-NOT-CLOSE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-16-01-410-001

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

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Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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LOAD COMPRESSOR DRAIN TUBE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the load compressor drain tube.
- (2) An installation of the load compressor drain tube.

TASK 49-16-02-000-801

2. Load Compressor Drain Tube Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. **Prepare for the Removal**

SUBTASK 49-16-02-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-16-02-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-02-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Load Compressor Drain Tube Removal

SUBTASK 49-16-02-020-001

- (1) Do these steps to remove the load compressor drain tube [2]:
 - (a) Remove the two nuts [3] and two bolts [5] that attach the two clamps [4] to the load compressor drain tube [2] and engine compressor bearing drain tube [8].

NOTE: The engine compressor bearing drain tube [8] is attached to the load compressor drain tube [2].
 - (b) Remove the two clamps [4] from the load compressor drain tube [2] and engine compressor bearing drain tube [8].
 - (c) Put the oil resistant container 1 gal, (4 l), STD-1058, below the load compressor drain tube [2].
 - (d) Remove the bolt [6] that attaches the load compressor drain tube [2] to the APU.
 - (e) Remove the bolt [6] that attaches the engine compressor bearing drain tube [8] to the APU.
 - (f) Remove the bolt [6] that attaches the drain tube [9] to the APU.
 - (g) Disconnect the coupling nut [1] for the load compressor drain tube from the bracket and mid drain tube.
 - (h) Remove the load compressor drain tube [2], engine compressor bearing drain tube [8] and drain tube [9].
 - (i) Remove the packing [7] from the load compressor drain tube [2].
 - 1) Discard the packing [7].
 - (j) Remove the packing [7] from the engine compressor bearing drain tube [8].
 - 1) Discard the packing [7].
 - (k) Remove the packing [7] from the drain tube [9].
 - 1) Discard the packing [7].
 - (l) Remove the oil resistant container 1 gal, (4 l), STD-1058.
 - (m) Make sure you install all necessary protection covers.

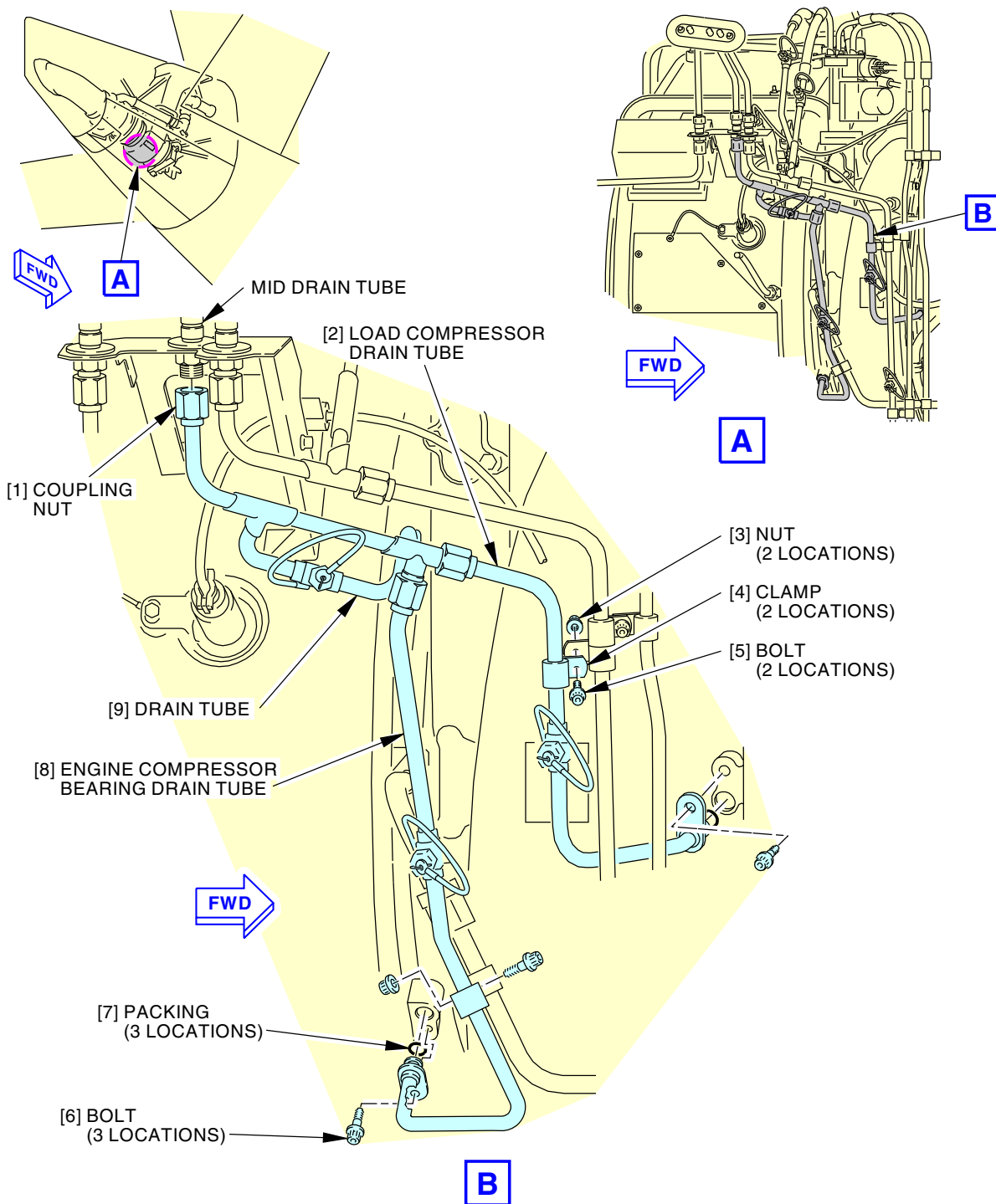
————— **END OF TASK** —————

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Load Compressor Drain Tube Installation
Figure 401/49-16-02-990-801

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TASK 49-16-02-400-801

3. Load Compressor Drain Tube Installation

(Figure 401)

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Load Compressor Drain Tube Installation



CAUTION REMOVE THE PROTECTION COVERS FROM ALL OPENINGS. DAMAGE TO THE ENGINE CAN OCCUR.

SUBTASK 49-16-02-420-001

- (1) Do these steps to install the load compressor drain tube [2]:
 - (a) Lubricate the three new packings [7] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [7] on the load compressor drain tube [2].
 - (c) Install the packing [7] on the engine compressor bearing drain tube [8].
 - (d) Install the packing [7] on the drain tube [9].
 - (e) Install the load compressor drain tube [2], engine compressor bearing drain tube [8] and drain tube [9] with the three bolts [6].
 - (f) Connect and tighten the coupling nut [1] for the load compressor drain tube to the bracket and mid drain tube.
 - (g) Install the two clamps [4] on the load compressor drain tube [2] and engine compressor bearing drain tube [8] with the two bolts [5] and two nuts [3].

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-02-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-02-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-02-860-004

- (3) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

———— **END OF TASK** ————

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APU PLENUM DRAIN - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the APU plenum drain.
- B. The APU plenum drain is on the bottom of the APU inlet plenum.

TASK 49-16-03-200-801

2. APU Plenum Drain Inspection

(Figure 601)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Procedure

SUBTASK 49-16-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-16-03-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-03-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-03-210-001

- (4) Do the steps that follow to examine the APU plenum drain:
 - (a) Examine the drain tube for corrosion.

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- (b) Push lockwire through the plenum drain outlet to make sure it is not clogged.

SUBTASK 49-16-03-410-001

- (5) Close the APU access doors.(APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-16-03-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-16-03-860-004

- (7) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

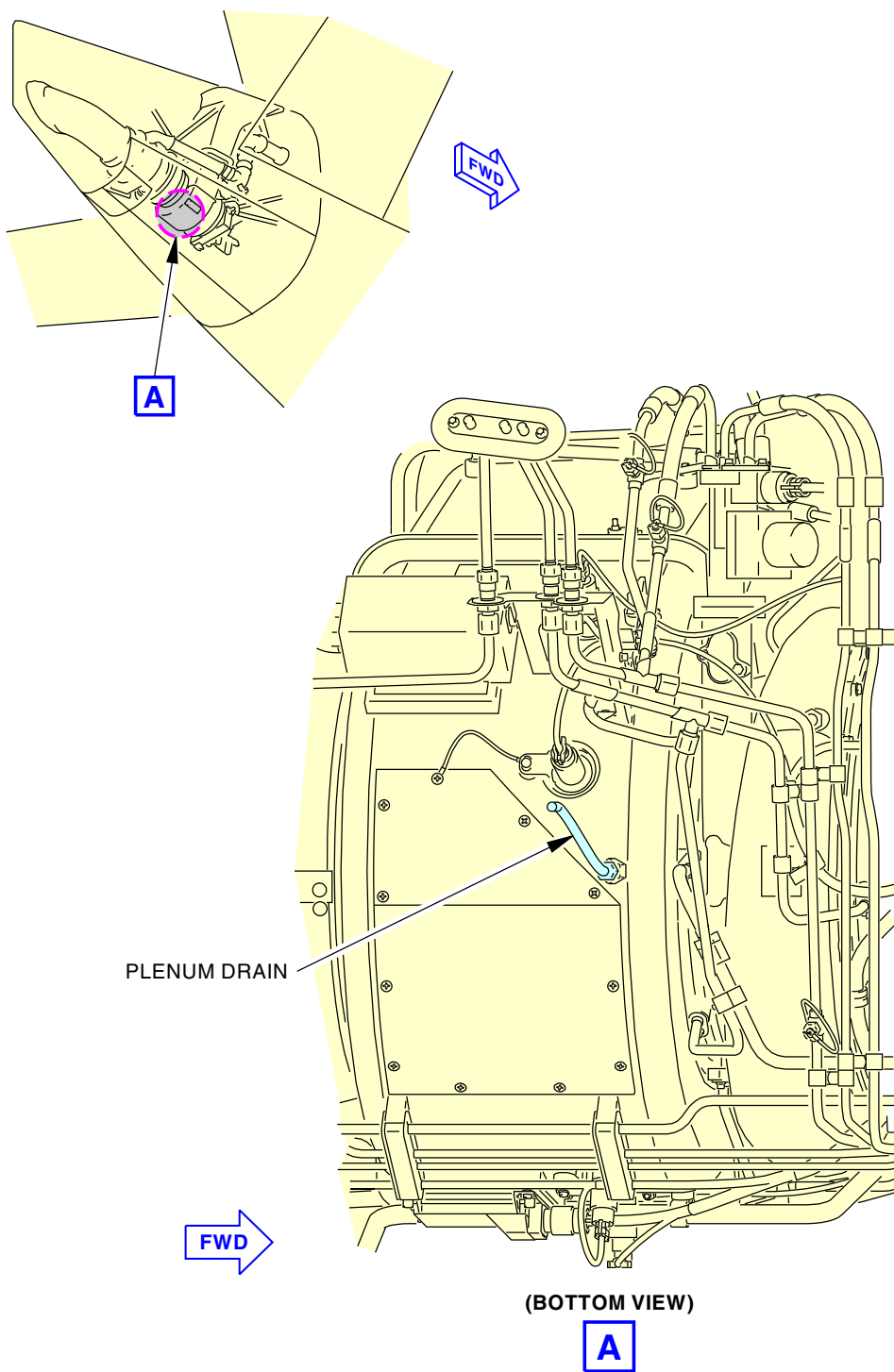
———— **END OF TASK** ————

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**Plenum Drain Inspection
Figure 601/49-16-03-990-801**

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APU COMBUSTOR DRAIN VALVE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains the steps required to do a functional check of the APU Combustor Drain Valve.

TASK 49-16-99-280-801

2. APU Combustor Drain Valve - Functional Check

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-16-01-000-801	Combustor Drain Valve Removal (P/B 401)
49-16-01-400-801	Combustor Drain Valve Installation (P/B 401)

B. **Procedure**

SUBTASK 49-16-99-020-001

- (1) Do this task: Combustor Drain Valve Removal, TASK 49-16-01-000-801.

SUBTASK 49-16-99-280-001

- (2) Do this check for the APU Combustor Drain Valve (AlliedSignal CMM 49-31-09).

SUBTASK 49-16-99-420-001

- (3) Do this task: Combustor Drain Valve Installation, TASK 49-16-01-400-801.

———— **END OF TASK** ————

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APU COMPONENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains three scheduled maintenance tasks. These tasks are for life limited components that cannot be reused or recycled and must be discarded.

TASK 49-20-99-000-801

2. Discard 1st/2nd Stage Compressor Impeller

A. Procedure

SUBTASK 49-20-99-000-001

- (1) Remove and discard the 1st and 2nd stage compressor impellers.

———— **END OF TASK** ————

TASK 49-20-99-000-802

3. Discard the APU Turbine Wheels

A. Procedure

SUBTASK 49-20-99-000-002

- (1) Remove and discard the APU turbine wheels.

———— **END OF TASK** ————

TASK 49-20-99-000-803

4. Discard the APU Load Compressor Impeller

A. Procedure

SUBTASK 49-20-99-000-003

- (1) Remove and discard the APU load compressor impeller.

———— **END OF TASK** ————

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APU ENGINE - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) APU engine - deactivation.
- (2) APU engine - activation.

TASK 49-21-00-040-801

2. APU Engine - Deactivation

A. General

- (1) This task will deactivate the APU engine.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Procedure

SUBTASK 49-21-00-210-003

- (1) Make sure that the APU selector on the P5 overhead panel is in the OFF position.

SUBTASK 49-21-00-020-001

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

E. APU Engine - Tryout

NOTE: This tryout is to make sure that the APU engine is in a zero energy state.

SUBTASK 49-21-00-420-001

- (1) Put the APU selector to the ON position.

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SUBTASK 49-21-00-210-004

- (2) Make sure that the air inlet door does not move.

SUBTASK 49-21-00-020-002

- (3) Put the APU selector to the OFF position.
- (a) Install a DO NOT OPERATE tag, STD-858 on the APU selector.

———— **END OF TASK** ————

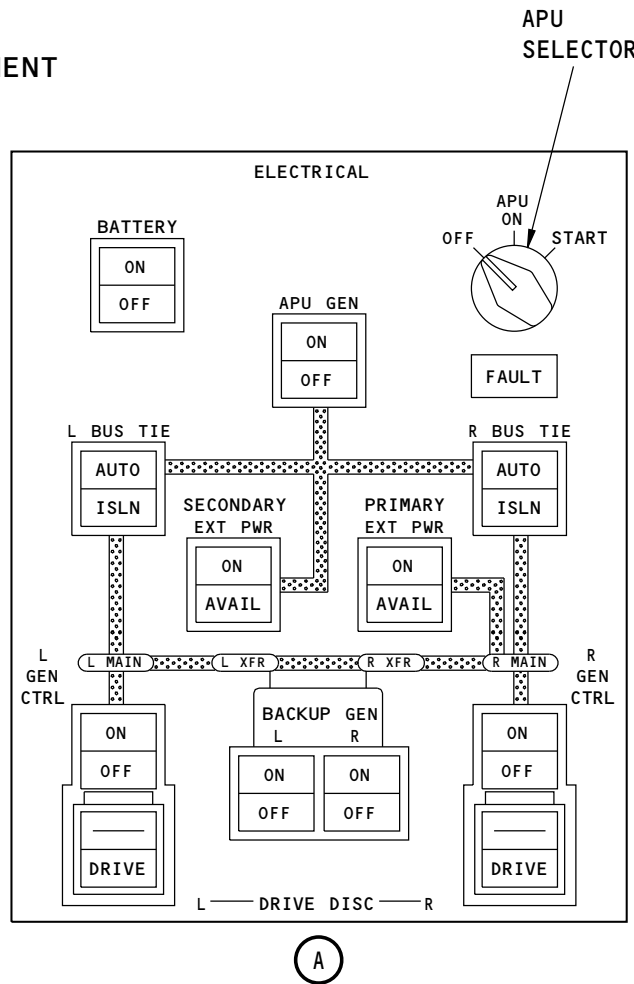
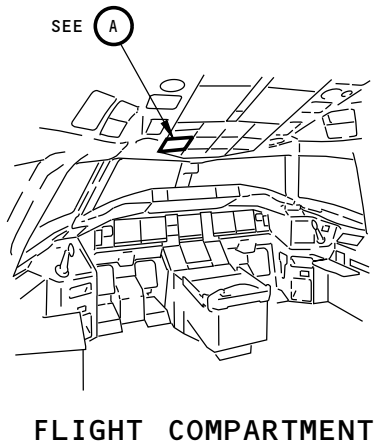
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APU Flight Compartment Controls
Figure 201/49-21-00-990-805

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TASK 49-21-00-440-801

3. **APU Engine - Activation**

(Figure 201)

A. General

- (1) This task will activate the APU engine.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Procedure

SUBTASK 49-21-00-020-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1
B	7	C49600	APU INLET DR ACTR
H	7	C24606	APU GCU
K	8	C24652	APU CRK CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 49-21-00-020-004

- (2) Remove the DO NOT OPERATE tag, STD-858 from the APU selector.

————— **END OF TASK** —————

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APU ENGINE - INSPECTION/CHECK

1. General

- A. This procedure has the steps to inspect these parts of the APU:
- (1) Load Compressor
 - (2) First Stage Compressor
 - (3) Second Stage Compressor
 - (4) Combustion Chamber
 - (5) First Stage Stator Vane Assembly
 - (6) First Stage Turbine Section
- B. Use a flexible borescope to inspect the internal parts of the APU.
- C. You can use this procedure to verify internal damage to the APU load compressor and power section before an APU removal.

TASK 49-21-00-200-801

2. APU Engine Inspection

(Figure 601, Figure 603, Figure 604)

A. General

- (1) The APU can have higher than usual noise, sometimes sounding like a whistling or whining noise similar to hydraulic pumps. This noise is louder than the APU exhaust noise and may be heard on the right side of the aircraft. When an unusual noise is present, it usually is caused by damage on one or more of the APU compressor impeller blades.

B. References

Reference	Title
20-20-04-200-801	Penetrant Inspection (P/B 601)
49-11-01 P/B 401	AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-31-03-000-801	Fuel Nozzle Removal (P/B 401)
49-31-03-400-801	Fuel Nozzle Installation (P/B 401)
49-41-02-000-801	Igniter Plug Removal (P/B 401)
49-41-02-400-801	Igniter Plug Installation (P/B 401)

C. Tools/Equipment

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

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Reference	Description
COM-1959	Light Source - APU Borescope Part #: ILK-7 Supplier: 32212 Part #: ILK-7A Supplier: 32212 Opt Part #: ILK-5 Supplier: 32212
COM-2609	Tube - Guide Part #: 2025269-1 Supplier: 06848
COM-4316	Borescope - Inspection, Flexible 6 mm Part #: IF6C5X1-8 Supplier: 32212 Opt Part #: 7110561 Supplier: 32212

D. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00667	Compound - Antiseize - Loctite C5-A Copper Based Anti-Seize (Replaces FEL-PRO C5-A)	MIL-PRF-907
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Borescope plug	49-53-53-01-250	ARO ALL
2	Packing	49-53-53-01-255	ARO ALL
3	Gasket	49-16-01-01-065	ARO ALL
4	Borescope plug	49-16-01-01-060	ARO ALL
5	Borescope plug	49-53-53-01-110	ARO ALL
6	Gasket	49-53-53-01-115	ARO ALL

F. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

G. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

H. Prepare for the Inspection

SUBTASK 49-21-00-860-001

- (1) Make sure the APU selector is in the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 49-21-00-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-21-00-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

I. First Stage, Second Stage and Load Compressor Inspection

SUBTASK 49-21-00-010-002

- (1) Do these steps to get access to the load compressor (Figure 601):

NOTE: The load compressor impeller may also be viewed by shining a bright light through the inlet plenum access doors located on the lower left side and the upper left side of the APU inlet plenum (composite structure). Loosen the IGV actuator (IGVA) retaining cover bolts approximately 1/2 inch and push the clevis assembly toward the IGV actuator using a socket wrench on the captive bolt. This action will open the IGV vanes manually. You can use a borescope through these two inlet plenum access doors to inspect the load compressor.

- (a) Remove the lockwire from the borescope plug [1].
- (b) Remove the borescope plug [1] from the APU.
- (c) Remove the packing [2] from the borescope plug [1].
 - 1) Discard the packing [2].
- (d) Connect the 6 mm flexible borescope, COM-4316, to the APU borescope light source, COM-1959.
- (e) Put the 6 mm flexible borescope, COM-4316, in the borescope port for the load compressor.
- (f) Remove the end cap from the electric starter motor to show the shaft.



CAUTION

MAKE SURE THE TIP OF THE BORESCOPE IS CLEAR OF THE IMPELLER BLADES. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE SHAFT.

- (g) Slowly turn the shaft counterclockwise with a socket and ratchet to turn the APU.
- (h) Adjust the 6 mm flexible borescope, COM-4316, as necessary, to view the load compressor.

SUBTASK 49-21-00-010-003

- (2) Do these steps to get access to the first stage compressor (Figure 601):

NOTE: The first stage compressor impeller may also be viewed by shining a bright light in and aft through the inlet plenum access doors located on the lower left side and the upper left side of the APU inlet plenum (composite structure).

- (a) Turn the captive screws on the inlet plenum to open the access panel.

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- (b) Put the 6 mm flexible borescope, COM-4316, tip through the screen to view the first stage compressor.
- (c) If the end cap was not removed from the electric starter motor, remove the end cap to show the shaft.



CAUTION

MAKE SURE THE TIP OF THE BORESCOPE IS CLEAR OF THE IMPELLER BLADES. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE SHAFT.

- (d) Slowly turn the shaft counterclockwise with a socket and ratchet to turn the APU.
NOTE: You can see 17 blades on the first stage compressor impeller.
- (e) Adjust the 6 mm flexible borescope, COM-4316, as necessary, to view the first stage compressor.

SUBTASK 49-21-00-010-004

- (3) Do these steps to get access to the second stage compressor (Figure 601):
 - (a) Remove the lockwire from the borescope plug [5].
 - (b) Remove the borescope plug [5] from the APU.
 - (c) Remove the gasket [6] from the borescope plug [5].
 - 1) Discard the gasket [6].
 - (d) Put the 6 mm flexible borescope, COM-4316, in the borescope port for the second stage compressor.
 - (e) If the end cap was not removed from the electric starter motor, remove the end cap to show the shaft.



CAUTION

MAKE SURE THE TIP OF THE BORESCOPE IS CLEAR OF THE IMPELLER BLADES. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE SHAFT.

- (f) Slowly turn the shaft counterclockwise with a socket and ratchet to turn the APU.
- (g) Adjust the 6 mm flexible borescope, COM-4316, as necessary to view the second stage compressor.

SUBTASK 49-21-00-290-001

- (4) Examine the applicable compressor for these conditions (Figure 602) (Table 601):
NOTE: Any amount of diffuser vane damage is allowed as long as compressor blade damage limits are not exceeded.

Table 601/49-21-00-993-803 Compressor Impeller Damage Limits

CONDITION	LIMITS	ACTION
Damaged Impeller Blades	Leading edge damage (nicks) up to 3 per blade maximum, on any number of blades, up to 0.05 in. (1.27 mm) wide/deep, separated by a minimum 0.100 in. (2.540 mm) and no nicks within 0.250 in. (6.350 mm) of the blade root.	No action required if limits are met.

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Table 601/49-21-00-993-803 Compressor Impeller Damage Limits (Continued)

CONDITION	LIMITS	ACTION
	Bending or damage at corner of blade: up to 0.375 inch (9.6 mm) by 0.375 inch (9.6 mm) maximum on any number of blades and 0.5 inch (12.7 mm) by 0.5 inch (12.7 mm) maximum on no more than one blade.	Continue in service. Borescope inspections are recommended at 200 APU hour intervals.
	Bending or damage at corner of blades: Up to 1.0 inch (25.4 mm) by 1.0 inch (25.4 mm) on any number of blades.	Acceptable for up to 200 APU hours. Then replace APU.
	Bending or damage at corner of blades: More than 1.0 inch (25.4 mm) by 1.0 inch (25.4 mm) on one or more blades.	Operate APU for ground use only. If pieces of the load compressor blade are missing, examine the ducts between the APU and the air conditioning packs for damage or debris.
	Any number of blades with damage from heat (blue or black discoloration).	Replace the APU.
	Any number of blades with cracks that can cause a portion of the blade to break away.	Replace the APU.

- (a) Examine the load compressor backshroud for rib cracking (Figure 602 (Sheet 7)).

NOTE: A borescope is not necessary for this inspection. If necessary, do this task:
Penetrant Inspection, TASK 20-20-04-200-801.

- 1) Cracks are permitted in the rib area only.
 - a) Cracks are not permitted outside of the rib area (into the backshroud).
 - b) Continue in service until the crack is repaired at the next shop visit.
 - c) At the next 'A' check, make sure you do the inspection of the load compressor backshroud.

<1> Continue the inspections at the 'A' Check intervals, until the backshroud is replaced or repaired.
- 2) Cracks beyond the base of the rib are not permitted.
 - a) Replace the APU.

- (b) Replace the APU if the load compressor has a condition that is not permitted.

- (c) If it is necessary to replace the APU, then do these tasks:

Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or
Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801,
Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or
Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

SUBTASK 49-21-00-410-001

- (5) For the load compressor, do these steps to install the borescope plug [1] (Figure 601):

- (a) Lubricate the new packing [2] with Mobil Jet Oil II, D00520.
- (b) Install the packing [2] on the borescope plug [1].
- (c) Apply the Loctite C5-A compound, D00667, to the threads of the borescope plug [1].
- (d) Install the borescope plug [1] on the APU.
 - 1) Tighten the borescope plug [1] to 220 in-lb (24.9 N·m).

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- 2) Install the MS20995C32 lockwire, G01048, on the borescope plug [1].
- (e) If it is not necessary to manually turn the APU engine for other inspection tasks, remove the socket and ratchet from the electric starter motor and install the end cap.

SUBTASK 49-21-00-410-002

- (6) For the first stage compressor, do these steps to install the access panel (Figure 601):
 - (a) Put the access panel on the inlet plenum.
 - (b) Turn the captive screws to attach the access panel to the inlet plenum.
 - (c) If it is not necessary to manually turn the APU engine for other inspection tasks, remove the socket and ratchet from the electric starter motor and install the end cap.

SUBTASK 49-21-00-410-003

- (7) For the second stage compressor, do these steps to install the borescope plug [5] (Figure 601):
 - (a) Install the new gasket [6] on the borescope plug [5].
 - (b) Apply the Loctite C5-A compound, D00667, to the threads of the borescope plug [5].
 - (c) Install the borescope plug [5] on the APU.
 - 1) Tighten the borescope plug [5] to 155 in-lb (17.5 N·m)-165 in-lb (18.6 N·m).
 - 2) Install the MS20995C20 lockwire, G50225, on the borescope plug [5].
 - (d) If it is not necessary to manually turn the APU engine for other inspection tasks, remove the socket and ratchet from the electric starter motor and install the end cap.

J. Annular Combustion Chamber, First Stage Stator Vane and First Stage Turbine Inspection

SUBTASK 49-21-00-010-005



MAKE SURE THE APU INTERNAL TEMPERATURE IS NOT MORE THAN 176°F (80°C) BEFORE INSERTING THE BORESCOPE. TOO MUCH HEAT CAN DAMAGE THE BORESCOPE.

- (1) Do the steps that follow to install the borescope (Figure 601):
 - (a) Remove the lockwire from the borescope plug [4].
 - (b) Remove the borescope plug [4] from the APU.
 - (c) Remove the gasket [3] from the borescope plug [4].
 - 1) Discard the gasket [3].
 - (d) ALTERNATE METHOD: The borescope equipment may also be inserted through the igniter plug port(s) or the fuel nozzle port(s) for greater visibility of the combustion chamber, first stage nozzle or first stage turbine blades.
 - 1) If it is necessary to get borescope access to the igniter plug port, do this task: Igniter Plug Removal, TASK 49-41-02-000-801.
 - 2) If it is necessary to get borescope access to the fuel nozzle port, do this task: Fuel Nozzle Removal, TASK 49-31-03-000-801.
 - (e) Slowly put the 6 mm flexible borescope, COM-4316, in the borescope port, igniter plug port or fuel nozzle port.
 - (f) Move the 6 mm flexible borescope, COM-4316, as necessary, to look at the combustion chamber.



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SUBTASK 49-21-00-290-002

- (2) Examine the combustion chamber for these conditions (Figure 602 (Sheet 4)):
- (a) Replace the APU if carbon particles in the combustion chamber are more than 0.25 in. (6.4 mm) thick.
 - (b) Replace the APU if there are cracks between the dilution holes that can cause material to break away.
 - (c) Replace the APU if cracks around the dilution holes are more than 0.25 in. (6.4 mm) in length.
 - (d) Cracks between the effusion holes of both the inner and outer panel are permitted.
 - (e) No cracks are permitted around the circumference of the turbine inlet transition area.
 - (f) Replace APU if there are burn-through holes at either the inner or outer panel of the combustion chamber.
 - 1) Loss of Thermal Barrier Coating (TBC) at either inner or outer panel is permitted.
 - (g) Replace the APU if there are cracks in the louvers in the annular combustion chamber.
 - (h) Replace any fuel nozzle if the nozzle opening has carbon particles 0.25 in. (6.4 mm) in diameter. To replace it, do these tasks:
 - Fuel Nozzle Removal, TASK 49-31-03-000-801,
 - Fuel Nozzle Installation, TASK 49-31-03-400-801.
 - (i) If it is necessary to replace the APU, then do these tasks:
 - Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or
 - Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801,
 - Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or
 - Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

SUBTASK 49-21-00-290-003

- (3) Examine the first stage stator vane assembly for these conditions (Figure 602 (Sheet 5)):

NOTE: The steps that follow are intended to evaluate the turbine for heat distress, corrosion and foreign object damage (FOD). Borescope inspection provides visibility to approximately one half (lower section) of the first stage turbine nozzle ring and the leading edges of the first stage blades. In most cases, this is sufficient to detect heat distress, corrosion and FOD.

NOTE: A borescope with an articulating viewing head provides greater flexibility in viewing the stator vanes.

- (a) Move the 6 mm flexible borescope, COM-4316, as necessary to look at the stator vane assembly.
- (b) Replace the APU if there is missing material at the inner-platform of the vanes.
- (c) Replace the APU if the leading edge side of the vane has thru-wall holes.
- (d) Leading and trailing edge cracks are permitted.

NOTE: The trailing edge of some stator vanes may be difficult to view. Trailing edge cracks on the stator vanes will be visible when viewed from an angle offset from the leading edge of the vane, looking aft.

- (e) Missing material at the trailing edge which does not extend forward beyond a line connecting the cooling discharge passages is permitted.
- (f) Replace the APU if the missing material extends forward beyond a line connecting the cooling discharge passages.

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- (g) Trailing edge cracks are permitted.
- (h) If it is necessary to replace the APU, then do these tasks:
 - Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or
 - Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801,
 - Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or
 - Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

SUBTASK 49-21-00-290-004

- (4) Examine the first stage turbine for these conditions (Figure 602):
 - (a) Move the 6 mm flexible borescope, COM-4316, as necessary, to look at the first stage turbine blades.
 - (b) If the end cap was not removed from the electric starter motor, remove the end cap to show the shaft.



CAUTION

MAKE SURE THE TIP OF THE BORESCOPE IS CLEAR OF THE TURBINE BLADES. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE SHAFT.

- (c) Slowly turn the shaft counterclockwise with a socket and ratchet to turn the APU.
- (d) Adjust the 6 mm flexible borescope, COM-4316, as necessary to view the first stage turbine.
- (e) Rounding of the leading edge at the blade tip is permitted down to approximately 75% span.
- (f) Leading edge cracks confined to the curvature of the leading edge are permitted from approximately 50% span outboard.
- (g) Replace the APU if there are cracks extending aft beyond the curvature of the leading edge.
- (h) Replace the APU if there are leading edge cracks inboard of the 50% span.
- (i) Replace the APU if the leading edge has thru-wall holes.
- (j) Foreign object damage (FOD) dents are permitted from the 50% span outboard, provided there are no thru-wall holes associated with the damage.
- (k) Slowly remove the 6 mm flexible borescope, COM-4316, from the APU.
- (l) Remove the socket and ratchet from the electric starter motor and install the end cap.
- (m) If it is necessary to replace the APU, then do these tasks:
 - Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or
 - Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801,
 - Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or
 - Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

K. IGV Rod End Hardware Inspection

SUBTASK 49-21-00-010-007

- (1) Do these steps to view the IGV rod end clevis hardware (Figure 603):
 - (a) Remove the two bolts and two washers that hold the cover for the IGV rod end clevis.
- (2) Do these steps to view the IGV rod end bearing hardware:
 - (a) Remove the two bolts and two washers that hold the cover for the IGV rod end.

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SUBTASK 49-21-00-210-001

- (3) If you see damage to the IGV rod end clevis or rod end bearing hardware (Figure 604), you must remove the APU. (PAGEBLOCK 49-11-01/401).

NOTE: Both linkage ends are installed during APU assembly in the shop and are set as part of the inlet guide vane rigging procedure. This uses a special tool that sets the gap between the guide vanes through adjustment of the linkage.

SUBTASK 49-21-00-410-007

- (4) Install the cover plates as follows:
- (a) Install the two bolts and two washers that hold the cover for the IGV rod end.
 - (b) Install the two bolts and two washers that hold the cover for the IGV clevis end.

L. Put the airplane back to its usual condition

SUBTASK 49-21-00-410-008

- (1) If the igniter plug(s) were removed for borescope access, then do this task: Igniter Plug Installation, TASK 49-41-02-400-801.

SUBTASK 49-21-00-410-009

- (2) If the fuel nozzle(s) were removed for borescope access, remove the guide tube, COM-2609, from the fuel nozzle port. After you remove the guide tube, COM-2609, do this task: Fuel Nozzle Installation, TASK 49-31-03-400-801.

SUBTASK 49-21-00-410-010

- (3) Do these steps to install the borescope plug [4] (Figure 601):
- (a) Install the new gasket [3] on the borescope plug [4].
 - (b) Apply the Loctite C5-A compound, D00667, to the threads of the borescope plug [4].
 - (c) Install the borescope plug [4] on the APU.
 - 1) Tighten the borescope plug [4] to 160 in-lb (18.1 N·m).
 - 2) Install the MS20995C20 lockwire, G50225, on the borescope plug [4].

SUBTASK 49-21-00-410-011

- (4) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

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

315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-21-00-410-012

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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SUBTASK 49-21-00-860-005

- (6) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

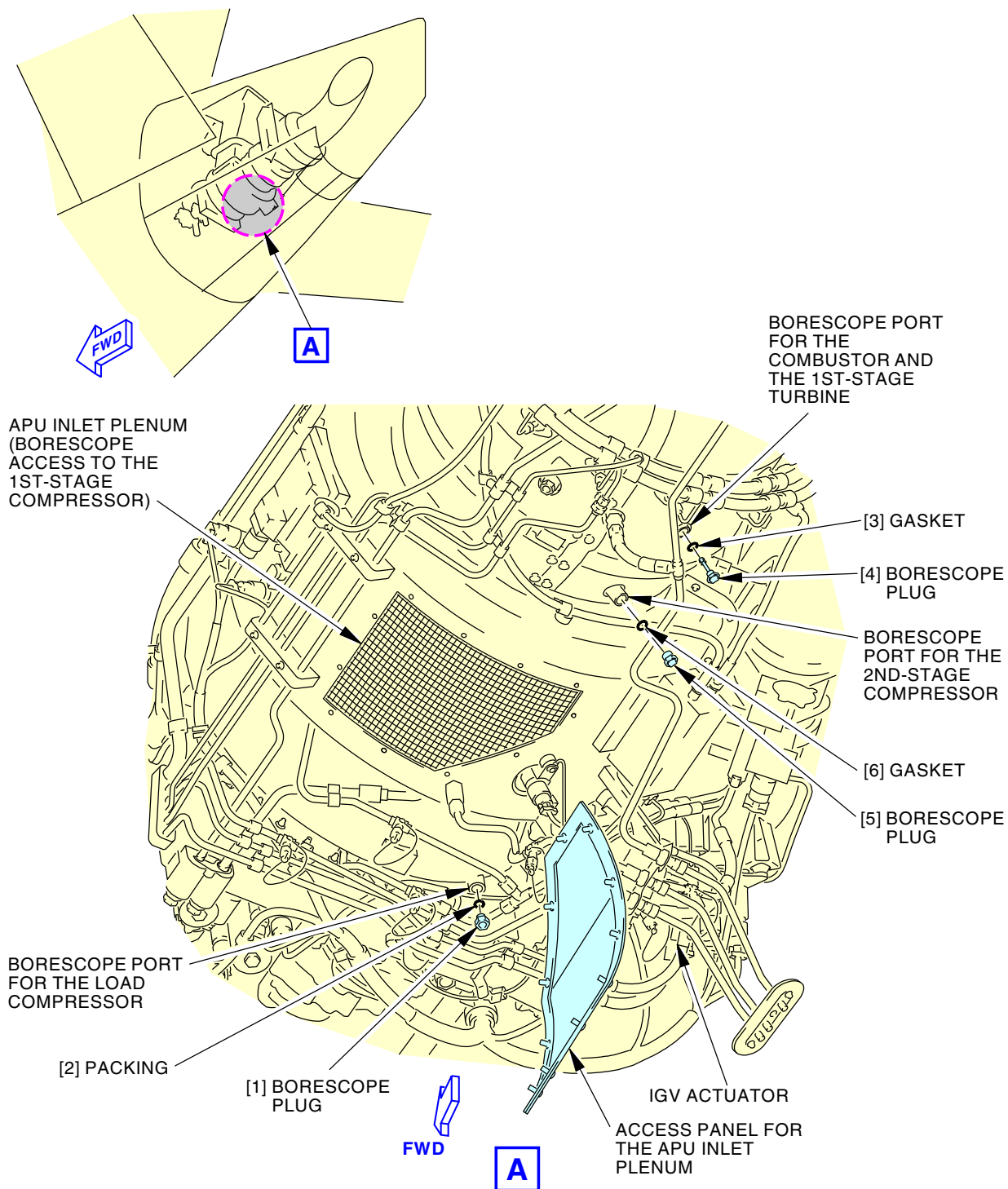
————— **END OF TASK** —————

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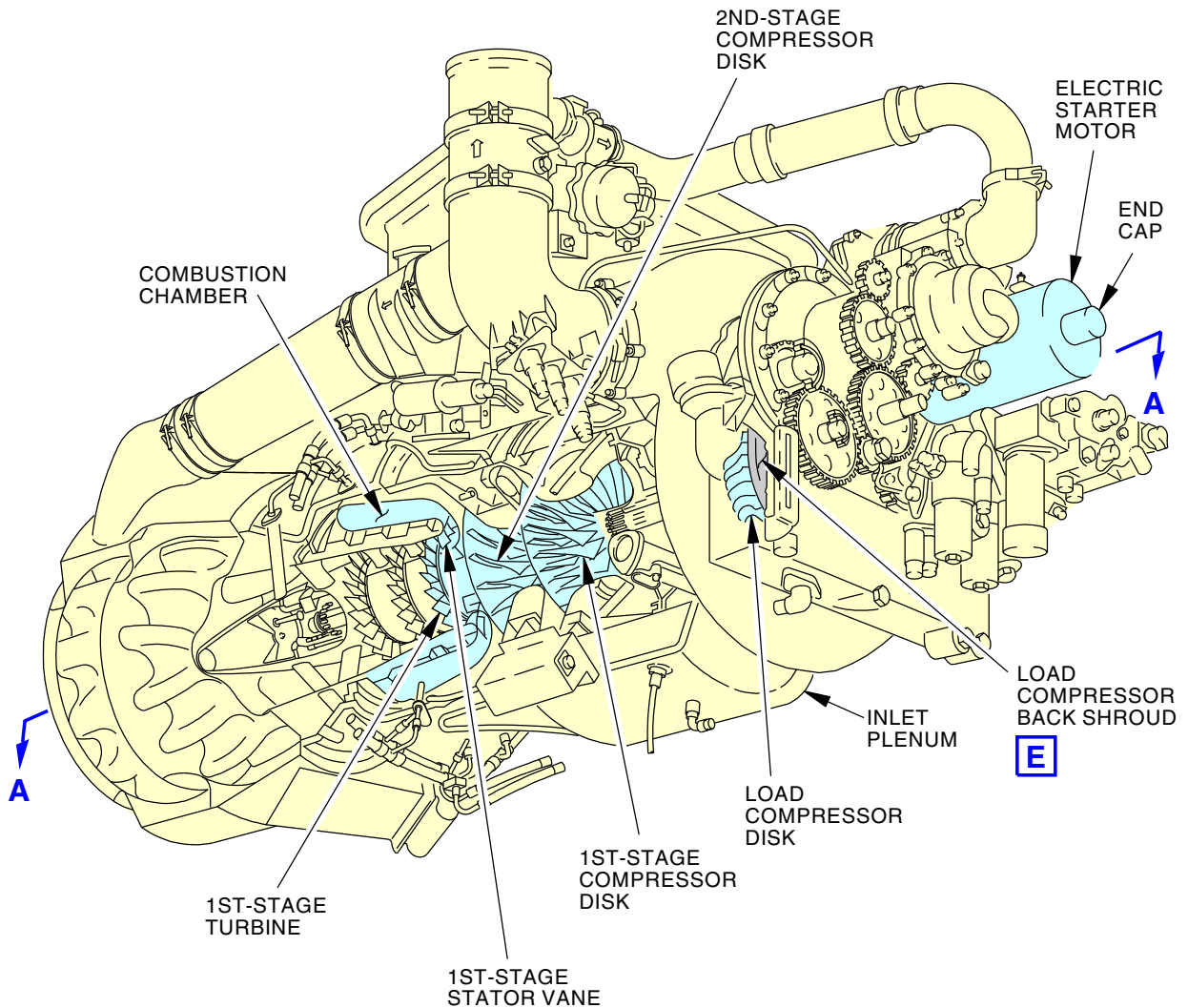
**APU Borescope Inspection Access
Figure 601/49-21-00-990-801**

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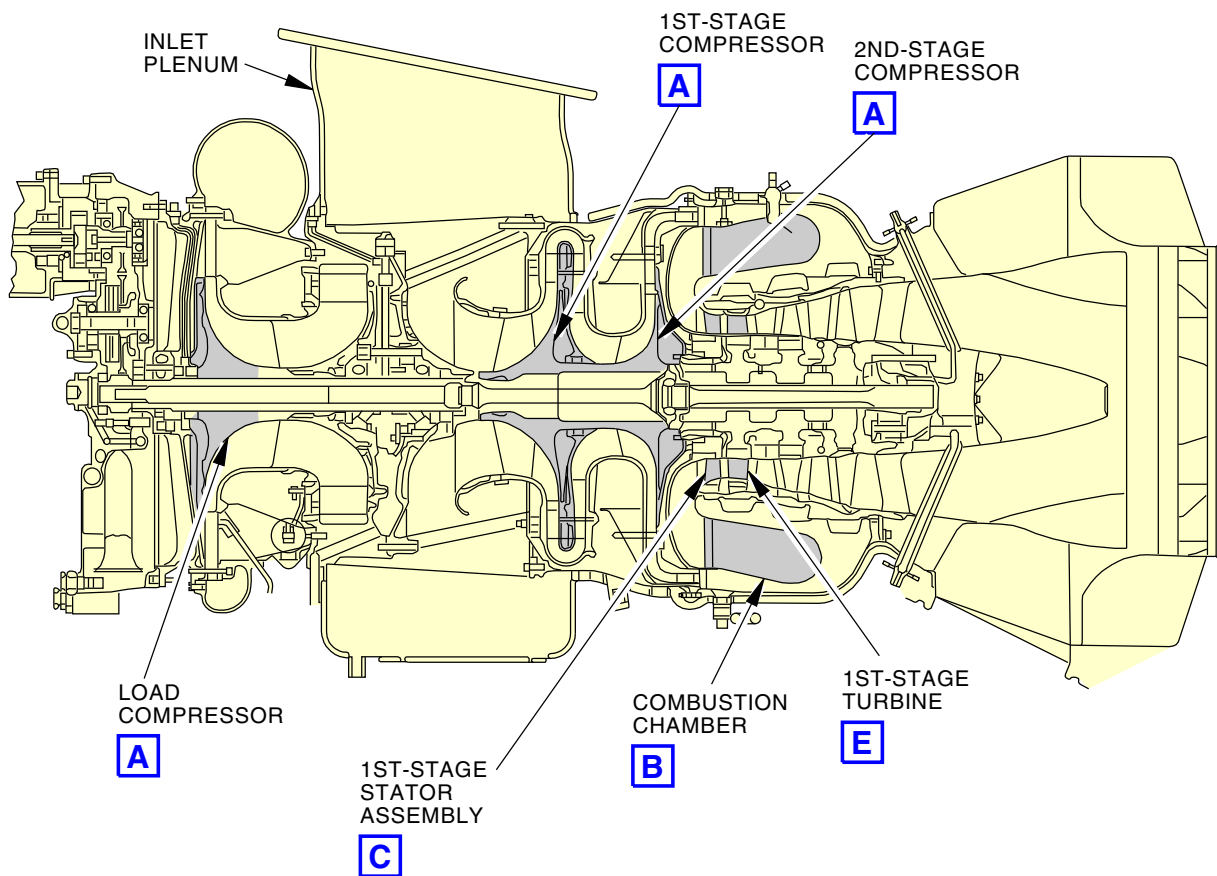
**APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 1 of 7)**

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**APU CROSS SECTION
A-A**

E53789 S0006423863_V4

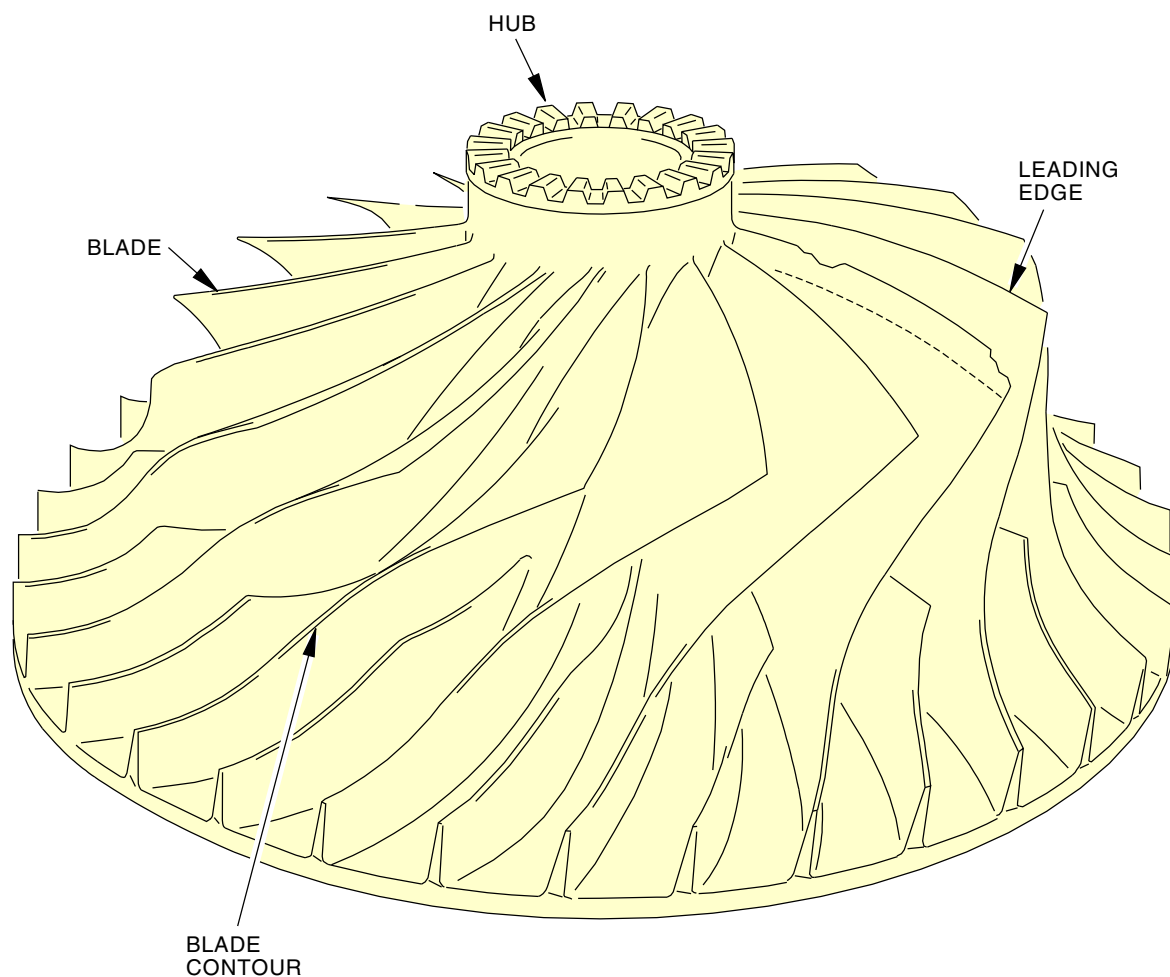
**APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 2 of 7)**

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**1ST-STAGE COMPRESSOR
(LOAD COMPRESSOR AND 2ND-STAGE
COMPRESSOR ARE ALMOST THE SAME)**

A

D23472 S0006423864_V3

**APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 3 of 7)**

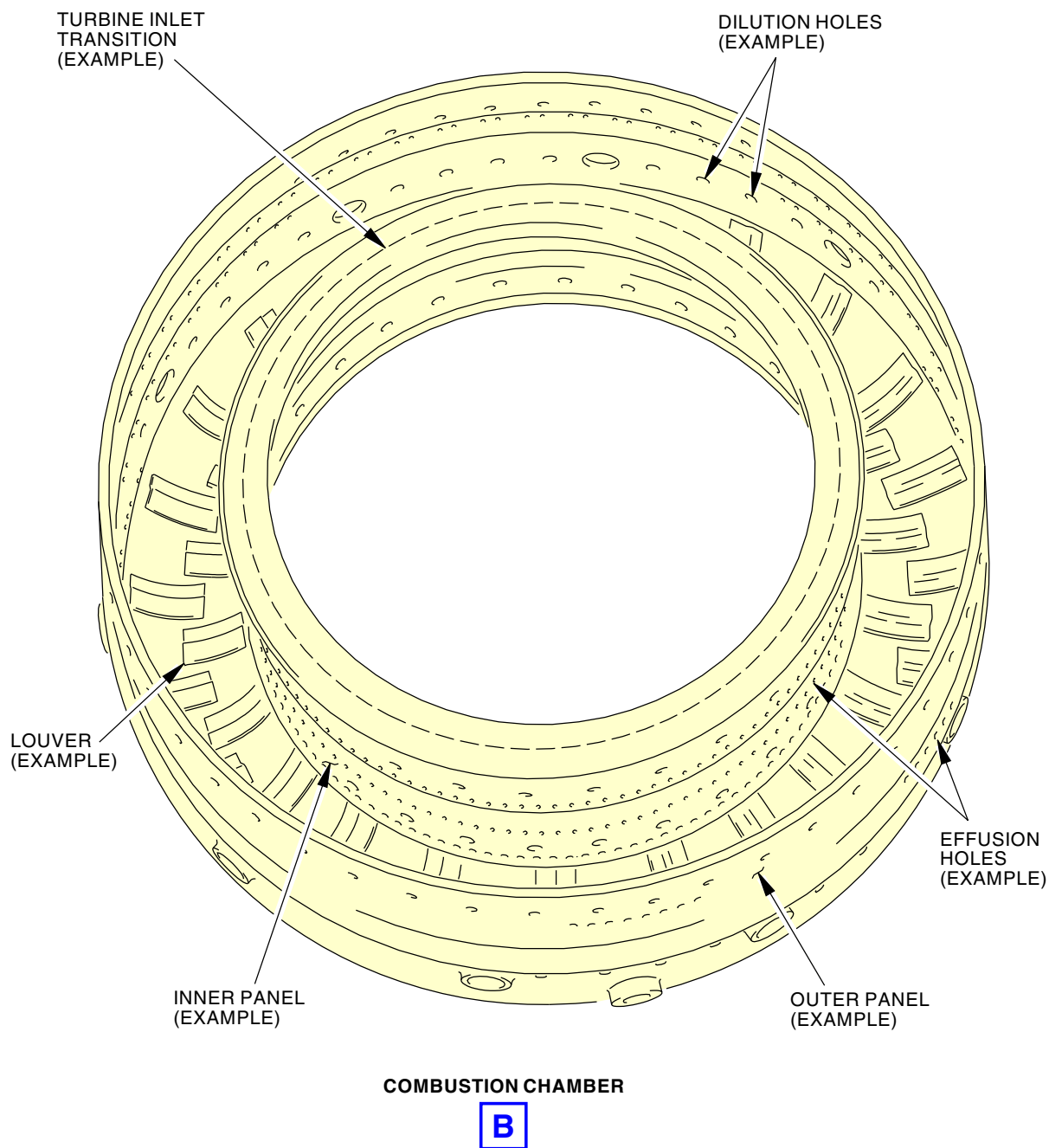
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E38621 S0006423865_V4

APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 4 of 7)

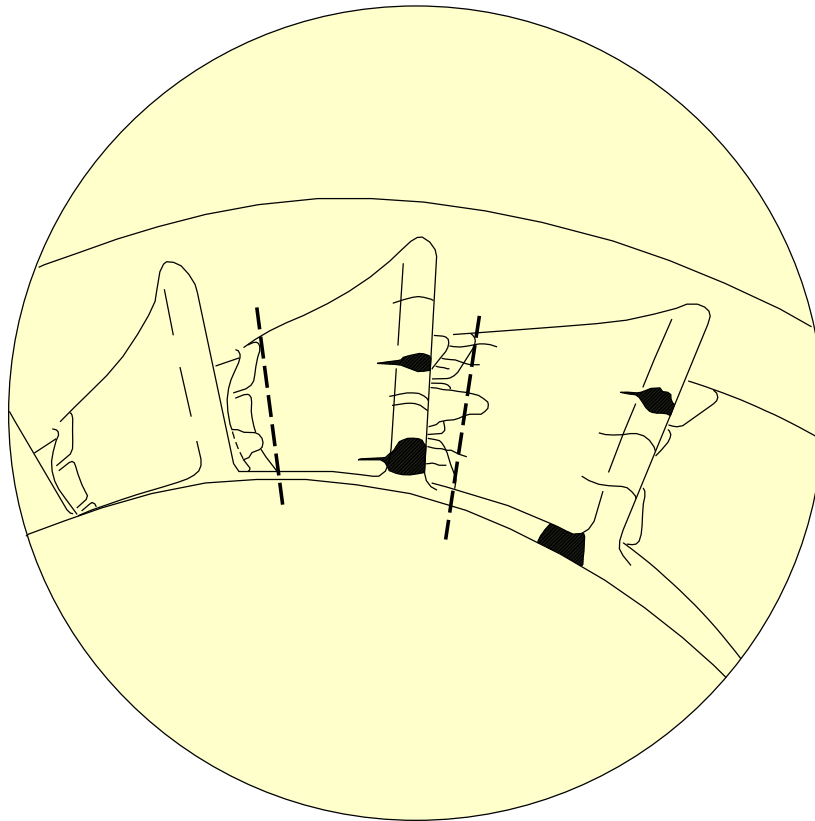
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1ST-STAGE STATOR ASSEMBLY
(BORESCOPE VIEW)

C

E38658 S0006423866_V5

APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 5 of 7)

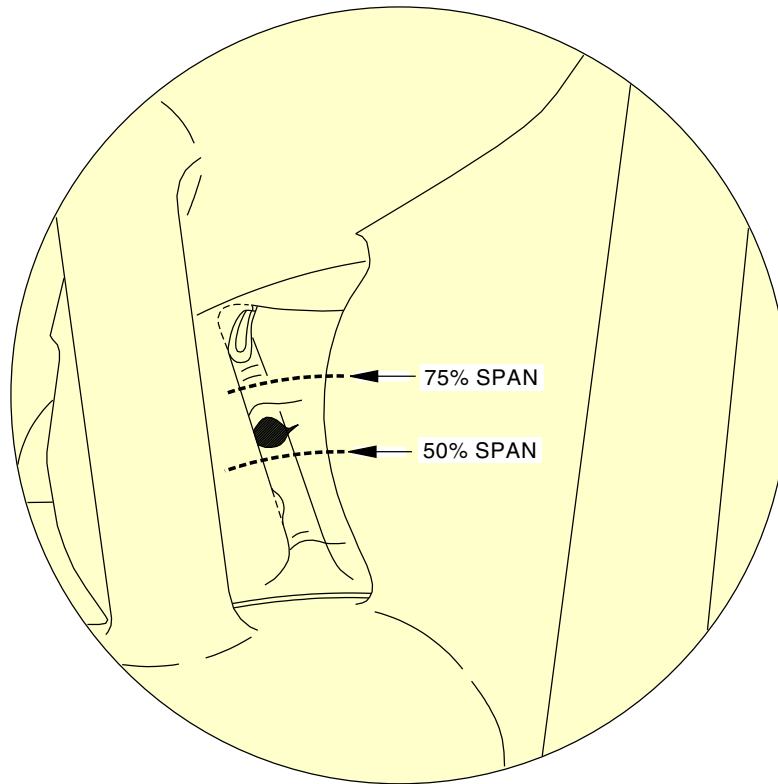
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**1ST-STAGE TURBINE
(BORESCOPE VIEW)**



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**APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 6 of 7)**

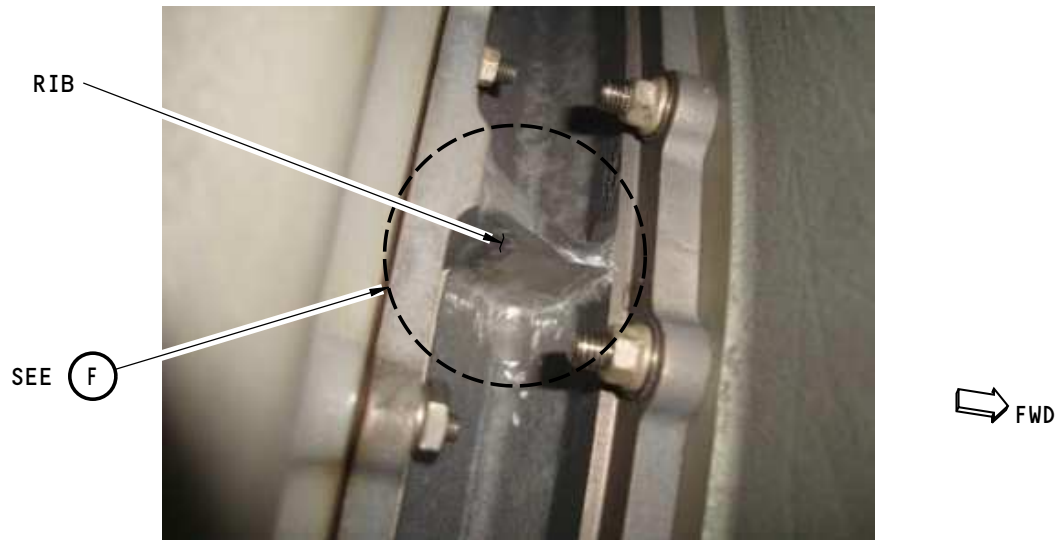
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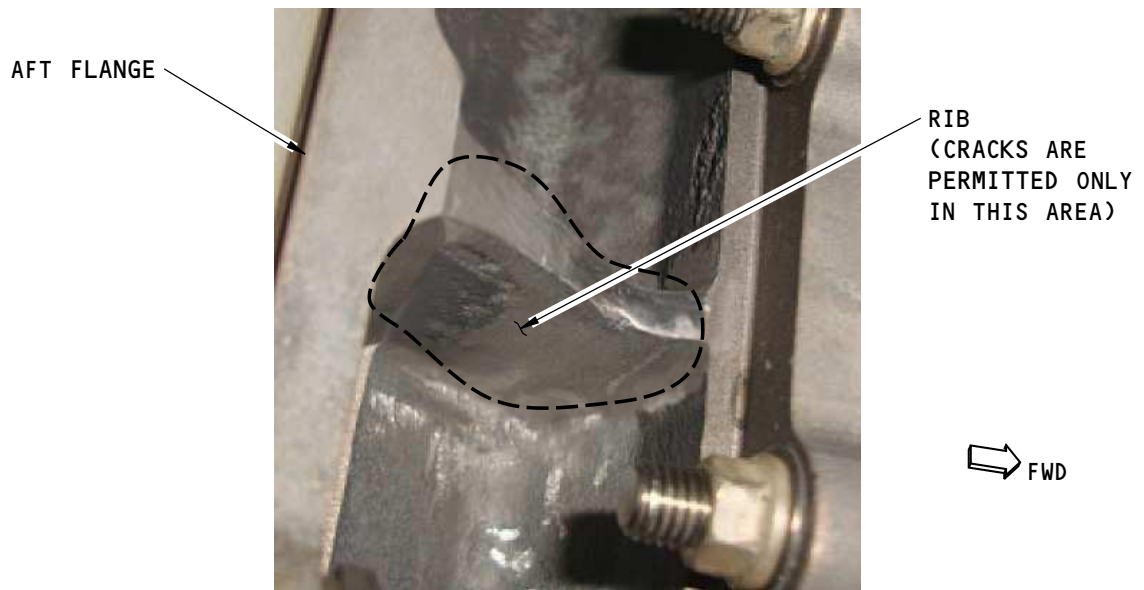
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LOAD COMPRESSOR BACK SHROUD

(E)



(F)

2116801 S0000453805_V2

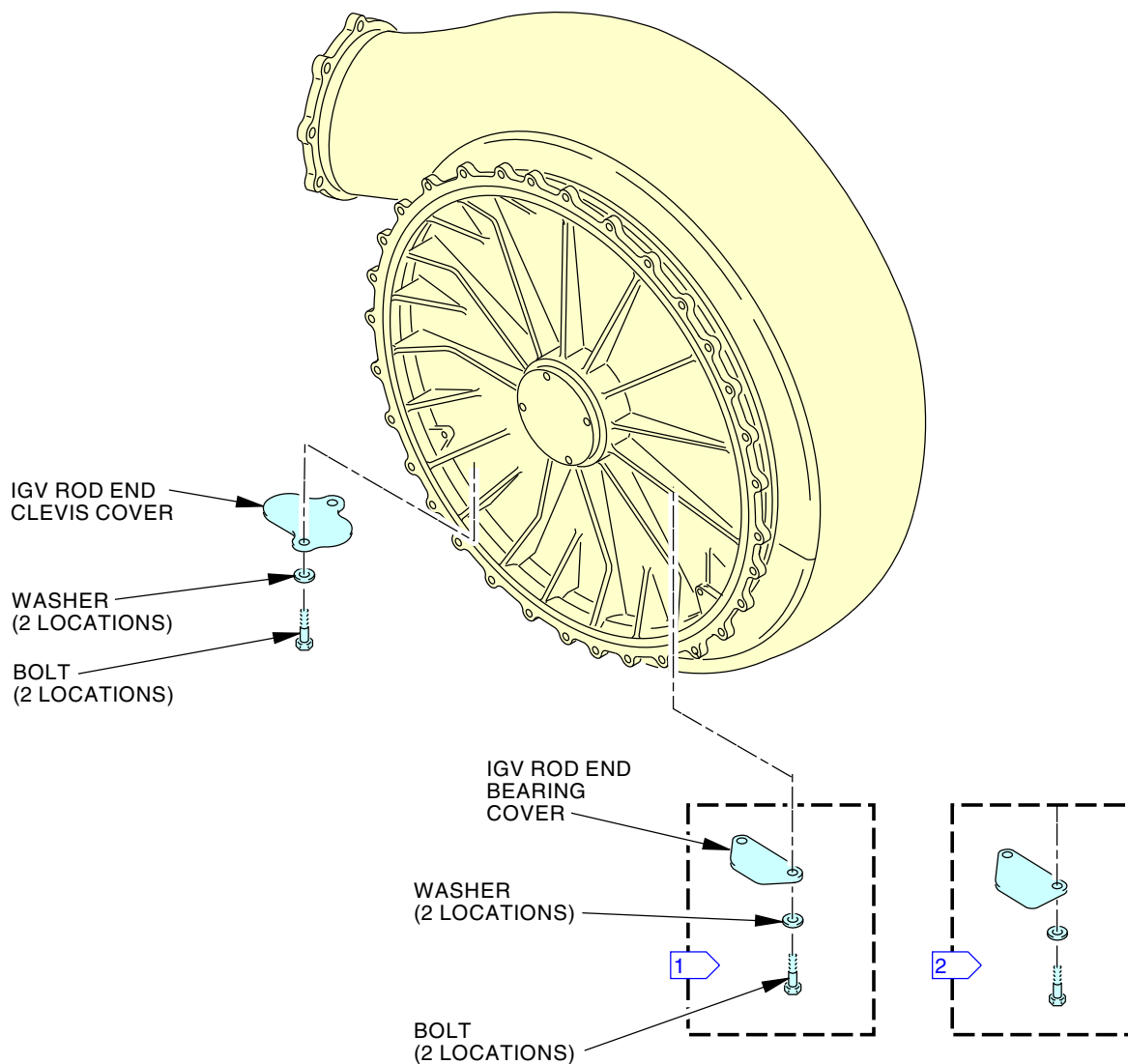
APU Borescope Inspection
Figure 602/49-21-00-990-802 (Sheet 7 of 7)

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- 1 PRE HW SB-49-7752
- 2 POST HW SB-49-7752

2063406 S0000425973_V2

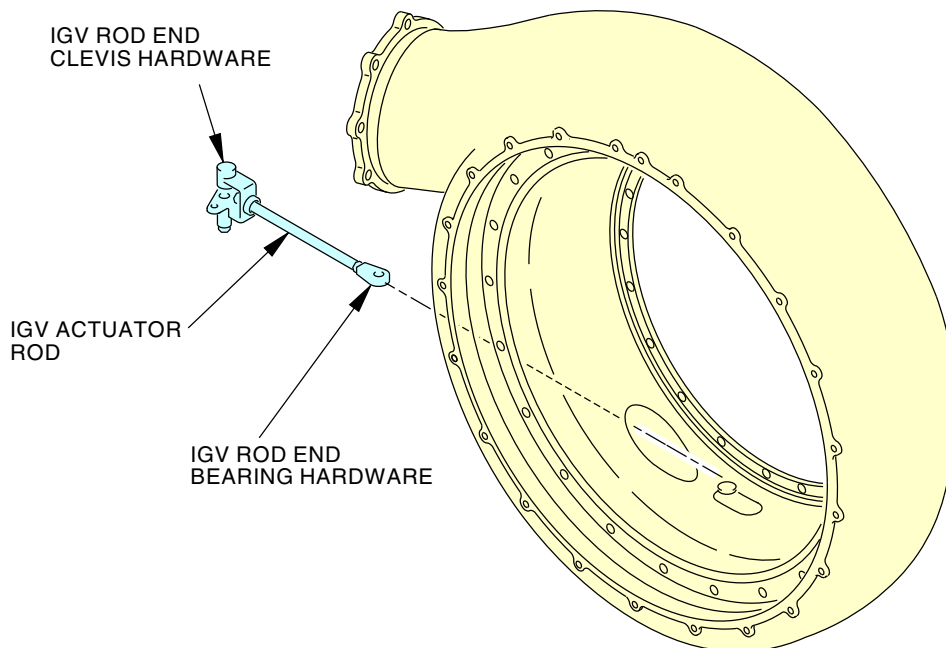
**Access for the IG V Rod End Linkage Inspection
Figure 603/49-21-00-990-803**

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IGV Rod End Linkage Inspection
Figure 604/49-21-00-990-804

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OIL FILTER ELEMENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil filter element
 - (2) An installation of the oil filter element
 - (3) A removal of the generator scavenge oil filter element
 - (4) An installation of the generator scavenge oil filter element.
- B. The filter elements are attached to the lube cluster.

TASK 49-27-03-000-801

2. Oil Filter Element Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-27-03-200-801	Oil Filter Elements Inspection (P/B 601)

B. Tools/Equipment

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

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-03-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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SUBTASK 49-27-03-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Filter Element Removal

SUBTASK 49-27-03-020-001



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



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



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



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

- (1) Do the steps that follow to remove the oil filter element:
- (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 under the lube cluster.
 - (b) Remove the oil filter housing [7].
 - (c) Remove the packing [8] from the oil filter housing [7].
 - 1) Discard the packing [8].
 - (d) Remove the oil filter element [1].
 - (e) Do this task: Oil Filter Elements Inspection, TASK 49-27-03-200-801.

NOTE: This inspection will show the condition of the APU engine.

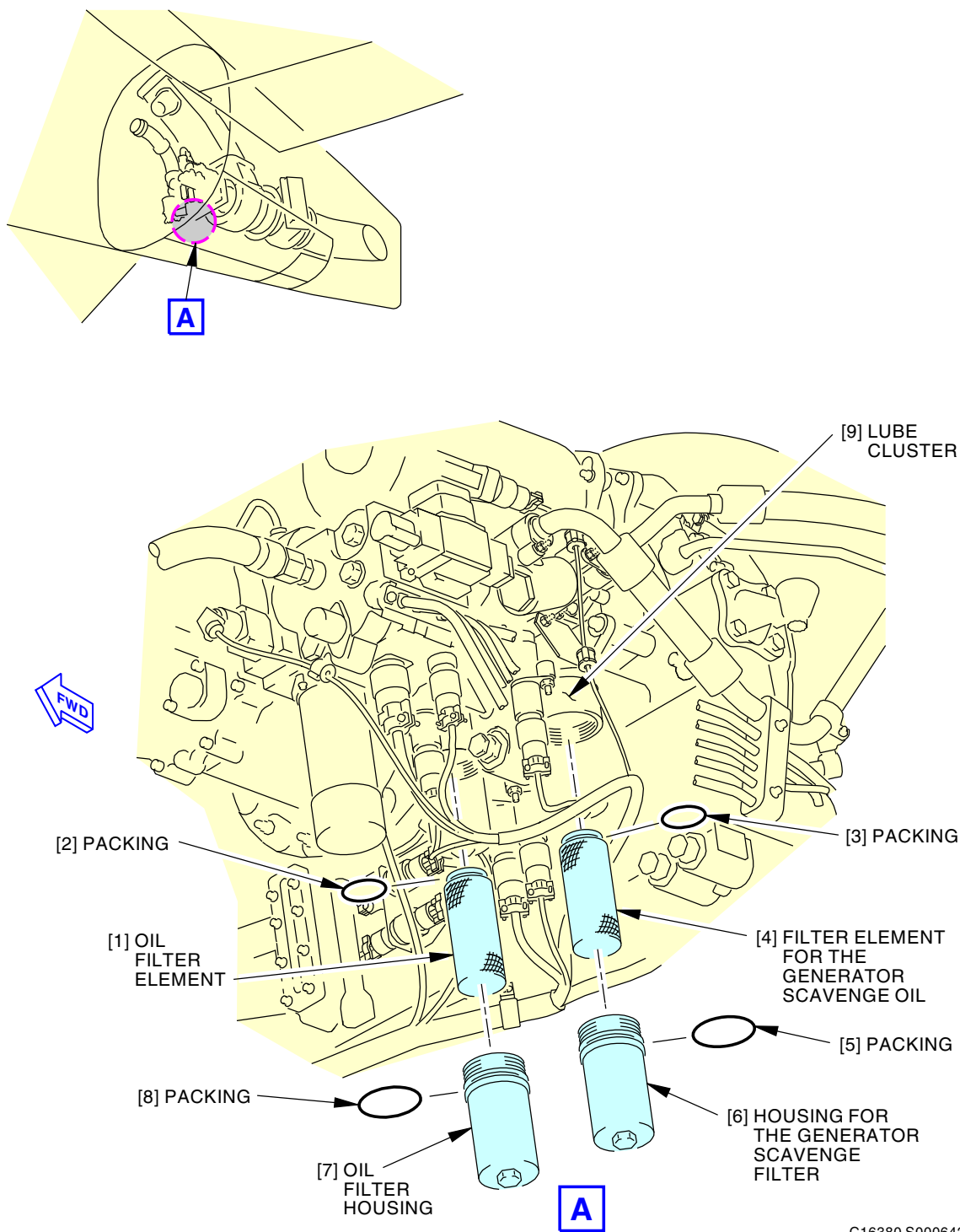
————— **END OF TASK** —————

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**Oil Filter Elements Installation
Figure 401/49-27-03-990-801**

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TASK 49-27-03-400-801

3. Oil Filter Element Installation

(Figure 401)

A. References

Reference	Title
12-13-04-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil filter element	49-27-27-01-050	ARO ALL
7	Oil filter housing	49-27-27-01-040	ARO ALL
8	Packing	49-27-27-01-045	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Filter Element Installation

SUBTASK 49-27-03-420-001

- (1) Do the steps that follow to install the oil filter element [1]:
 - (a) Lubricate the packings [8] and [2] with Mobil Jet Oil II, D00520.
NOTE: The oil filter element [1] is supplied with the packing [2] already installed.
 - (b) Install the oil filter element [1] into the lube cluster [9].
 - (c) Install the packing [8] on the oil filter housing [7].
 - (d) Install the oil filter housing [7] onto the lube cluster [9].
 - 1) Tighten the oil filter housing [7] to 10-20 pound-inches (1.13-2.26 newton-meters).
 - (e) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.

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G. APU Oil Filter Element Installation Test

SUBTASK 49-27-03-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-03-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-03-790-001

- (3) Do the steps that follow to do the installation test for the oil filter element:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Let the APU operate at a no load condition for 5 minutes.
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
 - (d) Examine the oil filter housing for signs of leakage.
 - (e) Repair the cause of any leakage that you find.

SUBTASK 49-27-03-640-001

- (4) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.

SUBTASK 49-27-03-410-001

- (5) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

TASK 49-27-03-000-802

4. Generator Scavenge Oil Filter Element Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-27-03-200-801	Oil Filter Elements Inspection (P/B 601)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

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C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-03-860-005

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-03-860-006

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-03-010-002

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Generator Scavenge Oil Filter Element Removal

SUBTASK 49-27-03-020-002



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



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



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

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(WARNING PRECEDES)



CAUTION

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

- (1) Do the steps that follow to remove the filter element for the generator scavenge oil:
 - (a) Put the oil resistant container 1 gal, (4 l), STD-1058 under the lube cluster.
 - (b) Remove the housing [6] for the generator scavenge filter.
 - (c) Remove the packing [5] from the housing [6].
 - 1) Discard the packing [5].
 - (d) Remove the generator scavenge filter element [4].
 - (e) Do this task: Oil Filter Elements Inspection, TASK 49-27-03-200-801.

NOTE: This inspection will show the condition of the APU engine.

————— **END OF TASK** —————

TASK 49-27-03-400-802

5. Generator Scavenge Oil Filter Element Installation

(Figure 401)

A. References

Reference	Title
12-13-04-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Scavenge filter element	49-27-27-01-050	ARO ALL
5	Packing	49-27-27-01-045	ARO ALL
6	Housing	49-27-27-01-040	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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F. Generator Scavenge Oil Filter Element Installation

SUBTASK 49-27-03-420-002

- (1) Do the steps that follow to install the generator scavenge filter element [4] for the generator scavenge oil:
 - (a) Lubricate the packings [3] and packing [5] with the Mobil Jet Oil II, D00520.
NOTE: The generator scavenge filter element [4] is supplied with the packing [3] already installed.
 - (b) Install the generator scavenge filter element [4] in the lube cluster [9].
 - (c) Install the packing [5] on the housing [6].
 - (d) Install the housing [6] on the lube cluster.
 - 1) Tighten the housing [6] to 10-20 pound-inches (1.13-2.26 newton-meters).
 - (e) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.

G. Generator Scavenge Filter Installation Test

SUBTASK 49-27-03-860-007

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-03-860-008

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-03-790-002

- (3) Do the steps that follow to do the installation test for the generator scavenge filter:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Let the APU operate at a no load condition for five minutes.
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
 - (d) Examine the housing for the generator scavenge filter for leakage.
 - (e) Repair the cause of any leakage that you find.

SUBTASK 49-27-03-640-002

- (4) Make sure the APU oil system is full. To check the oil level, do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.

SUBTASK 49-27-03-410-002

- (5) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)
Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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————— END OF TASK —————

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OIL FILTER ELEMENTS - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the oil filter element and generator scavenge oil filter element. The two oil filter elements are installed on the lube cluster.

TASK 49-27-03-200-801

2. Oil Filter Elements Inspection

A. References

Reference	Title
12-22-05-610-802	Flush the APU Oil (P/B 301)
49-11-01-000-801	Auxiliary Power Unit Removal (Hydraulic Jack Method) (P/B 401)
49-11-01-000-805	Auxiliary Power Unit Removal (Fishpole Hoist Method) (P/B 401)
49-11-01-400-801	Auxiliary Power Unit Installation (Hydraulic Jack Method) (P/B 401)
49-11-01-400-805	Auxiliary Power Unit Installation (Fishpole Hoist Procedure) (P/B 401)
49-27-03-000-801	Oil Filter Element Removal (P/B 401)
49-27-03-000-802	Generator Scavenge Oil Filter Element Removal (P/B 401)
49-27-03-400-801	Oil Filter Element Installation (P/B 401)
49-27-03-400-802	Generator Scavenge Oil Filter Element Installation (P/B 401)
49-27-04-200-801	Magnetic Chip Collector Inspection (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Procedure

SUBTASK 49-27-03-020-003

- (1) If an inspection of the oil filter element is necessary and the element is installed on the lube cluster, do this task: Oil Filter Element Removal, TASK 49-27-03-000-801.

SUBTASK 49-27-03-020-004

- (2) If an inspection of the generator scavenge oil filter element is necessary and the element is installed on the lube cluster, do this task: Generator Scavenge Oil Filter Element Removal, TASK 49-27-03-000-802.

SUBTASK 49-27-03-210-001

- (3) Do these steps to inspect the oil filter and/or generator scavenge oil filter housing(s):
- (a) Examine the oil filter housing(s) for dents and cracks.
 - (b) Examine the oil filter housing(s) for crossed, stripped and peened threads.
 - (c) If you find one or more of the above damage, replace the oil filter housing(s).

SUBTASK 49-27-03-210-002

- (4) Do these steps to inspect the oil filter and/or generator scavenge oil filter element(s):

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- (a) Examine the oil filter element(s) for metal particles and other unwanted materials.

NOTE: The oil filter element(s) and oil condition will give you an indication of internal damage to the APU.

- (b) If you find metal particles and other unwanted materials, then do these steps to flush the oil from the APU gearbox:

- 1) Discard the oil filter element(s).
- 2) If the oil filter element was removed for an inspection, install a new oil filter element. To install it, do this task: Oil Filter Element Installation, TASK 49-27-03-400-801.

NOTE: It is not necessary to do the installation test for the oil filter element at this time. The APU oil change procedure will do a check for oil leakage and other oil problems.

NOTE: A new oil filter element must be installed on the lube cluster if an APU starting and operation are necessary to get the APU warm.

- 3) If the generator scavenge oil filter element was removed for an inspection, install a new generator scavenge oil filter element. To install it, do this task: Generator Scavenge Oil Filter Element Installation, TASK 49-27-03-400-802.

NOTE: It is not necessary to do the installation test for the generator scavenge oil filter element at this time. The APU oil change procedure will do a check for oil leakage and other oil problems.

NOTE: A new generator scavenge oil filter element must be installed on the lube cluster if an APU starting and operation are necessary to get the APU warm.

- 4) Do an inspection of the magnetic chip collector on the oil sump (drain plug). To inspect it, do this task: Magnetic Chip Collector Inspection, TASK 49-27-04-200-801.

NOTE: Do not replace the oil filter element and generator scavenge oil filter element at this time. New oil filter elements were installed before this inspection.

- 5) Do this task: Flush the APU Oil, TASK 12-22-05-610-802.

NOTE: Do not replace the oil filter element and generator scavenge oil filter element at this time. The oil filter elements will be replaced when you inspect the oil filter elements for metal particles and other unwanted materials again.

- 6) Remove the oil filter element from the lube cluster. To remove it, do this task: Oil Filter Element Removal, TASK 49-27-03-000-801.

- 7) Remove the generator scavenge oil filter element. To remove it, do this task: Generator Scavenge Oil Filter Element Removal, TASK 49-27-03-000-802.

- 8) Examine the oil filter elements for metal particles and other unwanted materials.

- 9) If you find more metal particles and other unwanted materials, then replace the APU. These are the tasks:

Auxiliary Power Unit Removal (Fishpole Hoist Method), TASK 49-11-01-000-805 or Auxiliary Power Unit Removal (Hydraulic Jack Method), TASK 49-11-01-000-801, Auxiliary Power Unit Installation (Fishpole Hoist Procedure), TASK 49-11-01-400-805 or Auxiliary Power Unit Installation (Hydraulic Jack Method), TASK 49-11-01-400-801.

- 10) If you find no metal particles and no other unwanted materials, then do these steps:

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- a) Install a new or the same oil filter element. To install it, do this task: Oil Filter Element Installation, TASK 49-27-03-400-801.
- b) Install a new or the same generator scavenge oil filter element. To install it, do this task: Generator Scavenge Oil Filter Element Installation, TASK 49-27-03-400-802.
- (c) If you find no metal particles and no other unwanted materials, then do these steps to install the oil filter and/or generator scavenge oil filter element(s):
 - 1) Discard the oil filter and/or generator scavenge oil filter element(s).
 - 2) If the oil filter element was removed for an inspection, install a new oil filter element. To install it, do this task: Oil Filter Element Installation, TASK 49-27-03-400-801.
 - 3) If the generator scavenge oil filter element was removed for an inspection, install a new generator scavenge oil filter element. To install it, Generator Scavenge Oil Filter Element Installation, TASK 49-27-03-400-802.

———— **END OF TASK** ————

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MAGNETIC CHIP COLLECTORS - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) A removal of the magnetic chip collectors.
 - (2) An inspection of the magnetic chip collectors.
 - (3) An installation of the magnetic chip collectors.
- B. There are five magnetic chip collectors on the APU.
- (1) Three magnetic chip collectors are on the gearbox and one magnetic chip collector is on the lube cluster. One more magnetic chip collector is on the air turbine starter.

TASK 49-27-04-000-801

2. Magnetic Chip Collector Removal

(Figure 201)

A. General

- (1) There are four magnetic chip collectors for the APU oil system (with one more on the air turbine starter). The magnetic chip collectors are installed on these parts of the oil system:
 - (a) Generator scavenge [1]
 - (b) Oil sump [3]
 - (c) Turbine bearing scavenge [4]
 - (d) Midbearing scavenge [5].
- (2) The magnetic chip collectors retain metal particles from the APU oil.
- (3) The magnetic chip collectors are used to isolate internal APU problems.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

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SUBTASK 49-27-04-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-04-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Magnetic Chip Collector Removal

SUBTASK 49-27-04-020-001

- (1) Do these steps to remove each of the four magnetic chip collectors [2]:
- Push the magnetic chip collector [2] in and turn it counterclockwise to release it.
 - Remove the magnetic chip collector [2].

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CAUTION

DO NOT REMOVE THE PERMANENT SECONDARY SEAL FROM THE MAGNETIC CHIP COLLECTOR. THE REMOVAL OF THE SECONDARY SEAL WILL CAUSE DAMAGE TO THE MAGNETIC CHIP COLLECTOR.

- (c) Remove the packing [6] from the magnetic chip collector [2].
- Discard the packing [6].

ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE TWO PACKINGS

- (d) Remove the two packings [6] from the magnetic chip collector [2].
- Discard the two packings [6].

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————— END OF TASK —————

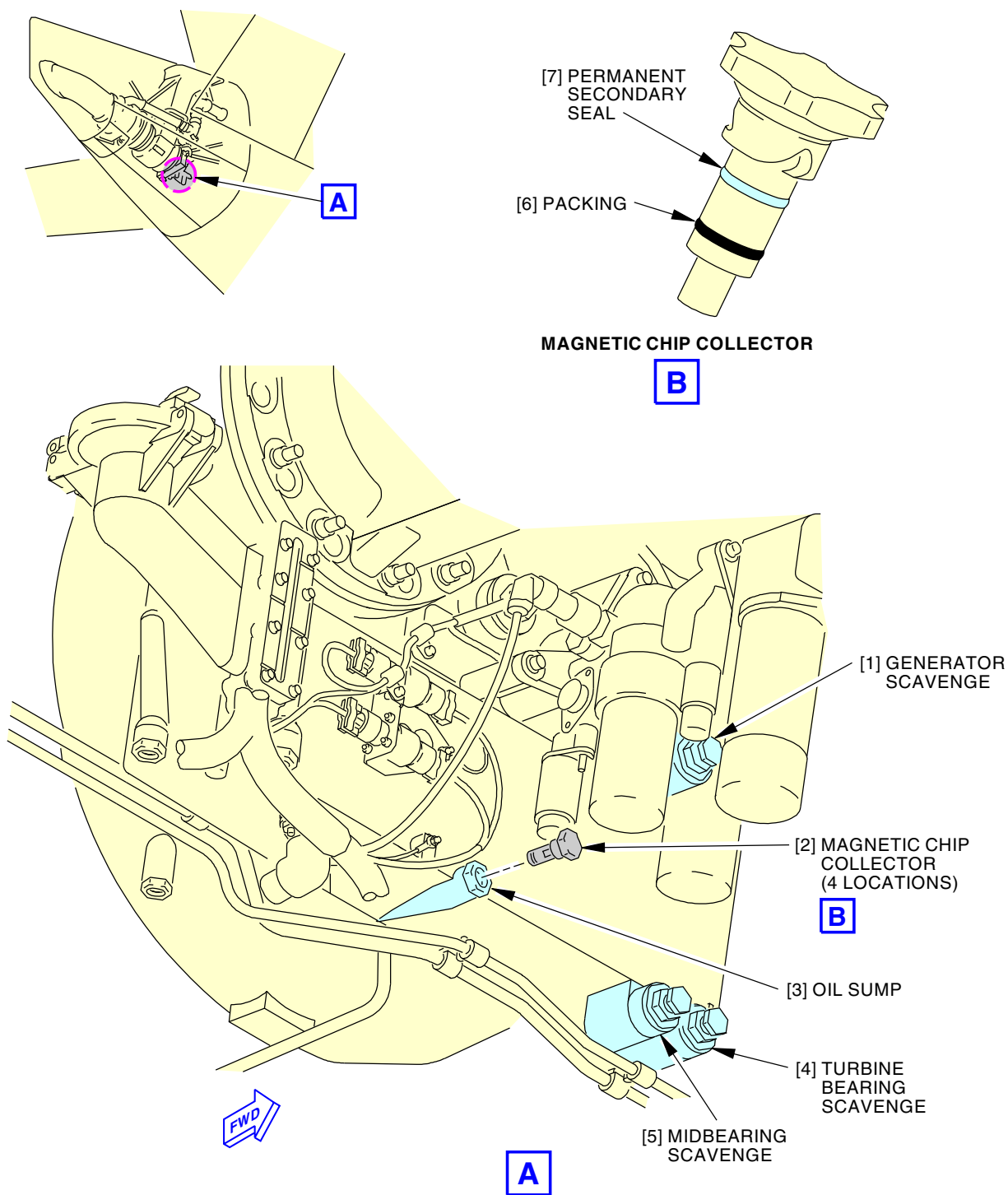
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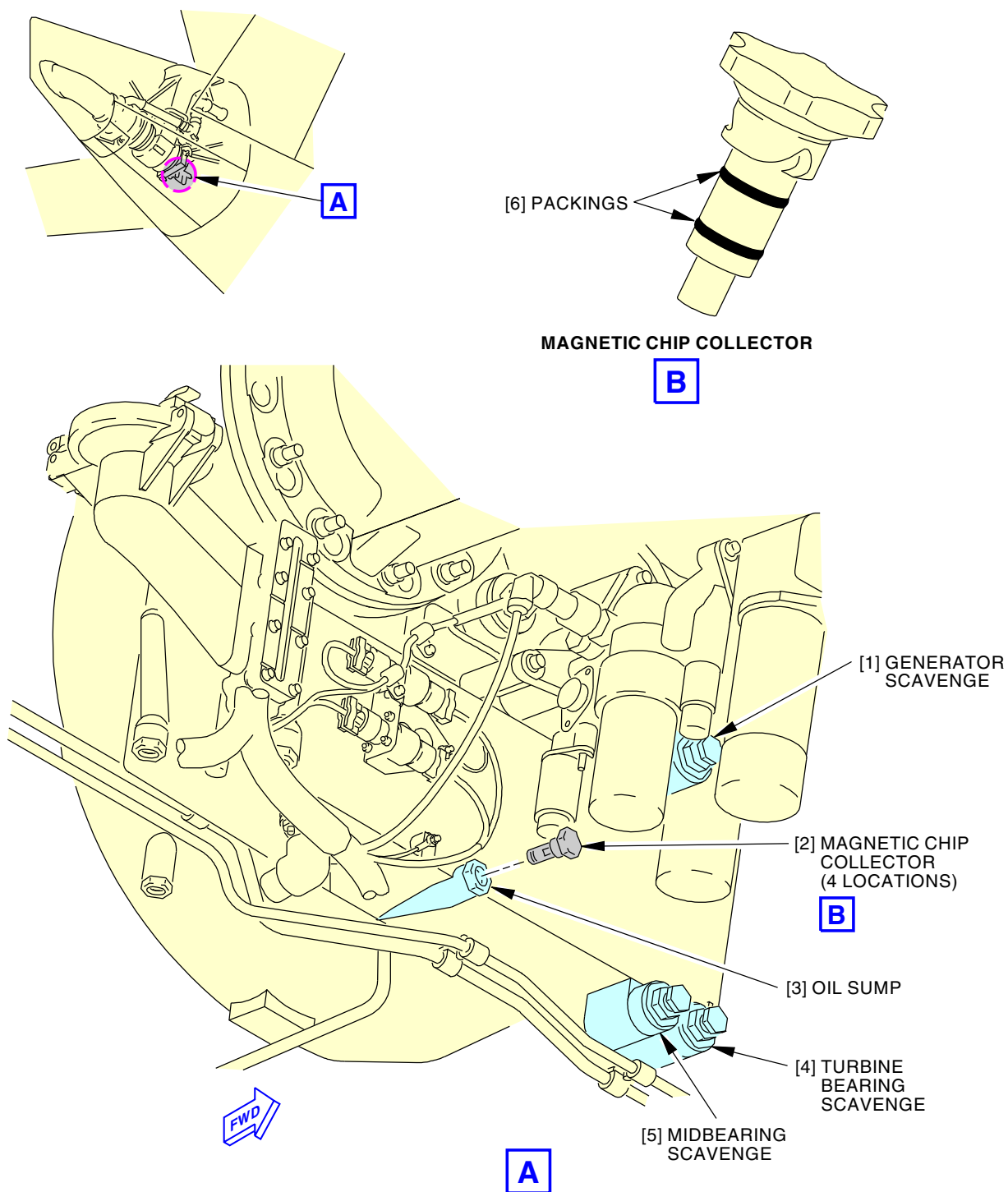
Magnetic Chip Collector Installation
Figure 201/49-27-04-990-801 (Sheet 1 of 2)

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**Magnetic Chip Collector Installation
Figure 201/49-27-04-990-801 (Sheet 2 of 2)**

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TASK 49-27-04-200-801

3. Magnetic Chip Collector Inspection

(Figure 202)

A. General

- (1) There are four magnetic chip collectors for the APU oil system (with one more on the air turbine starter). Magnetic chip collectors are on these parts of the oil system:
 - (a) Generator scavenge
 - (b) Oil sump
 - (c) Turbine bearing scavenge
 - (d) Midbearing scavenge.

B. References

Reference	Title
24-21-01-000-801	APU Generator Removal (P/B 401)
24-21-01-400-801	APU Generator Installation (P/B 401)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-01 P/B 401	AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION
49-27-03-000-802	Generator Scavenge Oil Filter Element Removal (P/B 401)
49-27-03-400-802	Generator Scavenge Oil Filter Element Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

D. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

F. Magnetic Chip Collectors Inspection

SUBTASK 49-27-04-210-001

- (1) Do these steps to examine the magnetic chip collectors for metal particles (Figure 202):

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

 - (a) If the magnetic chip collectors were not removed, then do this task: Magnetic Chip Collector Removal, TASK 49-27-04-000-801.
 - (b) Silver color particles are permitted as follows:

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- 1) If you find silver color particles on the chip collector for the generator scavenge, do these steps:
 - a) Replace the APU generator. To replace it, do these tasks:
APU Generator Removal, TASK 24-21-01-000-801,
APU Generator Installation, TASK 24-21-01-400-801.
 - b) Replace the APU generator scavenge oil filter element. To replace it, do these tasks:
Generator Scavenge Oil Filter Element Removal, TASK 49-27-03-000-802,
Generator Scavenge Oil Filter Element Installation, TASK 49-27-03-400-802.
- 2) If you find a small or medium quantity of silver particles on the oil sump chip collector or the mid-bearing scavenge chip collector, do these steps:
 - a) Do an inspection of the magnetic chip collector at 50 APU hours.
 - <1> If no silver particles are found, the APU can continue in service (no additional inspections need to be done).
 - <2> If you find silver particles, replace the APU:AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401.
- 3) A large quantity of silver particles on the oil sump chip collector or the mid-bearing scavenge chip collector is not permitted.
- (c) A small quantity of metal particles that are not silver color are permitted.
- (d) If you find a medium quantity of metal particles on the magnetic chip collectors that are not silver color, then do these steps:



DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES, AND GLOVES WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 1) Put the magnetic chip collectors fully into the solvent, B00074, and clean with a cotton wiper, G00034, to remove the metal particles.
- 2) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the magnetic chip collectors.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the magnetic chip collectors.
- 3) Do this task: Magnetic Chip Collector Installation, TASK 49-27-04-400-801.
- 4) Operate the APU for 5 minutes. To operate the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- 5) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
- 6) Do this task: Magnetic Chip Collector Removal, TASK 49-27-04-000-801.
- 7) Examine the magnetic chip collectors again.
- 8) More metal particles on the magnetic chip collectors are not permitted.
 - a) If you find more metal particles on the magnetic chip collectors, replace the APU: AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401.

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- (e) A large quantity of metal particles on the magnetic chip collector is not permitted.

NOTE: A large quantity of metal particles give an indication of internal damage to the APU.

- 1) If you find a large quantity of metal particles on the magnetic chip collector, then do these tasks:

a) Replace the APU: AUXILIARY POWER UNIT (APU) -
REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401.

- (f) If you find a quantity of 4340 steel slivers on the magnetic chip collector for the turbine bearing scavenge, then do these steps:

NOTE: A quantity of 4340 steel slivers on the magnetic chip collector for the turbine bearing scavenge is permitted. Continued inspection of this magnetic chip collector is recommended at 300 APU hour intervals. The 4340 steel slivers are the result of wear between the turbine bearing thrust washer and turbine bearing outer race. If inspections over a period of 1200 APU hours show a quantity of 4340 steel slivers, it is recommended that the APU must be replaced in a subsequent 300 APU hour interval.

- 1) Contact Honeywell Service Engineering that you found a quantity of 4340 steel slivers on the magnetic chip collector for the turbine bearing scavenge with the APU serial number and the APU hour when you first found the steel slivers and subsequent inspections.



WARNING

DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES, AND GLOVES WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 2) Put the magnetic chip collector fully into the solvent, B00074, and clean with a cotton wiper, G00034, to remove the 4340 steel slivers.
- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the magnetic chip collector.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the magnetic chip collector.

- (g) If a medium or large quantity of particles were found on the magnetic chip collector (any type of material), do these steps to clean the chip collector:



WARNING

DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM IT. PUT ON GOGGLES, AND GLOVES WHEN YOU USE IT. KEEP IT AWAY FROM SPARKS, FLAMES, AND HEAT. IT IS POISONOUS AND FLAMMABLE. THE SOLVENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 1) Put the magnetic chip collector fully into the solvent, B00074, and clean with a cotton wiper, G00034, to remove the 4340 steel slivers.



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- 2) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the magnetic chip collector.

NOTE: It is recommended that you use a pressure of 60-90 psig (414-620 kPa) of air or nitrogen to dry the magnetic chip collector.

- (h) Do this task: Magnetic Chip Collector Installation, TASK 49-27-04-400-801.

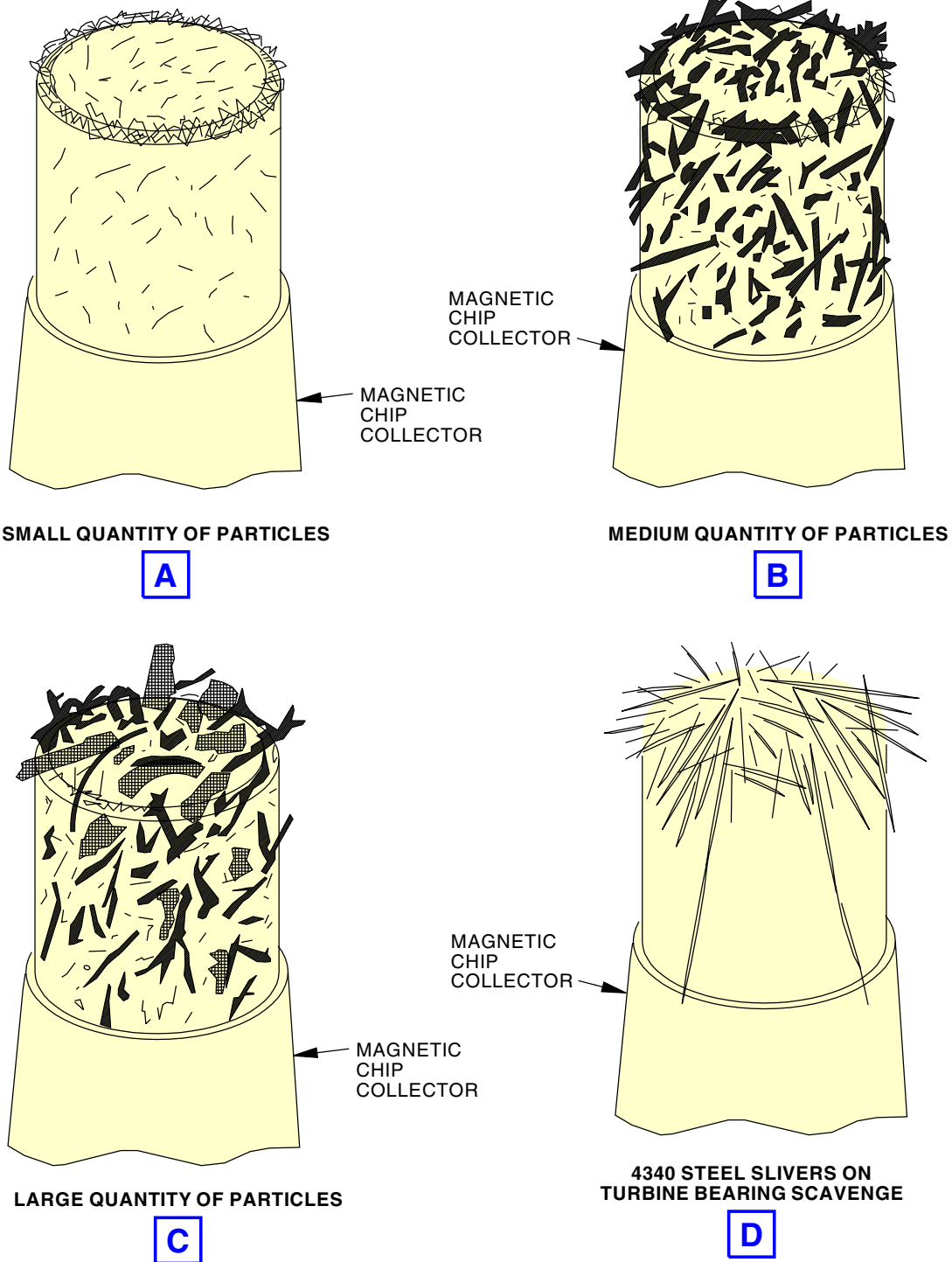
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Magnetic Chip Collector Inspection
Figure 202/49-27-04-990-802

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TASK 49-27-04-400-801

4. Magnetic Chip Collector Installation

(Figure 201)

A. General

- (1) There are four magnetic chip collectors for the APU oil system (with one more on the air turbine starter). The magnetic chip collectors are installed on these parts of the oil system:
- (a) Generator scavenge [1]
 - (b) Oil sump [3]
 - (c) Turbine bearing scavenge [4]
 - (d) Midbearing scavenge [5].

B. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Magnetic chip collector	49-27-04-01-050	ARO ALL
6	Packing	49-27-04-01-055	ARO ALL

E. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

F. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Magnetic Chip Collector Installation

SUBTASK 49-27-04-420-001

- (1) Do these steps to install each of the four magnetic chip collectors [2]:
- (a) Lubricate the one or two new packings [6] with Mobil Jet Oil II, D00520.

ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE PACKING AND SEAL

- (b) Install the packing [6] on the magnetic chip collector [2].

NOTE: If the permanent secondary seal [7] is damaged or worn, it is permitted to replace the seal [7] with the new packing [6].

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ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE TWO PACKINGS

- (c) Install the two packings [6] on the magnetic chip collector [2].

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- (d) Install the magnetic chip collector [2] in the drain plug.
(e) Push and turn the magnetic chip collector [2] clockwise.

NOTE: When the magnetic chip collector is in the locked position, it will align with the hex on the housing.

- (f) Optional: Make sure the magnetic chip collector is installed correctly as follows:

NOTE: If this optional step is performed, it is not necessary to start the APU in the installation test that follows.

- 1) Have a 2nd technician (one who did not originally do the installation) make sure the magnetic chip collector is hand tight.
a) Do a visual inspection to make sure magnetic chip collector is aligned with the hex on the housing.

H. Put the Airplane Back to its Usual Condition

SUBTASK 49-27-04-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-04-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-04-790-001

- (3) Do these steps for the installation test of the magnetic chip collectors:

NOTE: If the above optional step to make sure the magnetic chip collector is installed correctly (with a 2nd technician) has been done, it is not necessary to do this installation test.

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
(b) Make sure the magnetic chip collectors do not leak oil.
(c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 49-27-04-410-001

- (4) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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APU OIL FILTER BYPASS VALVE/SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil filter bypass valve/switch
 - (2) An installation of the oil filter bypass valve/switch.
- B. The oil filter bypass valve/switch is a single component. The oil filter bypass valve/switch is referred to as the bypass valve. The bypass valve is part of the lube cluster.

TASK 49-27-07-000-801

2. Oil Filter Bypass Valve/Switch Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-07-860-001

- (1) Make sure the APU selector on the P5 panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-07-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-07-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Bypass Valve Removal

SUBTASK 49-27-07-020-001

- (1) Do the steps that follow to remove the bypass valve [1]:
 - (a) Disconnect the electrical connector (D49017P) [5] from the bypass valve [1].
 - 1) Put a cap on the end of the electrical connector (D49017P) [5] to prevent contamination.
 - (b) Put the oil resistant container 1 gal, (4 l), STD-1058 under the bypass valve [1].
 - (c) Loosen the nut [4] on the lube cluster.
 - (d) Turn the bypass valve [1] counterclockwise until the flange disengages the stud.
 - (e) Remove the bypass valve [1].
 - (f) Remove the packing [2], packing [3] from the bypass valve [1].
 - 1) Discard the packing [2], packing [3].
 - (g) Make sure you install all necessary protective covers.

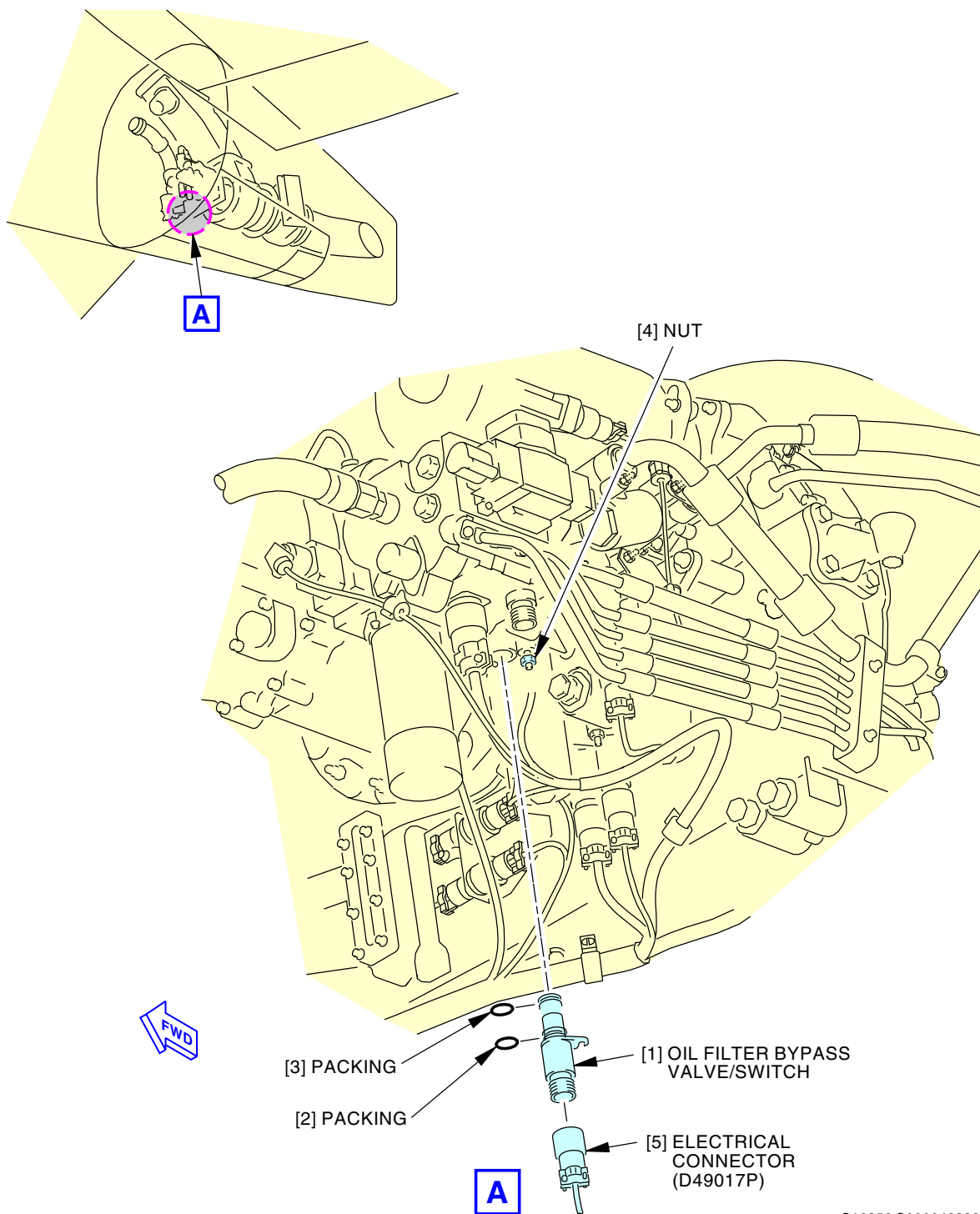
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Oil Filter Bypass Valve/Switch Installation
Figure 401/49-27-07-990-801

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TASK 49-27-07-400-801

3. Oil Filter Bypass Valve/Switch Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Bypass valve	49-27-27-01-120	ARO ALL
2	Packing	49-27-27-01-130	ARO ALL
3	Packing	49-27-27-01-125	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Bypass Valve Installation

SUBTASK 49-27-07-420-001



CAUTION

REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do the steps that follow to install the bypass valve [1]:
 - (a) Lubricate the packing [2], packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [2], packing [3] on the bypass valve [1].
 - (c) Install the bypass valve [1] into the lube cluster.
 - 1) Turn the bypass valve [1] clockwise until the flange fully engages the stud.
 - 2) Tighten the nut [4].
 - (d) Remove the cap from the electrical connector (D49017P) [5].
 - (e) Connect the electrical connector (D49017P) [5] to the bypass valve [1].

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G. Bypass Valve Installation Test

SUBTASK 49-27-07-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-07-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-07-740-001

- (3) Do the steps that follow to do the installation test for the bypass valve:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the oil filter bypass valve/switch, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Examine the bypass valve for oil leakage.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-07-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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AIR/OIL COOLER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the air/oil cooler
- (2) An installation of the air/oil cooler.

TASK 49-27-09-000-801

2. Air/Oil Cooler Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-09-860-001

- (1) Make sure the APU selector on the P5 panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-09-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-09-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left

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(Continued)

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Air/Oil Cooler Removal

SUBTASK 49-27-09-020-001



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

- (1) Do the steps that follow to disconnect the oil tubes:
 - (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 below the oil cooler.
 - (b) Loosen the nut [2].
 - (c) Turn the oil supply tube [3] counterclockwise.
 - (d) Disconnect the oil supply tube [3].
 - (e) Let the oil supply tube drain into the container.
 - (f) Remove the 2 packings [4] from the oil supply tube [3].
 - 1) Discard the packings [4].
 - (g) Loosen the nut [5].
 - (h) Turn the oil return tube [6] counterclockwise.
 - (i) Disconnect the oil return tube [6].
 - (j) Let the oil return tube drain into the container.
 - (k) Remove the 2 packings [7] from the oil return tube [6].
 - 1) Discard the packings [7].
 - (l) Make sure you install all necessary protection covers.

SUBTASK 49-27-09-020-002

- (2) Remove the air/oil cooler:
 - (a) Install plugs or covers in the oil ports for the air/oil cooler.

NOTE: This will prevent oil spillage during the removal.
 - (b) Loosen the nuts [8] on the air/oil cooler [1].
 - (c) Push up on the air/oil cooler [1] to disengage the cooler from the studs on the APU.
 - (d) Remove the air/oil cooler [1].
 - (e) Remove the protection covers from the oil ports.
 - (f) Drain the oil from air/oil cooler [1] into the container.
 - (g) Install the protection covers in the oil ports.

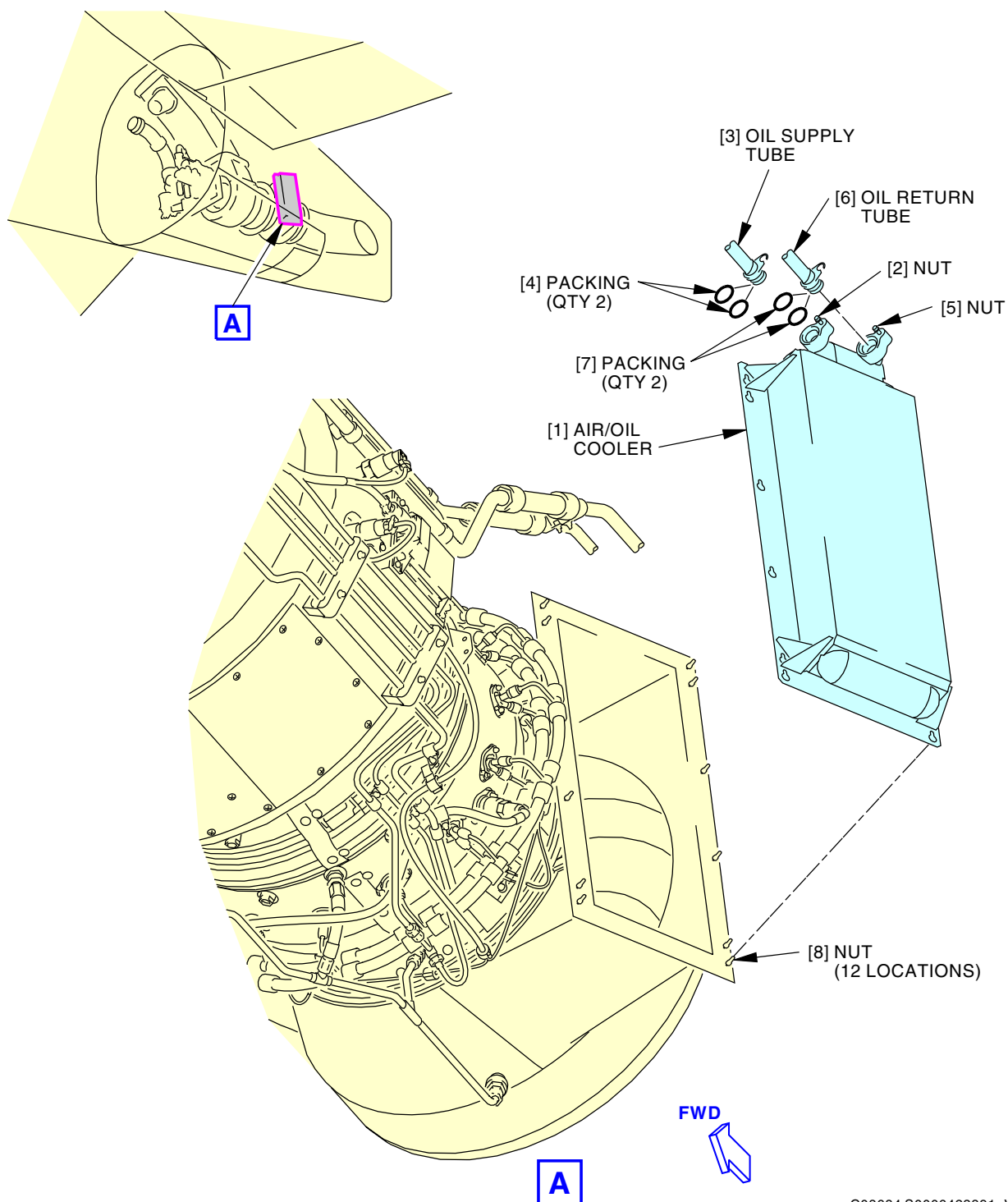
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Air/Oil Cooler Installation
Figure 401/49-27-09-990-801

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TASK 49-27-09-400-801

3. Air/Oil Cooler Installation

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-13-04-200-801	APU Oil Level Inspection (P/B 301)
12-13-04-600-801	APU Oil Replenishing (P/B 301)
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Air/oil cooler	49-27-09-01-050	ARO ALL
4	Packing	49-27-27-01-085	ARO ALL
		49-27-27-01-230	ARO ALL
7	Packing	49-27-27-01-240	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Air/Oil Cooler Installation



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-27-09-420-001

- (1) Do the steps that follow to install the air/oil cooler [1]:(Figure 401)
 - (a) Install the air/oil cooler [1] onto the APU.
 - (b) Make sure the air/oil cooler [1] is fully engaged on the studs.
 - (c) Tighten the nuts [8].

SUBTASK 49-27-09-420-002

- (2) Do the steps that follow to connect the oil tubes:

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- (a) Lubricate the 4 new packings [4], packings [7] with Mobil Jet Oil II, D00520.
- (b) Install the 2 packings [7] on the oil return tube [6].
- (c) Connect the oil return tube [6] to the air/oil cooler [1].
- (d) Turn the retainer for the oil return tube [6] fully clockwise.
- (e) Tighten the nut [5] for the oil return tube [7].
- (f) Install the two packings [4] on the oil supply tube [3].
- (g) Connect the oil supply tube [3] to the air/oil cooler [1].
- (h) Turn the retainer for the oil supply tube [3] fully clockwise.
- (i) Tighten the nut [2] for the oil supply tube [3].

G. Air/Oil Cooler Installation Test

SUBTASK 49-27-09-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-09-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-09-210-001

- (3) Do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.
 - (a) Make sure the oil level more than 7.5 quarts on EICAS or make sure the oil level is FULL on the oil level sight gage.

SUBTASK 49-27-09-710-001

- (4) Do the steps that follow to do the air/oil cooler installation test:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 1) Use the APU air to operate the left and right air conditioning packs. To operate the packs, do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
 - 2) Use the APU generator to operate the left and the right transfer bus. To supply power, do this task: Supply Electrical Power, TASK 24-22-00-860-805
 - 3) Wait for the OIL TEMP display on the APU maintenance page shows more than 60 ° C.
 - (b) Examine the air/oil cooler [1] for oil leakage.
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 49-27-09-610-001

- (5) Do this task: APU Oil Replenishing, TASK 12-13-04-600-801.

NOTE: The oil level will be down about 1.4 - 2.0 quarts.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-09-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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AIR/OIL COOLER - CLEANING/PAINTING

1. General

A. This procedure has the task to clean the air inlet for the air/oil cooler.

TASK 49-27-09-000-802

2. Air/Oil Cooler Cleaning

(Figure 701)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-123	Brush - Soft Bristle
STD-1114	Air Source - Regulated, Dry, Filtered 0-150 PSIG with Pressure Gauge range 100 PSIG, 1 PSIG increment and +/-1 psi minimum accuracy

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Air/Oil Cooler Cleaning

SUBTASK 49-27-09-860-005

(1) Make sure the APU selector on the P5 panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-09-860-006

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-09-010-002

(3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-27-09-020-003

- (4) Do the steps that follow to clean the air/oil cooler:
- (a) Remove any loose objects that block the air path for the air/oil cooler.
 - (b) Use a soft bristle brush, STD-123 to loosen the contaminants on the face of the air/oil cooler.
 - (c) Use the Regulated Dry Filtered Air Source, STD-1114 at 100 psig to remove the contamination from the air/oil cooler.

SUBTASK 49-27-09-860-007

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-09-860-008

- (6) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-09-410-002

- (7) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

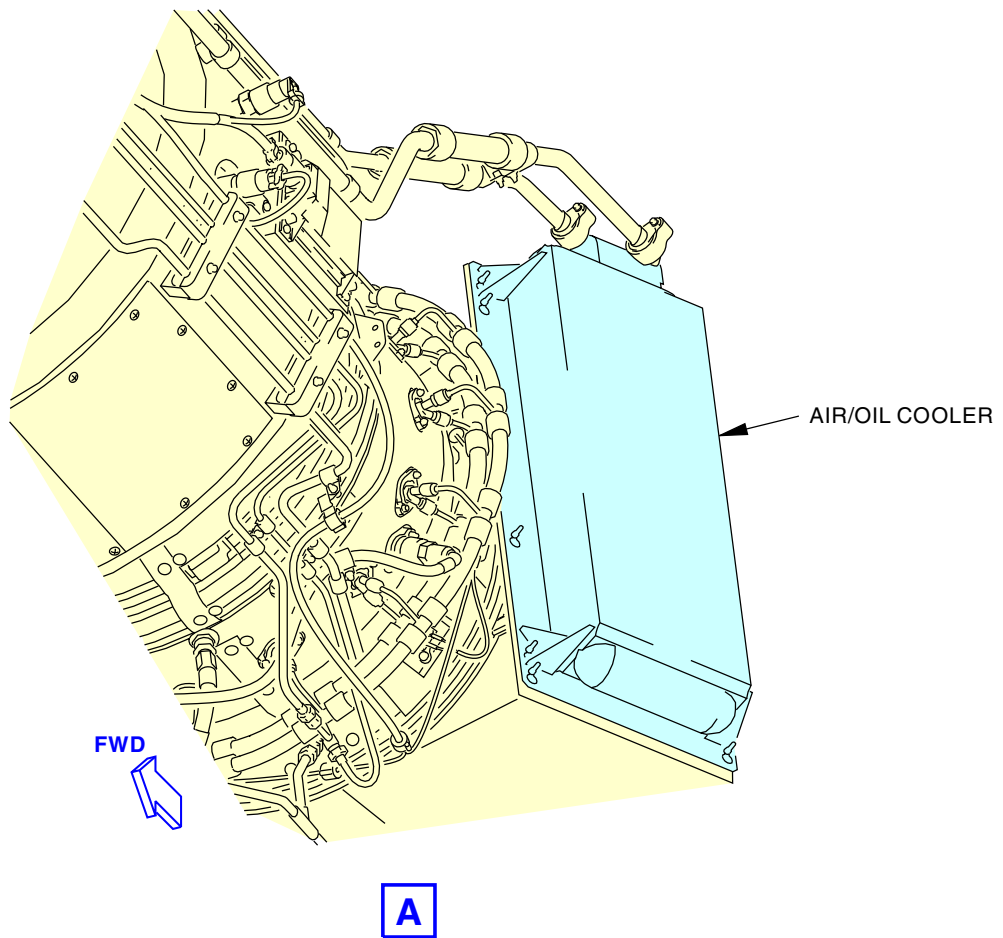
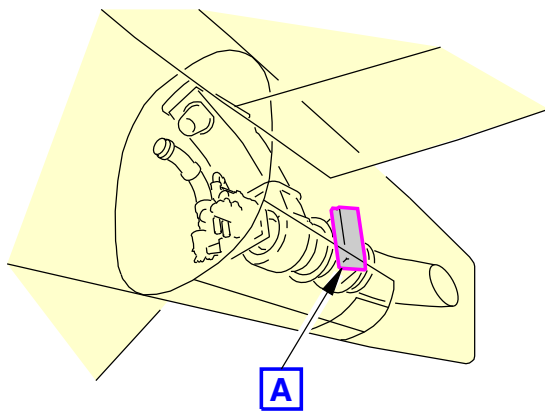
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Air/Oil Cooler Cleaning
Figure 701/49-27-09-990-802

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OIL THERMAL BYPASS VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil thermal bypass valve
 - (2) An installation of the oil thermal bypass valve.
- B. The oil thermal bypass valve is also referred to as the temperature control valve. For this procedure, the oil thermal bypass valve is referred to as the thermal bypass valve.

TASK 49-27-10-000-801

2. Oil Thermal Bypass Valve Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Tools/Equipment**

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

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. **Prepare for the Removal**

SUBTASK 49-27-10-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-10-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-10-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Thermal Bypass Valve Removal

SUBTASK 49-27-10-020-001



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

- (1) Do these steps to disconnect the oil tubes:
 - (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 below the oil supply tube [14] and oil return tube [19].
 - (b) Loosen the nut [16] that attaches the oil supply tube [14] to the thermal bypass valve [1].
 - (c) Turn the retainer on the oil supply tube [14] counterclockwise until it disengages the stud.
 - (d) Disconnect the oil supply tube [14].
 - (e) Let the oil supply tube [14] drain into the container.
 - (f) Remove the two packings [13] from the oil supply tube [14].
 - 1) Discard the two packings [13].
 - (g) Loosen the nut [20] that attaches the oil return tube [19] to the thermal bypass valve [1].
 - (h) Turn the retainer on the oil return tube [19] counterclockwise until it disengages the stud.
 - (i) Disconnect the oil return tube [19].
 - (j) Let the oil return tube [19] drain into the container.
 - (k) Remove the two packings [22] from the oil return tube [19].
 - 1) Discard the two packings [22].
 - (l) Make sure you install all necessary protection covers.

SUBTASK 49-27-10-020-002

- (2) Do these steps to remove the thermal bypass valve [1]:
 - (a) Remove the bolt [5] and clamp [6] from the APU wire harness.
 - (b) Remove the nut [12] and nut [18] that attaches the thermal bypass valve [1] to the lube cluster [8].
 - (c) Remove the thermal bypass valve [1] and shim [4] from the lube cluster [8].
 - (d) Remove the transfer tube [2] and transfer tube [9].
 - (e) Remove the four packings [3] from the transfer tube [2].
 - 1) Discard the four packings [3].
 - (f) Remove the four packings [7] from the transfer tube [9].
 - 1) Discard the four packings [7].
 - (g) Remove the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (h) Make sure you install all necessary protection covers.

————— END OF TASK —————

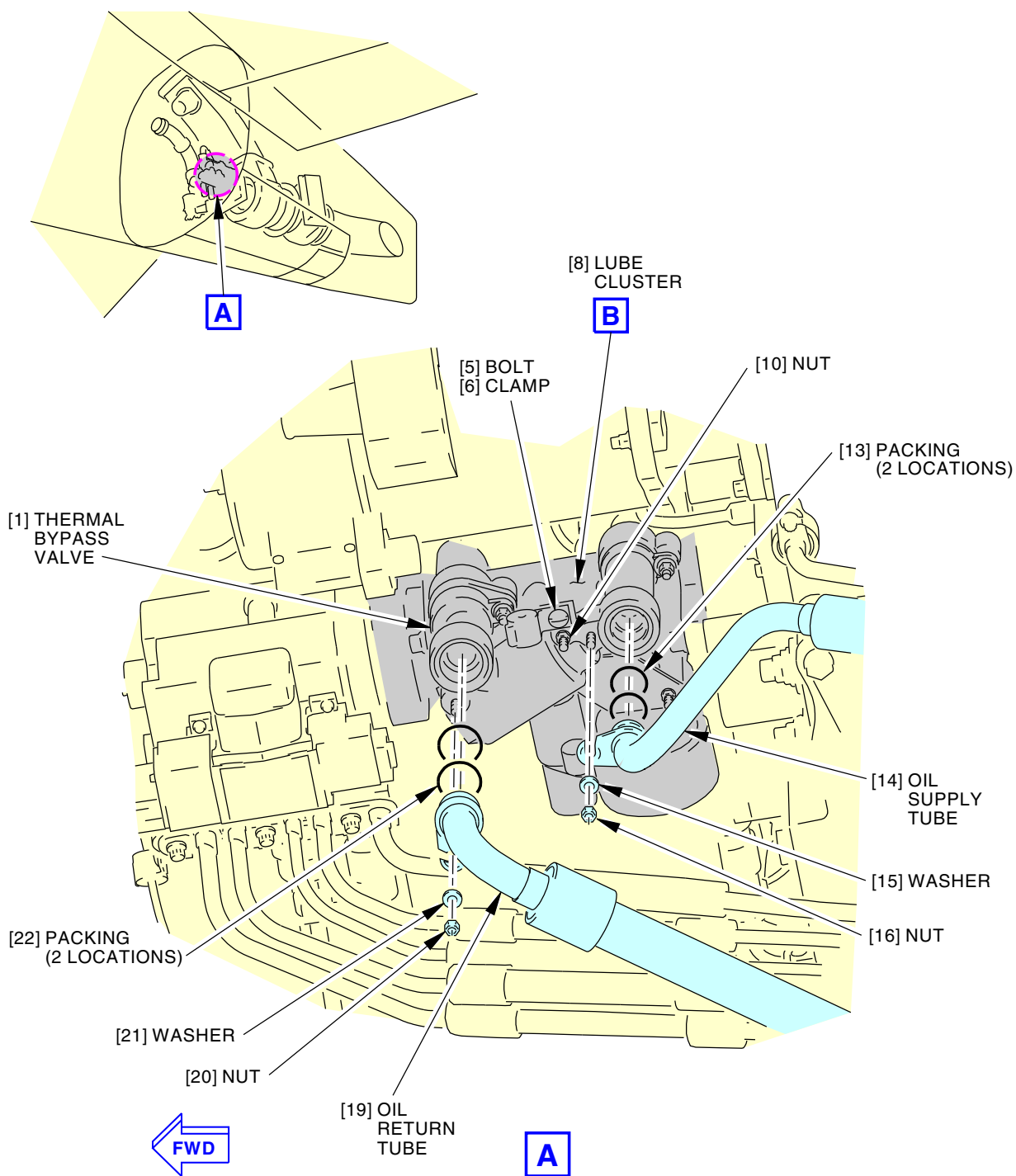
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**Thermal Bypass Valve Installation
Figure 401/49-27-10-990-801 (Sheet 1 of 2)**

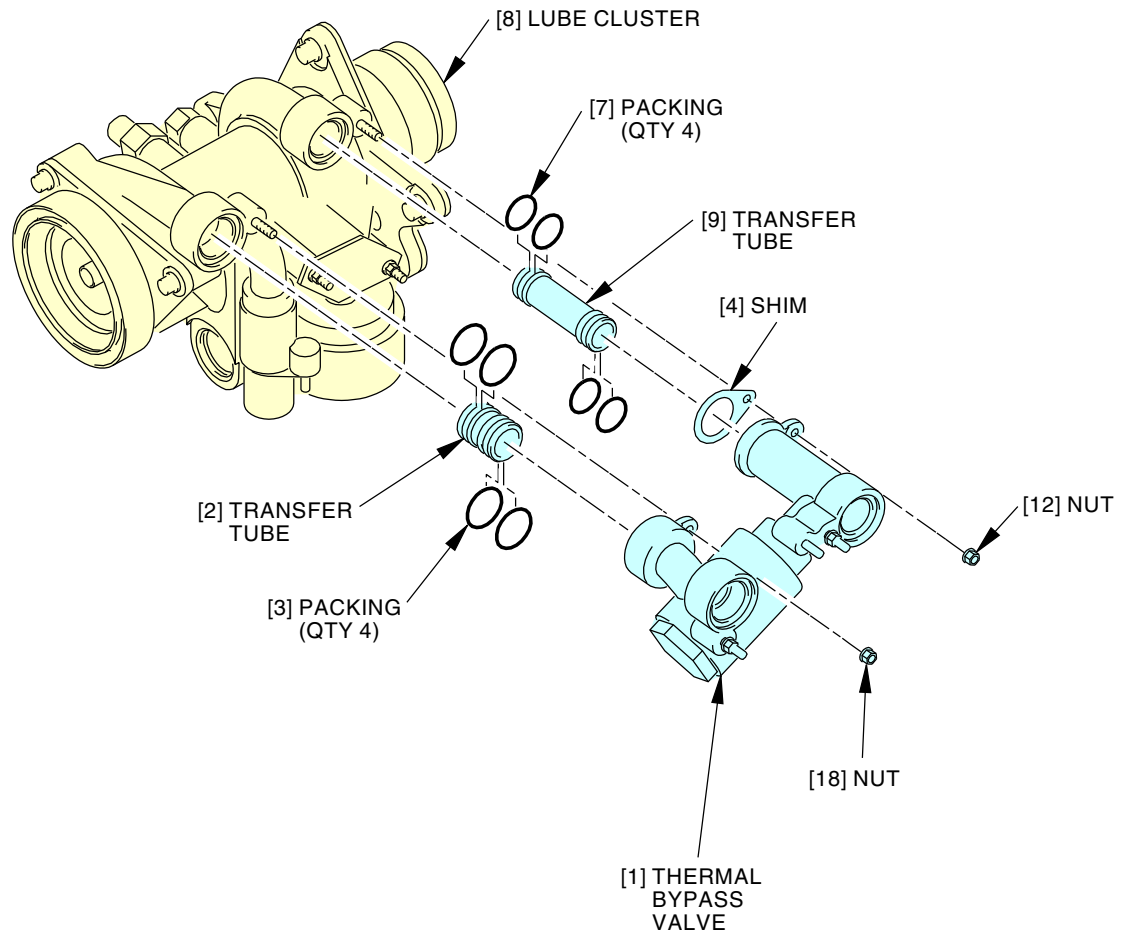
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**LUBE CLUSTER
(SHOWN REMOVED FOR CLARITY)**

B

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**Thermal Bypass Valve Installation
Figure 401/49-27-10-990-801 (Sheet 2 of 2)**

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TASK 49-27-10-400-801

3. Oil Thermal Bypass Valve Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-13-04-200-801	APU Oil Level Inspection (P/B 301)
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-371	Gauge - Feeler, 0.0 to 0.5 in (0.0 to 12.7 mm), Readable to 1/1000 in (.025 mm)

C. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Thermal bypass valve	49-27-27-01-190	ARO ALL
3	Packing	49-27-27-01-085	ARO ALL
7	Packing	49-27-27-01-220	ARO ALL
13	Packing	49-27-27-01-085	ARO ALL
		49-27-27-01-230	ARO ALL
22	Packing	49-27-27-01-240	ARO ALL

E. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

F. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Procedure



CAUTION REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-27-10-420-001

(1) Do these steps to install the thermal bypass valve [1]:

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- (a) Lubricate the four new packings [3] and four new packings [7] with a light coat of Mobil Jet Oil II, D00520.
- (b) Install the four packings [3] on the transfer tube [2].
- (c) Install the four packings [7] on the transfer tube [9].
- (d) Install the transfer tube [2] in the forward port of the lube cluster [8].
- (e) Install the transfer tube [9] in the aft port of the lube cluster [8].
- (f) Install the shims [4] on the stud of the lube cluster [8].
NOTE: The total thickness of the shims [4] is 0.024 in. (0.610 mm).
NOTE: Use a maximum of two shims (part number 3881634-1) and four shims (part number 3881634-2).
- (g) Install the thermal bypass valve [1] on the lube cluster [8] with the nut [12] and nut [18].
 - 1) Tighten the nut [12] and nut [18] to 40 in-lb (4.5 N·m).
- (h) Put a 0.0 to 0.5 in (0.0 to 12.7 mm) feeler gauge, STD-371 between the lube cluster [8] and thermal bypass valve [1] and measure the gap.
 - 1) The gap must be 0.000 in. (0.000 mm) to 0.005 in. (0.127 mm).
- (i) Do the above steps again to remove or install the shims [4] as necessary to make sure the gap between the lube cluster [8] and thermal bypass valve [1] is 0.000 in. (0.000 mm) to 0.005 in. (0.127 mm).
- (j) Put the APU wire harness in the clamp [6] and install the clamp on the thermal bypass valve [1] with the bolt [5].

SUBTASK 49-27-10-420-002

- (2) Do these steps to connect the oil tubes:
 - (a) Lubricate the two new packings [13] and two new packings [22] with a light coat of Mobil Jet Oil II, D00520.
 - (b) Install the two packings [22] on the oil return tube [19].
 - (c) Connect the oil return tube [19] to the thermal bypass valve [1].
 - (d) Turn the retainer on the oil return tube [19] clockwise until it engages the stud.
 - (e) Tighten the nut [20] that attaches the oil return tube [19] to the thermal bypass valve [1].
 - (f) Install the two packings [13] on the oil supply tube [14].
 - (g) Connect the oil supply tube [14] to the thermal bypass valve [1].
 - (h) Turn the retainer on the oil supply tube [14] clockwise until it engages the stud.
 - (i) Tighten the nut [16] that attaches the oil supply tube [14] to the thermal bypass valve [1].

H. Thermal Bypass Valve Installation Test

SUBTASK 49-27-10-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1

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(Continued)

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-10-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-10-210-002

- (3) Do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.
- (a) Make sure the oil level is FULL on the EICAS display or the oil level is FULL on the oil level sight gage.

NOTE: There is 7.25 qt (6.9 l) of oil in the APU gearbox housing.

SUBTASK 49-27-10-710-001

- (4) Do the installation test for the thermal bypass valve:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- (b) Look at the APU maintenance page. To look at the APU maintenance page, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
- (c) Operate the left and right air conditioning packs with the APU. To operate the left and right air conditioning packs, do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
- (d) Wait for the OIL TEMP display on the APU maintenance page to show the oil temperature is more than 77°C.
- NOTE: When the oil temperature is more than 77°C, oil will flow through the air/oil cooler.
- (e) Examine the lube cluster and thermal bypass valve for oil leakage.
- (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-10-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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LOW OIL PRESSURE SWITCH - LUBE CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the low oil pressure switch
 - (2) An installation of the low oil pressure switch.
- B. The low oil pressure switch is part of the lube cluster.
- C. The low oil pressure switch is referred to as the LOP switch.

TASK 49-27-14-000-801

2. Low Oil Pressure Switch Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. **Prepare for the Removal**

SUBTASK 49-27-14-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-14-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-14-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Low Oil Pressure Switch Removal

SUBTASK 49-27-14-020-001

- (1) Do the steps that follow to remove the LOP switch [1]:
 - (a) Disconnect the electrical connector (D49015P) [4] from the LOP switch [1].
 - 1) Install a cap on the electrical connector (D49015P) [4] to prevent contamination.
 - (b) Put the oil resistant container 1 gal, (4 l), STD-1058 under the LOP switch.

NOTE: Some oil can come out of the lube cluster when the LOP switch is removed.
 - (c) Loosen the nut [2] on the lube cluster.
 - (d) Turn the LOP switch [1] counterclockwise until the flange disengages the studs.
 - (e) Remove the LOP switch [1] from the lube cluster.
 - (f) Remove the packing [3] from the LOP switch [1].
 - 1) Discard the packing [3].

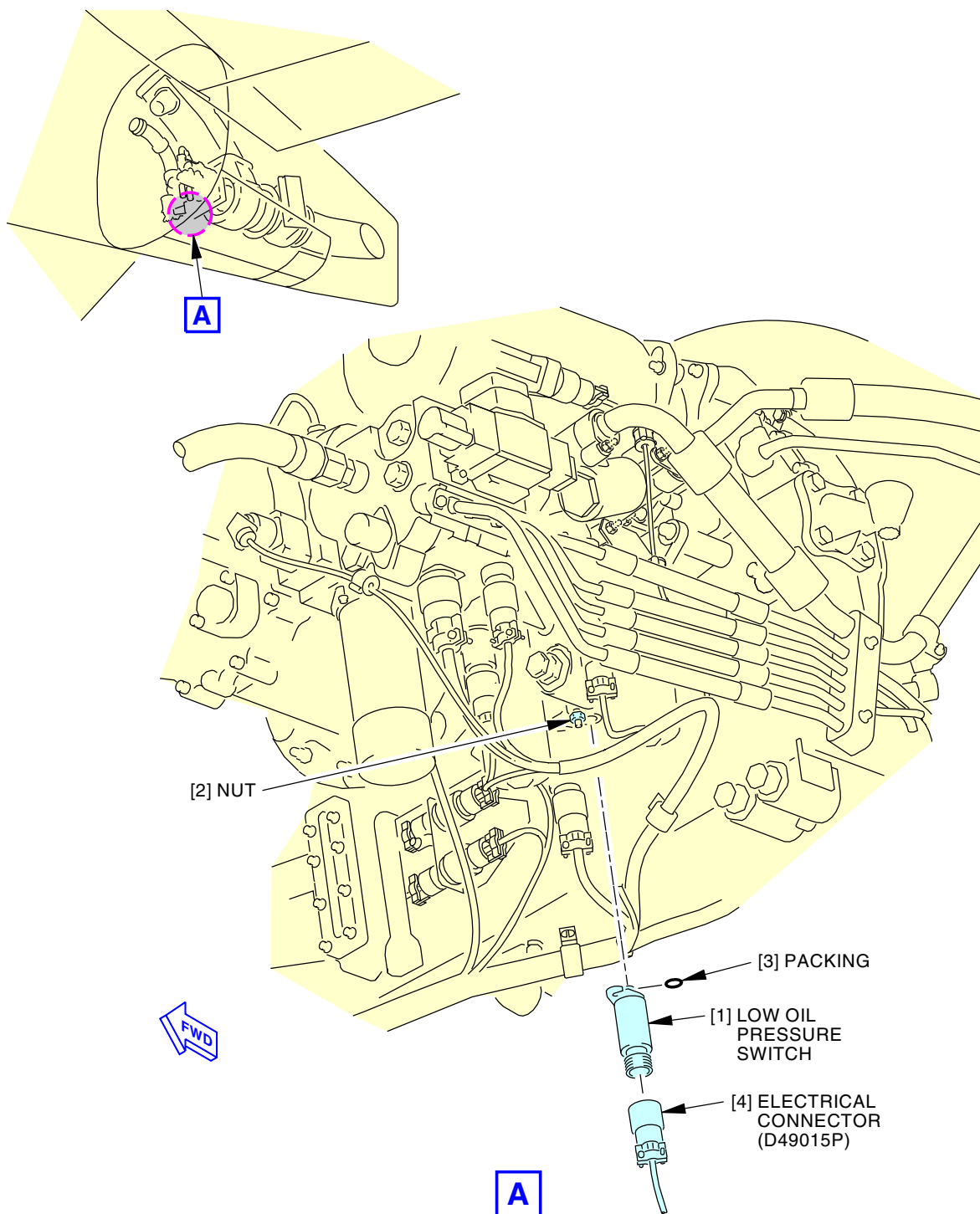
————— **END OF TASK** —————

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Low Oil Pressure Switch Installation
Figure 401/49-27-14-990-801

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TASK 49-27-14-400-801

3. Low Oil Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
12-13-04-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	LOP switch	49-27-27-01-080	ARO ALL
3	Packing	49-27-27-01-085	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Low Oil Pressure Switch Installation

SUBTASK 49-27-14-420-001

- (1) Do the steps that follow to install the LOP switch [1]:
 - (a) Lubricate the new packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3] on the LOP switch [1].
 - (c) Install the LOP switch [1] into the lube cluster.
 - (d) Turn the LOP switch [1] clockwise until the flange fully engages the stud.
 - (e) Tighten the nut [2].
 - (f) Remove the cap from the electrical connector (D49015P) [4].
 - (g) Connect the electrical connector (D49015P) [4] to the LOP switch [1].

G. Low Oil Pressure Switch Installation Test

SUBTASK 49-27-14-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-14-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-14-740-001

- (3) Do the steps that follow to do the installation test for the LOP switch:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Examine the LOP switch for leakage.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the low oil pressure switch, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (f) To examine the APU oil level, do this task: APU Oil Level Inspection, TASK 12-13-04-200-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-14-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follows:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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GENERATOR FILTER BYPASS VALVE/SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the generator filter bypass valve/switch
 - (2) An installation of the generator filter bypass valve/switch.
- B. The generator filter bypass valve/switch is one part. For this procedure, the generator filter bypass valve/switch is referred to as the bypass valve. The bypass valve is part of the lube cluster.

TASK 49-27-15-000-801

2. Generator Filter Bypass Valve/Switch Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-15-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-15-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-15-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Generator Bypass Valve Removal

SUBTASK 49-27-15-020-001

- (1) Do the steps that follow to remove the bypass valve [1]:
 - (a) Disconnect the electrical connector (D49018P) [5] from the bypass valve [1].
 - 1) Put a cap on the end of the electrical connector (D49018P) [5] to prevent contamination.
 - (b) Put the oil resistant container 1 gal, (4 l), STD-1058 below the bypass valve [1].

NOTE: Some oil can come out of the lube cluster when the bypass valve [1] is removed.
 - (c) Loosen the nut [4] on the lube cluster.
 - (d) Turn the bypass valve [1] counterclockwise until the flange disengages the stud.
 - (e) Remove the bypass valve [1].
 - (f) Remove the packing [2], packing [3] from the bypass valve.
 - 1) Discard the packing [2], packing [3].
 - (g) Make sure you install all necessary protection covers.

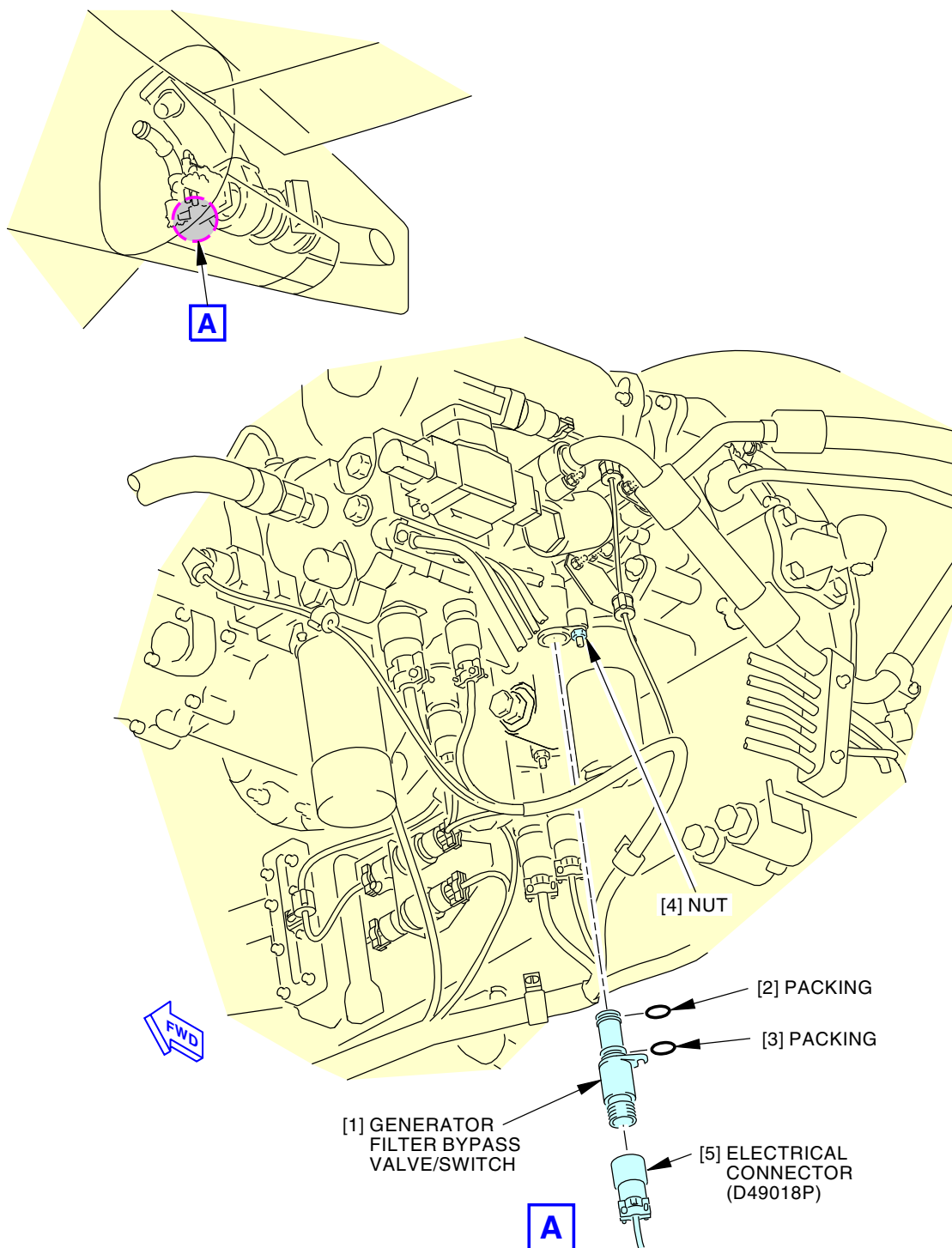
————— **END OF TASK** —————

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**Generator Filter Bypass Valve/Switch Installation
Figure 401/49-27-15-990-801**

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TASK 49-27-15-400-801

3. Generator Filter Bypass Valve/Switch Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Bypass valve	49-27-27-01-100	ARO ALL
2	Packing	49-27-27-01-105	ARO ALL
3	Packing	49-27-27-01-110	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Generator Bypass Valve Installation

SUBTASK 49-27-15-420-001



CAUTION

REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do the steps that follow to install the bypass valve [1]:
 - (a) Lubricate the new packing [2], packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [2], packing [3] on the bypass valve [1].
 - (c) Install the bypass valve [1] into the lube cluster.
 - (d) Turn the bypass valve [1] clockwise until the flange fully engages the stud.
 - (e) Tighten the nut [4].
 - (f) Remove the cap from the electrical connector (D49018P) [5].
 - (g) Connect the electrical connector (D49018P) to the bypass valve [1].

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G. Generator Bypass Valve Installation Test

SUBTASK 49-27-15-860-003

- (1) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-15-860-004

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-15-740-001

- (3) Do the steps that follow to do the installation test for the bypass valve:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU generator bypass valve/switch, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Examine the bypass valve for oil leakage.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-15-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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OIL PRESSURE SENSOR - LUBE CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil pressure sensor
 - (2) An installation of the oil pressure sensor.
- B. The oil pressure sensor is part of the lube cluster.

TASK 49-27-16-000-801

2. Oil Pressure Sensor Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-27-16-860-001

- (1) Make sure the APU selector on the P5 panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-16-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-16-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Pressure Sensor Removal

SUBTASK 49-27-16-020-001

- (1) Do the steps that follow to remove the oil pressure sensor:
 - (a) Disconnect the electrical connector (D49016P) [4] from the oil pressure sensor [1].
 - 1) Put a cap on the end of the electrical connector (D49016P) [4] to prevent contamination.
 - (b) Put the oil resistant container 1 gal, (4 l), STD-1058 below the oil pressure sensor.
NOTE: Some oil can come out of the lube cluster when the oil pressure sensor is removed.
 - (c) Loosen the nut [2] on the lube cluster.
 - (d) Turn the oil pressure sensor [1] counterclockwise until the flange disengages the stud.
 - (e) Remove the oil pressure sensor [1].
 - (f) Remove the packing [3] from the oil pressure sensor [1].
 - 1) Discard the packing [3].
 - (g) Make sure you install all necessary protection covers.

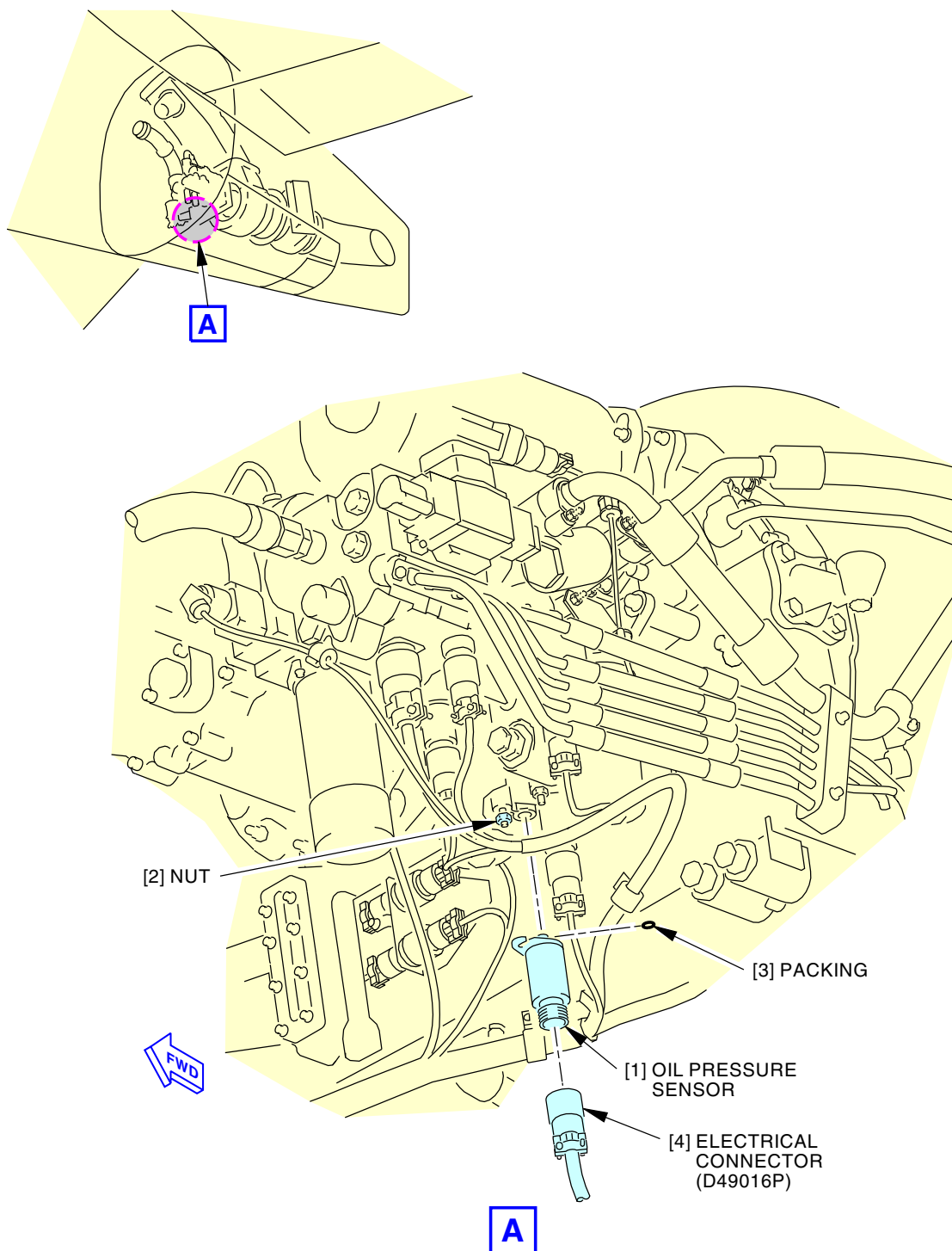
———— **END OF TASK** ————

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**Oil Pressure Sensor Installation
Figure 401/49-27-16-990-801**

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TASK 49-27-16-400-801

3. Oil Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil pressure sensor	49-27-27-01-065	ARO ALL
		49-61-02-01-065	ARO ALL
3	Packing	49-27-27-01-070	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Pressure Sensor Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-27-16-420-001

- (1) Do the steps that follow to install the oil pressure sensor [1]:
 - (a) Lubricate the new packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3] on the oil pressure sensor [1].
 - (c) Install the oil pressure sensor [1] in the lube cluster.
 - 1) Turn the oil pressure sensor [1] clockwise until the flange fully engages the studs.
 - 2) Tighten the nut [2].
 - (d) Remove the cap from the electrical connector (D49016P) [4].
 - (e) Connect the electrical connector (D49016P) [4] to the oil pressure sensor [1].

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G. Installation Test

SUBTASK 49-27-16-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-16-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-16-740-001

- (3) Do the steps that follow to do the installation test for the oil pressure sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the oil pressure sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Make sure the oil pressure sensor does not leak.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-16-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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OIL TEMPERATURE SENSOR - LUBE CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil temperature sensor
 - (2) An installation of the oil temperature sensor.
- B. The oil temperature sensor is part of the lube cluster.

TASK 49-27-17-000-801

2. Oil Temperature Sensor Removal

(Figure 401)

A. **References**

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-27-17-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-27-17-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-17-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Oil Temperature Sensor Removal

SUBTASK 49-27-17-020-001

- (1) Do the steps that follow to remove the oil temperature sensor [2]:
 - (a) Disconnect the electrical connector (D49014P) [1] from the oil temperature sensor [2].
 - 1) Put a cap on the end of the electrical connector (D49014P) [1] to prevent contamination.
 - (b) Remove the oil temperature sensor [2].
 - (c) Remove the packing [3] from the oil temperature sensor [2].
 - 1) Discard the packing [3].
 - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

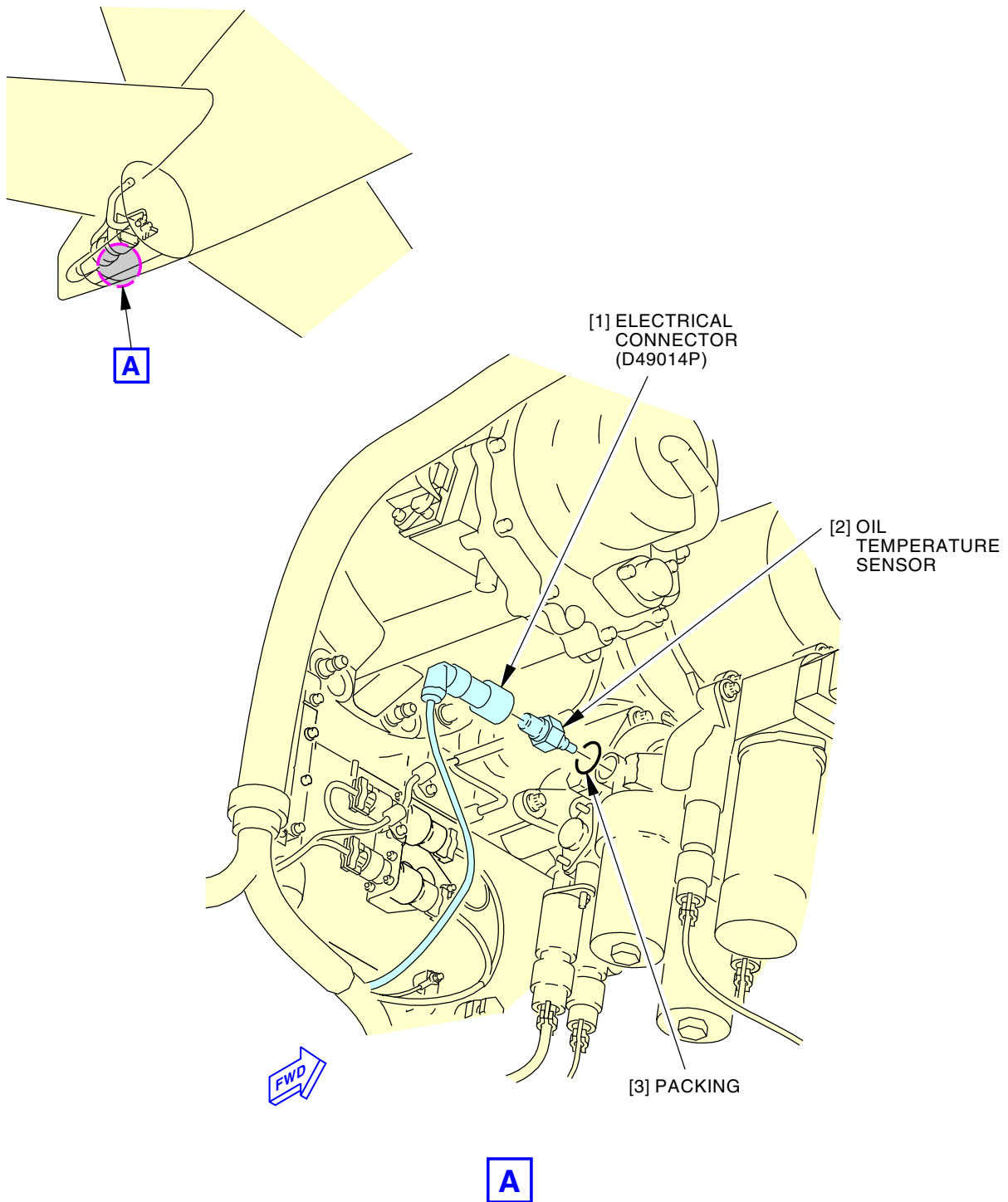
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Oil Temperature Sensor Installation
Figure 401/49-27-17-990-801

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TASK 49-27-17-400-801

3. Oil Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil temperature sensor	49-27-27-01-165	ARO ALL
3	Packing	49-27-27-01-170	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Temperature Sensor Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTIVE COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-27-17-420-001

- (1) Do the steps that follow to install the oil temperature sensor [2]:
 - (a) Lubricate the new packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3] on the oil temperature sensor [2].
 - (c) Install the oil temperature sensor [2] in the lube cluster.
 - (d) Remove the cap from the electrical connector (D49014P) [1].
 - (e) Connect the electrical connector (D49014P) [1] to the oil temperature sensor [2].

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G. Oil Temperature Sensor Installation Test

SUBTASK 49-27-17-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-27-17-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-27-17-740-001

- (3) Do the steps that follow to do the installation test for the oil temperature sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Make sure the oil temperature sensor does not leak.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the inlet pressure sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-17-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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LUBE CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the lube cluster
 - (2) An installation of the lube cluster.
- B. The lube cluster has these components attached to it:
- (1) Low oil pressure switch
 - (2) Oil filter element
 - (3) Oil filter bypass valve/switch
 - (4) Generator scavenge oil filter element
 - (5) Generator filter bypass valve/switch
 - (6) Oil temperature sensor
 - (7) Oil pressure sensor.

TASK 49-27-27-000-801

2. Lube Cluster Removal

(Figure 401)

A. General

- (1) You must remove the fuel cluster before you can remove the lube cluster.

B. References

Reference	Title
49-27-10-000-801	Oil Thermal Bypass Valve Removal (P/B 401)
49-31-31-000-801	Fuel Cluster Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Prepare for the Removal

SUBTASK 49-27-27-020-001



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



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

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(WARNING PRECEDES)



WARNING

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



CAUTION

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

- (1) Do this task: Fuel Cluster Removal, TASK 49-31-31-000-801.

F. Lube Cluster Removal

SUBTASK 49-27-27-940-001

- (1) Put the oil resistant container 1 gal, (4 l), STD-1058 under the lube cluster.

SUBTASK 49-27-27-030-001

- (2) Do these steps to disconnect the electrical connectors from the lube cluster:
- (a) Disconnect the electrical connector (D49015P) [16] from the low oil pressure switch [5].
 - (b) Disconnect the electrical connector (D49016P) [17] from the oil pressure sensor [6].
 - (c) Disconnect the electrical connector (D49014P) [18] from the oil temperature sensor [7].
 - (d) Disconnect the electrical connector (D49017P) [19] from the oil filter bypass valve/switch [8].
 - (e) Disconnect the electrical connector (D49018P) [15] from the generator filter bypass valve/switch [4].
 - (f) Loosen the bolt [3] and open the clamp [2] to release the wire harness.
 - (g) Install caps on the electrical connectors to prevent contamination.

SUBTASK 49-27-27-030-002

- (3) Do these steps to disconnect the oil cooler tubes:
- (a) Loosen the nut for the oil return tube [11].
 - (b) Turn the flange for the oil return tube [11] counterclockwise until it disengages the stud.
 - (c) Disconnect the oil return tube [11].
 - (d) Remove the two packings [10] from the oil return tube [11].
 - 1) Discard the two packings [10].
 - (e) Loosen the nut for the oil supply tube [12].
 - (f) Turn the flange for the oil supply tube [12] counterclockwise until it disengages the stud.
 - (g) Disconnect the oil supply tube [12].
 - (h) Remove the two packings [9] from the oil supply tube [12].
 - 1) Discard the two packings [9].

SUBTASK 49-27-27-020-002

- (4) Do these steps to remove the lube cluster [1]:
- (a) Loosen the four bolts [20] that attaches the lube cluster [1] to the gearbox [14].
 - (b) Remove the lube cluster [1].
 - (c) Remove the packing [13] from the lube cluster [1].

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- 1) Discard the packing [13].
- (d) If the new lube cluster [1] does not have the thermal bypass valve installed, remove the thermal bypass valve from the removed lube cluster. To remove it, do this task: Oil Thermal Bypass Valve Removal, TASK 49-27-10-000-801.
NOTE: The clamp [2] is attached to the thermal bypass valve.
- (e) Make sure you install all necessary protection covers.

———— **END OF TASK** ————

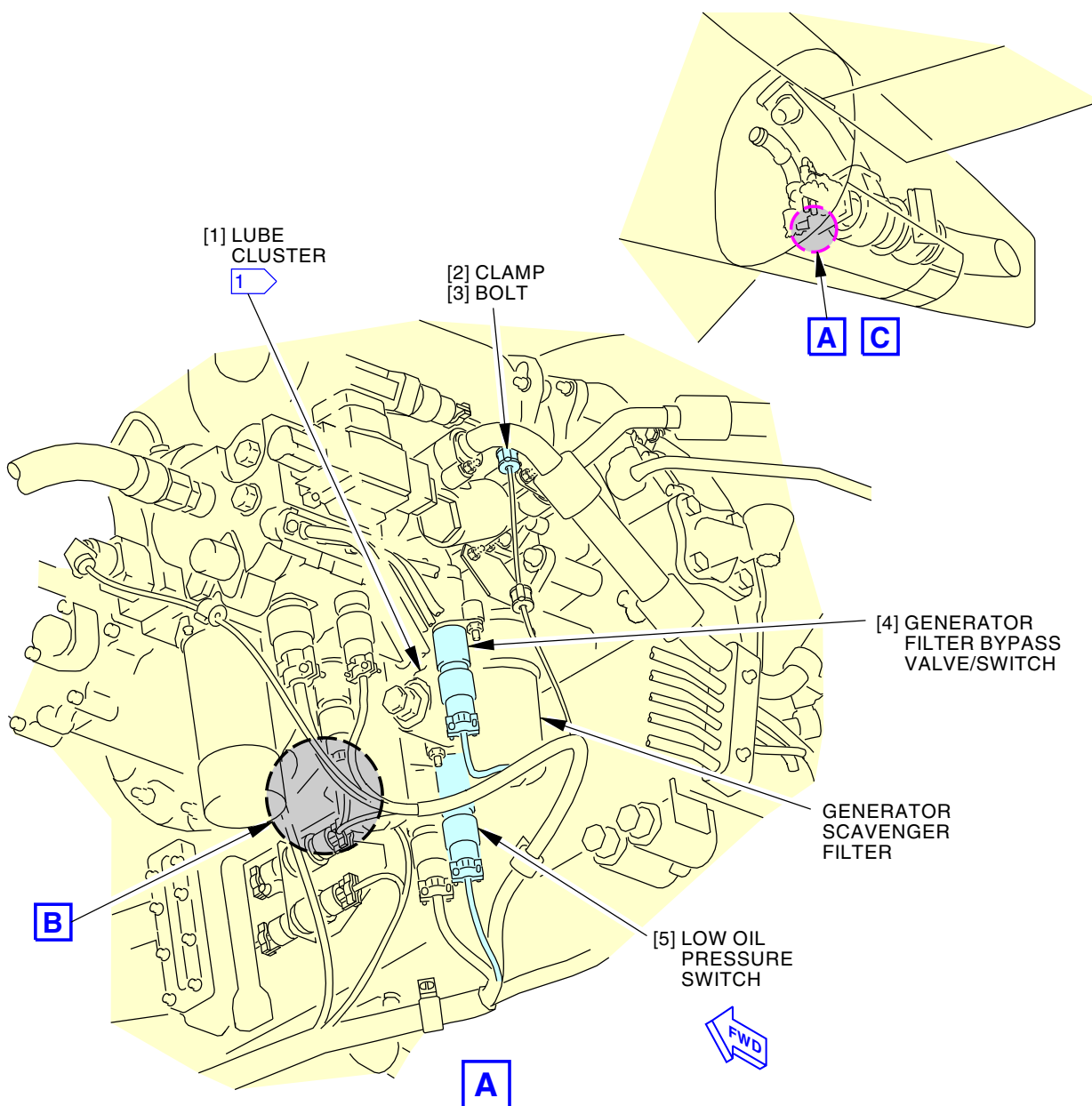
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- 1** THE LUBE CLUSTER INCLUDES THESE COMPONENTS:
- LOW OIL PRESSURE SWITCH
 - OIL FILTER
 - OIL FILTER BYPASS VALVE/SWITCH
 - GENERATOR SCAVENGE OIL FILTER
 - GENERATOR FILTER BYPASS VALVE/SWITCH
 - OIL TEMPERATURE SENSOR
 - OIL PRESSURE SENSOR
 - THERMAL BYPASS VALVE

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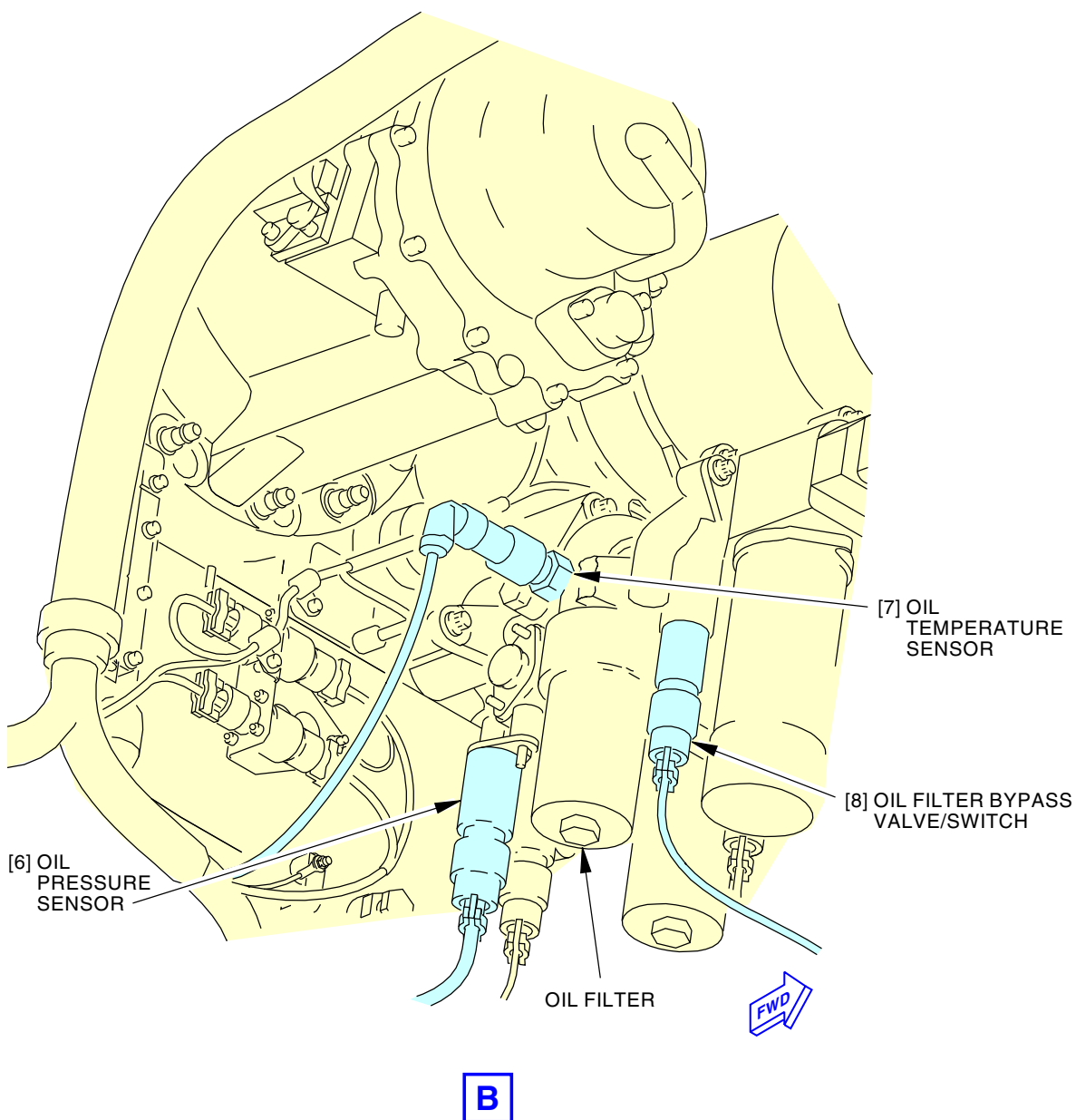
Lube Cluster Installation
Figure 401/49-27-27-990-801 (Sheet 1 of 3)

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Lube Cluster Installation
Figure 401/49-27-27-990-801 (Sheet 2 of 3)

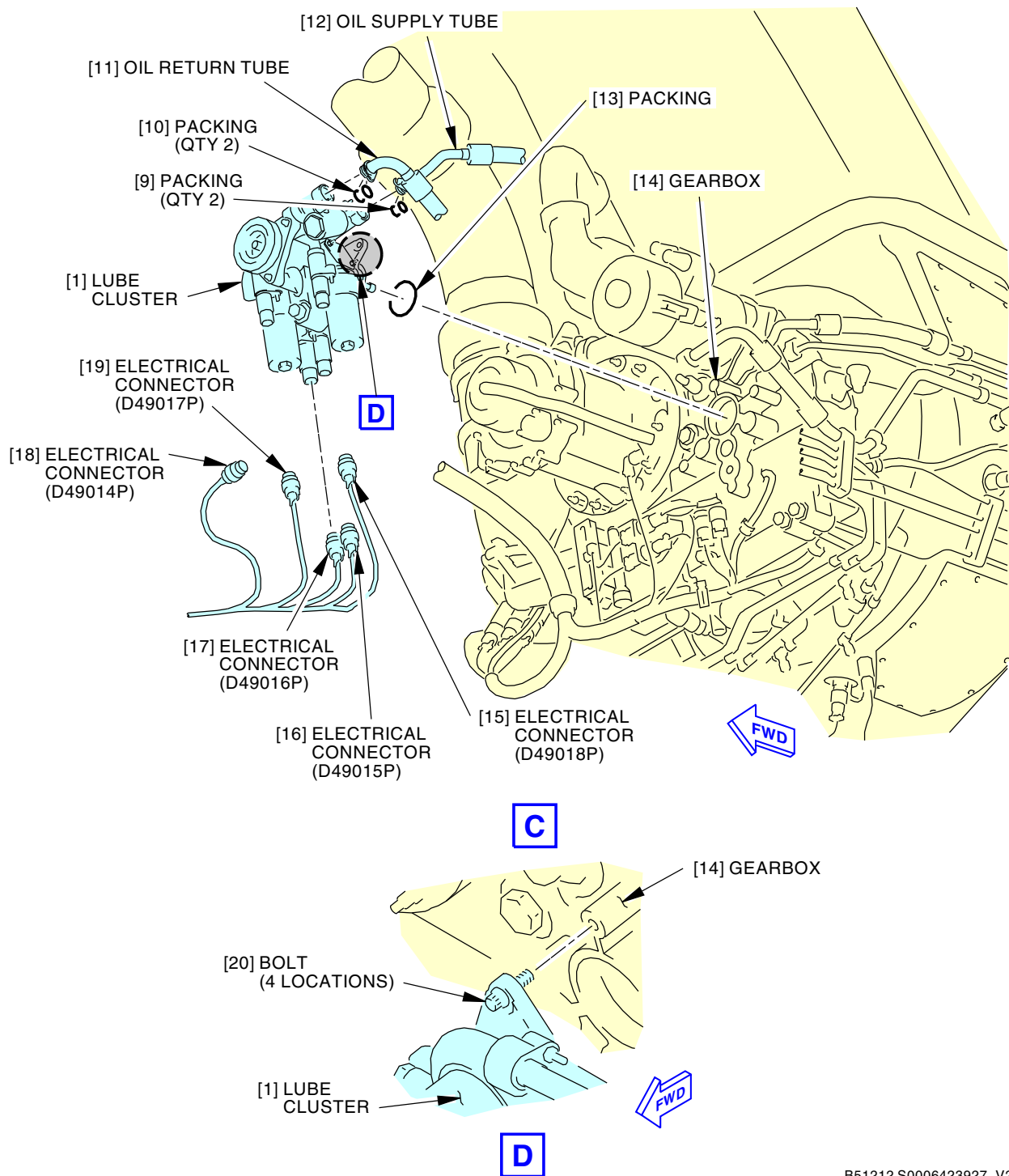
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Lube Cluster Installation
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TASK 49-27-27-400-801

3. Lube Cluster Installation

(Figure 401)

A. References

Reference	Title
12-13-04-600-801	APU Oil Replenishing (P/B 301)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)
49-27-10-400-801	Oil Thermal Bypass Valve Installation (P/B 401)
49-31-31-400-801	Fuel Cluster Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lube cluster	49-27-27-01-005	ARO ALL
9	Packing	49-27-27-01-230	ARO ALL
10	Packing	49-27-27-01-240	ARO ALL
13	Packing	49-27-27-01-175	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure

SUBTASK 49-27-27-420-001



CAUTION REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the lube cluster [1]:
 - (a) Remove the two plugs from the two oil ports on the lube cluster [1].
 - (b) If the new lube cluster [1] does not have the thermal bypass valve installed, do this task: Oil Thermal Bypass Valve Installation, TASK 49-27-10-400-801.
NOTE: The clamp [2] is attached to the thermal bypass valve.
 - (c) Lubricate the new packing [13] with a light coat of Mobil Jet Oil II, D00520.
 - (d) Install the packing [13] on the lube cluster [1].

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MAKE SURE THAT YOU CAREFULLY INSTALL THE LUBE CLUSTER TO THE GEARBOX. IF YOU DO NOT HOLD THE LUBE CLUSTER CAREFULLY, IT CAN BEND THE DRIVE SHAFT IN THE LUBE CLUSTER.

- (e) While you align the drive shaft in the lube cluster [1] with the gearbox [14], carefully install the lube cluster [1] to the gearbox.
- (f) Tighten the four bolts [20] to 214 in-lb (24.2 N·m)-236 in-lb (26.7 N·m).

SUBTASK 49-27-27-430-001

- (2) Do these steps to connect the oil cooler tubes:
 - (a) Remove the two plugs from the oil return tube [11] and oil supply tube [12].
 - (b) Lubricate the two new packings [9] and two new packings [10] with a light coat of Mobil Jet Oil II, D00520.
 - (c) Install the two packings [9] on the oil supply tube [12].
 - (d) Connect the oil supply tube [12] to the lube cluster [1].
 - 1) Turn the flange for the oil supply tube [12] clockwise until it fully engages the stud.
 - 2) Tighten the nut for the oil supply tube [12].
 - (e) Install the two packings [10] on the oil return tube [11].
 - (f) Connect the oil return tube [11] to the lube cluster [1].
 - 1) Turn the flange for the oil return tube [11] clockwise until it fully engages the stud.
 - 2) Tighten the nut for the oil return tube [11].

SUBTASK 49-27-27-430-003

- (3) Do these steps to connect the electrical connectors:
 - (a) Remove the caps from the electrical connectors.
 - (b) Connect the electrical connector (D49015P) [16] to the low oil pressure switch [5].
 - (c) Connect the electrical connector (D49016P) [17] to the oil pressure sensor [6].
 - (d) Connect the electrical connector (D49014P) [18] to the oil temperature sensor [7].
 - (e) Connect the electrical connector (D49017P) [19] to the oil filter bypass valve/switch [8].
 - (f) Connect the electrical connector (D49018P) [15] to the generator filter bypass valve/switch [4].
 - (g) Put the wire harness in the clamp [2].
 - (h) Close the clamp [2] and tighten the bolt [3].

SUBTASK 49-27-27-420-002

- (4) Do this task: Fuel Cluster Installation, TASK 49-31-31-400-801.

G. Lube Cluster Installation Test

SUBTASK 49-27-27-710-001

- (1) Do the installation test for the lube cluster:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Let the APU operate at a no load condition for five minutes.
 - (c) Examine the fuel cluster and lube cluster for leakage:
 - 1) Examine the oil supply tube and oil return tube for signs of oil leakage.
 - 2) Examine the fuel supply line and fuel tube assembly for signs of fuel leakage.

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- 3) Examine the connection between the fuel cluster and lube cluster for signs of oil leakage.
- 4) Examine the connection between the lube cluster and gearbox for signs of oil leakage.
- (d) Do this task: APU Bite Test, TASK 49-11-00-740-801.
- (e) If a maintenance message shows for the APU oil system, then refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
- (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
- (g) Repair the cause of any leakage that you find.

SUBTASK 49-27-27-610-002

- (2) Do this task: APU Oil Replenishing, TASK 12-13-04-600-801.

NOTE: The oil level will be down about 1.4 qt (1.3 l)-2.0 qt (1.9 l).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-27-27-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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FUEL FILTER ELEMENT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the fuel filter element
 - (2) An installation of the fuel filter element.
- B. The fuel filter element is attached to the fuel cluster.

TASK 49-31-02-000-801

2. Fuel Filter Element Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Tools/Equipment**

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

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. **Prepare for the Removal**

SUBTASK 49-31-02-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-02-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-02-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Fuel Filter Element Removal

SUBTASK 49-31-02-940-001

- (1) Do the steps that follow to remove the fuel filter element [2]:
 - (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel filter housing [1].
 - (b) Loosen the nuts [4] that attach the fuel filter housing [1].
 - (c) Turn the fuel filter housing [1] counterclockwise until the flange disengages the studs.
 - (d) Remove the fuel filter housing [1].
 - (e) Remove the packing [5] from the fuel filter housing [1].
 - 1) Discard the packing [5].
 - (f) Remove the fuel filter element [2].
 - (g) Remove the packing [3] from the fuel filter element [2].
 - 1) Discard the packing [3].
 - (h) Make sure you install all necessary protection covers.

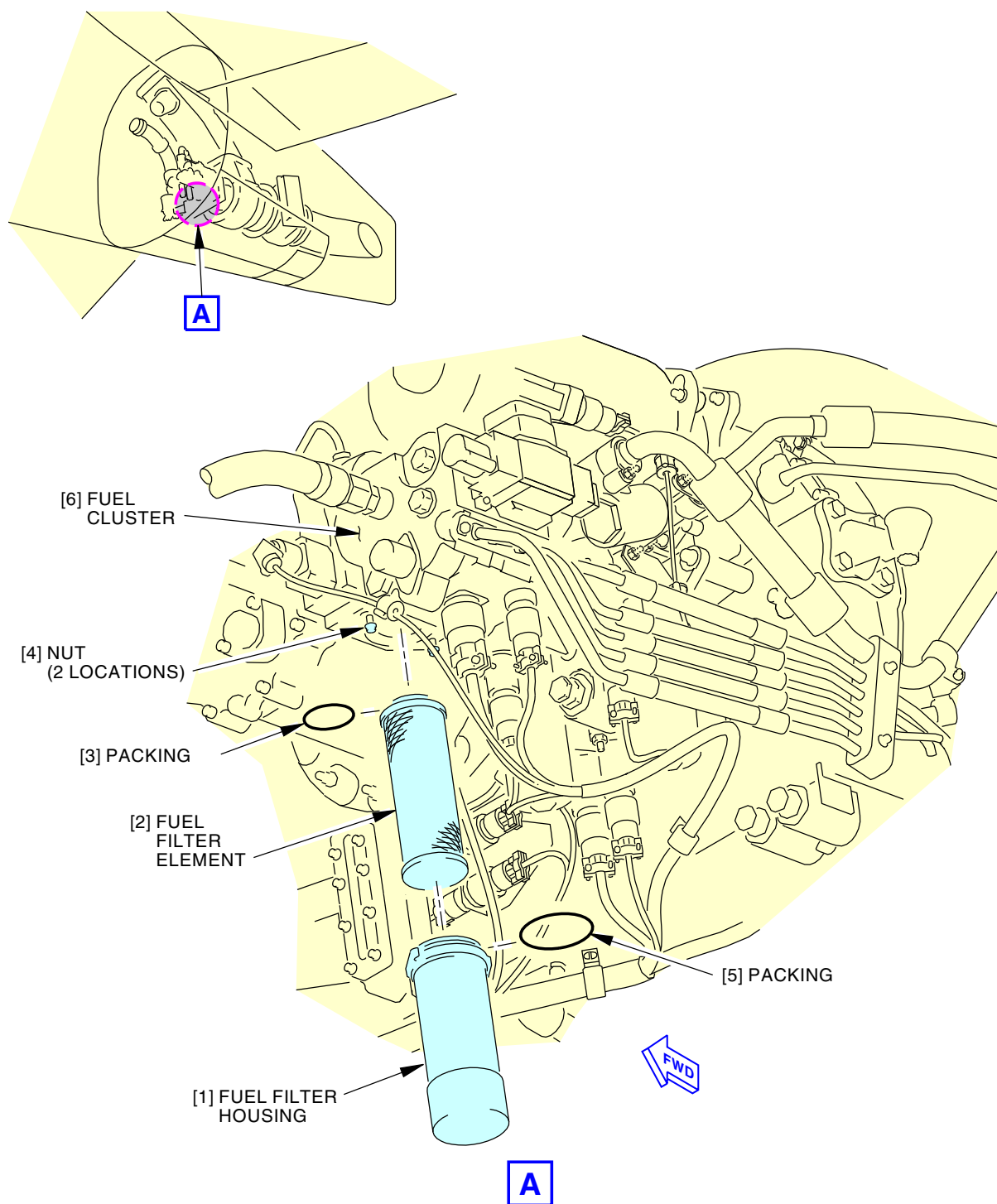
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Fuel Filter Element Installation
Figure 401/49-31-02-990-801

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TASK 49-31-02-400-801

3. Fuel Filter Element Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Fuel filter element	49-31-31-01-145	ARO ALL
3	Packing	49-31-31-01-135	ARO ALL
5	Packing	49-31-31-01-140	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Fuel Filter Element Installation



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-31-02-420-001

- (1) Do the steps that follow to install the fuel filter element:
 - (a) Lubricate the new packing [3], packing [5] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3] on the fuel filter element [2].
 - (c) Install the fuel filter element [2] into the fuel cluster [6].
 - (d) Install the packing [5] on the fuel filter housing [1].
 - (e) Install the fuel filter housing [1] on the fuel cluster.
 - (f) Turn the fuel filter housing [1] clockwise until the flange fully engages the studs.
 - (g) Tighten the nuts [4].

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G. APU Fuel Filter Element Installation Test

SUBTASK 49-31-02-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-02-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-31-02-790-001

- (3) Do a leak check for the fuel filter element:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Operate the APU at a no load condition for 5 minutes.
 - (c) Examine the fuel filter housing [1] for signs of leakage.
 - (d) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

H. Put the airplane back to its usual condition:

SUBTASK 49-31-02-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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FUEL NOZZLE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the fuel nozzle
 - (2) An installation of the fuel nozzle.
- B. You must remove the primary and secondary fuel manifolds before you remove the fuel nozzle.
- C. There are 14 fuel nozzles on the APU.

TASK 49-31-03-000-801

2. Fuel Nozzle Removal

(Figure 401)

A. References

Reference	Title
49-31-04-000-801	Fuel Manifold Removal (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Prepare for the Removal

SUBTASK 49-31-03-020-002

- (1) Do this task: Fuel Manifold Removal, TASK 49-31-04-000-801.

D. Fuel Nozzle Removal

SUBTASK 49-31-03-020-001

- (1) Do these steps to remove the fuel nozzle [3]:
 - (a) Remove the lockwire from the two bolts [2].
 - (b) Remove the two bolts [2] that attaches the fuel nozzle [3] to the APU.
 - (c) Remove the fuel nozzle [3].
 - (d) Remove the case [4] and packing [1] from the fuel nozzle [3].
 - 1) Discard the packing [1].
 - (e) Install a blocker plate over the opening for the fuel nozzle [3].
 - (f) Install the two bolts [2] that attach the blocker plate to the APU.
 - (g) Make sure you install all necessary protection covers.

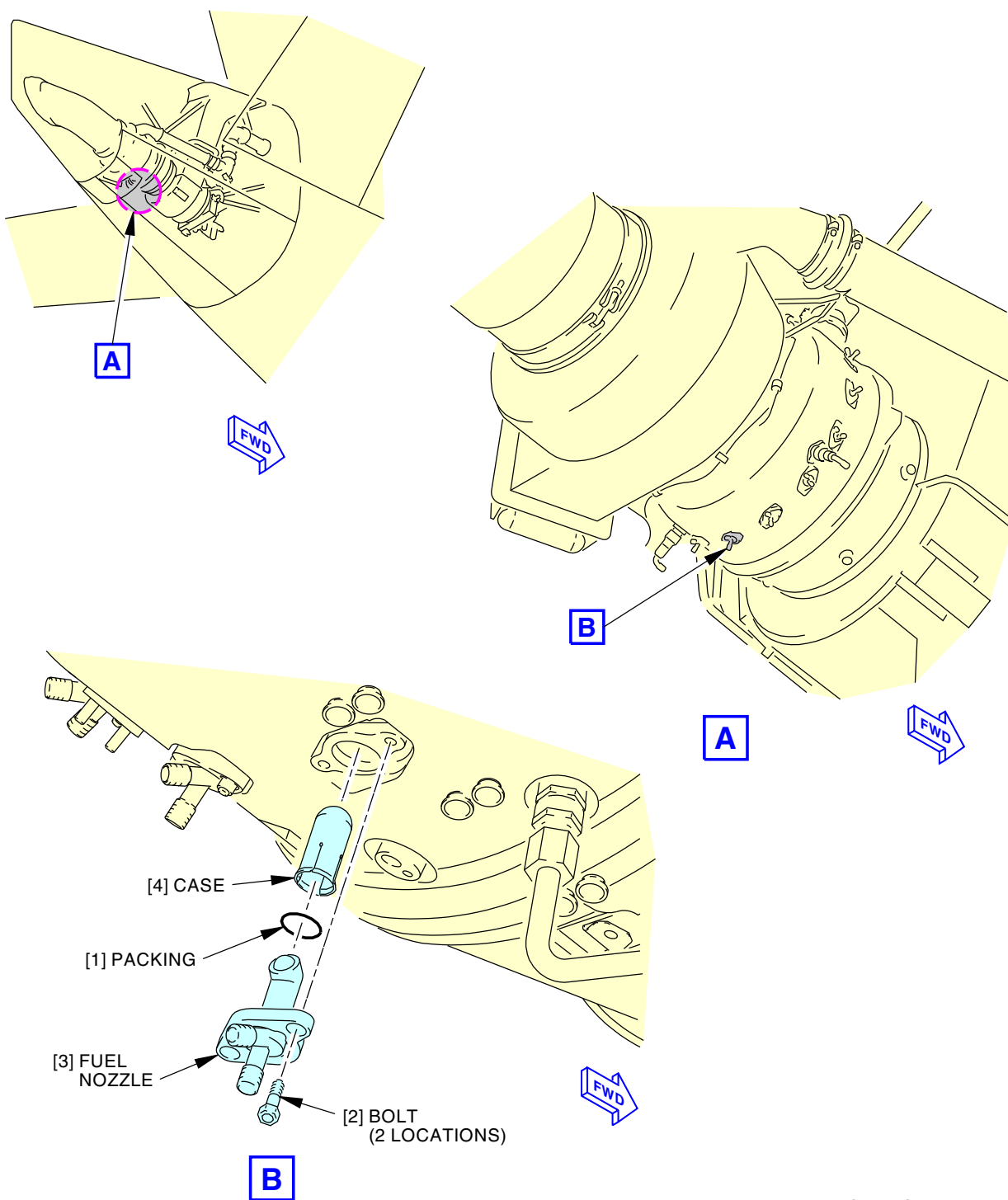
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**Fuel Nozzle Installation
Figure 401/49-31-03-990-801**

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TASK 49-31-03-400-801

3. Fuel Nozzle Installation

(Figure 401)

A. References

Reference	Title
49-31-04-400-801	Fuel Manifold Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00667	Compound - Antiseize - Loctite C5-A Copper Based Anti-Seize (Replaces FEL-PRO C5-A)	MIL-PRF-907
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-31-03-01-060	ARO ALL
3	Fuel nozzle	49-31-03-01-055	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Procedure

SUBTASK 49-31-03-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the fuel nozzle [3]:
 - (a) Remove the two bolts [2] that attach the blocker plate to the APU.
 - (b) Remove the blocker plate.
 - (c) Visually inspect the case [4] for cracks.
 - 1) If cracks are found, replace the case [4].
 - (d) Install the new packing [1] and case [4] on the fuel nozzle [3].
 - (e) Apply the Loctite C5-A compound, D00667 to the threads of the two bolts [2].
 - (f) Install the fuel nozzle [3] in the APU with the two bolts [2].
 - 1) Tighten the two bolts [2] to 55 in-lb (6.2 N·m).
 - (g) Install the MS20995C20 lockwire, G50225 on the two bolts [2].

SUBTASK 49-31-03-420-002

- (2) Do this task: Fuel Manifold Installation, TASK 49-31-04-400-801.

————— **END OF TASK** —————

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FUEL MANIFOLDS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the fuel manifolds
 - (2) An installation of the fuel manifolds.
- B. There are two fuel manifolds on the APU, the primary and the secondary manifolds. The manifolds are located on the aft end of the APU.

TASK 49-31-04-000-801

2. Fuel Manifold Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-31-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-04-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-04-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Fuel Manifolds Removal

SUBTASK 49-31-04-000-001



WARNING

DO NOT TOUCH THE APU FUEL MANIFOLDS IF THE APU IS HOT. THE FUEL MANIFOLDS ARE HOT AFTER THE APU IS OPERATED. HOT COMPONENTS CAN BURN YOU

- (1) Do the steps that follow to remove the fuel manifolds:
 - (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below secondary fuel manifold [1] and primary fuel manifold [2].
 - (b) Disconnect the tube [4] for the secondary fuel supply.
NOTE: Fuel can come out of the tube [4].
 - (c) Disconnect the tube [5] for the primary fuel supply.
NOTE: Fuel can come out of the tube [5].
 - (d) Disconnect the primary fuel manifold [2] and the secondary fuel manifold [1] from the fuel nozzles [3].
NOTE: Fuel can come out of the secondary fuel manifold [1] and primary fuel manifold [2].
 - (e) Remove the primary fuel manifold [2] and the secondary fuel manifold [1].
 - (f) Make sure you install all necessary protection covers.

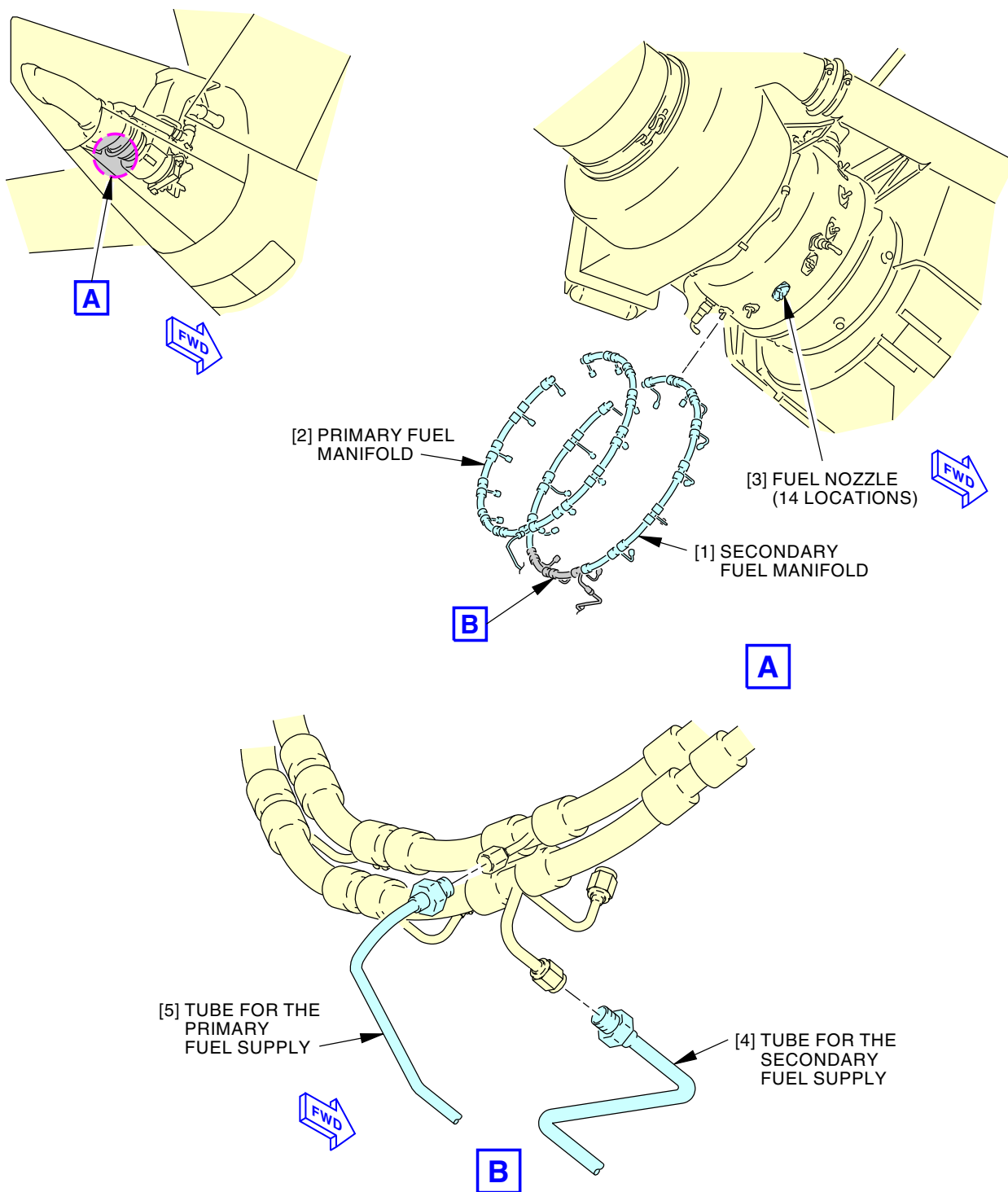
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Fuel Manifolds Installation
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TASK 49-31-04-400-801

3. Fuel Manifold Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Secondary fuel manifold	49-31-04-01-050	ARO ALL
2	Primary fuel manifold	49-31-04-01-055	ARO ALL
3	Fuel nozzle	49-31-03-01-055	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Fuel Manifolds Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-31-04-400-001

(1) Do the steps that follow to install the fuel manifolds:

- Put the primary fuel manifold [2] on the APU.
- Put the secondary fuel manifold [1] on the APU.

NOTE: The secondary fuel manifold [1] is installed aft of the primary fuel manifold [2].



MAKE SURE YOU OBEY THE TORQUE VALUE FOR THE COUPLING NUTS. COUPLING NUTS MUST BE INSTALLED HAND-TIGHT BEFORE YOU USE A TORQUE WRENCH. DAMAGE TO THE TUBE FITTINGS AND FUEL LEAKAGE CAN OCCUR IF YOU TIGHTEN MORE THAN THE TORQUE VALUE FOR THE COUPLING NUTS.

- Connect the fuel nozzles [3] to the primary fuel manifold [2] and the secondary fuel manifold [1].
 - Tighten the coupling nuts to 55 - 60 inch-pounds (6.2 - 6.8 Newton-meters).
- Connect the tube [5] for the primary fuel supply to the primary fuel manifold [2].
 - Tighten the coupling nut to 55 - 60 inch-pounds (6.2 - 6.8 Newton-meters).
- Connect the tube [4] for the secondary fuel supply to the secondary fuel manifold [1].

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- 1) Tighten the coupling nut to 55 - 60 inch-pounds (6.2 - 6.8 Newton-meters).

F. Fuel Manifolds Installation Test

SUBTASK 49-31-04-860-003

- (1) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-31-04-860-004

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-04-790-001

- (3) Do the steps that follow to do the installation test for the fuel manifolds.
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Examine the fuel supply tubes for leakage.
 - (c) Examine the fuel nozzles for leakage.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-04-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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FUEL FILTER DIFFERENTIAL PRESSURE SWITCH - FUEL CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the fuel filter differential pressure switch
 - (2) An installation of the fuel filter differential pressure switch.
- B. The fuel filter differential pressure switch is part of the fuel cluster.
- C. The fuel filter differential pressure switch is referred to as the differential pressure switch.

TASK 49-31-06-000-801

2. Fuel Filter Differential Pressure Switch Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-31-06-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-06-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-06-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Fuel Filter Differential Pressure Switch Removal

SUBTASK 49-31-06-020-001

- (1) Do the steps that follow to remove the differential pressure switch [1]:
 - (a) Disconnect the electrical connector (D49010P) [5] from the differential pressure switch [1].
 - (b) Loosen the captive bolts [2].
 - (c) Remove the differential pressure switch [1].
 - (d) Remove the packing [3], packing [4] from the differential pressure switch [1].
 - 1) Discard the packing [3], packing [4].
 - (e) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

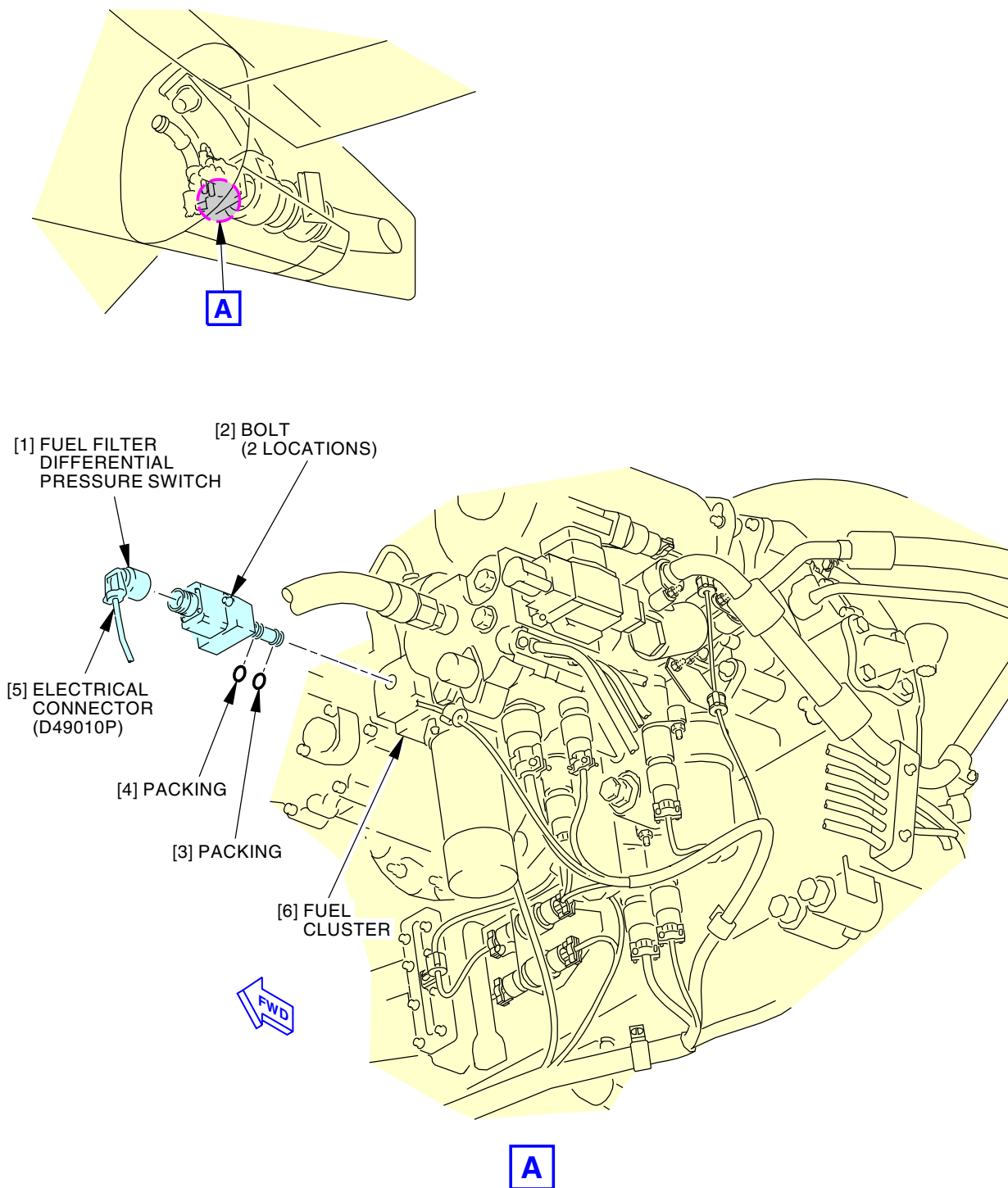
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**Fuel Filter Differential Pressure Switch Installation
Figure 401/49-31-06-990-801**

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TASK 49-31-06-400-801

3. Fuel Filter Differential Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure switch	49-31-31-01-300	ARO ALL
3	Packing	49-31-31-01-295	ARO ALL
4	Packing	49-31-31-01-290	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Fuel Filter Differential Pressure Switch Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AN NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-31-06-420-001

- (1) Do the steps that follow to install the differential pressure switch:
 - (a) Lubricate the new packing [3], packing [4] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3], packing [4] on the differential pressure switch [1].
 - (c) Install the differential pressure switch [1] on the fuel cluster.
 - (d) Tighten the bolts [2].
 - (e) Remove the cap from the electrical connector (D49010P) [5].
 - (f) Connect the electrical connector (D49010P) [5] to the differential pressure switch [1].

G. Fuel Filter Differential Pressure Switch Installation Test

SUBTASK 49-31-06-860-003

- (1) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

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SUBTASK 49-31-06-860-004

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-06-740-001

- (3) Do the steps that follow to do the installation test for the differential pressure switch:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Examine the fuel filter differential pressure switch for signs of leakage.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the fuel filter differential pressure switch, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-06-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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APU FUEL TEMPERATURE SENSOR-FUEL CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU fuel temperature sensor
 - (2) An installation of the APU fuel temperature sensor.
- B. The fuel temperature sensor is part of the fuel cluster.

TASK 49-31-07-000-801

2. Fuel Temperature Sensor Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-31-07-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-07-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-07-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. APU Fuel Temperature Sensor Removal

SUBTASK 49-31-07-020-001

- (1) Do the steps that follow to remove the fuel temperature sensor [1]:
 - (a) Disconnect the electrical connector (D49009P) [4] from the fuel temperature sensor [1].
 - 1) Install a cap on the electrical connector (D49009P) [4] to prevent contamination.
 - (b) Loosen the nuts [3] on the fuel cluster.
 - (c) Turn the fuel temperature sensor [1] counterclockwise until the flange disengages the studs.
 - (d) Remove the fuel temperature sensor [1] from the fuel cluster.
 - (e) Remove the packing [2] from the fuel temperature sensor [1].
 - 1) Discard the packing [2].
 - (f) Make sure you install all necessary protection covers.

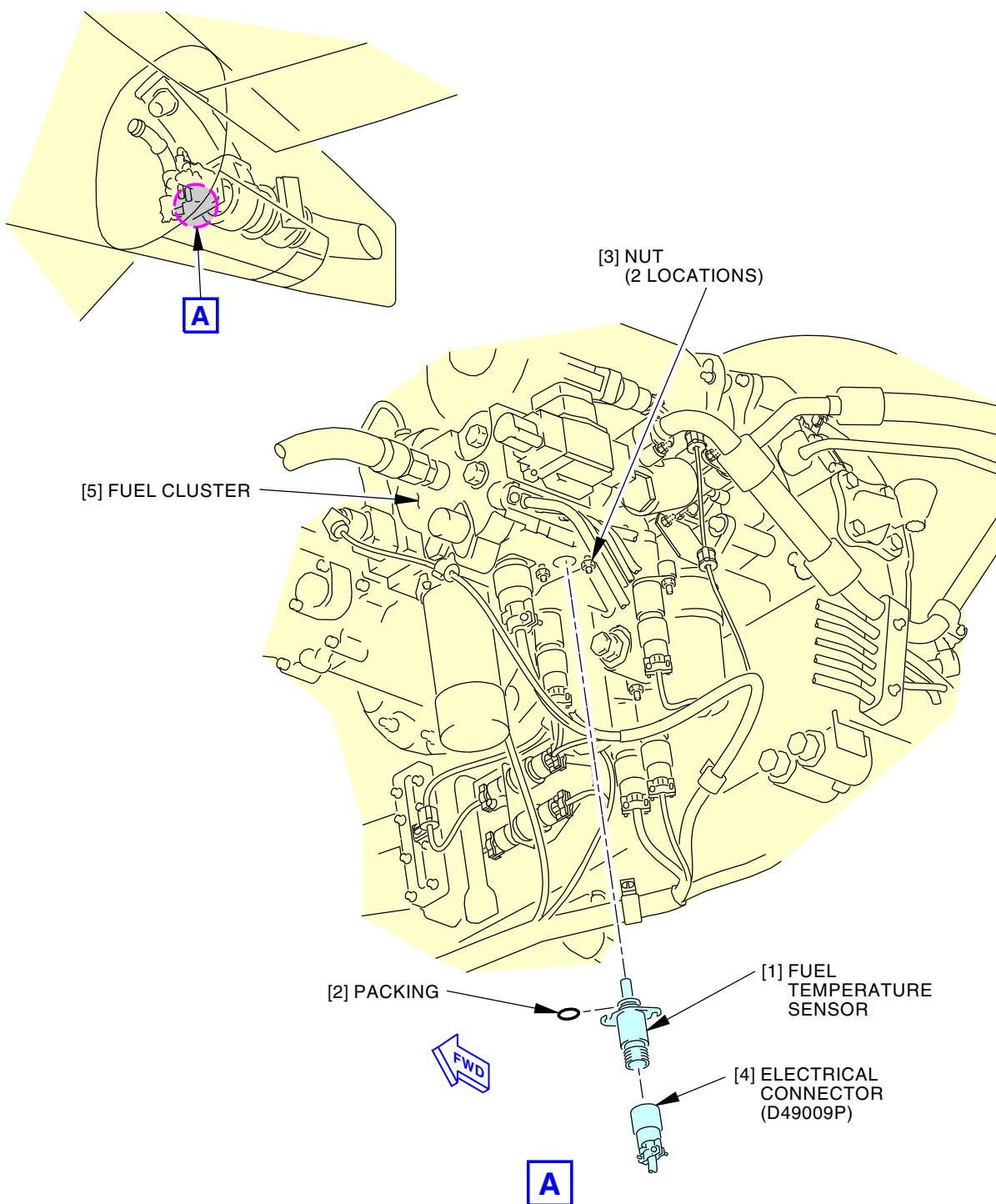
————— **END OF TASK** —————

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Fuel Temperature Sensor Installation
Figure 401/49-31-07-990-801

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TASK 49-31-07-400-801

3. Fuel Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel temperature sensor	49-31-31-01-275	ARO ALL
2	Packing	49-31-31-01-285	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. APU Fuel Temperature Sensor Installation

SUBTASK 49-31-07-420-001



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AN NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do the steps that follow to install the fuel temperature sensor [1]:
 - (a) Lubricate the new packing [2] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [2] on the fuel temperature sensor [1].
 - (c) Install the fuel temperature sensor [1] in the fuel cluster.
 - (d) Turn the fuel temperature sensor [1] clockwise until the flange fully engages the studs.
 - (e) Tighten the nuts [3].
 - (f) Remove the cap from the electrical connector (D49009P) [4].
 - (g) Connect the electrical connector (D49009P) [4] to the fuel temperature sensor [1].

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G. APU Fuel Temperature Sensor Installation Test

SUBTASK 49-31-07-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-07-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-31-07-740-001

- (3) Do the steps that follow to do the installation test for the fuel temperature sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Examine the fuel temperature sensor for signs of leakage.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the fuel temperature sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-07-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access panels that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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APU FUEL CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the APU fuel cluster
 - (2) An installation of the APU fuel cluster.
- B. The fuel cluster is attached to the lube cluster which is attached to the gearbox.
- C. The fuel cluster has these components attached to it:
 - (1) Fuel Filter Differential Pressure Switch
 - (2) Fuel Temperature Sensor
 - (3) Fuel Filter

TASK 49-31-31-000-801

2. Fuel Cluster Removal

(Figure 401)

A. General

- (1) You need a container to catch the fuel that will leak when you disconnect the fuel supply line and the tube assembly.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Tools/Equipment

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

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Removal

SUBTASK 49-31-31-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-31-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-31-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Fuel Cluster Removal

SUBTASK 49-31-31-020-005

- (1) Disconnect the electrical connectors:
- (a) Disconnect the electrical connector (D49009P) [13] from the fuel temperature sensor [5].
 - (b) Disconnect the electrical connector (D49010P) [7] from the fuel filter differential pressure switch [6].
 - (c) Disconnect the electrical connector (D49011P) [14] from the fuel cluster [1].
 - (d) Loosen the bolt [3] and open the clamp [2] to release APU wire harness.

SUBTASK 49-31-31-020-006

- (2) Do the steps that follow to disconnect the tube assembly [12] from the fuel cluster [1]:
- (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the tube assembly [12].
NOTE: The tube assembly [12] can leak fuel after it is disconnected from the fuel cluster [1].
 - (b) Loosen the three bolts [18] on the tube assembly [12].
 - (c) Disconnect the tube assembly [12].
 - (d) Remove the packings [15], packings [16], packings [17] from the tube assembly [12].
 - 1) Discard the packings [15], packings [16], packings [17].

SUBTASK 49-31-31-020-007

- (3) Do the steps that follow to disconnect the fuel supply [8]:
- (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the fuel supply [8].
 - (b) While you hold the reducer [19] with a wrench disconnect the fuel supply [8] from the fuel cluster [1].
 - (c) Remove the reducer [19] from the fuel cluster.
 - (d) Discard the packing [20] from the reducer [19].
 - (e) Put a plug in the fuel supply [8].

SUBTASK 49-31-31-020-001

- (4) Remove the fuel cluster:
- (a) Remove the clamp [9] that attaches the fuel cluster [1] to the lube cluster [11].
 - (b) Remove the fuel cluster [1].
 - (c) Remove the packing [10] from the fuel cluster [1].

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- 1) Discard the packing [10].
- (d) Install caps on the fuel ports for the fuel cluster [1].
- (e) Remove the clamp [2] from the fuel cluster [1], if the new fuel cluster does not have a clamp installed.
- (f) Make sure you install all necessary protection covers.

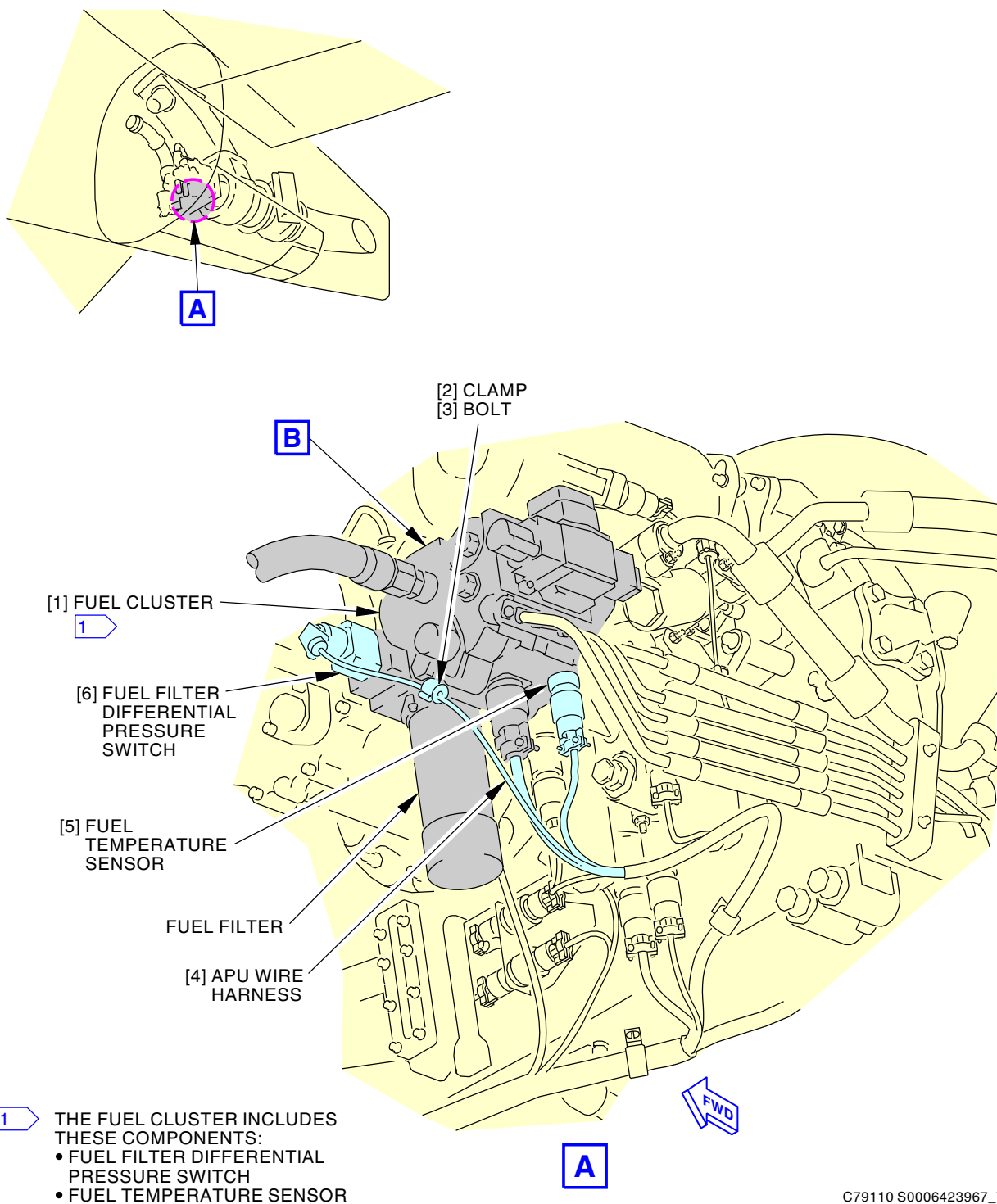
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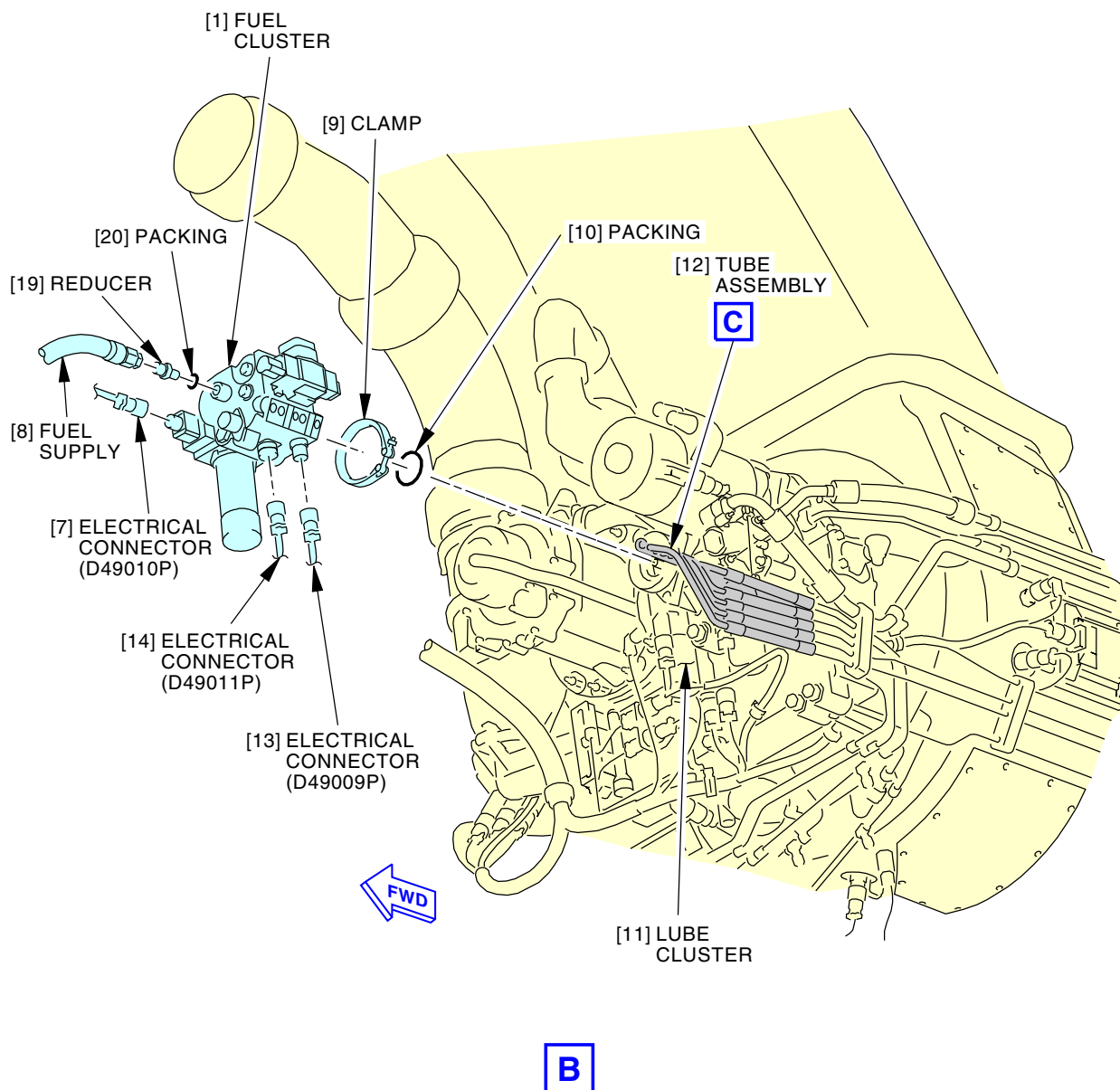
Fuel Cluster Installation
Figure 401/49-31-31-990-801 (Sheet 1 of 3)

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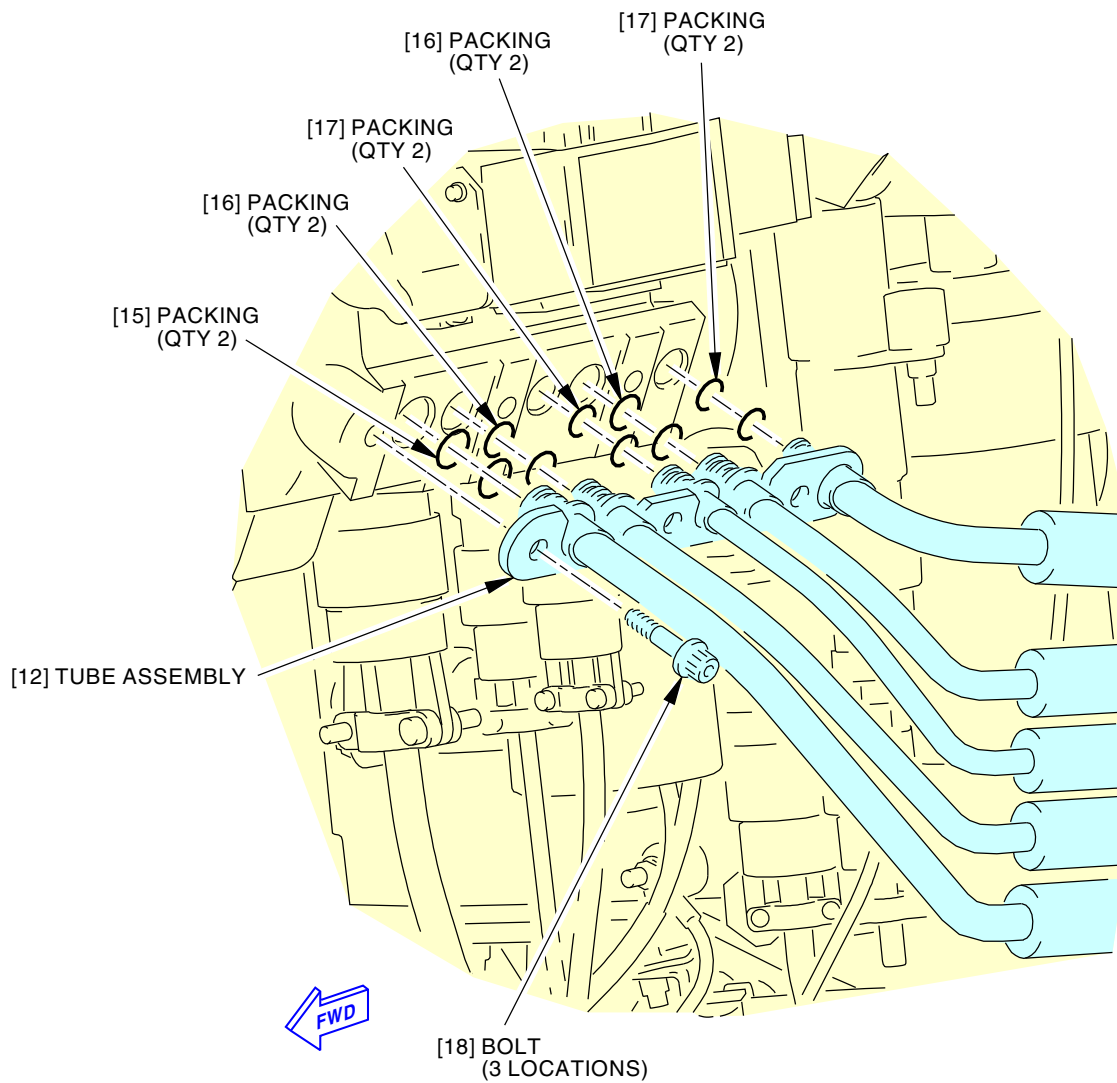
**Fuel Cluster Installation
Figure 401/49-31-31-990-801 (Sheet 2 of 3)**

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TUBE ASSEMBLY

C

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**Fuel Cluster Installation
Figure 401/49-31-31-990-801 (Sheet 3 of 3)**

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TASK 49-31-31-400-801

3. Fuel Cluster Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel cluster	49-31-31-01-120	ARO ALL
10	Packing	49-31-31-01-060	ARO ALL
15	Packing	49-31-31-01-075	ARO ALL
16	Packing	49-31-31-01-090	ARO ALL
17	Packing	49-31-31-01-105	ARO ALL
19	Reducer	49-11-01-01-151	ARO ALL
20	Packing	49-11-01-01-146	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Fuel Cluster Installation

SUBTASK 49-31-31-420-001



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Install the fuel cluster [1]:
 - (a) Install the clamp [2], if not already installed, on the new fuel cluster.
 - (b) Lubricate the new packing [10] with Mobil Jet Oil II, D00520.
 - (c) Install the packing [10] on the fuel cluster [1].

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YOU MUST HOLD THE FUEL CLUSTER WHILE YOU INSTALL THE CLAMP. IF YOU DO NOT HOLD THE FUEL CLUSTER, IT CAN BEND THE DRIVE SHAFT IN THE LUBE CLUSTER. IT CAN ALSO FALL AND BECOME DAMAGED.

- (d) Install the fuel cluster [1] on the lube cluster [11] with the clamp [9].

NOTE: Make sure the guide pin on the fuel cluster is aligned and engages the hole on the lube cluster.

- 1) Tighten the clamp [9] to 30 pound-inches (3.39 newton-meters).

SUBTASK 49-31-31-420-006

- (2) Do the steps that follow to connect the tube assembly [12] to the fuel cluster [1]:
- (a) Lubricate the new packings [15], packings [16], packings [17] with Mobil Jet Oil II, D00520.
 - (b) Install the packings [15], packings [16], packings [17] on the tube assembly [12].
 - (c) Connect the tube assembly [12] to the fuel cluster [1].
 - (d) Install the bolts [18] that hold the tube assembly [12] to the fuel cluster [1].

SUBTASK 49-31-31-420-007

- (3) Do the steps that follow to connect the electrical connectors to the fuel cluster [1]:
- (a) Remove the caps from the connectors.
 - (b) Connect the electrical connector (D49009P) [13] to the fuel temperature sensor [5].
 - (c) Connect the electrical connector (D49010P) [7] to the fuel filter differential pressure switch [6].
 - (d) Connect the electrical connector (D49011P) [14] to the fuel cluster [1].
 - (e) Put the wire harness in the clamp [2].
 - (f) Close the clamp [2] and tighten the bolt [3].

SUBTASK 49-31-31-420-002

- (4) Do these steps to install the reducer [19] on the fuel cluster [1]:
- (a) Lubricate the new packing [20] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [20] on the reducer [19].
 - (c) Install the reducer [19] on the fuel cluster [1] and torque the reducer [19] to 280 pound-inches.

SUBTASK 49-31-31-420-008

- (5) Do the steps that follow to connect the fuel supply [8]:
- (a) Remove the plug from the fuel supply [8].
 - (b) Connect the fuel supply line [8] to the fuel cluster [1].
 - 1) While you hold the reducer [19] with a wrench, tighten the coupling nut on the fuel supply [8] to a torque value of 665-735 pound-inches.



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G. Fuel Cluster Installation Test

SUBTASK 49-31-31-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-31-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-31-31-790-001

- (3) Do the steps that follow to do a leak check for the fuel cluster:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 1) Make sure the fuel cluster shows no signs of leakage.
 - (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the APU fuel system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

H. Put the airplane back to its usual condition:

SUBTASK 49-31-31-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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APU FUEL HOSE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU fuel hose
 - (2) An installation of the APU fuel hose.
- B. The APU fuel hose is attached to the firewall at the 2412 bulkhead.

TASK 49-31-41-000-801

2. APU Fuel Hose Removal

(Figure 401)

A. General

- (1) You will need a fuel-resistant container to catch the fuel that will leak when you disconnect the APU fuel hose.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Tools/Equipment

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

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Prepare for the Removal

SUBTASK 49-31-41-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-31-41-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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SUBTASK 49-31-41-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. APU Fuel Hose Removal

SUBTASK 49-31-41-020-001

- (1) Do these steps to remove the APU fuel hose [2]:
- (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the APU fuel hose [2].
 - (b) Remove the two screws [4], two washers [3] and two clamps [1] that attach the APU fuel hose [2] to the firewall.
 - (c) While you hold the reducer with a wrench, disconnect the APU fuel hose [2] from the reducer on the fuel cluster.
 - (d) Drain the fuel from the APU fuel hose [2] into the 5-gallon (19-liter) fuel resistant container, STD-1054.
 - (e) While you hold the nut on the APU fuel supply line with a wrench, disconnect the APU fuel hose [2] from the APU fuel supply line.
 - (f) Install two caps or plugs on the APU fuel hose [2].
 - (g) Remove the APU fuel hose [2].
 - (h) Make sure you install all necessary protection covers.

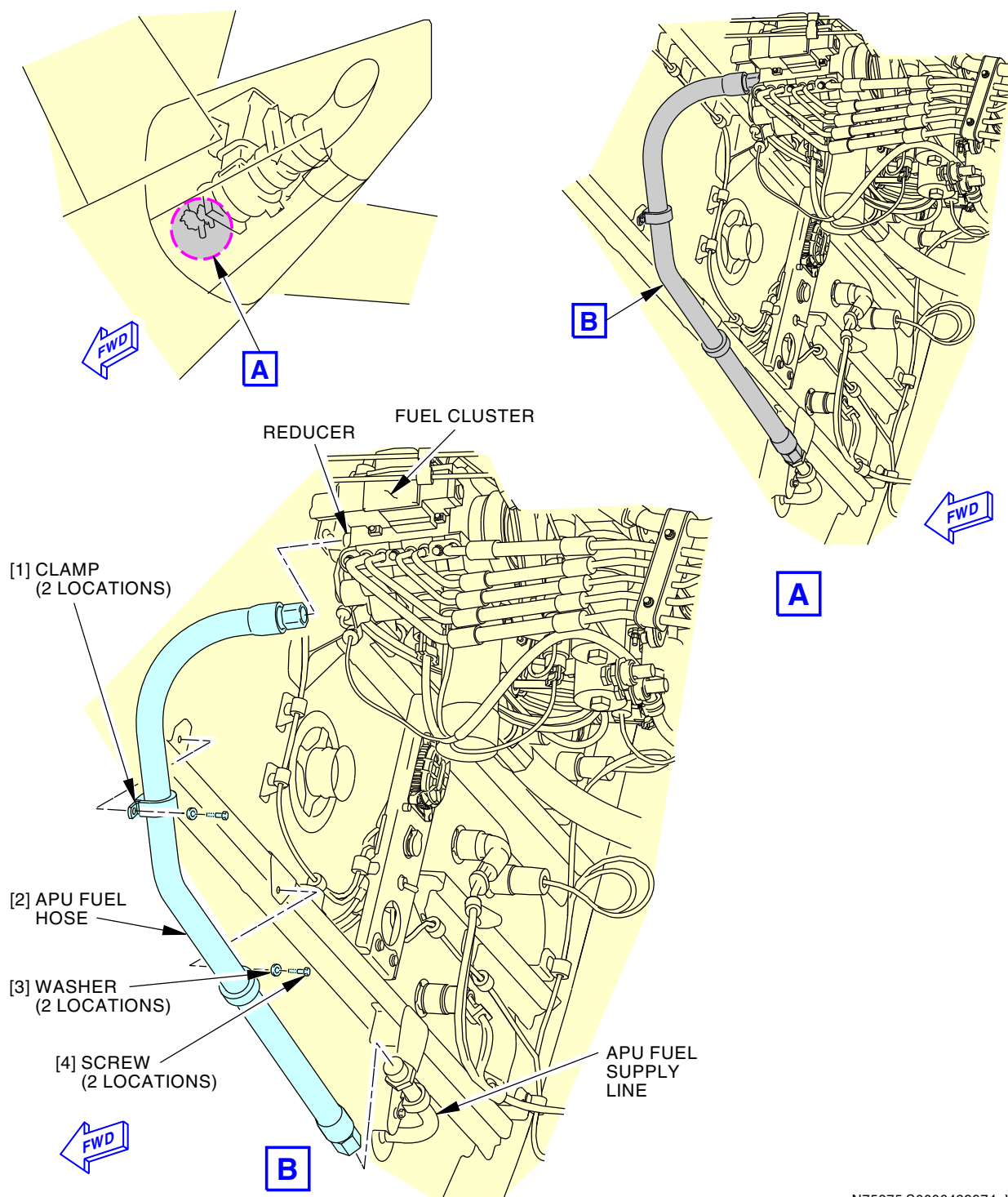
————— END OF TASK —————

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APU Fuel Hose Installation
Figure 401/49-31-41-990-801

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TASK 49-31-41-400-801

3. APU Fuel Hose Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APU fuel hose	49-31-05-01-020	ARO 001-014

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Fuel Hose Installation

SUBTASK 49-31-41-420-001



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

(1) Do these steps to install the APU fuel hose [2]:

- (a) If the two caps or plugs are installed on the APU fuel hose [2], remove the two caps or plugs.
- (b) Tighten the reducer on the fuel cluster to 280 inch-pounds (31.6 newton-meters).
- (c) Connect the APU fuel hose [2] to the reducer.
- (d) While you hold the reducer with a wrench, tighten the coupling nut on the APU fuel hose [2] to 665-735 inch-pounds (75.1-83.1 newton-meters).
- (e) Connect the APU fuel hose [2] to the APU fuel supply line.
- (f) While you hold the nut on the APU fuel supply line with a wrench, tighten the coupling nut on the APU fuel hose [2] to 665-735 inch-pounds (75.1-83.1 newton-meters).
- (g) Install the two clamps [1] on the APU fuel hose [2] with the two washers [3] and two screws [4].

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F. APU Fuel Hose Installation Test

SUBTASK 49-31-41-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-31-41-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-31-41-790-001

- (3) Do the installation test for the APU fuel hose:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Make sure the APU fuel hose shows no signs of leakage.
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-41-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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IGNITER PLUG - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the igniter plug
 - (2) An installation of the igniter plug.
- B. There are two igniter plugs on the APU. The two igniter plugs are at the 5 o'clock and 7 o'clock positions of the APU and adjacent to the fuel nozzles.

TASK 49-41-02-000-801

2. Igniter Plug Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-41-02-860-001

- (1) Make sure the Auxiliary Power Unit (APU) selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-41-02-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-02-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left

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<u>Number</u>	<u>Name/Location</u>
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Igniter Plug Removal

SUBTASK 49-41-02-020-001



DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit and to remove the two igniter plugs [2]:
 - (a) Make sure five minutes have gone by since the last APU start.
 - (b) Disconnect the ignition lead 1 [3] from the mounting boss [4] on the APU.

NOTE: The connections of the ignition lead 1 [3] and ignition lead 2 [1] hold the two igniter plugs [2] to the APU. When the two ignition leads are disconnected, the two igniter plugs can come out.

 - 1) Ground the ignition lead 1 [3] to a metal surface on the APU.
 - (c) Disconnect the ignition lead 2 [1] from the mounting boss [4] on the APU.
 - 1) Ground the ignition lead 2 [1] to a metal surface on the APU.
 - (d) Make sure you install all necessary protection covers.

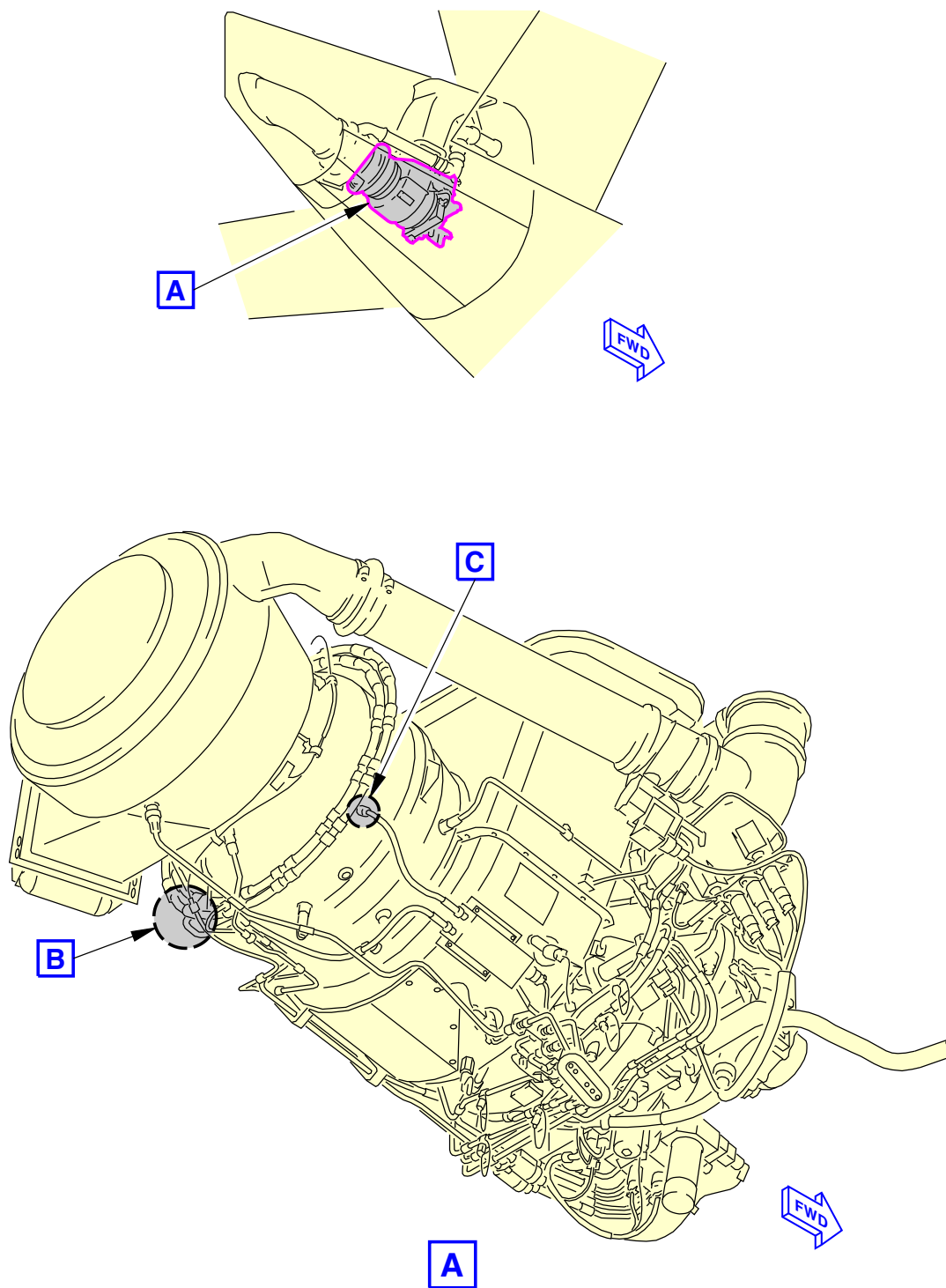
————— **END OF TASK** —————

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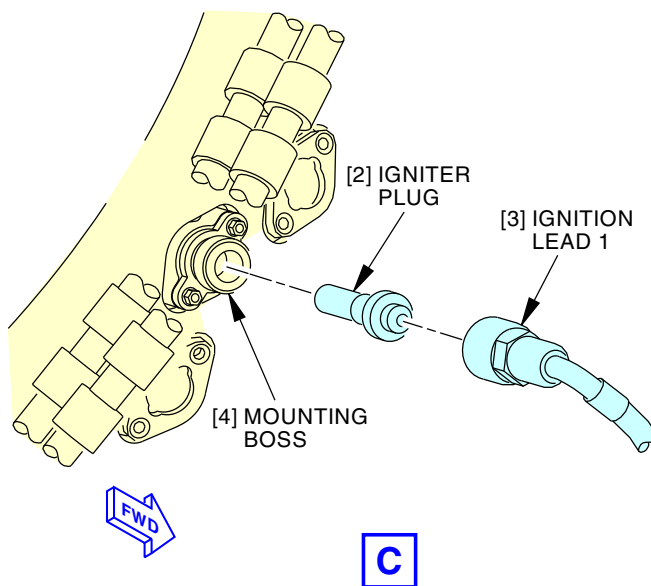
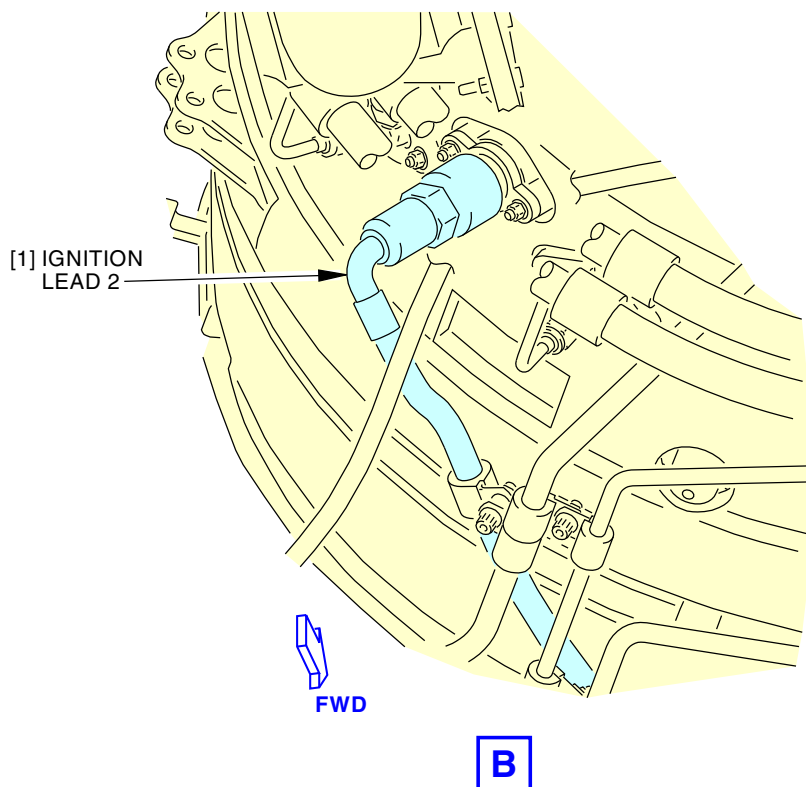
Igniter Plug Installation
Figure 401/49-41-02-990-802 (Sheet 1 of 2)

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**Igniter Plug Installation
Figure 401/49-41-02-990-802 (Sheet 2 of 2)**

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TASK 49-41-02-400-801

3. Igniter Plug Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Ignition lead 2	49-41-41-01-070	ARO ALL
3	Ignition lead 1	49-41-41-01-065	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-41-02-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the two igniter plugs [2]:
 - (a) Install the two igniter plugs [2] in the two mounting bosses [4].
 - (b) Connect the ignition lead 2 [1] to the igniter plug [2].
 - (c) Tighten the ignition lead 2 [1] to 100 in-lb (11.3 N·m)-110 in-lb (12.4 N·m).
 - (d) Connect the ignition lead 1 [3] to the igniter plug [2].
 - (e) Tighten the ignition lead 1 [3] to 100 in-lb (11.3 N·m)-110 in-lb (12.4 N·m).

F. Igniter Plug Installation Test

SUBTASK 49-41-02-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-02-860-004

- (2) Remove the DO-NOT-OPERATE tag from the Auxiliary Power Unit (APU) selector on the P5 overhead panel.

SUBTASK 49-41-02-740-001

- (3) Do the installation test for the igniter plug:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU ignition system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-02-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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IGNITER PLUG - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the igniter plug.

TASK 49-41-02-200-801

2. Igniter Plug Inspection

(Figure 601)

A. References

Reference	Title
49-41-02-000-801	Igniter Plug Removal (P/B 401)
49-41-02-400-801	Igniter Plug Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Procedure

SUBTASK 49-41-02-020-002

- (1) Do this task: Igniter Plug Removal, TASK 49-41-02-000-801.

SUBTASK 49-41-02-210-001

- (2) Inspect the semiconductor (firing tip) for radial cracks and wear.
(a) Replace the igniter plug if you find damage on the semiconductor.

SUBTASK 49-41-02-220-001

- (3) Inspect the outer electrode (shell):
- (a) Measure the inside diameter of the outer electrode.
 - 1) If the diameter anywhere around the outer electrode is more than 0.295 in. (7.5 mm), replace the igniter plug.
 - (b) Measure the distance from the inside diameter to the outer edge of the outer electrode.
 - 1) If the distance anywhere around the outer electrode is less than 0.085 in. (2.2 mm), replace the igniter plug.
 - (c) If the inside diameter of the outer electrode shows wear over 90°, replace the igniter plug.
 - (d) Examine the body of the igniter plug.
 - 1) If the body of the igniter plug has wear that is more than 0.015 in. (0.4 mm), replace the igniter plug.

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SUBTASK 49-41-02-110-001

- (4) Clean the igniter plug:

NOTE: It is not necessary to clean the igniter plug. If your decision is to clean the igniter plug, this cleaning procedure is recommended.

- (a) Clean the igniter plug with alcohol, B00130 and a cotton wiper, G00034.
- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to dry the igniter plug.

NOTE: It is recommended that you use a pressure of 60 psig (414 kPa)-90 psig (621 kPa) of air or nitrogen to dry the igniter plug.

SUBTASK 49-41-02-420-002

- (5) Do this task: Igniter Plug Installation, TASK 49-41-02-400-801.

————— **END OF TASK** —————

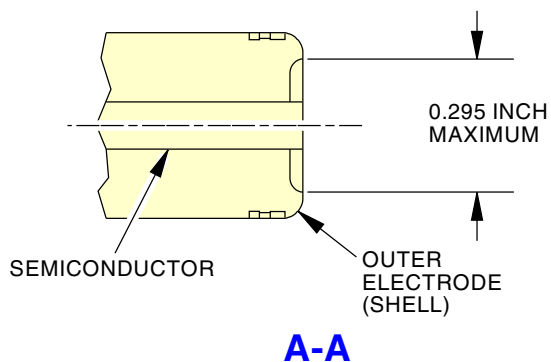
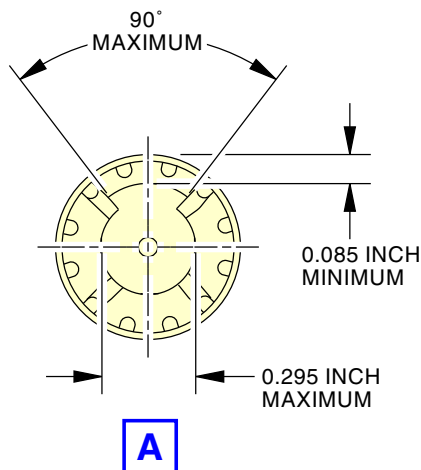
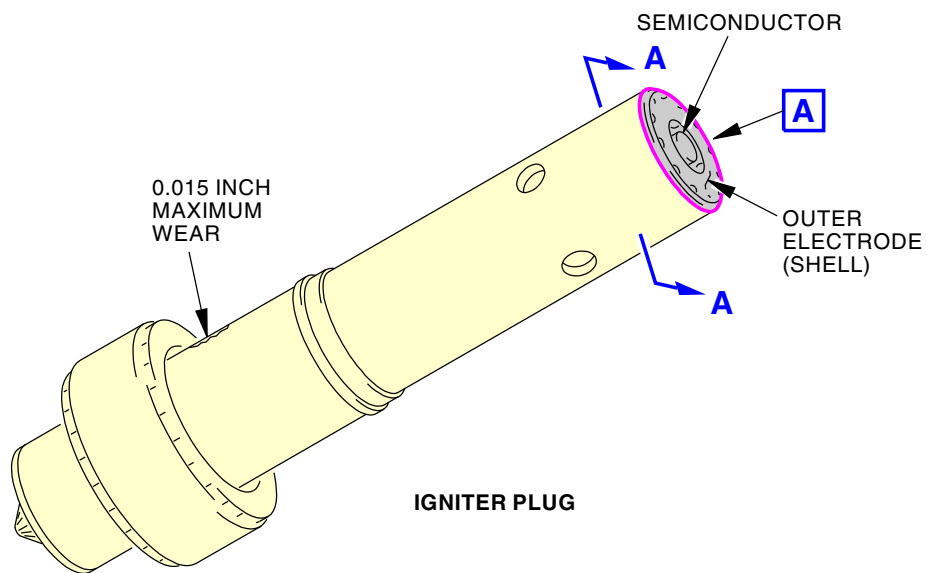
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**Igniter Plug Inspection
Figure 601/49-41-02-990-801**

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AIRCRAFT MAINTENANCE MANUAL
IGNITION UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the ignition unit
 - (2) An installation of the ignition unit.
- B. The ignition unit is part of the ignition cluster. The ignition cluster contains the two igniter plugs, two ignition leads and ignition unit.

TASK 49-41-03-000-801

2. Ignition Unit Removal

(Figure 401)

A. General

- (1) The high voltage from the ignition unit must be released before you can remove the ignition unit. To release the high voltage, the two ignition leads must be grounded to a metal surface on the APU.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-41-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-41-03-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-03-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Ignition Unit Removal

SUBTASK 49-41-03-020-001



DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit [1]:
 - (a) Make sure five minutes have gone by since the last APU start.
 - (b) Disconnect the ignition lead 1 [2] from the mounting boss on the APU.

NOTE: The connections of the ignition lead 1 [2] and ignition lead 2 [6] hold the two igniter plugs to the APU. When the two ignition leads are disconnected, the two igniter plugs can come out.
 - (c) Ground the ignition lead 1 [2] to a metal surface on the APU.
 - (d) Connect the ignition lead 1 [2] to the mounting boss on the APU.
 - (e) Disconnect the ignition lead 2 [6] from the mounting boss on the APU.
 - (f) Ground the ignition lead 2 [6] to a metal surface on the APU.
 - (g) Connect the ignition lead 2 [6] to the mounting boss on the APU.

SUBTASK 49-41-03-020-002

- (2) Do these steps to remove the ignition unit [1]:
 - (a) Disconnect the electrical connector [3] from the ignition unit [1].
 - (b) Disconnect the ignition lead 1 [2] and ignition lead 2 [6] from the ignition unit [1].
 - (c) Remove the four bolts [4] and four washers [5] that attaches the ignition unit [1] to the APU.
 - (d) Remove the ignition unit [1].
 - (e) Make sure you install all necessary protection covers.

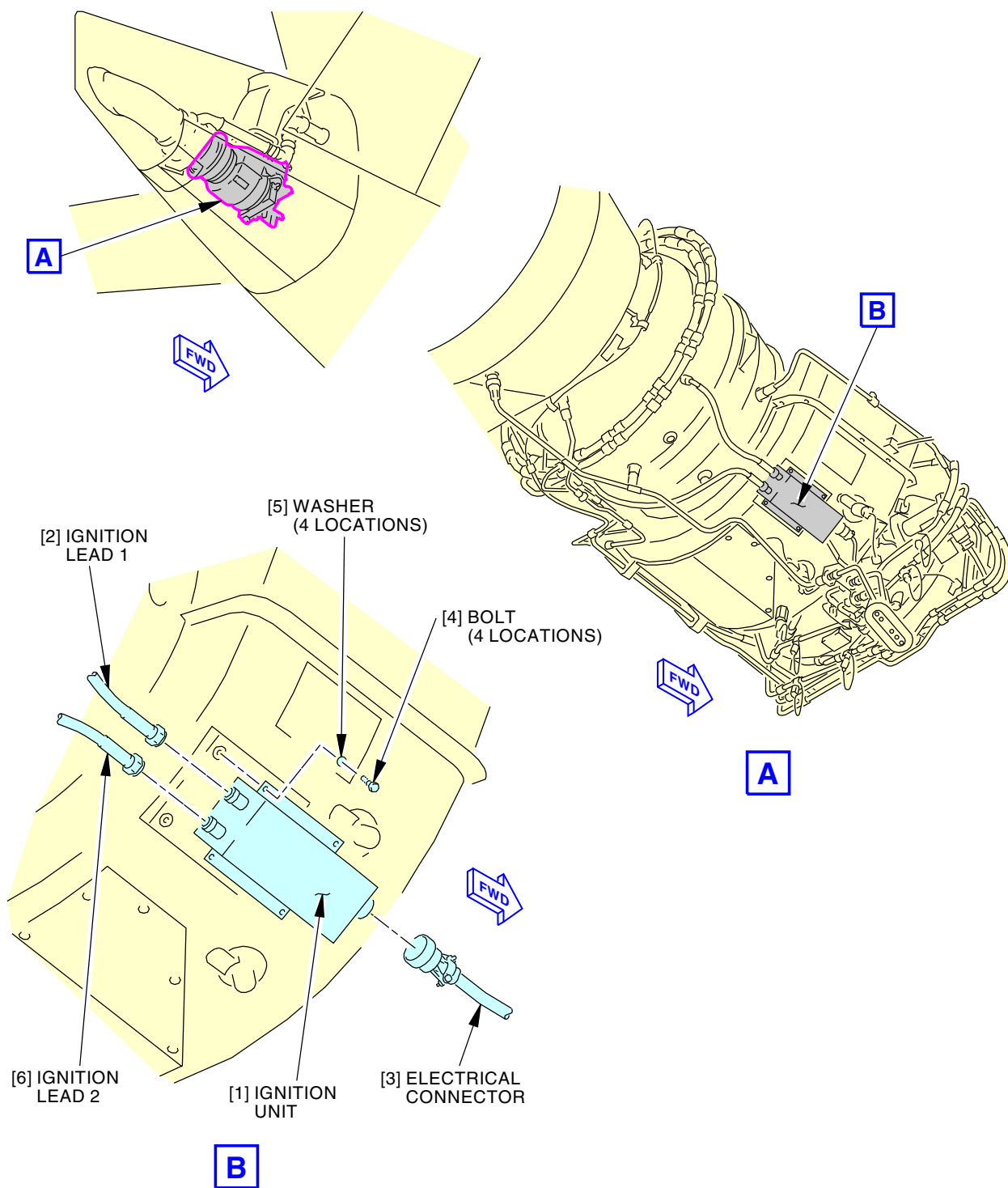
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Ignition Unit Installation
Figure 401/49-41-03-990-801

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TASK 49-41-03-400-801

3. Ignition Unit Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Ignition unit	49-41-41-01-075	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-41-03-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the ignition unit [1]:
 - (a) Put the ignition unit [1] on the APU with the four washers [5] and four bolts [4].
 - (b) Connect the ignition lead 1 [2] and ignition lead 2 [6] to the ignition unit [1].
 - 1) Tighten the ignition lead 1 [2] and ignition lead 2 [6] to 75 in-lb (8.5 N·m).
 - (c) Connect the electrical connector [3] to the ignition unit [1].

F. Ignition Unit Installation Test

SUBTASK 49-41-03-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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SUBTASK 49-41-03-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-41-03-710-001

- (3) Do the installation test for the ignition unit [1]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU ignition system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-03-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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IGNITION LEAD - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the two ignition leads
 - (2) An installation of the two ignition leads.
- B. The two ignition leads are part of the ignition cluster. The ignition cluster contains the two igniter plugs, two ignition leads and ignition unit.

TASK 49-41-04-000-801

2. Ignition Lead Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-41-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-41-04-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-04-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left

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<u>Number</u>	<u>Name/Location</u>
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Ignition Lead Removal

SUBTASK 49-41-04-020-001



DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit [3] and to remove the two igniter plugs:
 - (a) Make sure five minutes have gone by since the last APU start.
 - (b) Disconnect the ignition lead [1] from the mounting boss [10] on the APU.

NOTE: The connections of the ignition lead [1] and ignition lead [2] hold the two igniter plugs to the APU. When the two ignition leads are disconnected, the two igniter plugs can come out.

 - 1) Ground the ignition lead [1] to a metal surface on the APU.
 - 2) Remove the two nuts [8] that attaches the mounting boss [9] to the APU.
 - 3) Remove the mounting boss [9], igniter plug [4] and gasket [10].
 - a) Discard the gasket [10].
 - (c) Disconnect the ignition lead [2] from the mounting boss [9] on the APU.
 - 1) Ground the ignition lead [2] to a metal surface on the APU.
 - 2) Remove the two nuts [8] that attaches the mounting boss [9] to the APU.
 - 3) Remove the mounting boss [9], igniter plug [7] and gasket [10].
 - a) Discard the gasket [10].

SUBTASK 49-41-04-020-002

- (2) Do these steps to remove the ignition lead [1] and ignition lead [2]:
 - (a) Remove the two bolts [5] and two clamps [6] that hold the ignition lead [2] to the APU.
 - (b) Disconnect the ignition lead [1] and ignition lead [2] from the ignition unit [3].
 - (c) Remove the ignition lead [1] and ignition lead [2].
 - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

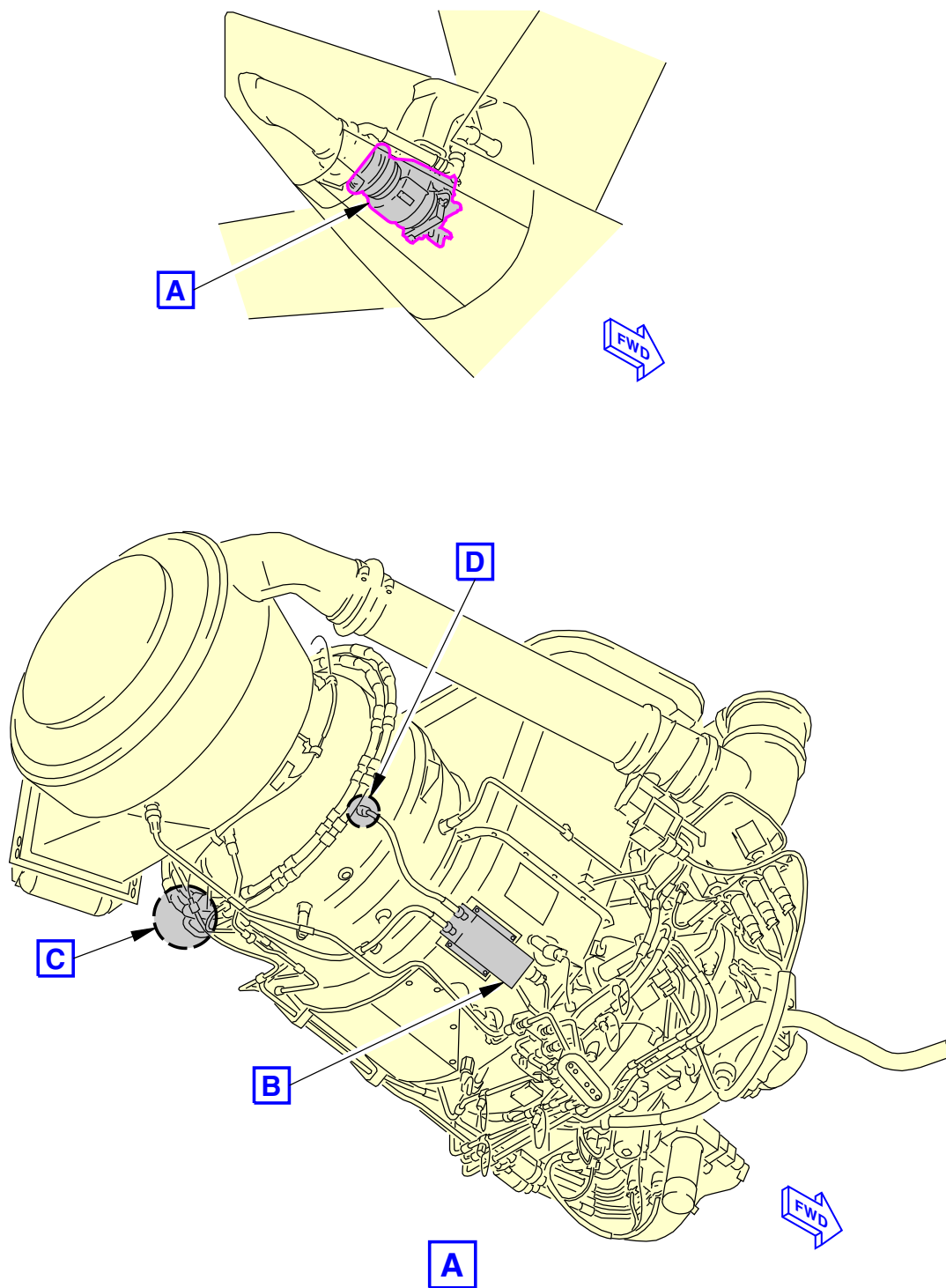
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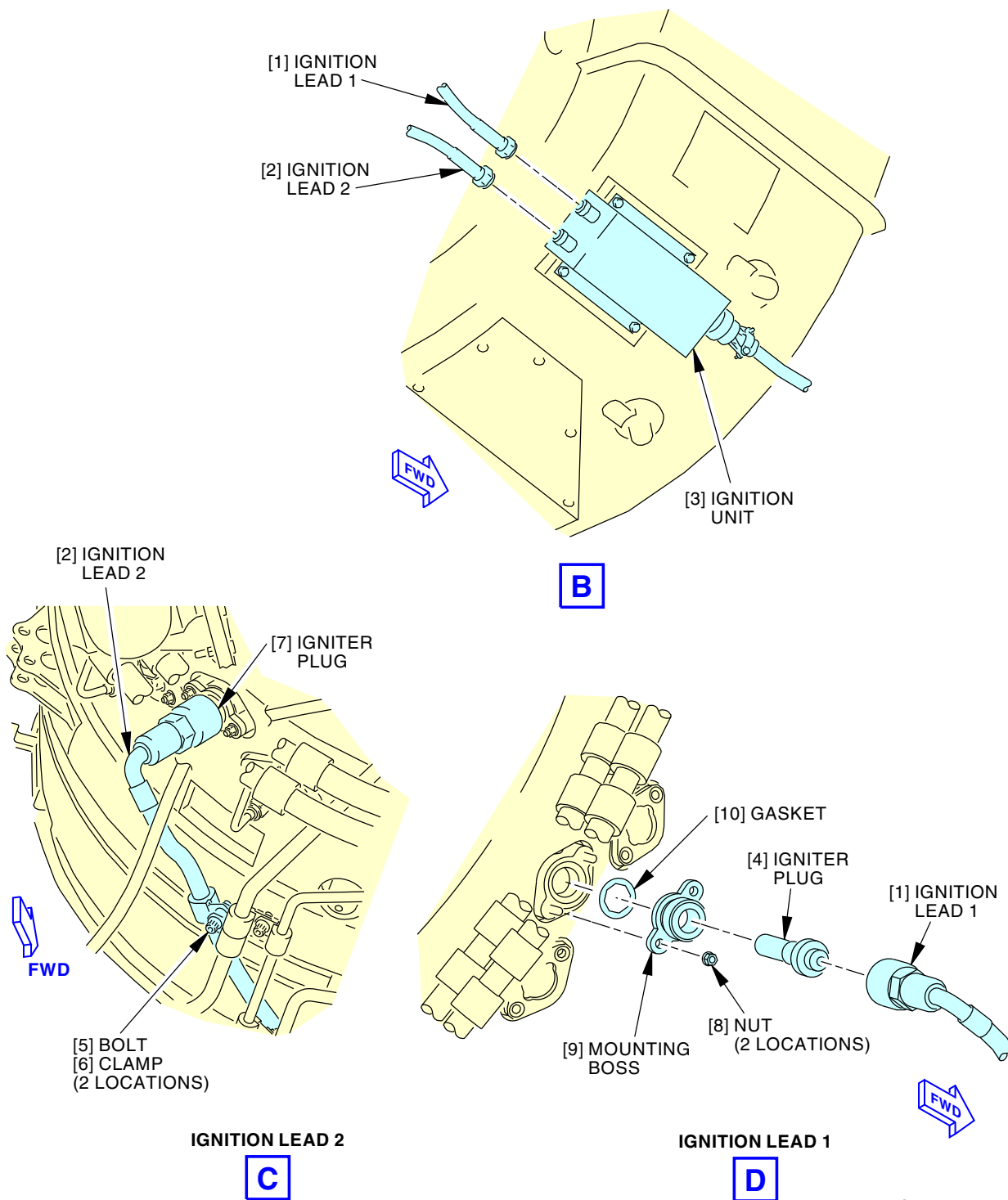
Ignition Lead Installation
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**Ignition Lead Installation
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TASK 49-41-04-400-801

3. Ignition Lead Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Ignition lead	49-41-41-01-065	ARO ALL
2	Ignition lead	49-41-41-01-070	ARO ALL
4	Igniter plug	49-41-41-01-060	ARO ALL
7	Igniter plug	49-41-41-01-060	ARO ALL
10	Gasket	49-41-41-01-085	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-41-04-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the ignition lead [1] and ignition lead [2]:
 - (a) Connect the ignition lead [1] and ignition lead [2] to the ignition unit [3].
 - (b) Tighten the ignition lead [1] and ignition lead [2] to the ignition unit [3] to 75 in-lb (8.5 N·m).
 - (c) Do these steps to install the ignition lead [1]:
 - 1) Install the igniter plug [4] in the mounting boss [9] with the new gasket [10].
 - 2) Put the mounting boss [9] with the igniter plug [4] on the two studs of the APU and install the two nuts [8].
 - 3) Connect the ignition lead [1] to the igniter plug [4].
 - 4) Tighten the ignition lead [1] to the igniter plug [4] to 100 in-lb (11.3 N·m)-110 in-lb (12.4 N·m).
 - (d) Do these steps to install the ignition lead [2]:

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- 1) Put the ignition lead [2] in the two clamps [6] and install the two bolts [5].
- 2) Install the igniter plug [7] in the mounting boss [9] with the new gasket [10].
- 3) Put the mounting boss [9] with the igniter plug [7] on the two studs of the APU and install the two nuts [8].
- 4) Connect the ignition lead [2] to the igniter plug [7].
- 5) Tighten the ignition lead [2] to the igniter plug [7] to 100 in-lb (11.3 N·m)-110 in-lb (12.4 N·m).

F. Ignition Lead Installation Test

SUBTASK 49-41-04-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-04-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-41-04-740-001

- (3) Do the installation test for the ignition lead:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU ignition system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-04-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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IGNITION CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the ignition cluster
 - (2) An installation of the ignition cluster.
- B. The ignition cluster has these components:
- (1) Ignition unit
 - (2) Two ignition leads
 - (3) Two igniter plugs.

TASK 49-41-41-000-801

2. Ignition Cluster Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-41-41-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-41-41-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-41-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Ignition Cluster Removal

SUBTASK 49-41-41-020-001



DO NOT TOUCH THE IGNITION COMPONENTS UNTIL YOU DO THESE STEPS. THESE STEPS WILL RELEASE THE HIGH VOLTAGE FROM THE IGNITION UNIT. IF YOU DO NOT OBEY THIS PROCEDURE, INJURY TO PERSONS CAN OCCUR.

- (1) Do these steps to release the high voltage from the ignition unit [6] and to remove the two igniter plugs [9]:
 - (a) Make sure five minutes have gone by since the last APU start.
 - (b) Disconnect the ignition lead 1 [3] from the mounting boss [10] on the APU.

NOTE: The connections of the ignition lead 1 [3] and ignition lead 2 [2] hold the two igniter plugs [9] to the APU. When the two ignition leads are disconnected, the two igniter plugs can come out.

 - 1) Ground the ignition lead 1 [3] to a metal surface on the APU.
 - 2) Remove the two nuts [12] that attaches the mounting boss [10] to the APU.
 - 3) Remove the mounting boss [10], igniter plug [9] and gasket [13].
 - a) Discard the gasket [13].
 - (c) Disconnect the ignition lead 2 [2] from the mounting boss [10] on the APU.
 - 1) Ground the ignition lead 2 [2] to a metal surface on the APU.
 - 2) Remove the two nuts [12] that attaches the mounting boss [10] to the APU.
 - 3) Remove the mounting boss [10], igniter plug [9] and gasket [13].
 - a) Discard the gasket [13].

SUBTASK 49-41-41-020-002

- (2) Do these steps to remove the ignition cluster [1]:
 - (a) Remove the two bolts [7] and two clamps [8] that hold the ignition lead 2 [2] to the APU.
 - (b) Do these steps to remove the ignition unit [6]:
 - 1) Disconnect the electrical connector [5] from the ignition unit [6].
 - 2) Remove the four bolts [4] and four washers [11] that attaches the ignition unit [6] to the APU.
 - (c) Remove the ignition cluster [1].
 - (d) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

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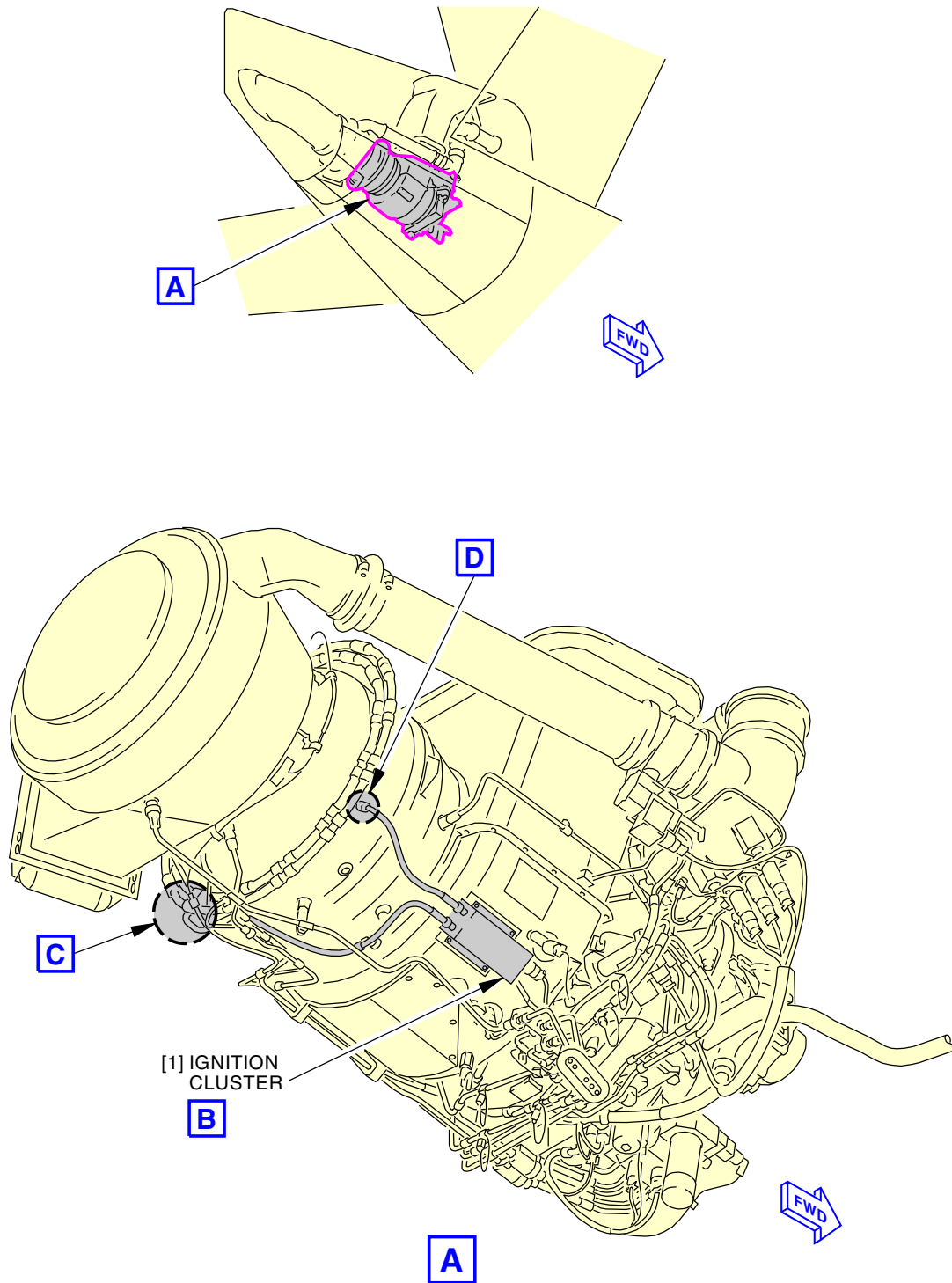
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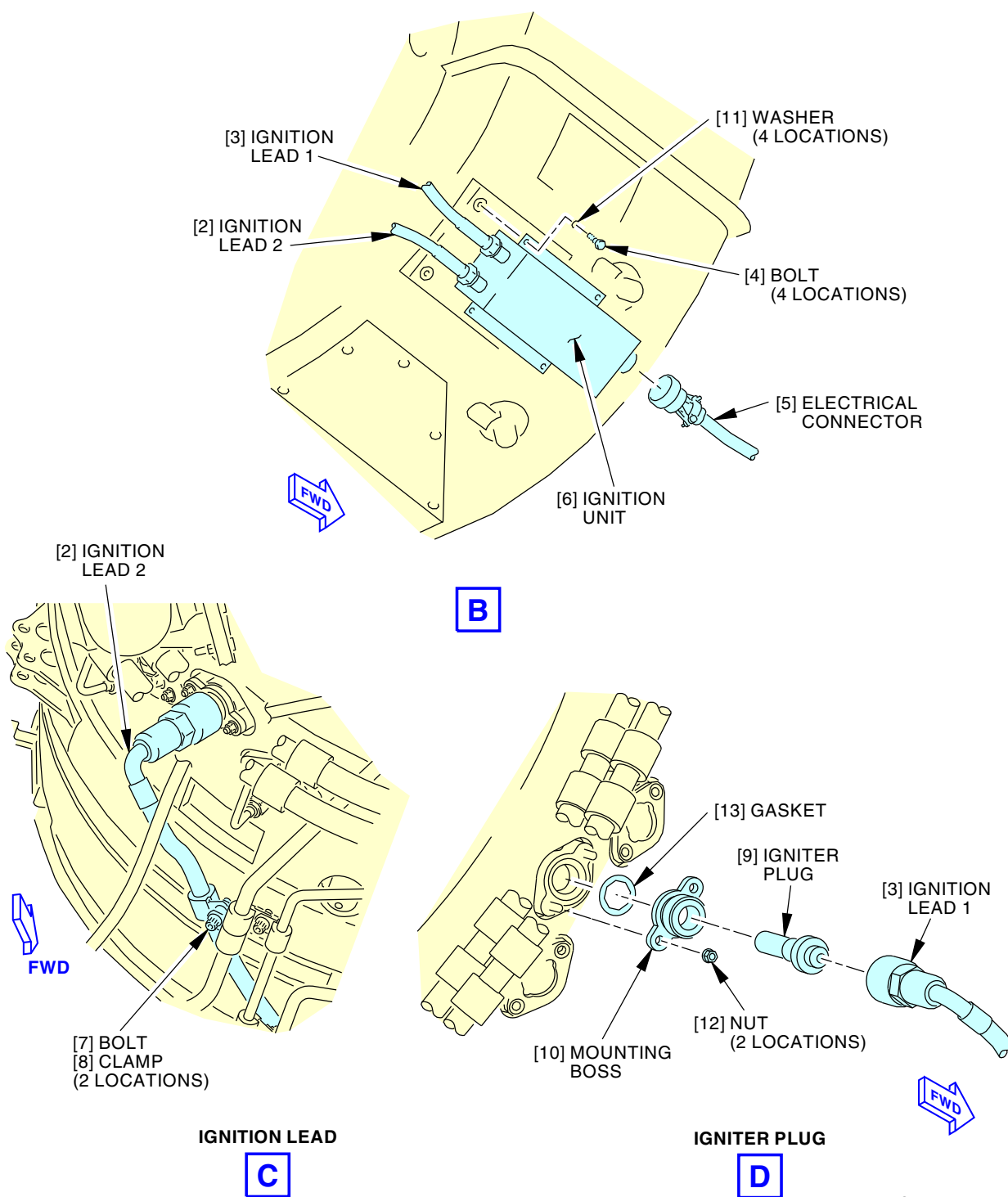
Ignition Cluster Installation
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**Ignition Cluster Installation
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TASK 49-41-41-400-801

3. Ignition Cluster Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Ignition lead 2	49-41-41-01-070	ARO ALL
3	Ignition lead 1	49-41-41-01-065	ARO ALL
6	Ignition unit	49-41-41-01-050	ARO ALL
		49-41-41-01-075	ARO ALL
13	Gasket	49-41-41-01-085	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure

SUBTASK 49-41-41-420-001



CAUTION REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the ignition cluster [1]:
 - (a) Put the ignition unit [6] with the ignition lead 2 [2] and ignition lead 1 [3] on the APU and install the four washers [11] and four bolts [4].
 - (b) Put the ignition lead 2 [2] in the two clamps [8] and install the two bolts [7].
 - (c) Install the two igniter plugs [9] in the two mounting bosses [10] with the two new gaskets [13].
 - (d) Put the two mounting bosses [10] with the two igniter plugs [9] on the four studs of the APU and install the four nuts [12].
 - (e) Connect the ignition lead 2 [2] and ignition lead 1 [3] to the two igniter plugs [9].
 - (f) Tighten the ignition lead 2 [2] and ignition lead 1 [3] to 100 in-lb (11.3 N·m)-110 in-lb (12.4 N·m).
 - (g) Connect the electrical connector [5] to the ignition unit [6].

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F. Ignition Cluster Installation Test

SUBTASK 49-41-41-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-41-41-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-41-41-740-001

- (3) Do the installation test for the ignition cluster:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU ignition system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-41-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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ELECTRIC STARTER MOTOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the electric starter motor.
- (2) An installation of the electric starter motor.

B. For this procedure, the electric starter motor is referred to as the starter motor.

TASK 49-42-01-000-801

2. Electric Starter Motor Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-11-01 P/B 401	AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-27-04-200-801	Magnetic Chip Collector Inspection (P/B 201)
49-42-02 P/B 401	ELECTRIC STARTER CLUTCH - REMOVAL/INSTALLATION

B. Location Zones

<u>Zone</u>	<u>Area</u>
162	Bulk Cargo Compartment, Right
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right
825	Bulk Cargo Door

D. Prepare for the Removal

SUBTASK 49-42-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-42-01-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-42-01-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access panels that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right
825	Bulk Cargo Door

- (4) Disconnect connector DM24012A from the APU Battery.

E. Electric Starter Motor Removal

SUBTASK 49-42-01-020-001

- (1) Do the steps that follow to remove the starter motor [1]:
- (a) Disconnect the electrical connector [8].



WARNING

BE CAREFUL WHEN YOU DISCONNECT THE ELECTRICAL LEADS FROM THE STARTER MOTOR. IT IS POSSIBLE THAT THERE IS ELECTRICAL POWER AT THE TERMINAL STUDS AND THE APU POWER CIRCUIT BREAKERS ARE OPEN. USE ELECTRICAL GLOVES AND TOOLS WITH ELECTRICAL INSULATION. ELECTRICAL SHOCK CAN CAUSE INJURIES TO PERSONNEL.

- (b) Move the terminal block cover [9] to get access to the terminals for the starter motor [1].
- (c) Remove the nut [2] from the starter motor [1].
- (d) Remove the positive lead [3] from the terminal stud on the starter motor [1].
- (e) Remove the nut [6] from the starter motor [1].
- (f) Remove the negative lead [7] from the terminal stud on the starter motor [1].
- (g) If it is necessary, do the steps that follow to install the fishpole hoist (Figure 402):
- 1) Install the fishpole hoist on the key hole slot on the firewall.
 - 2) Remove the bolt from the lift boss.
 - 3) Install the lifting-eye into the lift boss.
 - 4) Connect the fishpole hoist to the lifting-eye.
 - 5) Tighten the fishpole hoist cable.
- (h) Loosen the nuts [5] on the starter motor [1].
- (i) Turn the starter motor [1] counterclockwise.



CAUTION

BE CAREFUL WHEN YOU MOVE THE APU ELECTRIC STARTER MOTOR. THE ELECTRIC STARTER MOTOR WEIGHS 38 POUNDS (17.3 KG). IF THE ELECTRIC STARTER MOTOR FALLS, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (j) Remove the starter motor [1].
- (k) Remove the packing [4] from the starter motor [1].
- 1) Discard the packing [4].
- (l) If the starter motor shaft was sheared, replace the clutch, ELECTRIC STARTER CLUTCH - REMOVAL/INSTALLATION, PAGEBLOCK 49-42-02/401
- (m) Inspect the clutch for damage, do the steps that follow:

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- 1) Examine the clutch in the gearbox housing for excessive movement. If you find excessive movement, replace the APU, AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401
 - 2) Examine the clutch for uneven tension on the pawls and loose rivets. If you find damage, replace the clutch, ELECTRIC STARTER CLUTCH - REMOVAL/INSTALLATION, PAGEBLOCK 49-42-02/401
 - 3) Examine the clutch cavity for debris. If you find debris, clean the clutch cavity.
 - 4) Do this task : Magnetic Chip Collector Inspection, TASK 49-27-04-200-801. If you find a large quantity of metal particles on the magnetic chip collector, replace the APU, AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401.
- (n) If you used the fishpole hoist to remove the starter motor [1], do the steps that follow:
- 1) Remove the lifting-eye from the starter motor [1].
 - 2) Install the bolt into the lift boss.

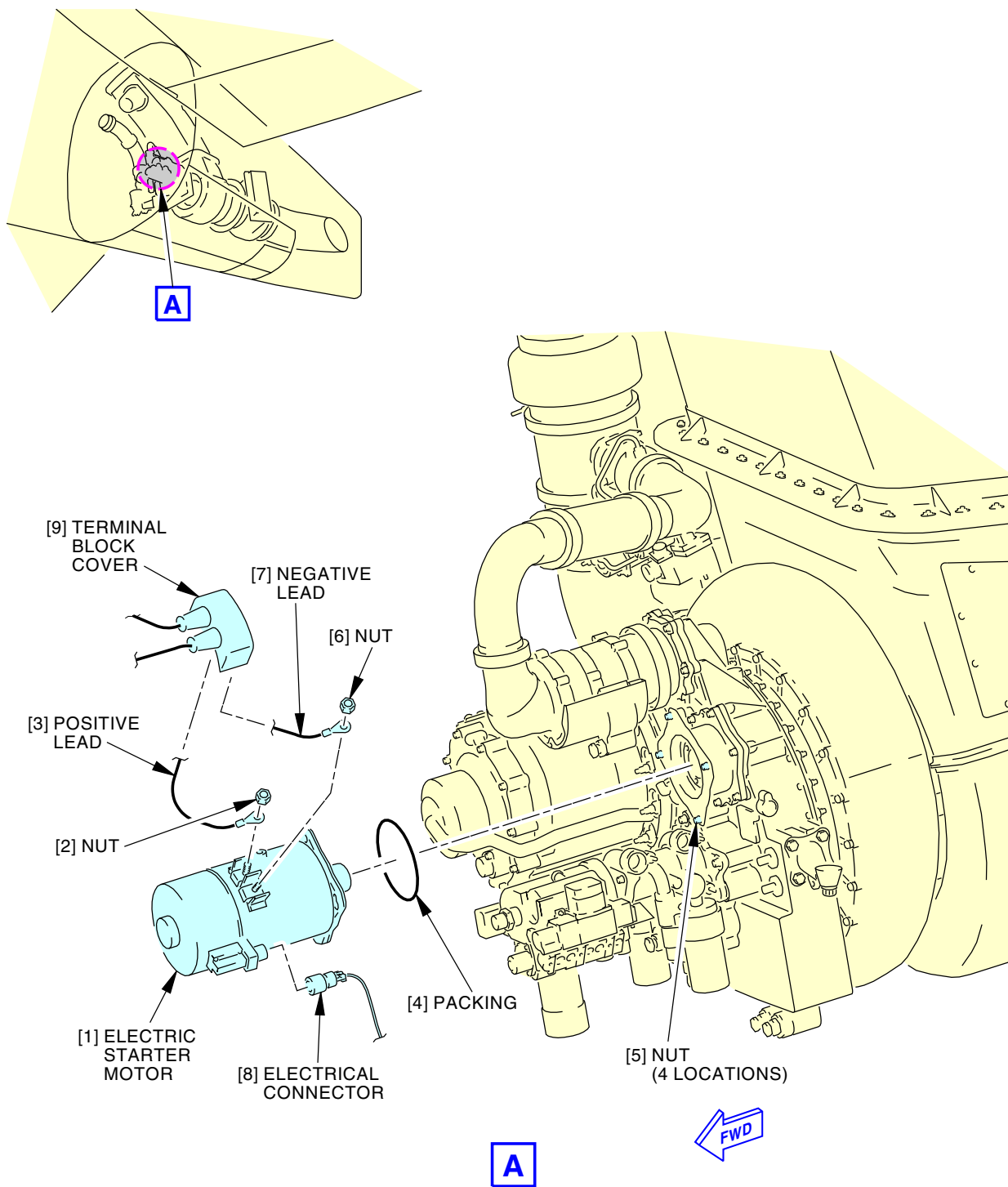
———— **END OF TASK** ————

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Electric Starter Motor Installation
Figure 401/49-42-01-990-801

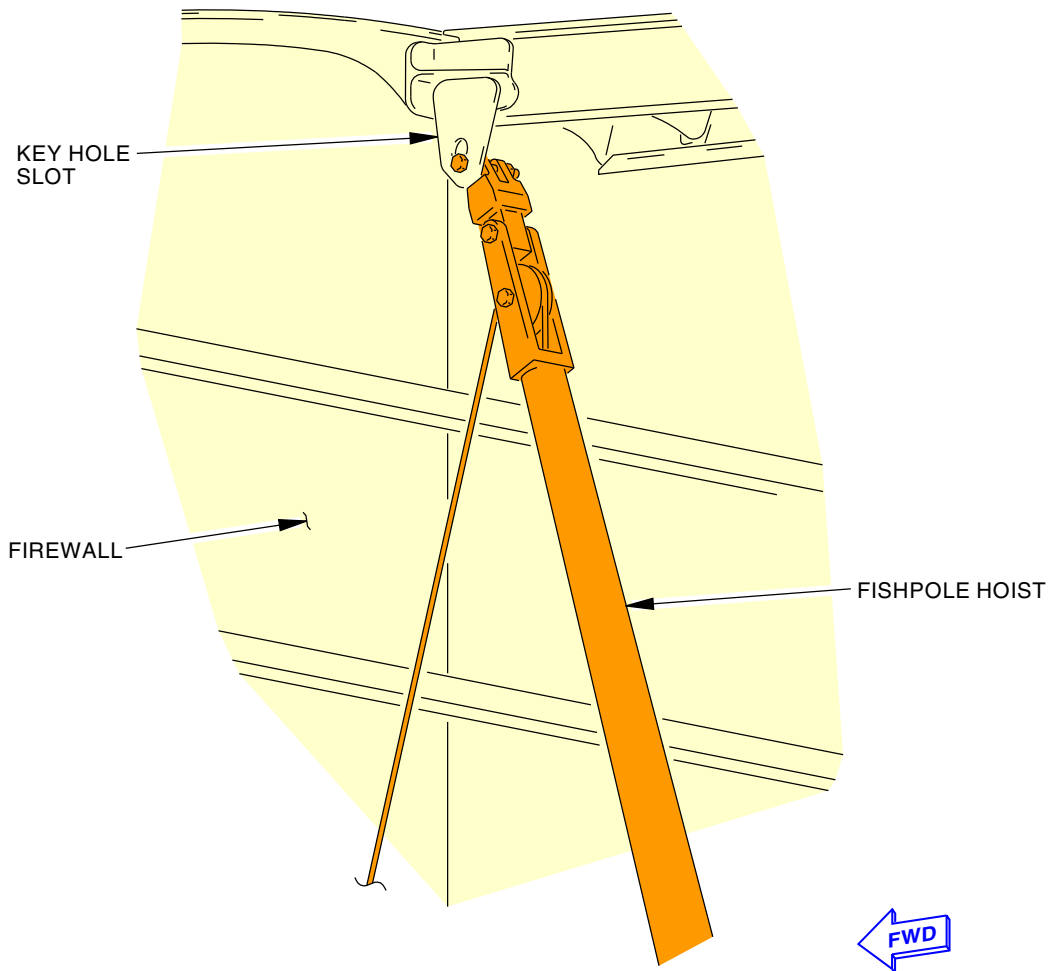
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Fishpole Hoist Installation
Figure 402/49-42-01-990-802

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TASK 49-42-01-400-801

3. Electric Starter Motor Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Starter motor	49-42-01-01-050	ARO ALL
4	Packing	49-42-01-01-060	ARO ALL

D. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right
825	Bulk Cargo Door

F. Electric Starter Motor Installation

SUBTASK 49-42-01-420-001

- (1) Do the steps that follow to install the starter motor [1]:
 - (a) Lubricate the new packing [4] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [4] on the starter motor [1].
 - (c) If it is necessary, connect the fishpole hoist to the starter motor [1]:
 - 1) Remove the bolt from the lift boss.
 - 2) Install the lifting-eye into the lift boss.
 - 3) Connect the fishpole hoist cable to the lift boss.
 - 4) Slowly raise the starter motor [1].



CAUTION

BE CAREFUL WHEN YOU MOVE THE ELECTRIC STARTER MOTOR. THE ELECTRIC STARTER MOTOR WEIGHS 38 POUNDS (17.3 KG). IF THE ELECTRIC STARTER MOTOR FALLS, IT CAN CAUSE DAMAGE TO EQUIPMENT.

- (d) Put the starter motor [1] on the gearbox adapter.

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- (e) Hold the starter motor [1] on the mounting pad and turn it clockwise.
 - 1) Tighten the nuts [5] to 60-80 pound-inches (6.78-9.04 newton-meters).
- (f) Install the positive lead [3] to the terminal stud on the starter motor [1].
- (g) Install the nut [2].
 - 1) Tighten the nut [2] to a torque value of 140-160 pound-inches (15.8-18.1 newton-meters).
- (h) Install the negative lead [7] to the stud on the starter motor [1].
- (i) Install the nut [6].
 - 1) Tighten the nut [6] to a torque value of 140-160 pound-inches (15.8-18.1 newton-meters).
- (j) Move the terminal block cover [9] over the terminals for the starter motor [1].
- (k) Connect the electrical connector [8].
- (l) If you used the fishpole hoist to install the starter motor [1], do the steps that follow:
 - 1) Remove the lifting-eye from the starter motor [1].
 - 2) Install the bolt into the lift boss.
 - 3) Remove the fishpole hoist from the firewall.
- (m) Install connector DM24012A (+ terminal) to the APU battery.

G. Electric Starter Motor Installation Test

SUBTASK 49-42-01-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-42-01-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-42-01-710-001

- (3) Do the steps that follow to do the installation test for the electric starter motor [1]:
 - (a) Move the APU BLEED switch on the P5 overhead panel to the OFF position.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
NOTE: The APU will do an electric start attempt.
 - (c) Make sure the EICAS status messages APU and APU START SYSTEM do not show.
 - (d) Move the APU BLEED switch on the P5 overhead panel to the AUTO position.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-42-01-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

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Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right
825	Bulk Cargo Door

———— **END OF TASK** ————

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ELECTRIC STARTER CLUTCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the electric starter clutch
 - (2) An installation of the electric starter clutch.
- B. The electric starter motor must be removed before you can remove the electric starter clutch.
- C. The electric starter clutch is referred to as the clutch.

TASK 49-42-02-000-801

2. Electric Starter Clutch Removal

(Figure 401)

A. References

Reference	Title
49-42-01-000-801	Electric Starter Motor Removal (P/B 401)

B. Tools/Equipment

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

Reference	Description
SPL-1965	Adapter - Torque, Starter Clutch Part #: 834730-1 Supplier: 06848

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Prepare for the Removal

SUBTASK 49-42-02-010-001

- (1) Do this task: Electric Starter Motor Removal, TASK 49-42-01-000-801.

E. Electric Starter Clutch Removal

SUBTASK 49-42-02-020-001

- (1) Do the steps that follow to remove the clutch [2] (Figure 401):
 - (a) Put the starter clutch torque adapter, SPL-1965 on the clutch [2] (Figure 402).
 - 1) Make sure the handle [22] for the clutch torque adapter is installed in the ELEC fitting on the cylinder [21].
 - (b) Turn the bolt [3] counterclockwise while you hold the clutch torque adapter.

NOTE: The clutch torque adapter will not permit the clutch [2] to turn while you loosen the bolt [3].
 - (c) Remove the clutch [2] and the clutch torque adapter from the gearbox adapter [1].

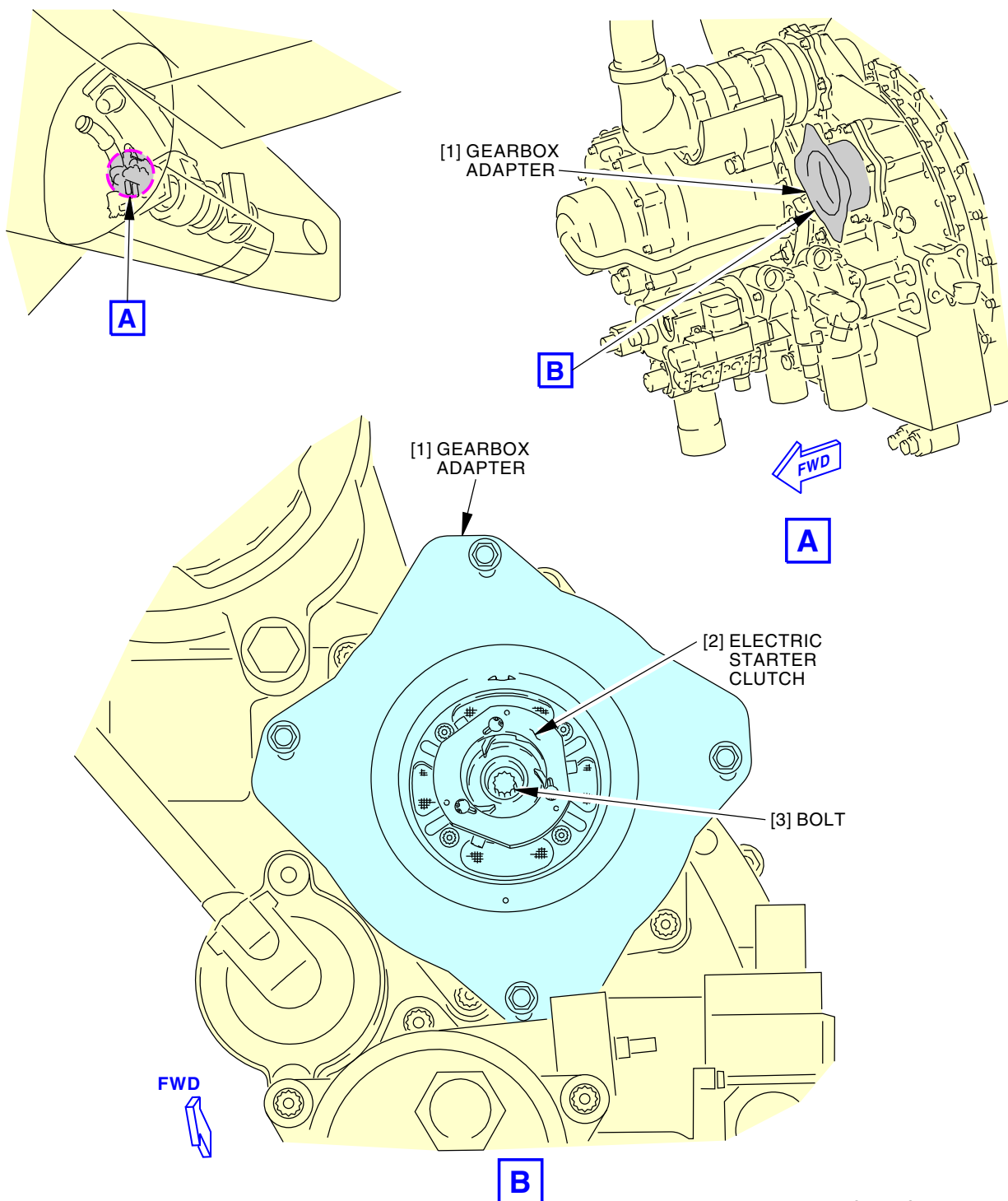
————— **END OF TASK** —————

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Electric Starter Clutch Installation
Figure 401/49-42-02-990-801

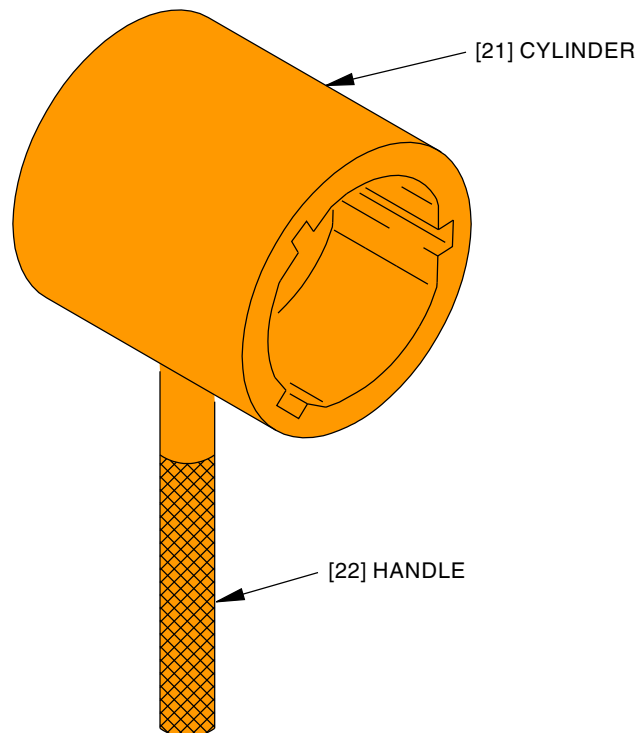
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Torque-Clutch Adapter Tool
Figure 402/49-42-02-990-802

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TASK 49-42-02-400-801

3. Electric Starter Clutch Installation

(Figure 401)

A. References

Reference	Title
49-42-01-400-801	Electric Starter Motor Installation (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Clutch	49-42-02-01-060	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Electric Starter Clutch Installation

SUBTASK 49-42-02-420-001

(1) Do the steps that follow to install the clutch [2] (Figure 401):

- (a) Install the clutch [2] into the gearbox adapter [1].
- (b) Put the clutch torque adapter on the clutch [2] (Figure 402).
 - 1) Make sure the handle [22] for the clutch torque adapter is installed in the ELEC fitting on the cylinder [21].
- (c) Turn the bolt [3] clockwise while you hold the clutch torque adapter.

NOTE: The clutch torque adapter will not permit the clutch [2] to turn while you loosen the bolt [3].

- 1) Tighten the bolt [3] to 50-70 pound-inches (5.65-7.91 newton-meters).
- 2) Loosen the bolt [3].
- 3) Tighten the bolt [3] again to 50-70 pound-inches (5.65-7.91 newton-meters).
- 4) Loosen the bolt [3].
- 5) Tighten the bolt [3] to 50-78 pound-inches (5.65-8.81 newton-meters).

NOTE: The bolt must be tightened three times to engage the clutch with the gear in the gearbox.

- (d) Remove the clutch torque adapter from the gearbox adapter [1].

SUBTASK 49-42-02-410-001

(2) Do this task: Electric Starter Motor Installation, TASK 49-42-01-400-801.

———— **END OF TASK** ————

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AIR TURBINE STARTER (ATS) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the air turbine starter
 - (2) An installation of the air turbine starter.
- B. For this procedure, the air turbine starter is referred to as the ATS.

TASK 49-43-01-000-801

2. Air Turbine Starter (ATS) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-11-01 P/B 401	AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-27-04-200-801	Magnetic Chip Collector Inspection (P/B 201)
49-43-02 P/B 401	AIR TURBINE STARTER (ATS) CLUTCH - REMOVAL/INSTALLATION

B. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-43-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-43-01-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-01-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Air Turbine Starter (ATS) Removal

SUBTASK 49-43-01-020-001



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

- (1) Do these steps to remove the ATS [1]:
- (a) Remove the clamp [2] that attaches the inlet duct to the ATS [1].
- NOTE: The inlet duct has a section of flexible tubing. You can move the inlet duct away from the ATS if it is necessary.



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



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



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

- (b) While you hold the ATS [1], remove the clamp [4] that attaches the ATS [1] to the gearbox adapter.
- NOTE: The ATS [1] can leak oil when you remove it.
- (c) Remove the ATS [1].
- (d) Remove the packing [3] from the ATS [1].
- 1) Discard the packing [3].
- (e) Inspect the clutch for damage, do the steps that follow:
- 1) Examine the clutch in the gearbox housing for excessive movement. If you find excessive movement, replace the APU, AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401
- 2) Examine the clutch for uneven tension on the pawls and loose rivets. If you find damage, replace the clutch, AIR TURBINE STARTER (ATS) CLUTCH - REMOVAL/INSTALLATION, PAGEBLOCK 49-43-02/401
- 3) Examine the clutch cavity for debris. If you find debris, clean the clutch cavity.

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- 4) Do this task : Magnetic Chip Collector Inspection, TASK 49-27-04-200-801. If you find a large quantity of metal particles on the magnetic chip collector, replace the APU, AUXILIARY POWER UNIT (APU) - REMOVAL/INSTALLATION, PAGEBLOCK 49-11-01/401.
- (f) Make sure you install all necessary protection covers.

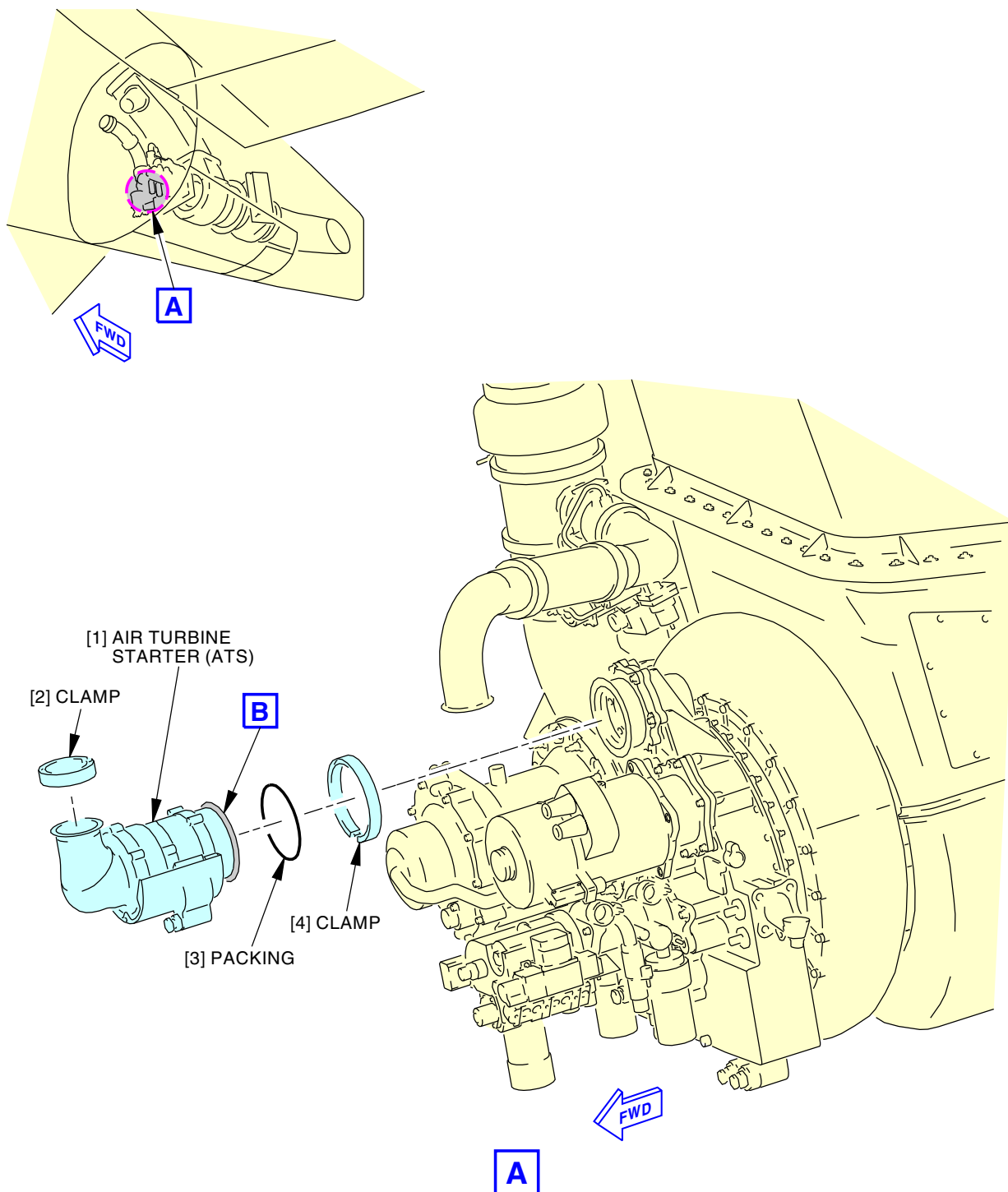
———— **END OF TASK** ————

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Air Turbine Starter (ATS) Installation
Figure 401/49-43-01-990-801 (Sheet 1 of 2)

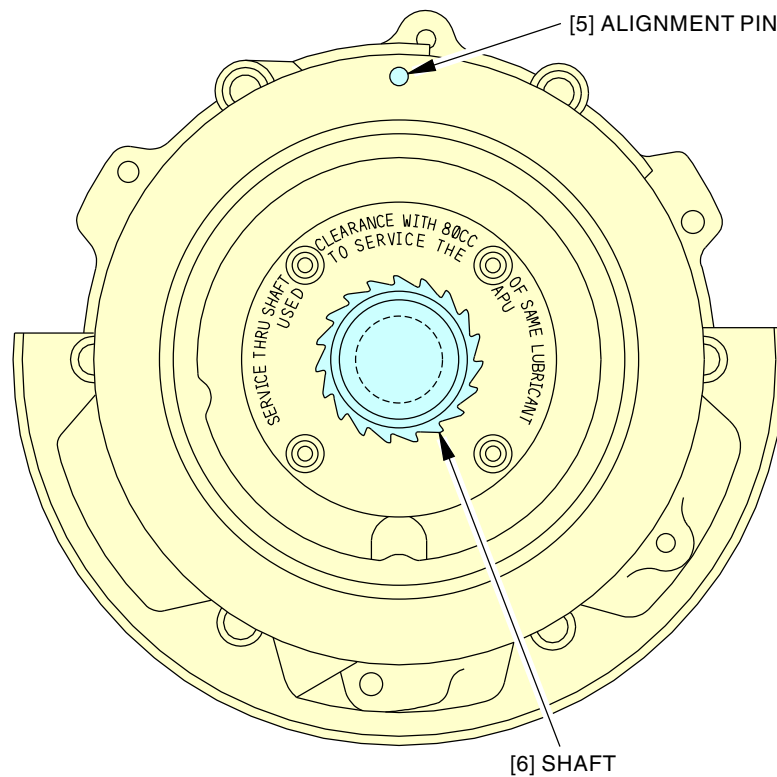
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Air Turbine Starter (ATS) Installation
Figure 401/49-43-01-990-801 (Sheet 2 of 2)

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TASK 49-43-01-400-801

3. Air Turbine Starter (ATS) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The air turbine starter (ATS) must be filled with oil before it is installed. This will increase the life of the ATS [1].

B. References

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-98	Beaker - Graduated, 250 ml Capacity in 50 ml Increments
STD-1126	Funnel - Oil Resistant

D. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	ATS	49-43-01-01-050	ARO ALL
3	Packing	49-43-01-01-060	ARO ALL

F. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

G. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

H. Procedure



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-43-01-420-001

- (1) Do these steps to install the ATS [1]:

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- (a) Lubricate the new packing [3] with a light coat of Mobil Jet Oil II, D00520.
- (b) Install the packing [3] on the ATS [1].



WARNING

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



CAUTION

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



CAUTION

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

- (c) Use the oil resistant funnel, STD-1126 and graduated beaker, STD-98 or equivalent tools to fill the ATS [1] with 80 cc (80 ml) of oil through the shaft clearance.
- (d) Hold the ATS [1] on the gearbox adapter.
- (e) Make sure the guide pin [5] on the ATS [1] is aligned with the hole on the gearbox adapter and the notches at the 6 o'clock positions are aligned.
- (f) Install the clamp [4] that attaches the ATS [1] to the gearbox adapter.
- (g) Install the clamp [2] that attaches the inlet duct to the ATS [1].

I. Air Turbine Starter (ATS) Installation Test

SUBTASK 49-43-01-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-01-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-43-01-860-005

- (3) Make sure the APU BLEED switch is in the AUTO position.

SUBTASK 49-43-01-860-006

- (4) Supply pneumatic power with an external source. To pressurize the system, do this task:
Pressurize the Pneumatic System, TASK 36-00-00-860-802.

NOTE: You must supply pneumatic power for the APU to do an air turbine start attempt.

SUBTASK 49-43-01-720-001

- (5) Do the installation test for the air turbine starter:

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- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

NOTE: The APU will do an air turbine start attempt.

- (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.

- (c) If a maintenance message shows for the air turbine starter, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

- (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-43-01-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-43-01-860-007

- (2) Remove the pneumatic power if it is not necessary. To remove it, do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

———— **END OF TASK** ————

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AIR TURBINE STARTER (ATS) CLUTCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the air turbine starter (ATS) clutch
 - (2) An installation of the air turbine starter (ATS) clutch.
- B. The air turbine starter (ATS) must be removed before you can remove the air turbine starter (ATS) clutch.
- C. The air turbine starter clutch is referred to as the clutch.

TASK 49-43-02-000-801

2. Air Turbine Starter (ATS) Clutch Removal

(Figure 401)

A. **References**

Reference	Title
49-43-01-000-801	Air Turbine Starter (ATS) Removal (P/B 401)

B. **Tools/Equipment**

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

Reference	Description
SPL-1965	Adapter - Torque, Starter Clutch Part #: 834730-1 Supplier: 06848

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Prepare for the Removal**

SUBTASK 49-43-02-010-001

- (1) Do this task: Air Turbine Starter (ATS) Removal, TASK 49-43-01-000-801.

E. **Air Turbine Starter (ATS) Clutch Removal**

SUBTASK 49-43-02-020-001

- (1) Do the steps that follow to remove the clutch [2] (Figure 401):
 - (a) Put the clutch torque adapter on the clutch [2] (Figure 402).
 - 1) Make sure the handle [22] for the starter clutch torque adapter, SPL-1965 is installed in the ATS fitting on the cylinder [21].
 - (b) Turn the bolt [3] counterclockwise while you hold the clutch torque adapter.

NOTE: The clutch torque adapter will not permit the clutch [2] to turn while you loosen the bolt [3].
 - (c) Remove the clutch [2] and the clutch torque adapter from the gearbox adapter [1].
 - (d) Make sure you install all necessary protection covers.

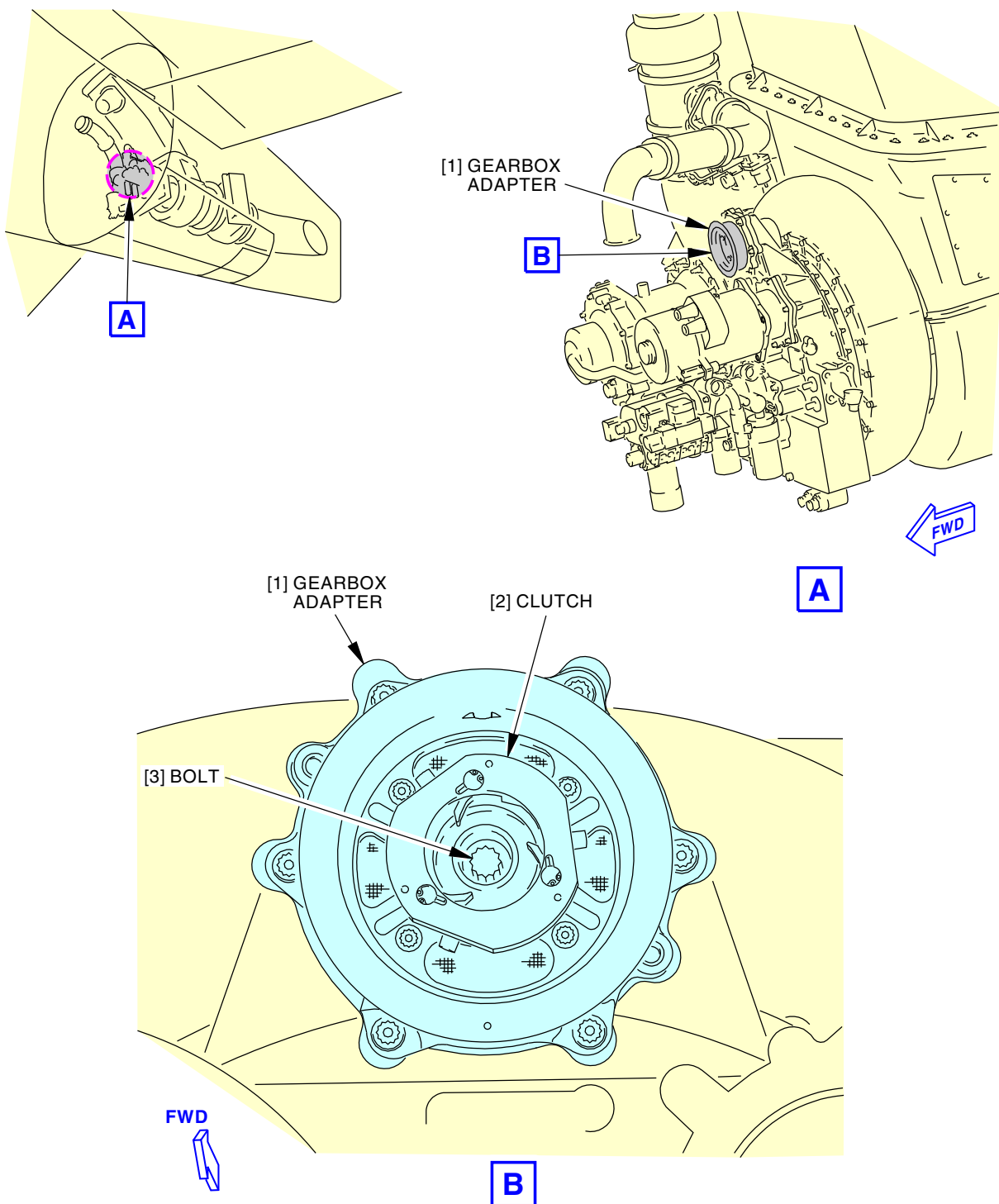
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**Air Turbine Starter Clutch Installation
Figure 401/49-43-02-990-801**

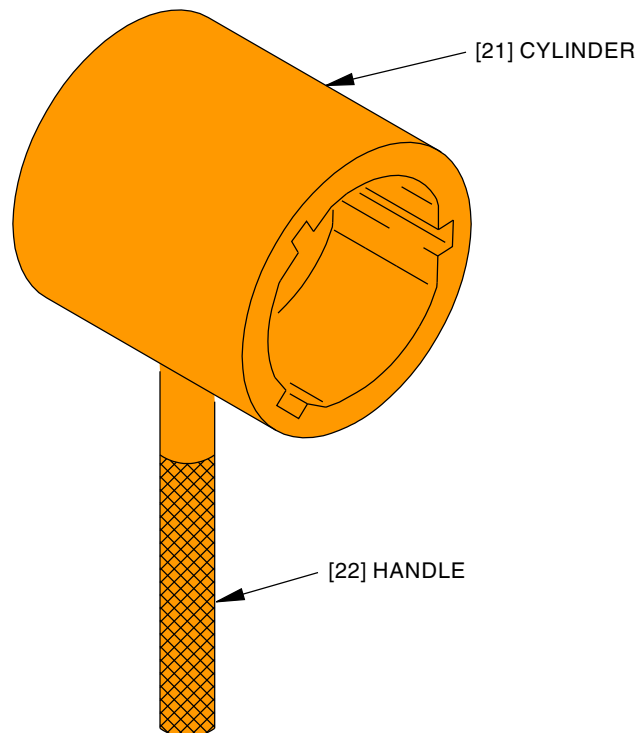
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Torque-Clutch Adapter Tool
Figure 402/49-43-02-990-802

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TASK 49-43-02-400-801

3. Air Turbine Starter (ATS) Clutch Installation

(Figure 401)

A. References

Reference	Title
49-43-01-400-801	Air Turbine Starter (ATS) Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
SPL-1965	Adapter - Torque, Starter Clutch Part #: 834730-1 Supplier: 06848

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Clutch	49-43-02-01-040	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Air Turbine Starter Clutch Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AN NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-43-02-420-001

(1) Do the steps that follow to install the clutch [2] (Figure 401):

- (a) Install the clutch [2] into the gearbox adapter [1].
- (b) Put the clutch torque adapter tool on the clutch [2] (Figure 402).
 - 1) Make sure the handle [22] for the starter clutch torque adapter, SPL-1965 is installed in the ATS fitting on the cylinder [21].
- (c) Turn the bolt [3] clockwise while you hold the clutch torque adapter.

NOTE: The clutch torque adapter will not permit the clutch [2] to turn while you loosen the bolt [3].

- 1) Tighten the bolt [3] to 50-70 pound-inches (5.65-7.91 newton-meters).
- 2) Loosen the bolt [3].
- 3) Tighten the bolt [3] again to 50-70 pound-inches (5.65-7.91 newton-meters).
- 4) Loosen the bolt [3].
- 5) Tighten the bolt [3] to 50-78 pound-inches (5.65-8.81 newton-meters).

NOTE: The bolt must be tightened three times to engage the clutch with the gear in the gearbox.

- (d) Remove the clutch torque adapter from the gearbox adapter [1].

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SUBTASK 49-43-02-410-001

(2) Do this task: Air Turbine Starter (ATS) Installation, TASK 49-43-01-400-801.

———— **END OF TASK** ————

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AIR TURBINE STARTER CONTROL VALVE (ATSCV) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the air turbine starter control valve (ATSCV)
- (2) An installation of the air turbine starter control valve (ATSCV).

B. For this procedure, the air turbine starter control valve is referred to as the ATSCV.

TASK 49-43-03-000-801

2. Air Turbine Starter Control Valve (ATSCV) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-43-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-43-03-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-03-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Air Turbine Starter Control Valve (ATSCV) Removal

SUBTASK 49-43-03-020-001

- (1) Do these steps to remove the ATSCV [1]:
 - (a) Disconnect the electrical connector [3] from the ATSCV [1].
 - (b) Remove the two clamps [2] that attaches the ATSCV [1] to the ATS inlet duct and adapter.
 - (c) Remove the ATSCV [1].
 - (d) Make sure you install all necessary protection covers.

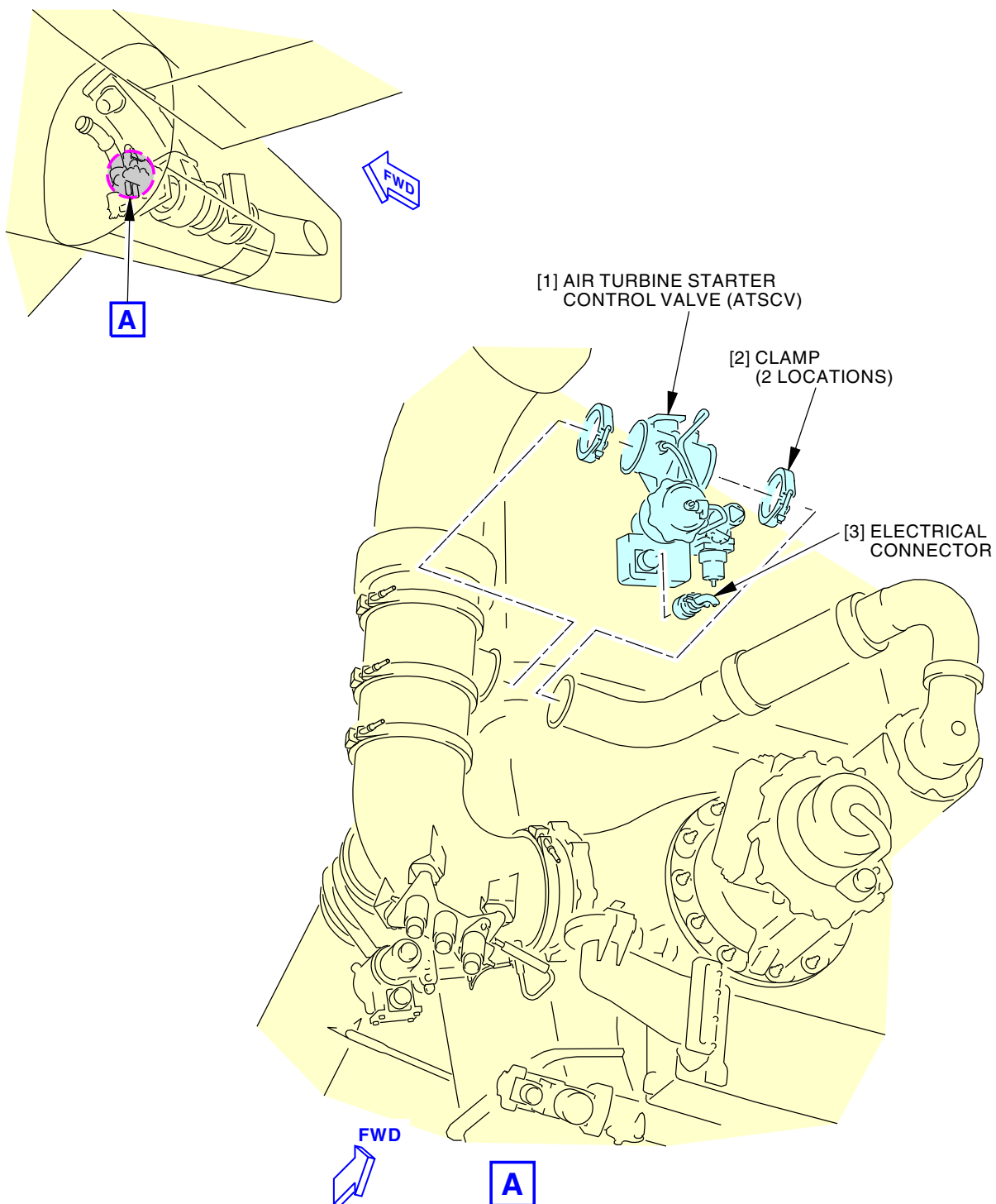
———— **END OF TASK** ————

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Air Turbine Starter Control Valve (ATSCV) Installation
Figure 401/49-43-03-990-801

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TASK 49-43-03-400-801

3. Air Turbine Starter Control Valve (ATSCV) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	ATSCV	49-43-03-01-050	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Procedure



CAUTION REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-43-03-420-001

- (1) Do these steps to install the ATSCV [1]:
 - (a) Put the ATSCV [1] between the air turbine starter adapter and inlet duct and align these parts with the paint stripes.
NOTE: There are paint stripes on the ATSCV and inlet duct.
 - (b) Install the two clamps [2].
 - 1) Tighten the two clamps [2] to 50 in-lb (5.6 N·m)-60 in-lb (6.8 N·m).
 - (c) Connect the electrical connector [3] to the ATSCV [1].

F. Air Turbine Starter Control Valve (ATSCV) Installation Test

SUBTASK 49-43-03-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-03-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-43-03-860-006

- (3) Supply pneumatic power with an external source. To pressurize the system, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

NOTE: You must supply pneumatic power for the APU to do an air turbine start attempt.

SUBTASK 49-43-03-860-005

- (4) Make sure the APU BLEED switch on the P5 overhead panel is in the AUTO position.

SUBTASK 49-43-03-720-001

- (5) Do the installation test for the ATSCV:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
NOTE: The APU will do an air turbine start attempt.
 - (b) During the APU starting and operation, examine the two clamps for the ATSCV for air leakage.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the air turbine starter, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-43-03-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-43-03-860-007

- (2) Remove the pneumatic power if it is not necessary. To remove it, do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

————— **END OF TASK** —————

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AIR TURBINE STARTER MAGNETIC CHIP COLLECTOR - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
 - (1) A removal of the air turbine starter magnetic chip collector.
 - (2) An inspection of the air turbine starter magnetic chip collector.
 - (3) An installation of the air turbine starter magnetic chip collector.
- B. The air turbine starter magnetic chip collector is referred to as the magnetic chip collector.
- C. The magnetic chip collectors are used to isolate problem with the air turbine starter.
- D. The magnetic chip collector can retain metal particles from the air turbine starter oil system.

TASK 49-43-04-000-801

2. Air Turbine Starter Magnetic Chip Collector Removal

(Figure 201)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-43-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-43-04-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-04-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Magnetic Chip Collector Removal

SUBTASK 49-43-04-020-001

- (1) Do the steps that follow to remove the magnetic chip collector [2]:
 - (a) Push the magnetic chip collector [2] in and turn it counterclockwise to release it.
 - (b) Remove the magnetic chip collector [2] from the air turbine starter [3].
 - (c) Remove the packings [1] from the magnetic chip collector [2].
 - 1) Discard the packings [1].

————— **END OF TASK** —————

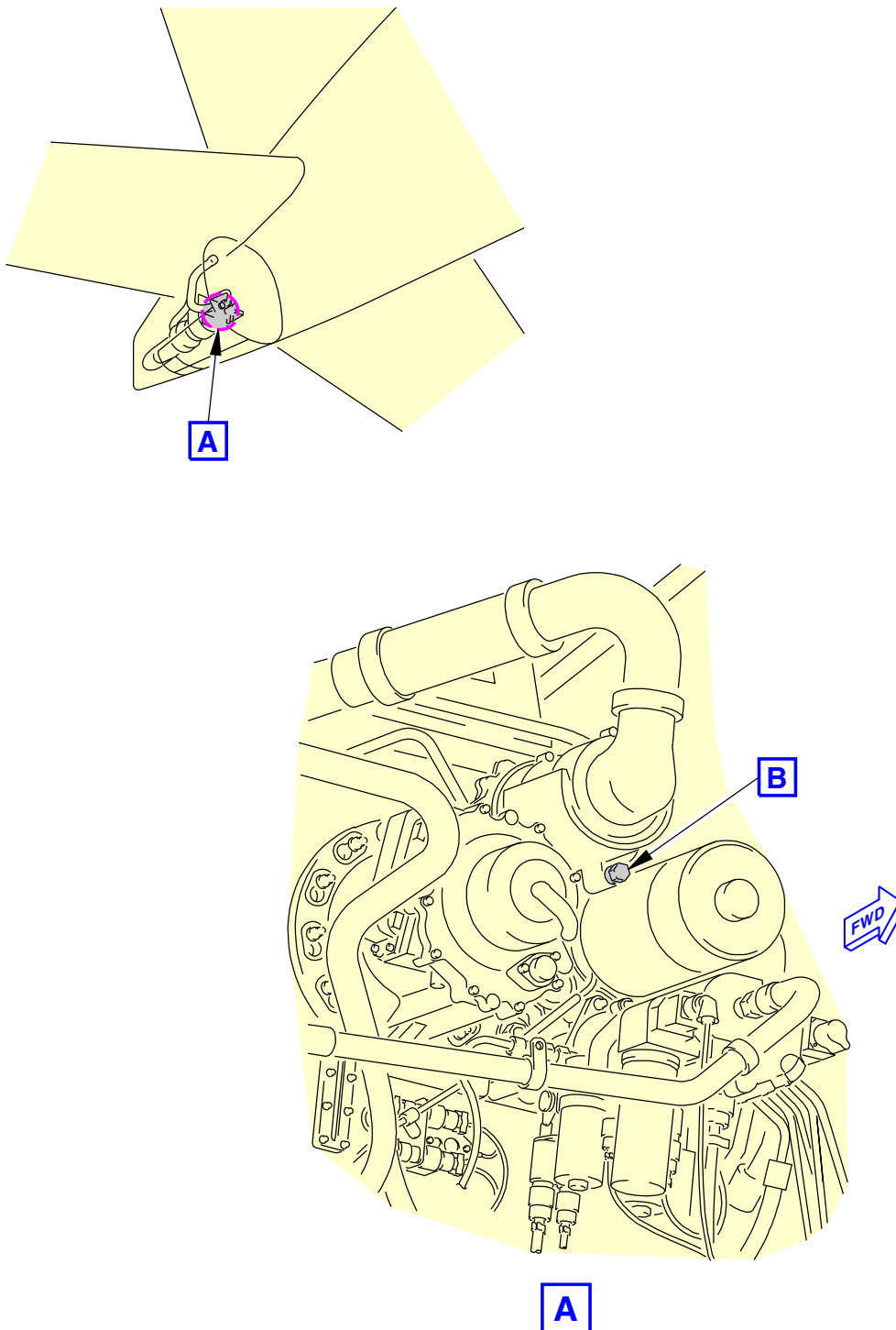
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ATS Magnetic Chip Collector Installation
Figure 201/49-43-04-990-801 (Sheet 1 of 2)

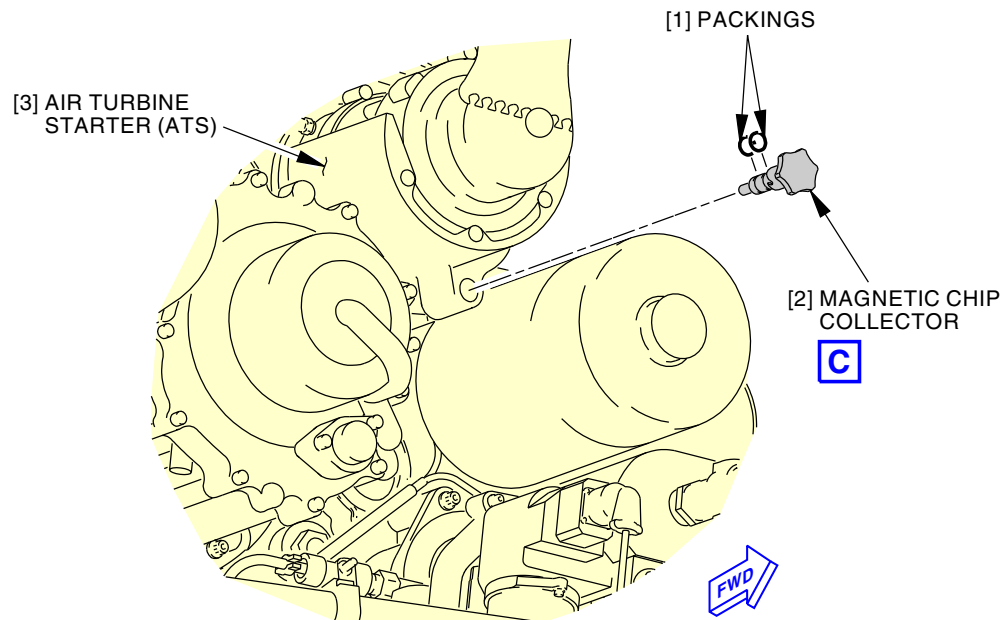
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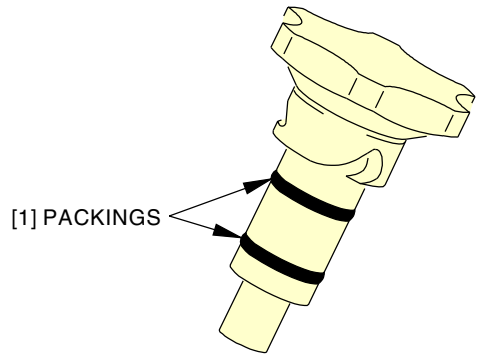
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B



MAGNETIC CHIP COLLECTOR

C

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ATS Magnetic Chip Collector Installation
Figure 201/49-43-04-990-801 (Sheet 2 of 2)

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TASK 49-43-04-200-801

3. Air Turbine Starter Magnetic Chip Collector Inspection

(Figure 202)

A. References

Reference	Title
49-27-04-200-801	Magnetic Chip Collector Inspection (P/B 201)
49-43-01-000-801	Air Turbine Starter (ATS) Removal (P/B 401)
49-43-01-400-801	Air Turbine Starter (ATS) Installation (P/B 401)
49-43-02-000-801	Air Turbine Starter (ATS) Clutch Removal (P/B 401)
49-43-02-400-801	Air Turbine Starter (ATS) Clutch Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1082	Source - Air, Regulated, Dry Filtered, 0-50 PSIG

C. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Magnetic Chip Collector Inspection

SUBTASK 49-43-04-210-001

- (1) Examine the magnetic chip collector for metal particles.

NOTE: Metal particles on the chip collector give an indication of internal damage to the air turbine starter or the air turbine starter clutch.

- (a) A small quantity of particles that are not silver color are permitted.
- (b) Silver color particles are not permitted.

NOTE: Silver color particles give an indication of internal damage to the air turbine starter clutch.

- 1) If you find silver color particles, replace these components:

- a) Air turbine starter.

These are the tasks:

Air Turbine Starter (ATS) Removal, TASK 49-43-01-000-801,
Air Turbine Starter (ATS) Installation, TASK 49-43-01-400-801.

- b) Air turbine starter clutch.

These are the tasks:

Air Turbine Starter (ATS) Clutch Removal, TASK 49-43-02-000-801,
Air Turbine Starter (ATS) Clutch Installation, TASK 49-43-02-400-801.

- (c) If you find a medium quantity of particles on the magnetic chip collector that are not silver color, do these steps:

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DO NOT GET THE SOLVENT IN YOUR MOUTH, OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 1) Put the magnetic chip collector fully into the solvent, B00074.



DO NOT USE COMPRESSED AIR WITH A PRESSURE MORE THAN 30 PSIG (207 KPA GAGE) TO CLEAN THE PARTS. USE PROTECTIVE GOGGLES OR A FACE SHIELD FOR EYE PROTECTION. DO NOT POINT THE AIR AT YOUR SKIN.

- 2) Dry the magnetic chip collector with the 0-50 psig dry filtered regulated air source, STD-1082.
- 3) Do this task: Air Turbine Starter Magnetic Chip Collector Installation, TASK 49-43-04-400-801.

NOTE: The installation for the magnetic chip collector has the steps to start and operate the APU. After the APU is operated, the examine the chip collector again.

- 4) Do this task: Air Turbine Starter Magnetic Chip Collector Removal, TASK 49-43-04-000-801.
- 5) Examine the magnetic chip collector again.
- 6) More particles on the magnetic chip collector are not permitted.
 - a) If you find more particles on the magnetic chip collector, inspect the other magnetic chip collectors. To inspect them, do this task: Magnetic Chip Collector Inspection, TASK 49-27-04-200-801.

- (d) A large quantity of particles on the magnetic chip collector is not permitted.

NOTE: A large quantity of particles gives an indication of internal damage to the air turbine starter.

- 1) If you find a large quantity of particles, replace these components:
 - a) Air turbine starter.
These are the tasks:
Air Turbine Starter (ATS) Removal, TASK 49-43-01-000-801,
Air Turbine Starter (ATS) Installation, TASK 49-43-01-400-801.
 - b) Air turbine starter clutch.
These are the tasks:
Air Turbine Starter (ATS) Clutch Removal, TASK 49-43-02-000-801,
Air Turbine Starter (ATS) Clutch Installation, TASK 49-43-02-400-801.
 - c) If you find more particles on the magnetic chip collector, inspect the other magnetic chip collectors. To inspect them, do this task: Magnetic Chip Collector Inspection, TASK 49-27-04-200-801.

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- (e) Do this task: Air Turbine Starter Magnetic Chip Collector Installation,
TASK 49-43-04-400-801.

————— **END OF TASK** —————

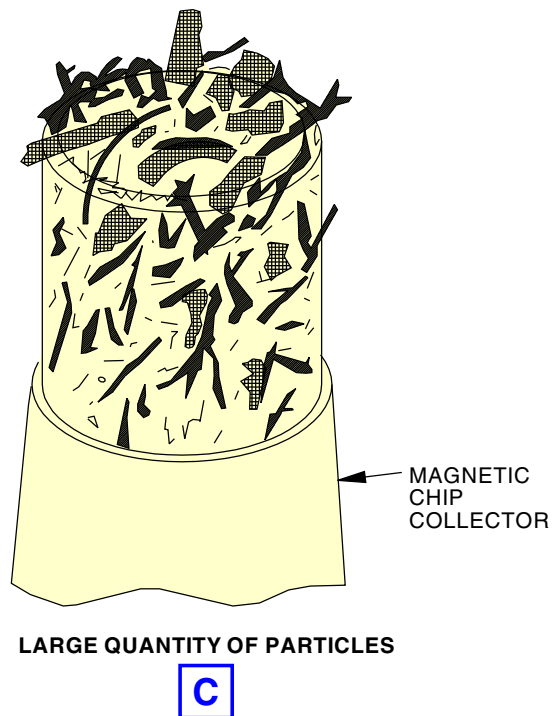
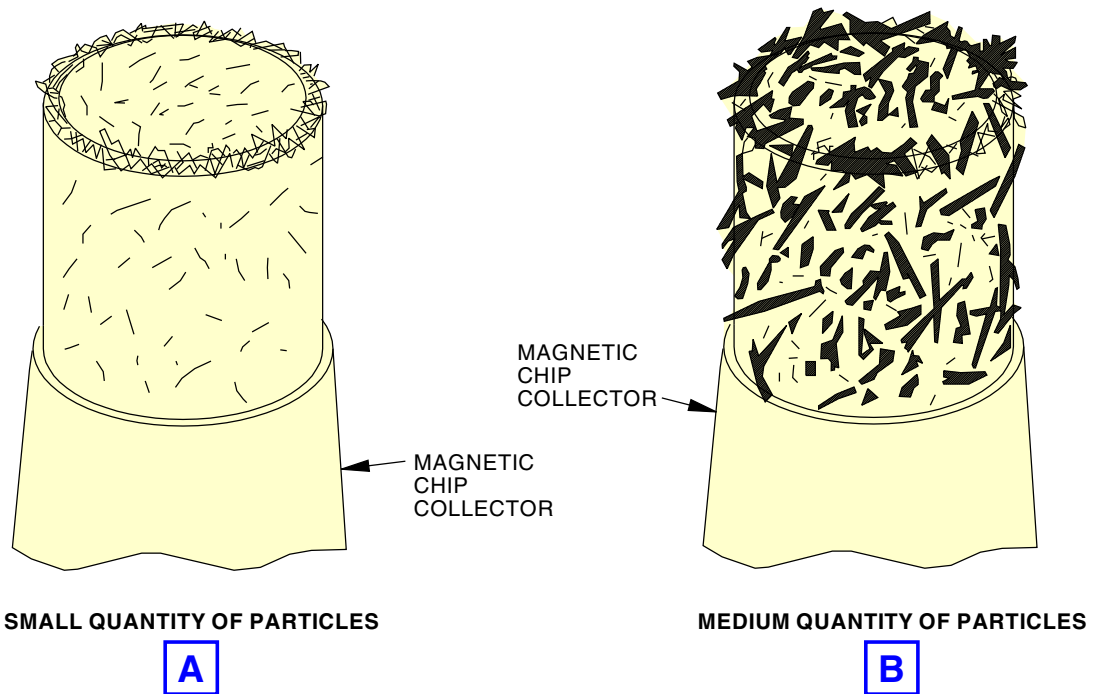
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Magnetic Chip Collector Inspection
Figure 202/49-43-04-990-802

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TASK 49-43-04-400-801

4. Air Turbine Starter Magnetic Chip Collector Installation

(Figure 201)

A. References

Reference	Title
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-43-01-01-053	ARO ALL
2	Magnetic chip collector	49-43-01-01-052	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Air Turbine Starter Magnetic Chip Collector Installation

SUBTASK 49-43-04-420-001

(1) Do the steps that follow to install the magnetic chip collector:

- Lubricate the new packings [1] with Mobil Jet Oil II, D00520.
- Install the packings [1] on the magnetic chip collector [2].
- Install the magnetic chip collector [2] in the air turbine starter [3].
- Push and turn the magnetic chip collector [2] clockwise.

NOTE: The magnetic chip collector is in the locked position when it is aligned with the hex points on the housing.

- Optional: Make sure the magnetic chip collector is installed correctly as follows:

NOTE: If this optional step is done, it is not necessary to start the APU in the installation test that follows.

- Have a 2nd technician (one who did not originally do the installation) make sure the magnetic chip collector is hand tight.
 - Do a visual inspection to make sure magnetic chip collector is aligned with the hex on the housing.

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G. Magnetic Chip Collector Installation Test

SUBTASK 49-43-04-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-43-04-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-43-04-790-001

- (3) Do the steps that follow to do the installation test for the magnetic chip collector:

NOTE: If the above optional step to make sure the magnetic chip collector is installed correctly (with a 2nd technician) has been done, it is not necessary to do this test.

- (a) Supply pneumatic power with an external source (TASK 36-00-00-860-802).

NOTE: You must supply pneumatic power for the APU to do an air turbine start attempt.

- (b) Make sure the APU BLEED switch on the P5 overhead panel is in the AUTO position.
(c) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
(d) Make sure the magnetic chip collector does not leak oil.
(e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 49-43-04-410-001

- (4) Close the APU access doors (TASK 49-11-02-410-801).

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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INLET GUIDE VANE (IGV) ACTUATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the inlet guide vane (IGV) actuator
 - (2) An installation of the inlet guide vane (IGV) actuator.
- B. The inlet guide vane (IGV) actuator is referred to as the IGV actuator.

TASK 49-52-02-000-801

2. Inlet Guide Vane (IGV) Actuator Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Tools/Equipment**

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

C. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. **Prepare for the Removal**

SUBTASK 49-52-02-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-52-02-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-02-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

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Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Inlet Guide Vane (IGV) Actuator Removal

SUBTASK 49-52-02-020-001

- (1) Do these steps to remove the IGV actuator [3]:
 - (a) Disconnect the electrical connector [2] from the IGV actuator [3].
 - 1) Put a cap on the electrical connector to prevent contamination.
 - (b) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the tube assembly [10].
 - (c) Remove the three bolts [11] that attach the tube assembly [10] to the IGV actuator [3].
 - (d) Disconnect the tube assembly [10] and drain the fuel into the container.

NOTE: Fuel can come out of the tube assembly when it is disconnected.
 - (e) Remove the two packings [1], two packings [8] and two packings [9] from the tube assembly [10].
 - 1) Discard the two packings [1], two packings [8] and two packings [9].
 - (f) Loosen the two bolts [6] that attach the cover plate [4] to the APU.
 - (g) Remove one bolt [6] and one washer [12] from the cover plate [4].
 - (h) Move the cover plate [4] to show the captive bolt [5].
 - (i) Loosen the captive bolt [5] until the IGV actuator [3] disengages from the IGV linkage.
 - (j) Remove the three bolts [7] and three washers [13] that attach the IGV actuator [3] to the APU.
 - (k) Pull out the IGV actuator [3] slowly.
 - (l) Remove the IGV actuator [3].
 - (m) Make sure you install all necessary protection covers.
 - (n) Remove the container.

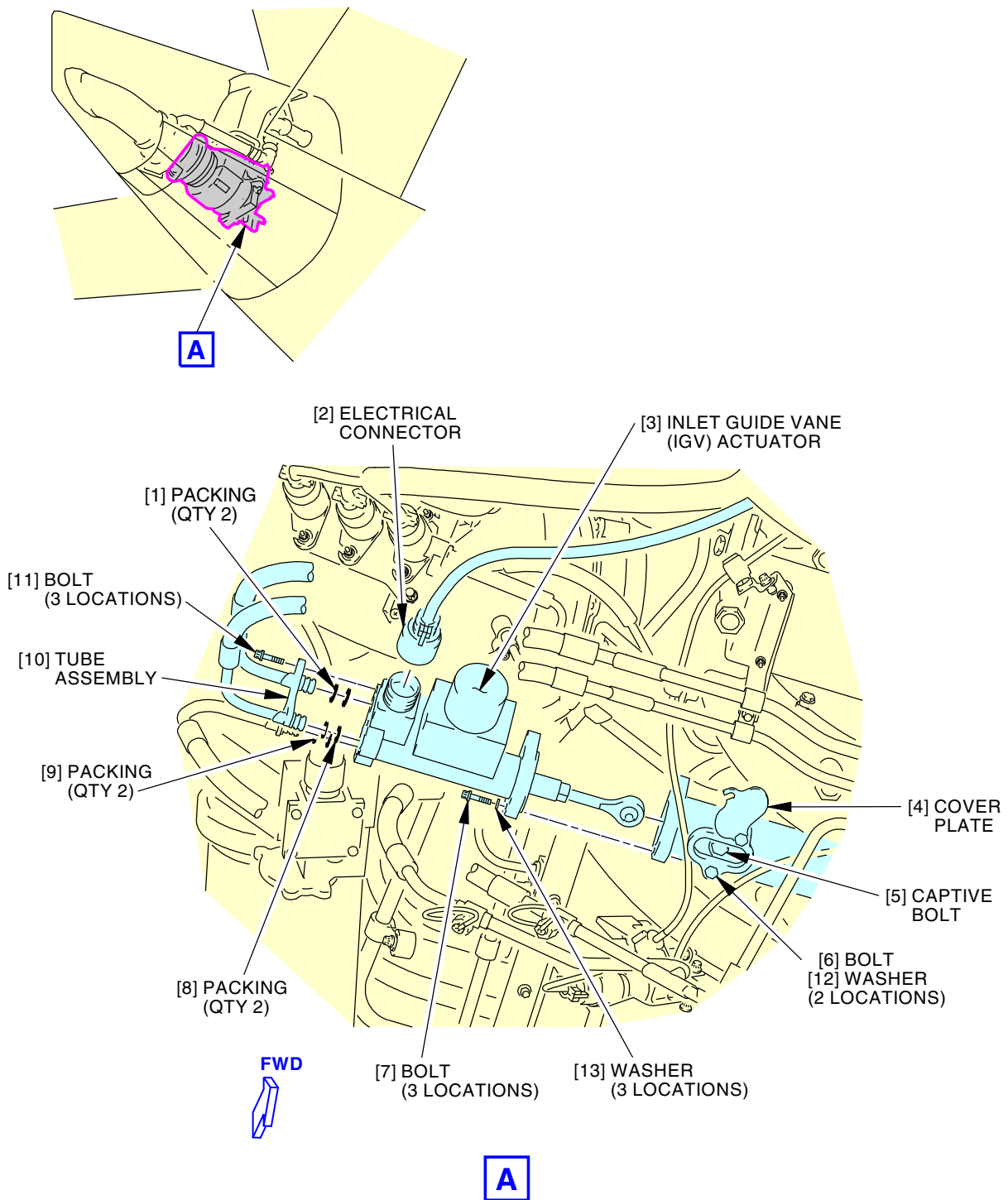
————— END OF TASK —————

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C09485 S0006424046_V3

Inlet Guide Vane Actuator Installation
Figure 401/49-52-02-990-801

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TASK 49-52-02-400-801

3. Inlet Guide Vane (IGV) Actuator Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-53-53-01-140	ARO ALL
3	IGV actuator	49-52-02-01-050	ARO ALL
8	Packing	49-53-53-01-147	ARO ALL
9	Packing	49-53-53-01-155	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure



CAUTION REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-52-02-420-001

- (1) Do these steps to install the IGV actuator [3]:
 - (a) Lubricate the two new packings [1], two new packings [8] and two new packings [9] with a light coat of Mobil Jet Oil II, D00520.
 - (b) Install the two packings [1], two packings [8] and two packings [9] on the tube assembly [10].

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- (c) Put the IGV actuator [3] in its position on the APU.
- NOTE: The electrical connector on the IGV actuator must be in the forward and down position.
- (d) Look through the opening of the compressor scroll housing and make sure the output shaft of the IGV actuator [3] aligns with the clevis assembly/IGV linkage/captive bolt [5] and the three holes on the IGV actuator [3] align with the APU.
- NOTE: If it is necessary to align the IGV actuator, you can turn the output shaft.
- (e) Install the captive bolt [5] in the output shaft of the IGV actuator [3].
- 1) Tighten the captive bolt [5] to 50 in-lb (5.6 N·m).
- (f) Install the three washers [13] and three bolts [7] that attach the IGV actuator [3] to the APU.
- (g) Move the cover plate [4] to the closed position and install the one washer [12] and one bolt [6].
- (h) Tighten the two bolts [6] to 50 in-lb (5.6 N·m).
- (i) Connect the tube assembly [10] to the IGV actuator [3] with the three bolts [11].
- (j) Connect the electrical connector [2] to the IGV actuator [3].

G. Inlet Guide Vane (IGV) Actuator Installation Test

SUBTASK 49-52-02-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-02-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-52-02-740-001

- (3) Do the installation test for the IGV actuator:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- (b) Do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
- (c) During the cooling pack operation, examine the tube assembly on the IGV actuator for signs of leakage.
- (d) Do this task: APU Bite Test, TASK 49-11-00-740-801.
- (e) If a maintenance message shows for the IGV actuator, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
- (f) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.
- (g) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-02-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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APU CHECK VALVE - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) A removal of the APU check valve
- (2) An installation of the APU check valve.

TASK 49-52-03-000-801

2. **APU Check Valve Removal**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-52-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-52-03-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-03-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. APU Check Valve Removal

SUBTASK 49-52-03-420-001

- (1) Do the steps that follow to remove the APU check valve:
 - (a) Remove the clamps [2].
 - (b) Remove the APU check valve [1].

———— **END OF TASK** ————

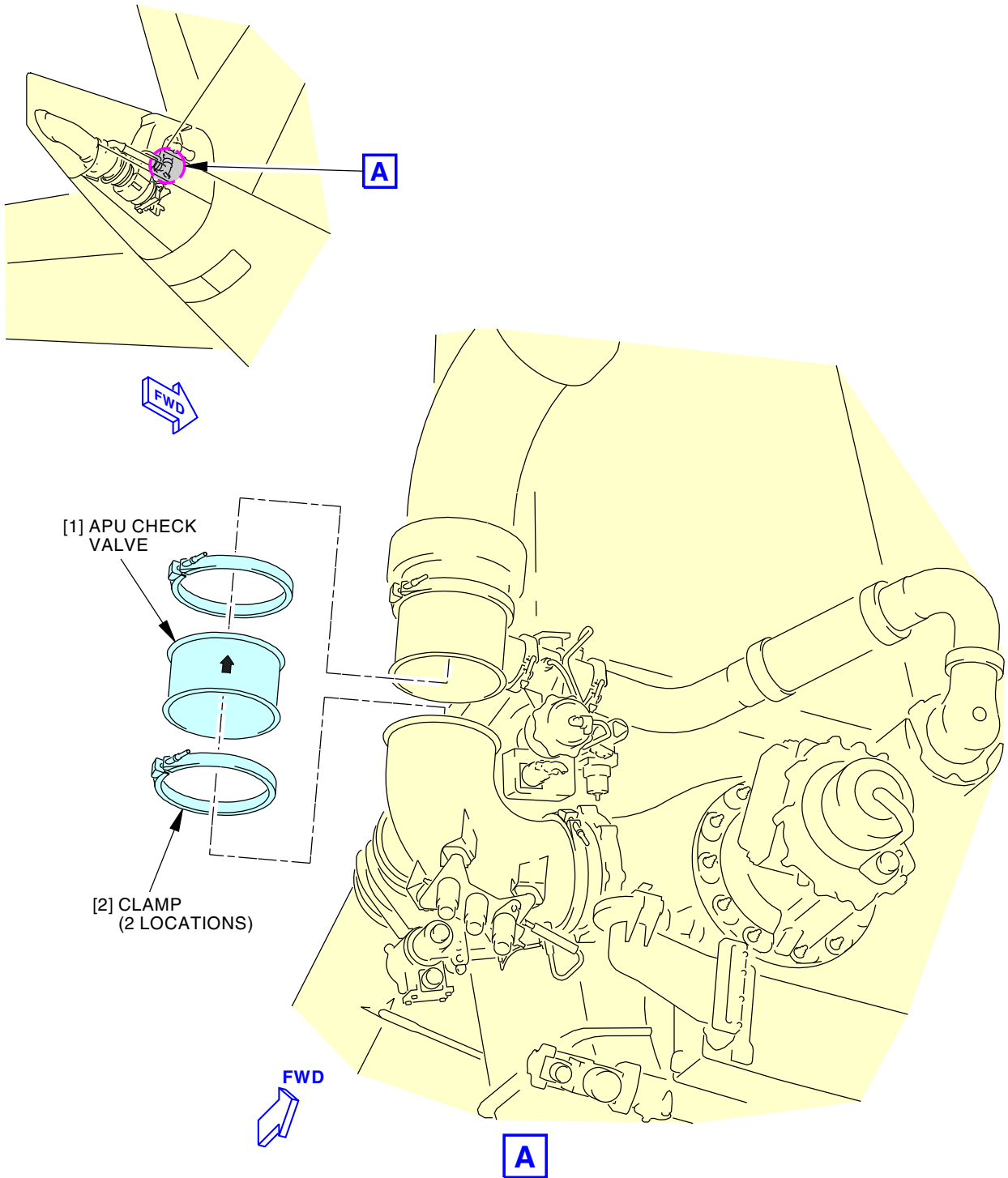
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APU Check Valve Installation
Figure 401/49-52-03-990-801

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TASK 49-52-03-400-801

3. **APU Check Valve Installation**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Check valve	49-52-03-01-050	ARO ALL

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. APU Check Valve Installation

SUBTASK 49-52-03-420-002

- (1) Do the steps that follow to install the APU check valve:



CAUTION

MAKE SURE THE ARROW ON THE APU CHECK VALVE POINTS UP. IF THE ARROW POINTS DOWN, THE APU CANNOT SUPPLY AIR TO THE AIRPLANE.

- (a) Hold the APU check valve [1] between pneumatic cluster and the bleed air duct.
- (b) Install the clamps [2].
- 1) Tighten the clamps [2] to 53-58 pound-inches (5.99-6.55 newton-meters).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-03-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-03-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

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SUBTASK 49-52-03-410-001

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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OIL SEAL BUFFER AIR SUPPLY TUBE - MAINTENANCE PRACTICES

1. General

- A. This procedure contains the steps to remove, inspect, clean and replace the Oil Seal Buffer Air Supply Tube in accordance with Allied Signal Service Bulletin 331-49-7432.

TASK 49-52-04-000-801

2. Buffer Air Supply Tube Check

(Figure 201)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	49-52-04-01-040	ARO ALL
6	Packing	49-52-04-01-030	ARO ALL
7	LC FWD buffer air supply tube	49-52-04-01-065	ARO ALL
8	LC AFT buffer air supply tube	49-52-04-01-070	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Preparation

SUBTASK 49-52-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-52-04-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-04-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Buffer Air Supply Tube Removal

ARO ALL PRE GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-210-001

- (1) Find the buffer air supply tube [1] and adapter fitting [4] on the right-hand side of the APU at approximately the 3 o'clock position.

SUBTASK 49-52-04-020-001

- (2) Disconnect the buffer air supply tube [1] from the adapter fitting [4], the load compressor scroll, and the inlet guide vane housing.

SUBTASK 49-52-04-020-002

- (3) Remove and discard the packings [2].

ARO ALL POST GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-210-004

- (4) Find LC FWD buffer air supply tube [7], LC AFT buffer air supply tube [8] and the buffer air fittings [10] on the right-hand side of the APU at approximately the 3 o'clock position.

SUBTASK 49-52-04-020-004

- (5) Disconnect LC FWD buffer air supply tube [7] and LC AFT buffer air supply tube [8] from the buffer air fittings [10], the load compressor scroll and the inlet guide vane housing.

SUBTASK 49-52-04-020-005

- (6) Remove and discard the packings [6].

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SUBTASK 49-52-04-210-002

- (7) Inspect the passage openings in the IGV housing and scroll housing for blockage.
- (a) If the passages are obstructed, immediately contact AlliedSignal field service engineering for instructions.

ARO ALL PRE GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-160-001

- (8) Make sure air flows freely through the buffer air supply tube [1].
- (a) If the tube is blocked, remove any obstructions with a flexible wire and flush the tube with water.

SUBTASK 49-52-04-020-003

- (9) Remove the adapter fitting [4] from the power section compressor housing.

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ARO ALL POST GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-160-003

- (10) Make sure air flows freely through LC FWD buffer air supply tube [7] and LC AFT buffer air supply tube [8].
 - (a) If the tubes are blocked, remove any obstructions with a flexible wire and flush the tubes with water.

SUBTASK 49-52-04-020-006

- (11) Remove the buffer air fittings [10] from the power section compressor housing.

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SUBTASK 49-52-04-160-002

- (12) Inspect the opening in the compressor housing for blockage.
 - (a) If the opening is blocked, remove the obstruction.

H. Buffer Air Supply Tube Installation

ARO ALL PRE GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-420-001

- (1) Replace the adapter fitting [4].
 - (a) Install a new packing [3] on the new adapter fitting [4].
 - (b) Lubricate the packing [3] and the threads of the adapter fitting [4] with oil, D00071.
 - (c) Install the adapter fitting [4] in the compressor housing.

SUBTASK 49-52-04-420-002

- (2) Install the buffer air supply tube [1].
 - (a) Install new packings [2] on the buffer air supply tube [1].
 - (b) Lubricate the packings [2] and the threads of the tube B-nut with oil, D00071.
 - (c) Install the buffer air supply tube [1].
 - 1) Lubricate the threads of the attaching bolts.
 - 2) Install the attaching bolts which hold the buffer air supply tube [1] to the IGV housing and load compressor scroll.

ARO ALL POST GTCP311-500 APU SB 49-7752

SUBTASK 49-52-04-420-003

- (3) Replace the buffer air fittings [10].
 - (a) Install new packings [3] on the new buffer air fittings [10].
 - (b) Lubricate the packings [3] and the threads of the buffer air fittings [10] with oil, D00071.
 - (c) Install the buffer air fittings [10] onto the engine assembly.

SUBTASK 49-52-04-420-004

- (4) Install LC AFT buffer air supply tube [8] and LC FWD buffer air supply tube [7].
 - (a) Install new packing [6] on LC AFT buffer air supply tube [8].
 - (b) Lubricate the packing [6] with oil, D00071.
 - (c) Install LC AFT buffer air supply tube [8].
 - 1) Lubricate the threads of the attaching bolts [5].
 - 2) Install the attaching bolts [5] which hold LC AFT buffer air supply tube [8] to the inlet guide vane (IGV) housing.

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ARO ALL POST GTCP311-500 APU SB 49-7752 (Continued)

- (d) Install new packing [6] on LC FWD buffer air supply tube [7].
- (e) Remove the existing bolt [5] from LC backshroud flange.
- (f) Install the bracket [12] onto LC backshroud flange with existing bolt [5].
- (g) Install the clamp [9] onto LC FWD buffer air supply tube [7] and attach to the bracket [12] with bolt [5] and nut [11].
- (h) Remove the existing bolt from LC bleed air adapter flange.
- (i) Install the clamp [9] onto LC FWD buffer air supply tube [7] and attach to the LC bleed adapter flange with existing bolt [5].
- (j) Install the clamps [9] onto LC AFT buffer air supply tube [8] and LC FWD buffer air supply tube [7], and attach with bolt [5].

ARO ALL

SUBTASK 49-52-04-210-003

- (5) If any obstructions were found in the tube or openings, inspect the borescope plug at the 5 o'clock position on the turbine housing.
 - (a) Remove the lockwire and borescope plug.
 - (b) Remove and discard the gasket.
 - (c) Remove any deposits from the plug and opening.
 - (d) Install a new gasket on the borescope plug.
 - (e) Lubricate the threads of the plug with oil, D00071.
 - (f) Install the borescope plug.
 - (g) Secure the plug with MS20995NC20 lockwire, G02166.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-04-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-52-04-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-52-04-410-001

- (3) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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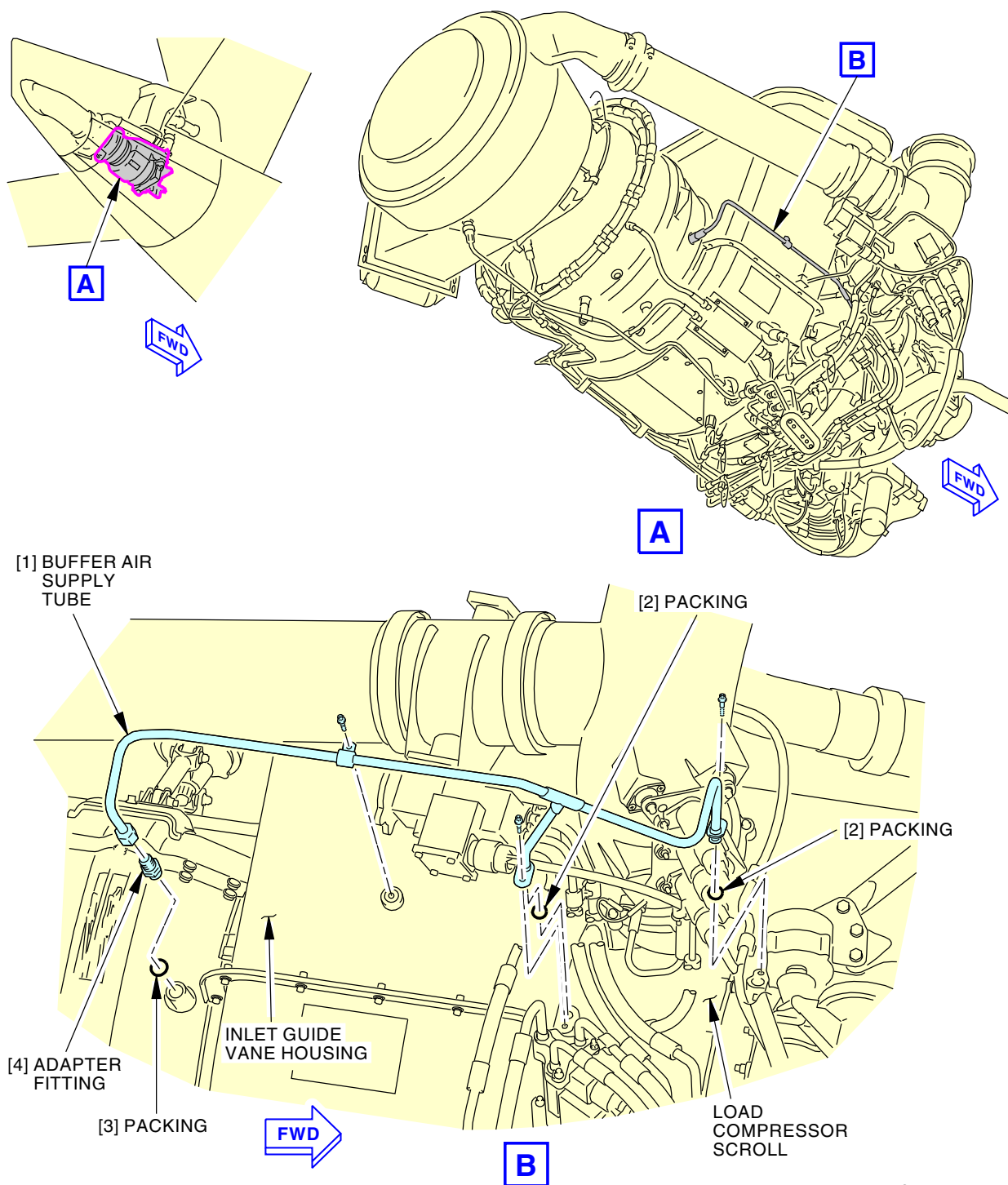
————— END OF TASK —————

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ARO ALL

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49-52-04

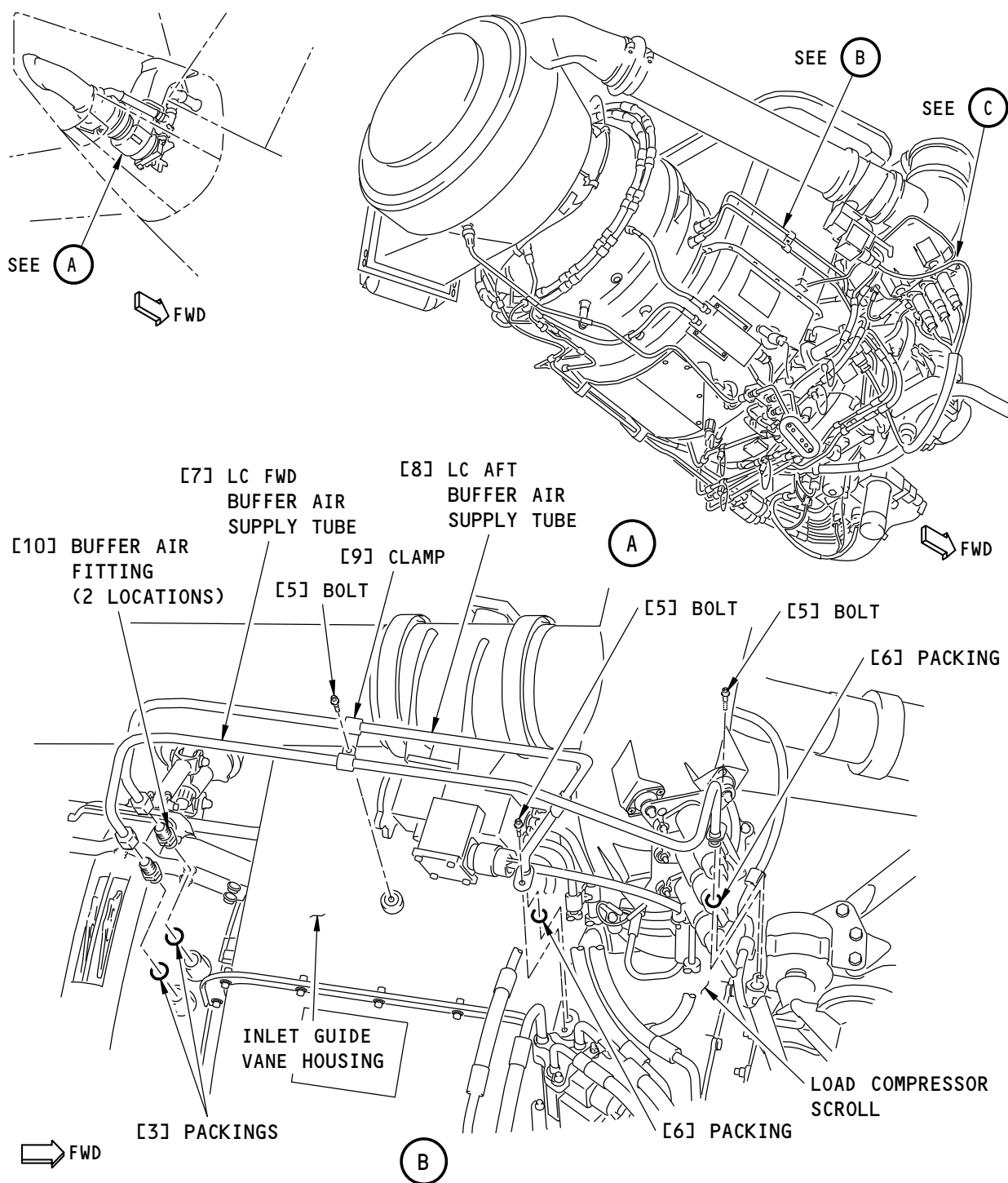
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L05807 S0006424056_V2

Oil Seal Buffer Air Supply Tube Installation
Figure 201/49-52-04-990-801 (Sheet 1 of 3)

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2460621 S0000568848_V1

**Oil Seal Buffer Air Supply Tube Installation
Figure 201/49-52-04-990-801 (Sheet 2 of 3)**

EFFECTIVITY
ARO ALL POST GTCP311-500 APU SB 49-7752

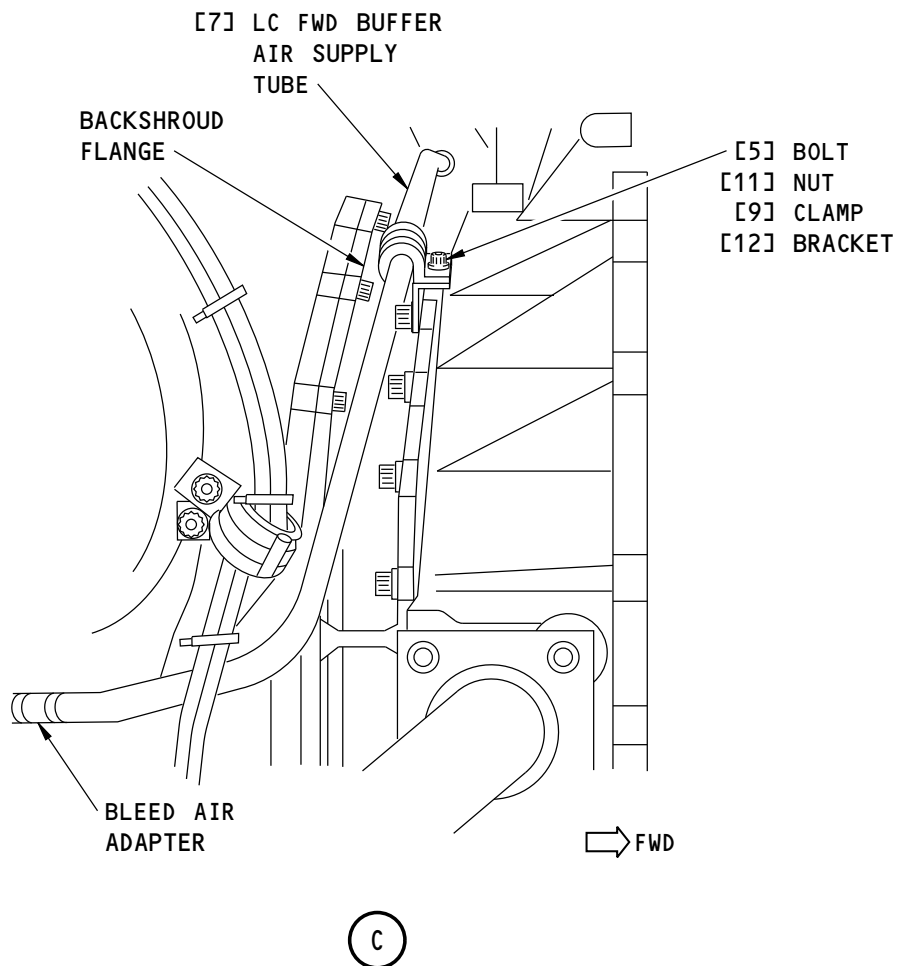
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2460608 S0000568989_V1

Oil Seal Buffer Air Supply Tube Installation
Figure 201/49-52-04-990-801 (Sheet 3 of 3)

EFFECTIVITY
ARO ALL POST GTCP311-500 APU SB 49-7752

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SURGE CONTROL VALVE - PNEUMATIC CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the surge control valve - pneumatic cluster
 - (2) An installation of the surge control valve - pneumatic cluster.
- B. The surge control valve is part of the pneumatic cluster.

TASK 49-53-01-000-801

2. Surge Control Valve Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-53-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-53-01-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-01-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follows:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Surge Control Valve Removal

SUBTASK 49-53-01-020-001

- (1) Do the steps that follow to remove the surge control valve [1]:
 - (a) Disconnect the electrical connector (D49026P) [6] from the surge control valve [1].
 - 1) Put a cap on the electrical connector (D49026P) [6] to prevent contamination.
 - (b) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 below the tube assembly [8].
 - (c) Remove the bolts [7] that hold the tube assembly [8] to the surge control valve [1].
 - (d) Disconnect the tube assembly [8] from the surge control valve [1].
 - (e) Remove the packings [3], packings [4], packings [5] from the tube assembly [8].
 - 1) Discard the packings [3], packings [4], packings [5].
 - (f) Remove the clamp [9] that holds the surge control valve [1] to the surge duct [10].
 - (g) Remove the clamp [2] that hold the surge control valve [1] to the pneumatic cluster [11].
 - (h) Remove surge control valve [1].
 - (i) Make sure you install all necessary protection covers.

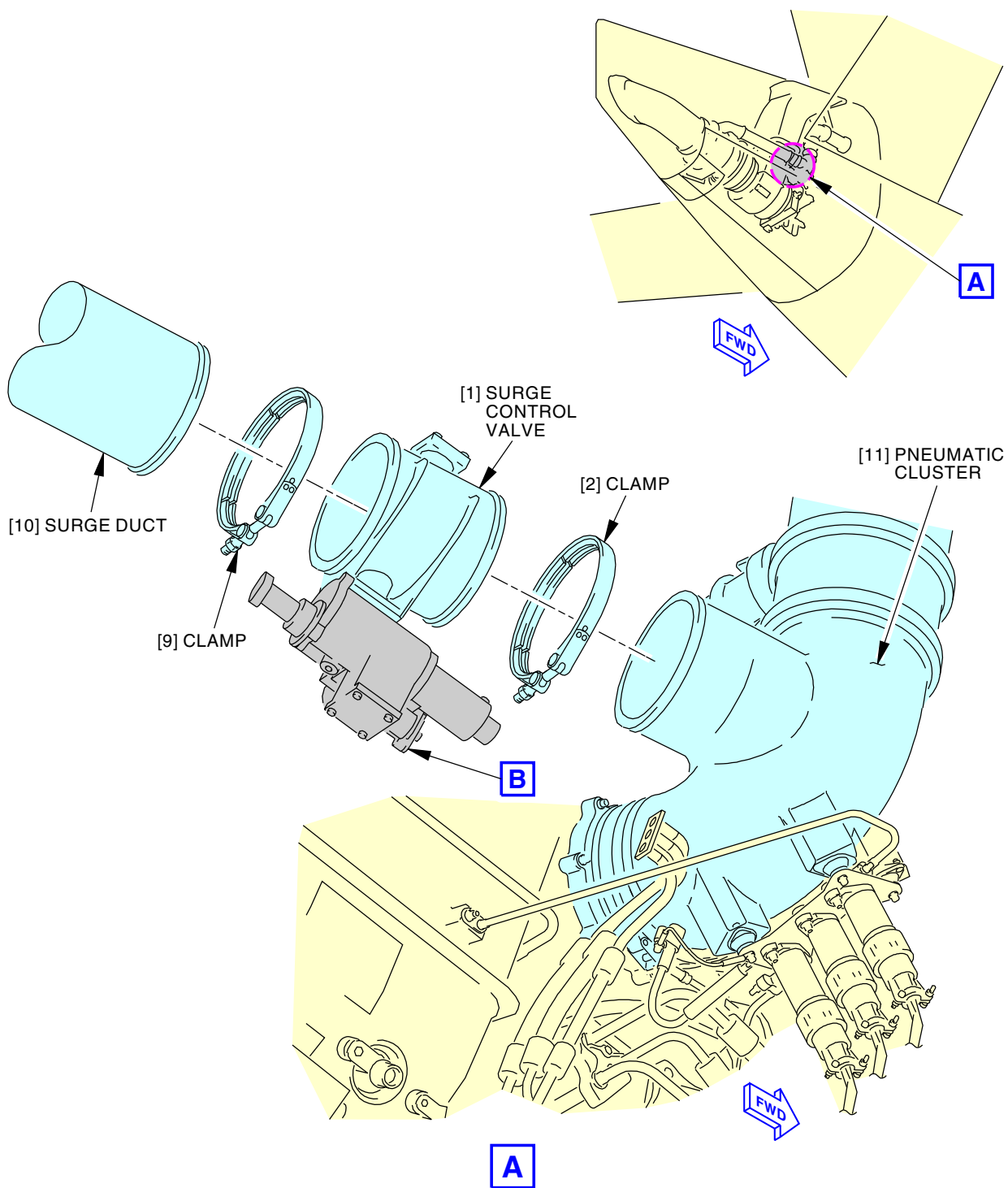
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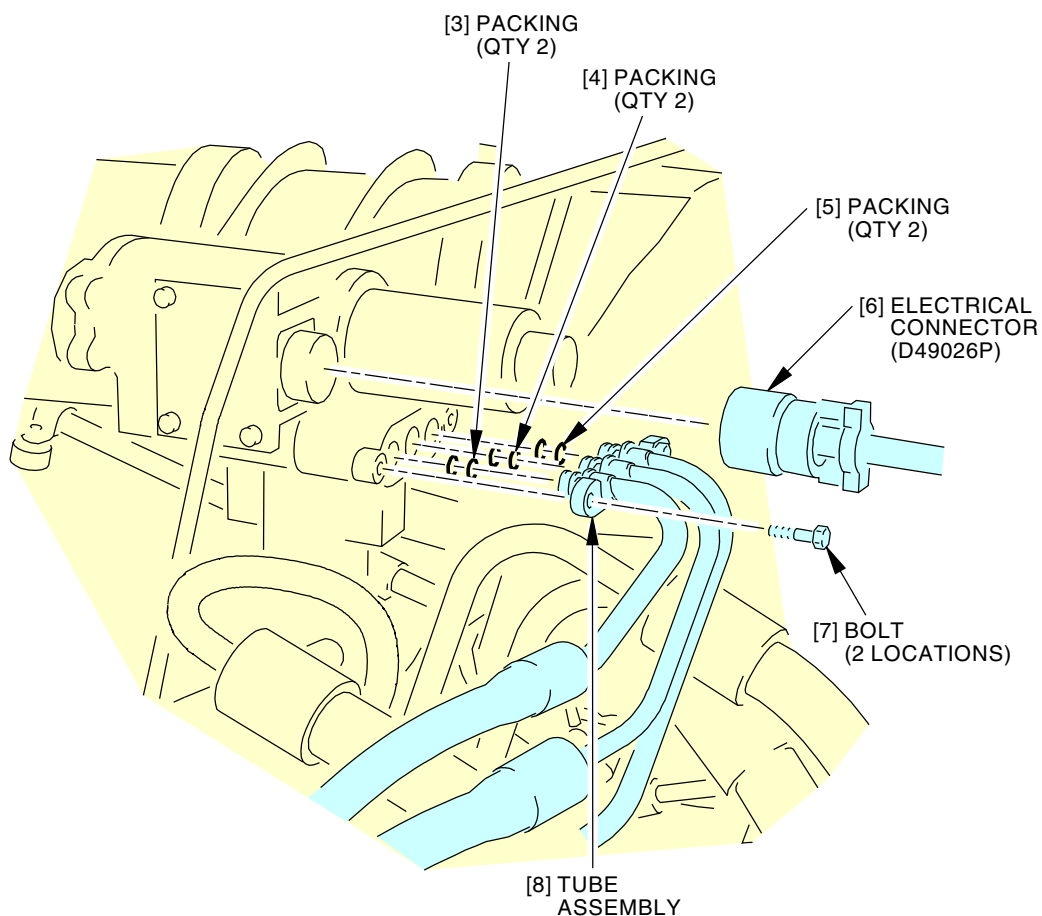
**Surge Control Valve Installation
Figure 401/49-53-01-990-801 (Sheet 1 of 2)**

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 **FWD**

B

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Surge Control Valve Installation
Figure 401/49-53-01-990-801 (Sheet 2 of 2)

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TASK 49-53-01-400-801

3. Surge Control Valve Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Surge control valve	49-53-53-01-035	ARO ALL
3	Packing	49-53-53-01-140	ARO ALL
4	Packing	49-31-31-01-090	ARO ALL
		49-53-53-01-155	ARO ALL
5	Packing	49-31-31-01-075	ARO ALL
		49-53-53-01-147	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Surge Control Valve Installation



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-53-01-420-001

- (1) Do the steps that follow to install the surge control valve [1]:
 - (a) Remove the plugs from the tube assembly [8].
 - (b) Remove the plugs from the surge control valve [1].
 - (c) Lubricate the new packings [3], packings [4], packings [5] with Mobil Jet Oil II, D00520.

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- (d) Install the packings [3], packings [4], packings [5] on the tube assembly [8].
- (e) Hold the surge control valve [1] while you install the clamp [2].
 - 1) Tighten the clamp [2] to 50-60 pound-inches (5.65-6.78 newton-meters).
- (f) Install the clamp [9].
 - 1) Tighten the clamp [9] to 50-60 pound-inches (5.65-6.78 newton-meters).
- (g) Connect the tube assembly [8] to the surge control valve.
- (h) Install the bolts [7] that hold the tube assembly [8] to the surge control valve [1].
- (i) Remove the cap from the electrical connector (D49026P) [6].
- (j) Connect the electrical connector (D49026P) [6] to the surge control valve [1].

G. Surge Control Valve - Pneumatic Cluster Installation Test

SUBTASK 49-53-01-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-01-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-53-01-710-001

- (3) Do the steps that follow to do the surge control valve installation test:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 1) Look at the visual position indicator for the surge control valve.
 - a) Use the APU air to operate the left and right air conditioning packs. To operate the packs, do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
 - b) Make sure the surge control valve changes position.
 - c) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.
 - d) Make sure the surge control valve changes position.
 - (b) Make sure the surge control valve does not leak fuel.
 - (c) Make sure the clamps for the surge control valve do not leak air.
 - (d) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (e) If a maintenance message shows for the APU pneumatic system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-01-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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TOTAL PRESSURE SENSOR - PNEUMATIC CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the total pressure sensor
 - (2) An installation of the total pressure sensor.
- B. The total pressure sensor is part of the pneumatic cluster.

TASK 49-53-02-000-801

2. Total Pressure Sensor Removal

(Figure 401)

A. **References**

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-53-02-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-53-02-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-02-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Total Pressure Sensor Removal

SUBTASK 49-53-02-020-001

- (1) Do the steps that follow to remove the total pressure sensor [1]:
 - (a) Disconnect the electrical connector (D49024P) [4] from the total pressure sensor [1].
 - 1) Put caps on the connector to prevent contamination.
 - (b) Loosen the nut [2].
 - (c) Turn the total pressure sensor [1] counterclockwise until the flange disengages the studs.
 - (d) Remove the total pressure sensor [1].
 - (e) Remove the packings [3] from the total pressure sensor [1].
 - 1) Discard the packings [3].
 - (f) Make sure you install all necessary protection covers.

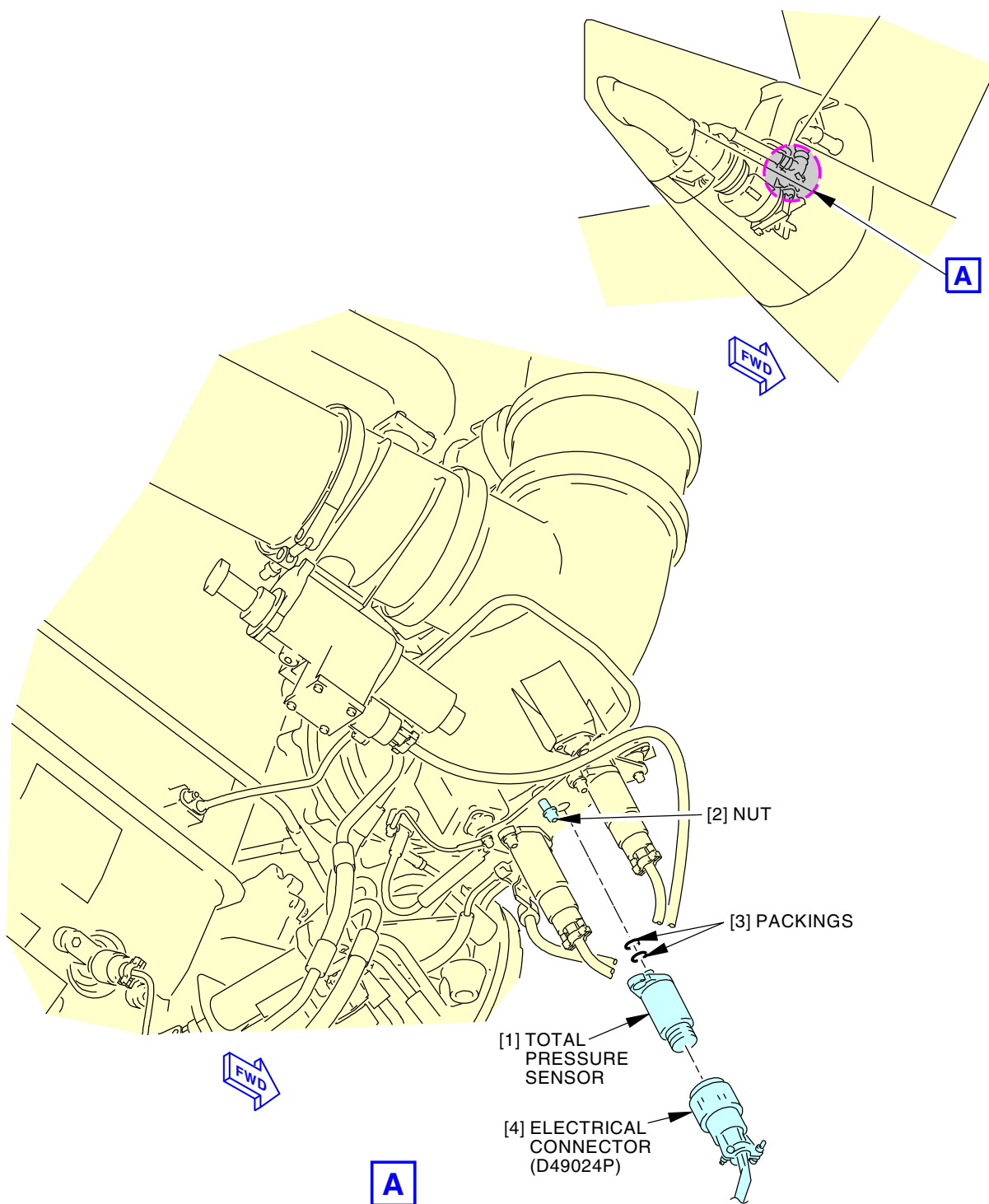
————— **END OF TASK** —————

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**Total Pressure Sensor Installation
Figure 401/49-53-02-990-801**

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TASK 49-53-02-400-801

3. Total Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Total pressure sensor	49-53-53-01-060	ARO ALL
3	Packing	49-53-53-01-064	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Total Pressure Sensor Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-53-02-420-001

- (1) Do the steps that follow to install the total pressure sensor [1].
 - (a) Lubricate the new packings [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packings [3] on the total pressure sensor [1].
 - (c) Install the total pressure sensor [1].
 - (d) Turn the total pressure sensor [1] clockwise until the flange fully engages the studs.
 - (e) Tighten the nut [2].
 - (f) Remove the cap from the electrical connector (D49024P) [4].
 - (g) Connect the electrical connector (D49024P) [4] to the total pressure sensor [1].

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G. Total Pressure Sensor Installation Test

SUBTASK 49-53-02-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-02-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-53-02-740-001

- (3) Do the steps that follow to test the total pressure sensor:

- (a) Operate the APU at a no load condition for 5 minutes:

1) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

- (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.

- (c) Make sure no maintenance messages show for the total pressure sensor.

- (d) If maintenance messages show for the total pressure sensor, do the applicable steps that follow:

- 1) Select the applicable maintenance message
- 2) Select MAINTENANCE MESSAGE DATA
- 3) Refer to the FIM.

- (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-02-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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FLEXIBLE SURGE DUCT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the flexible surge duct.
- (2) An installation of the flexible surge duct.

TASK 49-53-03-000-801

2. Flexible Surge Duct Removal

(Figure 401)

A. **General**

- (1) This task includes the steps to remove the Flexible Surge Duct.

B. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. **Prepare for the Removal**

SUBTASK 49-53-03-040-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO NOT OPERATE tag, STD-858.

SUBTASK 49-53-03-040-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-03-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

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Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Flexible Surge Duct Removal

SUBTASK 49-53-03-020-001

- (1) Do the steps that follow to remove the flexible surge duct [4].
 - (a) Remove the clamp [1] that holds the surge control valve duct [5] to the surge valve.
 - (b) Remove the clamp [2] that holds the flexible surge duct [4] to the exhaust diffuser.
NOTE: On some airplanes, the bracket is attached to the clamp.
 - (c) Remove the surge duct assembly from the APU.
 - (d) Remove the clamp [3] that holds the flexible surge duct [4] to the surge control valve duct [5].
 - (e) Remove the flexible surge duct [4] from the surge control valve duct [5].
 - (f) Make sure you install all necessary protection covers.

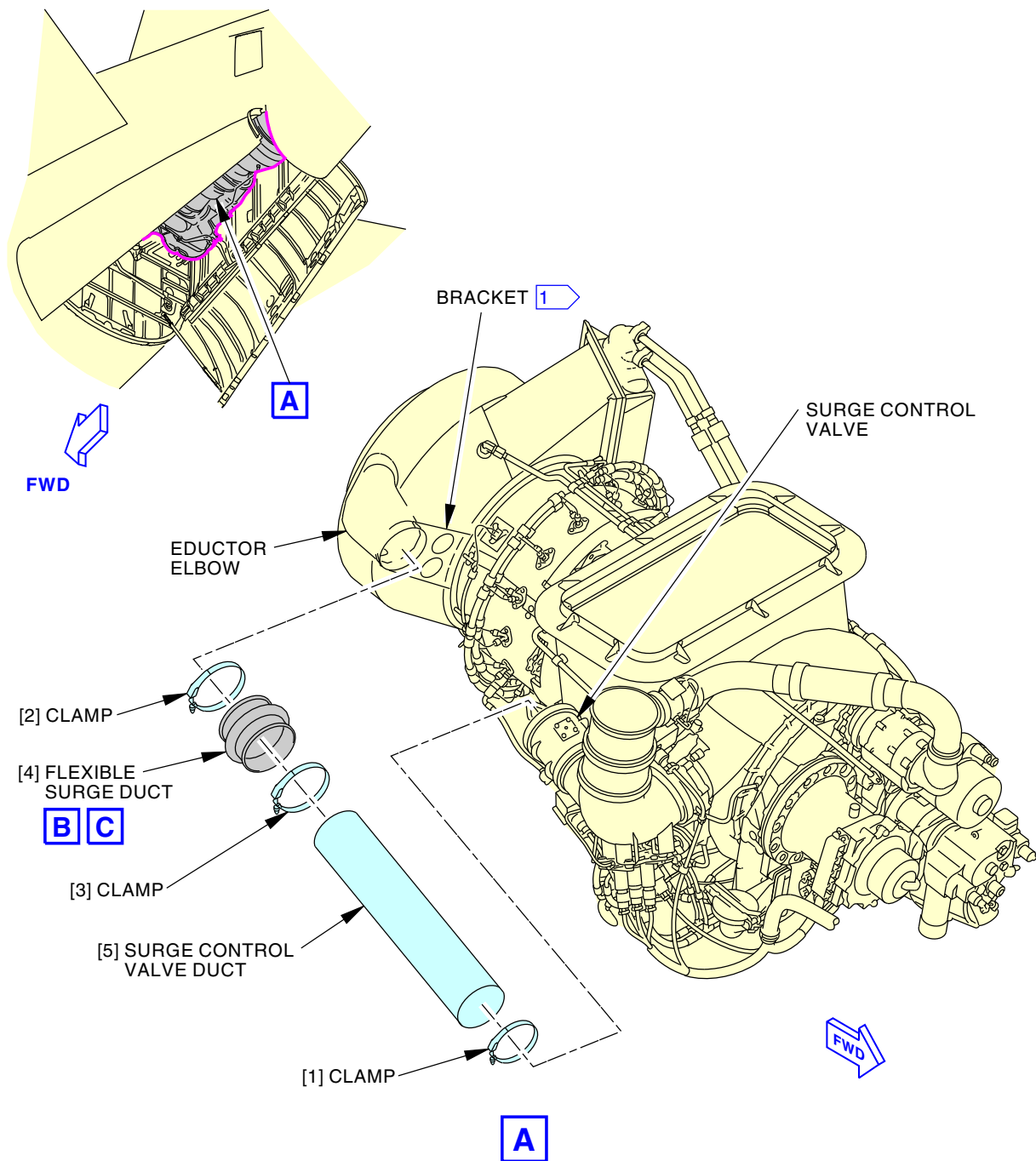
————— **END OF TASK** —————

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1 ON SOME AIRPLANES, THE BRACKET IS ATTACHED TO THE EDUCATOR ELBOW WITH [2] CLAMP.

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Flexible Surge Duct Installation
Figure 401/49-53-03-990-801 (Sheet 1 of 3)

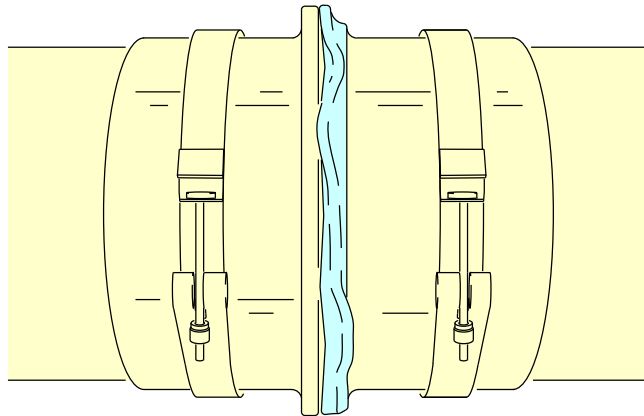
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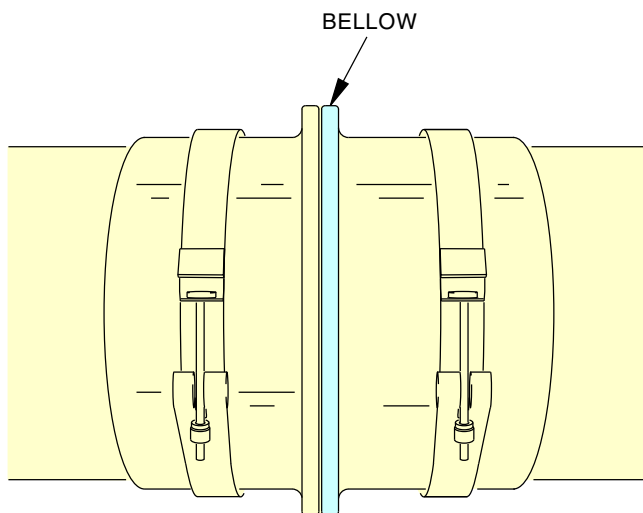
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(BEFORE ADJUSTMENT)

B



(AFTER ADJUSTMENT)

B

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Flexible Surge Duct Installation
Figure 401/49-53-03-990-801 (Sheet 2 of 3)

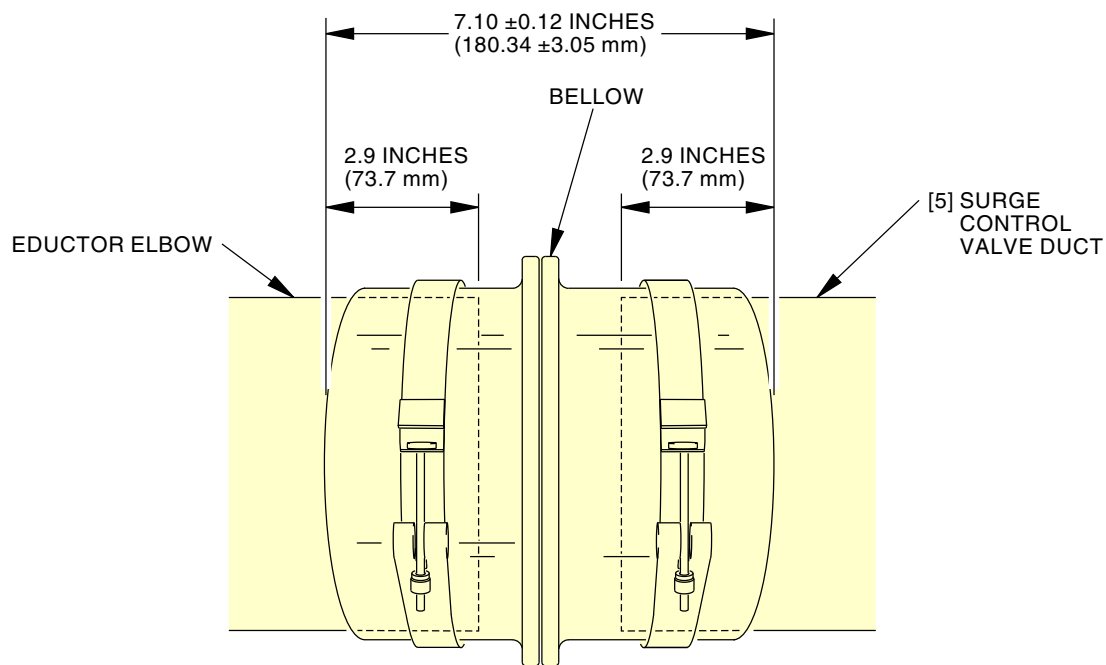
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APU FLEXIBLE SURGE DUCT

C

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Flexible Surge Duct Installation
Figure 401/49-53-03-990-801 (Sheet 3 of 3)

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TASK 49-53-03-400-801

3. Flexible Surge Duct Installation

A. General

- (1) This task includes the steps to install the Flexible Surge Duct.

B. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-583	Mallet - Non-metallic
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Flexible Surge Duct Installation



REMOVE THE PROTECTION COVERS FROM ALL OPENINGS. DAMAGE TO THE ENGINE CAN OCCUR.

SUBTASK 49-53-03-400-001

- (1) Measure and mark the maximum overlap distance of 2.9 in. (73.7 mm) on the eductor elbow.
 - (a) For visual reference, apply a temporary tape adjacent to the mark made in step (1).
- (2) Measure and mark the maximum overlap distance of 2.9 in. (73.7 mm) on the surge control valve duct [5].
 - (a) For visual reference, apply a temporary tape adjacent to the mark made in step (2).
- (3) Install the flexible surge duct [4] onto the eductor elbow. Adjust the flexible surge duct [4] as necessary to meet with the mark made in step (1).
- (4) Install the clamp [2] and tighten the nut to 15 in-lb (1.7 N·m).
- (5) Install the surge control valve duct [5] into the flexible surge duct [4]. Adjust the flexible surge duct [4] as necessary to meet with the mark made in step (3)
- (6) Install the clamp [3] but do not tighten yet.
- (7) Install the clamp [1] on the flanges of the surge control valve duct [5] and surge control valve and tighten the nut to 20 in-lb (2.3 N·m).
- (8) Visual check both marks on the eductor elbow and surge control valve duct [5] for proper position.
 - (a) Tighten the nut of clamp [3] to 15 in-lb (1.7 N·m).

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- (9) Tap the clamp [1] all around with a non-metallic mallet, STD-583 to ensure the clamp [1] is seated on the flanges.
 - (a) Tighten the nut of clamp [1] to 44 in-lb (5.0 N·m).
- (10) Repeat step (9) until less than 1/4 turn of the nut is needed to tighten the clamp [1] to 44 in-lb (5.0 N·m).

SUBTASK 49-53-03-200-001

- (11) Make sure that the flexible surge duct [4] is no more than 7.10 ±0.12 in. (180.34 ±3.05 mm) in length.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-03-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

SUBTASK 49-53-03-440-001

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-03-440-002

- (3) Remove the DO NOT OPERATE tag, STD-858 from the APU selector on the P5 overhead panel.

————— END OF TASK —————

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DIFFERENTIAL PRESSURE SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the differential pressure sensor
 - (2) An installation of the differential pressure sensor.
- B. The differential pressure sensor is part of the pneumatic cluster.

TASK 49-53-04-000-801

2. Differential Pressure Sensor Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-53-04-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-53-04-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-04-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Differential Pressure Sensor Removal

SUBTASK 49-53-04-020-001

- (1) Do the steps that follow to remove the differential pressure sensor [3].
 - (a) Disconnect the electrical connector (D49025P) [4] from the differential pressure sensor [3].
 - 1) Put caps on the connector to prevent contamination.
 - (b) Loosen the nut [7] on the differential pressure sensor [3].
 - (c) Disconnect the static pressure tube [6] from the differential pressure sensor [3].
 - (d) Loosen the nuts [1].
 - (e) Turn the differential pressure sensor [3] counterclockwise until the flange disengages the studs.
 - (f) Remove the differential pressure sensor [3].
 - (g) Remove the packings [5] from the static pressure tube [6].
 - 1) Discard the packings [5].
 - (h) Remove the packings [2] from the differential pressure sensor [3].
 - 1) Discard the packings [2].
 - (i) Make sure you install all necessary protection covers.

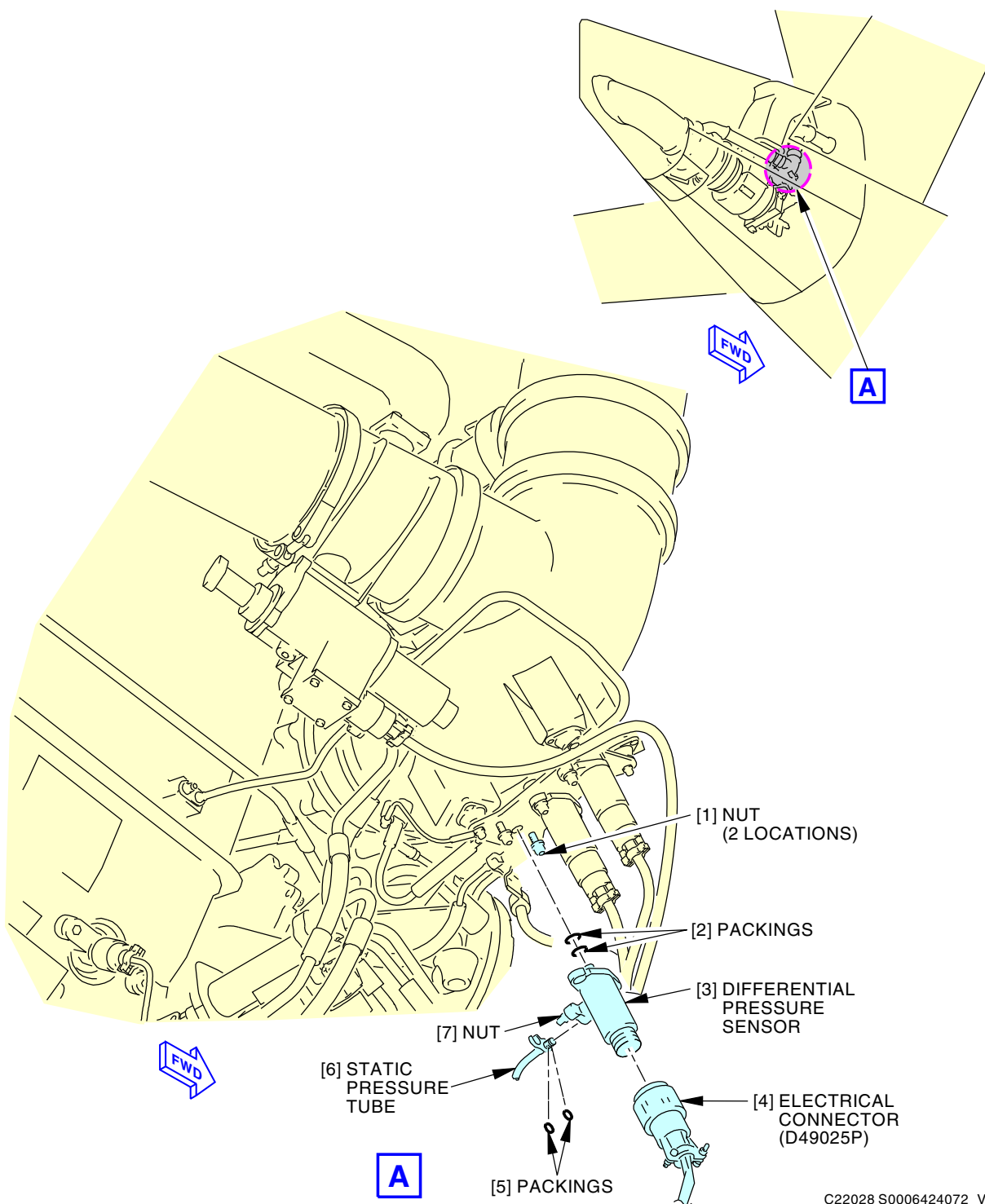
————— **END OF TASK** —————

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Differential Pressure Sensor Installation
Figure 401/49-53-04-990-801

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TASK 49-53-04-400-801

3. Differential Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-53-53-01-064	ARO ALL
3	Pressure sensor	49-53-53-01-055	ARO ALL
5	Packing	49-53-53-01-135	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Differential Pressure Sensor Installation



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-53-04-420-001

- (1) Do the steps that follow to install the differential pressure sensor [3].
 - (a) Lubricate the new packings [2], packings [5] with Mobil Jet Oil II, D00520.
 - (b) Install the packings [2] on the differential pressure sensor [3].
 - (c) Install the packings [5] on the static pressure tube [6].
 - (d) Install the differential pressure sensor [3].
 - (e) Turn the differential pressure sensor [3] clockwise until the flange fully engages the studs.
 - (f) Tighten the nuts [1].
 - (g) Connect the static pressure tube [6] to the differential pressure sensor [3].
 - (h) Tighten the nut [7].
 - (i) Remove the cap from the electrical connector (D49025P) [4].

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- (j) Connect the electrical connector (D49025P) [4] to the differential pressure sensor [3].

G. Differential Pressure Sensor Installation Test

SUBTASK 49-53-04-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-04-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-53-04-740-001

- (3) Do the steps that follow to test the differential pressure sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) Make sure there are no maintenance messages show for the differential pressure sensor.
 - (d) If a maintenance message for the differential pressure sensor shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-04-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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INLET PRESSURE SENSOR - PNEUMATIC CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the inlet pressure sensor
 - (2) An installation of the inlet pressure sensor.
- B. The inlet pressure sensor is part of the pneumatic cluster.

TASK 49-53-05-000-801

2. Inlet Pressure Sensor Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-53-05-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-53-05-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-05-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Inlet Pressure Sensor Removal

SUBTASK 49-53-05-020-001

- (1) Do the steps that follow to remove the inlet pressure sensor [1]:
 - (a) Disconnect the electrical connector (D49023P) [4] from the inlet pressure sensor [1].
 - 1) Put a caps on the electrical connector (D49023P) [4] to prevent contamination.
 - (b) Loosen the nut [2].
 - (c) Turn the inlet pressure sensor [1] counterclockwise until the flange disengages the studs.
 - (d) Remove the inlet pressure sensor [1].
 - (e) Remove the packing [3] from the inlet pressure sensor [1].
 - 1) Discard the packing [3].
 - (f) Make sure you install all necessary protection covers.

————— **END OF TASK** —————

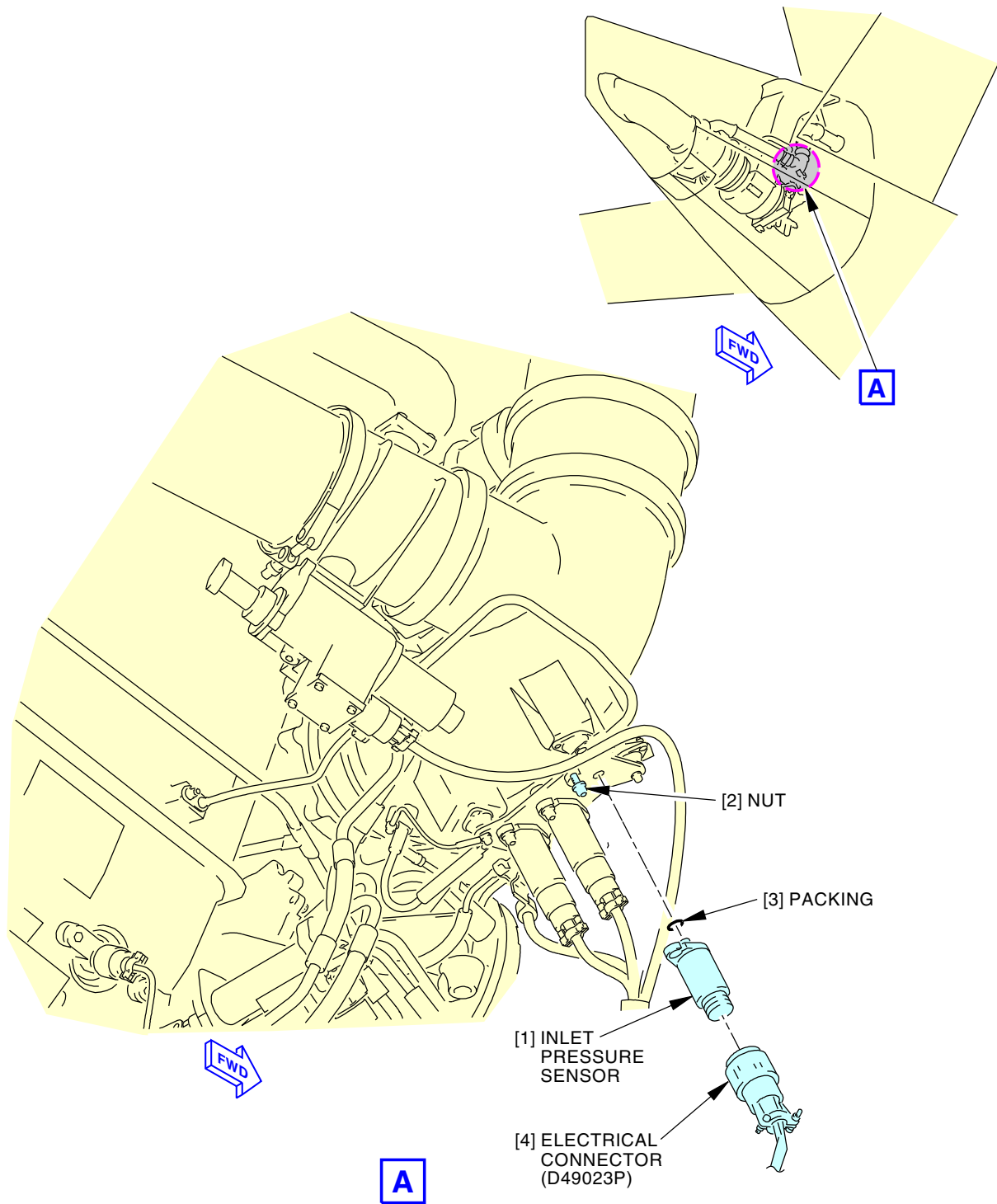
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Inlet Pressure Sensor Installation
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TASK 49-53-05-400-801

3. Inlet Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet pressure sensor	49-53-53-01-062	ARO ALL
3	Packing	49-53-53-01-064	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Inlet Pressure Sensor Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-53-05-420-001

- (1) Do the steps that follow to install the inlet pressure sensor [1].
 - (a) Lubricate the new packing [3] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [3] on the inlet pressure sensor [1].
 - (c) Install the inlet pressure sensor [1].
 - (d) Turn the inlet pressure sensor [1] clockwise until the flange fully engages the studs.
 - (e) Tighten the nuts [2].
 - (f) Remove the cap from the electrical connector (D49023P) [4].
 - (g) Connect the electrical connector (D49023P) [4] to the inlet pressure sensor [1].

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G. Inlet Pressure Sensor Installation Test

SUBTASK 49-53-05-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-05-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-53-05-740-001

- (3) Do the steps that follow to test the inlet pressure sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) Make sure no maintenance messages show for the inlet pressure sensor.
 - (d) If a maintenance message shows for the inlet pressure sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-05-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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PNEUMATIC CLUSTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the pneumatic cluster
 - (2) An installation of the pneumatic cluster.
- B. The pneumatic cluster has these components:
 - (1) Inlet pressure sensor
 - (2) Total pressure sensor
 - (3) Differential pressure sensor
 - (4) Surge control valve.
- C. These components can be removed individually or as an assembly. This procedure has the steps to remove the components as an assembly.

TASK 49-53-53-000-801

2. Pneumatic Cluster Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

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

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-53-53-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-53-53-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-53-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Pneumatic Cluster Removal

SUBTASK 49-53-53-020-001

- (1) Do the steps that follow to disconnect the electrical connectors:
- Disconnect the electrical connector (D49026P) [21] from the surge control valve [5].
 - Disconnect the electrical connector (D49023P) [10] from the inlet pressure sensor [2].
 - Disconnect the electrical connector (D49024P) [11] from the total pressure sensor [3].
 - Disconnect the electrical connector (D49025P) [12] from the differential pressure sensor [4].
 - Put caps on the electrical connectors to prevent contamination.

SUBTASK 49-53-53-020-002

- (2) Do the steps that follow to disconnect the tubes:
- Disconnect the tube assembly [23].
 - Put the 5-gallon (19-liter) fuel resistant container, STD-1054 under the tube assembly.
 - Remove the bolts [22] that attach the tube assembly [23] to the surge control valve [5].

NOTE: Fuel can come out of the tube assembly [23].
 - Disconnect the tube assembly [23] from the surge control valve [5].
 - Remove the packings [19], packings [20], packings [24] from the tube assembly [23].
 - Discard the packings [19], packings [20], packings [24].
 - Disconnect the static pressure tube:
 - Loosen the bolt [18] that holds the static pressure tube [14] to the differential pressure sensor [4].
 - Turn the flange for the static pressure tube [14] counterclockwise until the flange disengages the bolt [18].
 - Disconnect the static pressure tube [14] from the differential pressure sensor [4].
 - Loosen the bolt [18] that holds the static pressure tube [14] to the diffuser case.
 - Turn the flange for the static pressure tube [14] counterclockwise until the flange disengages the bolt [18].
 - Remove the static pressure tube [14].
 - Remove the packings [13] and packing [33] from the static pressure tube [14].

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- a) Discard the packings [13] and packing [33].
- (c) Remove the inlet pressure tube:
 - 1) Loosen the bolt [25] that holds the inlet pressure tube [15] to the pneumatic sensor assembly [27].
 - 2) Turn the flange for the inlet pressure tube [15] counterclockwise until the flange disengages the bolt [25].
 - 3) Disconnect the inlet pressure tube [15] from the pneumatic sensor assembly [27].
 - 4) Loosen the bolt [17] that holds the inlet pressure tube [15] to the APU inlet plenum.
 - 5) Turn the flange for the inlet pressure tube [15] counterclockwise until the flange disengages the bolt [17].
 - 6) Remove the inlet pressure tube [15].
 - a) Remove the packings [16], packings [26] from the inlet pressure tube [15].
 - b) Discard the packings [16], packings [26].
- (d) Make sure you install all necessary protection covers.

SUBTASK 49-53-53-020-003

- (3) Do the steps that follow to remove the pneumatic cluster [1]:
 - (a) Remove the clamp [7] that holds the pneumatic cluster [1] to the surge duct [6].
 - (b) Remove the clamp [9] that holds the pneumatic cluster [1] to the bleed duct [8].
 - (c) Hold the pneumatic cluster [1] while you remove the clamp [30] that holds the pneumatic cluster [1] to the APU [32].
 - (d) Remove the pneumatic cluster [1].
 - (e) Make sure you install all necessary protection covers.

———— **END OF TASK** ————

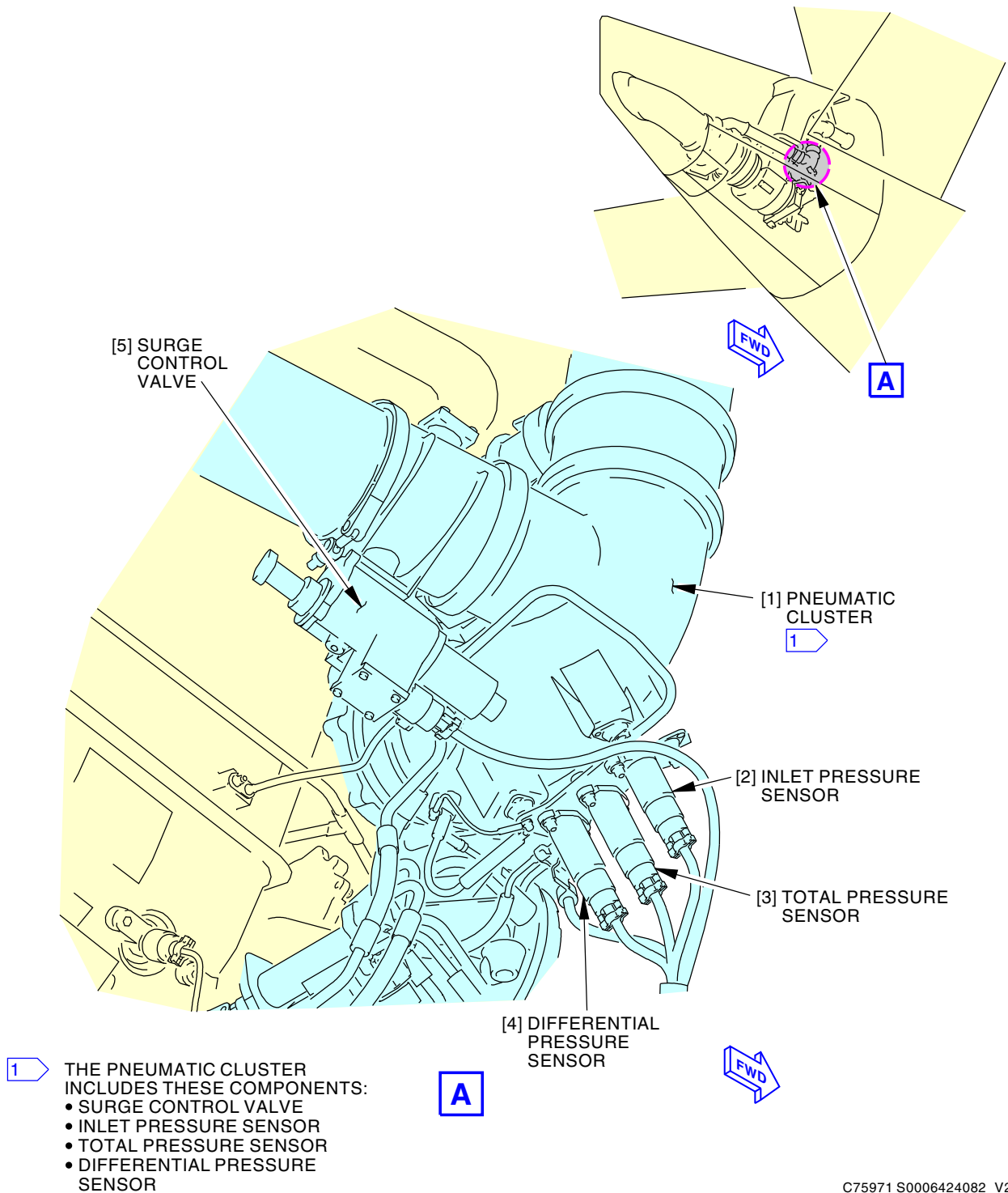
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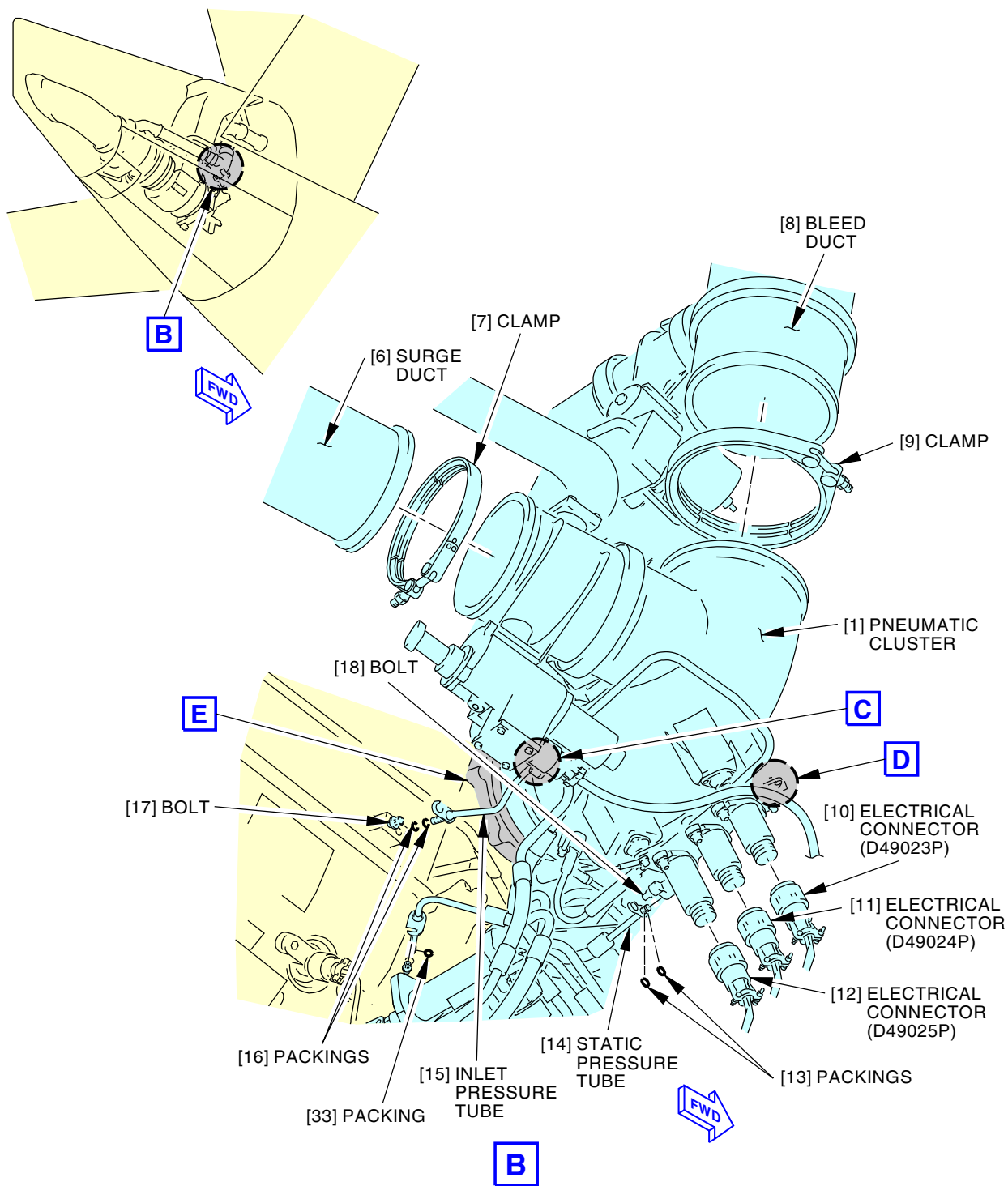
APU Pneumatic Cluster Installation
Figure 401/49-53-53-990-801 (Sheet 1 of 4)

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APU Pneumatic Cluster Installation
Figure 401/49-53-53-990-801 (Sheet 2 of 4)

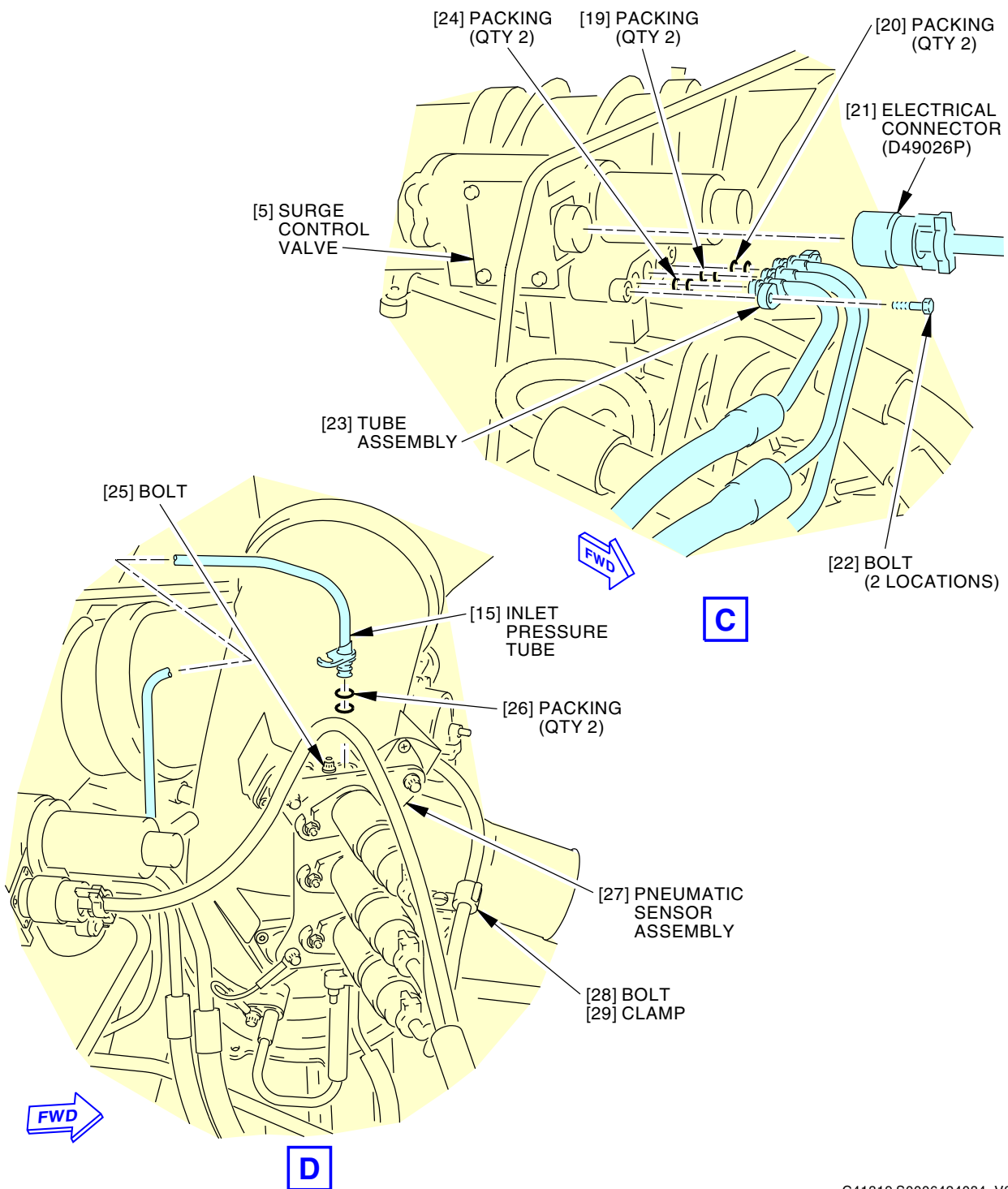
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**APU Pneumatic Cluster Installation
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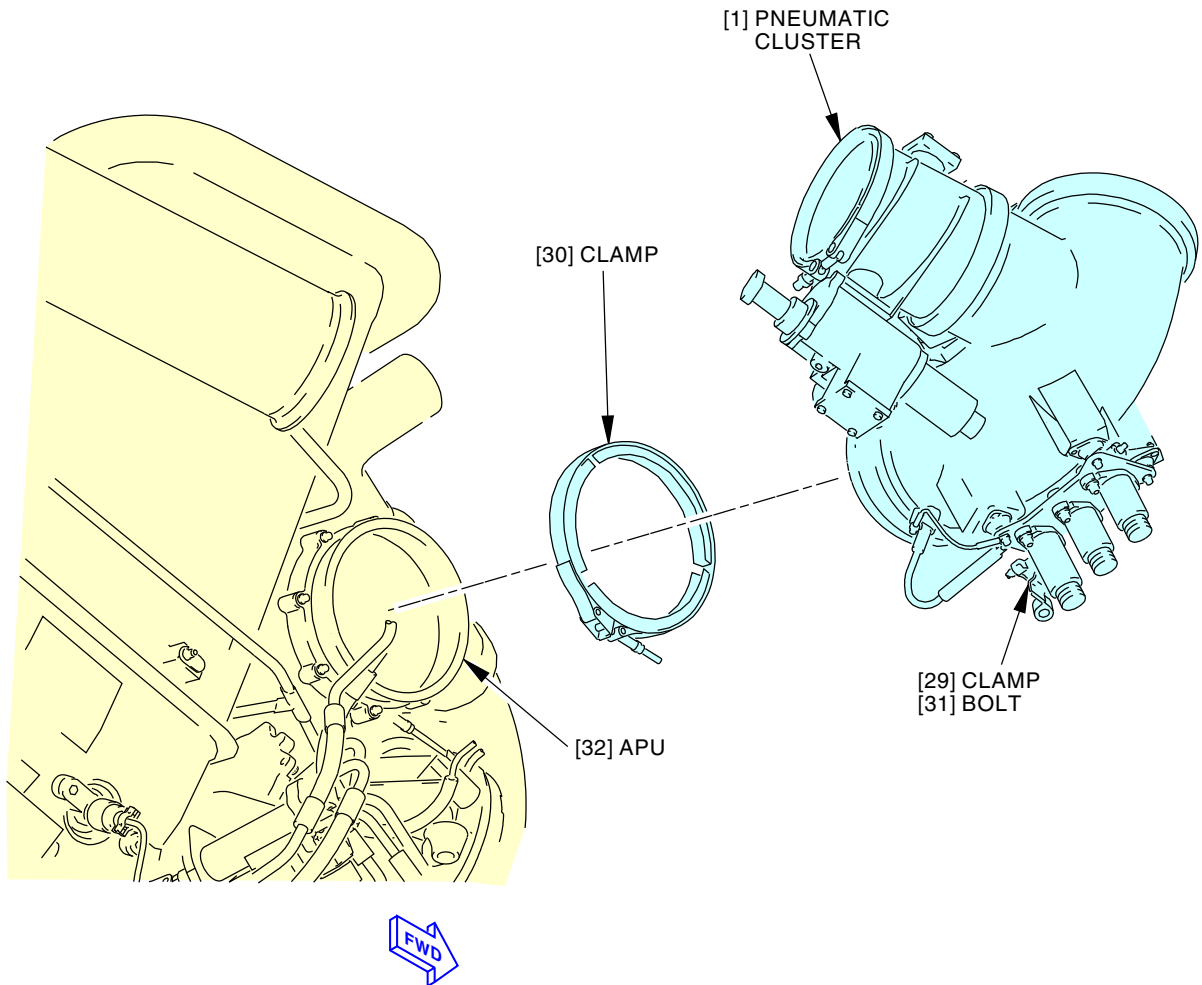
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APU Pneumatic Cluster Installation
Figure 401/49-53-53-990-801 (Sheet 4 of 4)

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TASK 49-53-53-400-801

3. Pneumatic Cluster Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pneumatic cluster	49-53-53-01-025	ARO ALL
13	Packing	49-53-53-01-135	ARO ALL
15	Inlet pressure tube	49-53-53-01-130	ARO ALL
16	Packing	49-53-53-01-135	ARO ALL
19	Packing	49-31-31-01-090	ARO ALL
20	Packing	49-31-31-01-075	ARO ALL
24	Packing	49-53-53-01-140	ARO ALL
26	Packing	49-53-53-01-135	ARO ALL
33	Packing	49-53-53-01-135	ARO ALL

D. Location Zones

Zone	Area
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Pneumatic Cluster Installation



REMOVE THE PROTECTION COVERS FROM THE OPENINGS AN
NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS,
DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-53-53-420-001

- (1) Do the steps that follow to install the pneumatic cluster:
 - (a) Hold the pneumatic cluster [1] to the APU [32] while you install the clamp [30].

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- 1) Tighten the clamp [30] to 52-58 inch-pounds (5.88-6.55 newton-meters).
- (b) Install the clamp [9] that connects the pneumatic cluster [1] to the bleed duct [8].
 - 1) Tighten the clamp [9] to 52-58 inch-pounds (5.88-6.55 newton-meters).
- (c) Install the clamp [7] that connects the pneumatic cluster [1] to the surge duct [6].
 - 1) Tighten the clamp [7] to 52-58 inch-pounds (5.88-6.55 newton-meters).

SUBTASK 49-53-53-420-002

- (2) Do the steps that follow to connect the tubes:
 - (a) Connect the tube assembly [23]:
 - 1) Lubricate the new packings [19], packings [20], packings [24] with Mobil Jet Oil II, D00520.
 - 2) Install the packings [19], packings [20], packings [24] on the tube assembly [23].
 - 3) Connect the tube assembly [23] to the surge control valve [5].
 - a) Install the bolts [22] that hold the tube assembly [23] to the pneumatic cluster [1].
 - b) Tighten the bolts [22] to 48-52 pound-inches (5.42-5.88 newton-meters).
 - (b) Connect the static pressure tube [14]:
 - 1) Lubricate the new new packings [13] and new packing [33] with Mobil Jet Oil II, D00520.
 - 2) Install the packings [13] and packing [33] on the static pressure tube [14].
 - 3) Connect the static pressure tube [14] to the differential pressure sensors [4] and the diffuser case.
 - a) Turn the flanges for the static pressure tube [14] clockwise until they engage the bolts [18].
 - b) Tighten the bolts [18] for the static pressure tube [14].
 - (c) Install the inlet pressure tube [15]:
 - 1) Lubricate the new packings [16], packings [26] with Mobil Jet Oil II, D00520.
 - 2) Install the packings [16], packings [26] on the inlet pressure tube [15].
 - 3) Install the inlet pressure tube [15] on the pneumatic cluster View B (Figure 401).
 - 4) Connect the inlet pressure tube [15] to the pneumatic sensor assembly [27].
 - a) Turn the flange for the inlet pressure tube [15] clockwise until it fully engages the bolt [25].
 - b) Tighten the bolt [25].
 - 5) Connect the inlet pressure tube [15] to the APU inlet plenum.
 - a) Turn the flange for the inlet pressure tube [15] clockwise until it fully engages the bolt [17].
 - b) Tighten the bolt [17].

SUBTASK 49-53-53-420-003

- (3) Do the steps that follow to connect the electrical connectors:
 - (a) Remove the caps from the electrical connectors and connector receptacles.
 - (b) Connect the electrical connector (D49026P) [21] to the surge control valve [5].
 - (c) Connect the electrical connector (D49023P) [10] to the inlet pressure sensor [2].

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- (d) Connect the electrical connector (D49024P) [11] to the total pressure sensor [3].
- (e) Connect the electrical connector (D49025P) [12] to the differential pressure sensor [4].

G. Pneumatic Cluster Installation Test

SUBTASK 49-53-53-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-53-53-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-53-53-710-001

- (3) Do the steps that follow to do the installation test for the pneumatic cluster:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 1) Make sure the surge control valve does not leak fuel.
 - 2) Look at the sight glass for the surge control valve.
 - a) Use the APU to pressurize the pneumatic system. To pressurize the system, (TASK 36-00-00-860-802).
 - b) Use the APU air to operate the left and right air conditioning packs. To operate the packs, do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.
 - c) Make sure the surge control valve changes position.
 - 3) Make sure the static pressure tube does not leak air.
 - 4) Make sure the inlet pressure tube does not leak air.
 - 5) Make sure the connection between the pneumatic cluster and the APU does not leak air.
 - 6) Make sure the connection between the pneumatic cluster and the surge duct does not leak air.
 - 7) Make sure the connection between the pneumatic cluster and the bleed duct does not leak air.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the APU pneumatic system, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-53-53-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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APU CONTROL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has the task to install the APU controller software.

TASK 49-61-00-470-801

2. APU Controller Software Installation

A. General

- (1) This procedure tells you how to install software into the Auxiliary Power Unit Controller (APUC). The APUC must contain this piece of software:
 - APUC Operational Program Software (OPS)REF: AIPC 46-00-00-49B
- (2) A Maintenance Access Terminal (MAT) is necessary for this procedure. For instructions on how to use a MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
- (3) If you do not know if the APUC needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration in this task: APU Controller (APUC) Installation Test, TASK 49-61-05-700-801.
- (4) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the Portable Maintenance Access Terminal (PMAT) in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

- (5) You can install the software from disks, the MAT hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.

NOTE: When new software is installed in the APUC, the load process first erases the old software and then installs the new software. If you install software directly to the APUC from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the APUC.

- (a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

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- (6) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.
 - (a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

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- (7) The airplane must be on the ground with the engines and Auxiliary Power Unit (APU) off before you can install software.

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- (8) To read about the conditions and times necessary for software installation, do this task:
On-Airplane Software Installation, TASK 20-15-11-400-801.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)
49-61-05-700-801	APU Controller (APUC) Installation Test (P/B 201)
AIPC 46-00-00-49B	Aircraft Illustrated Parts Catalog

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-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 49-61-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 49-61-00-860-002

- (2) Make sure these switches are in the correct position:
- (a) Make sure the APU selector on the P5 overhead panel is OFF.
 - (b) Make sure the APU TEST switch on the APU/EEC maintenance panel, P61, is in the TEST position.

SUBTASK 49-61-00-470-001

- (3) Use a MAT or a PMAT to install software in the APUC:

NOTE: Make sure you know the correct software part number for the APUC before you select the software part number on the display. For the APUC to be an approved installation, the correct software must be installed.

- (a) If the software is on a disk, put the correct disk in the disk drive.
- (b) Make these selections on the MAT:

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- 1) ONBOARD MAINTENANCE
 - 2) EXTENDED MAINTENANCE
 - 3) DATA LOAD.
- (c) Make these selections to select the component that will receive the software:
- 1) SELECT DESTINATION
 - 2) 49 APU SYSTEM
 - 3) APU CONTROLLER
 - 4) CONTINUE.
- (d) Make these selections to select the source of the software:
- 1) SELECT SOURCE
 - 2) Select the source of the software (if Disk Drive is the only selection, it is automatically selected).
 - 3) Select the correct software part number from the display.
 - 4) CONTINUE.
- (e) Select START to start the software installation.
- (f) When the software installation is completed, make sure the correct part number shows on the display.
- (g) Select CONTINUE to remove the configuration display.

———— **END OF TASK** ————

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SPEED SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the two speed sensors
 - (2) An installation of the two speed sensors.
- B. There are two speed sensors on the APU. Speed sensor 1 is located on the inlet plenum at the 4 o'clock position. Speed sensor 2 is located on the inlet plenum at the 9 o'clock position.

TASK 49-61-02-000-801

2. Speed Sensor Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
49-11-02-010-801	APU Access Doors (Open) (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.

<u>Reference</u>	<u>Description</u>
SPL-4828	Monopole Wrench - used to R/I APU speed sensor and oil heater Part #: 834770-1 Supplier: 06848

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-61-02-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-61-02-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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SUBTASK 49-61-02-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Speed Sensor Removal

SUBTASK 49-61-02-020-001

- (1) Do these steps to remove the speed sensor 1 [1]:

- (a) Disconnect the electrical connector (D49027P) [4] from the speed sensor 1 [1].

1) Install a cap on the electrical connector (D49027P).

- (b) Remove the bolt [3] and washer [11] from the strap assembly [2].

- (c) Turn the strap assembly [2] counterclockwise to loosen the speed sensor 1 [1] and remove the strap assembly [2].

NOTE: You can use the monopole wrench, SPL-4828 as an alternative tool to remove the speed sensor 1 [1].

- (d) Remove the speed sensor 1 [1].

- (e) Remove the two packings [5] from the speed sensor 1 [1].

1) Discard the two packings [5].

- (f) Make sure you install all necessary protection covers.

SUBTASK 49-61-02-020-002

- (2) Do these steps to remove the speed sensor 2 [6]:

- (a) Disconnect the electrical connector (D49028P) [9] from the speed sensor 2 [6].

1) Install a cap on the electrical connector (D49028P) [9].

- (b) Remove the bolt [8] and washer [12] from the strap assembly [7].

- (c) Turn the strap assembly [7] counterclockwise to loosen the speed sensor 2 [6] and remove the strap assembly [7].

NOTE: You can use the monopole wrench, SPL-4828 as an alternative tool to remove the speed sensor 2 [6].

- (d) Remove the speed sensor 2 [6].

- (e) Remove the two packings [10] from the speed sensor 2 [6].

1) Discard the two packings [10].

- (f) Make sure you install all necessary protection covers.

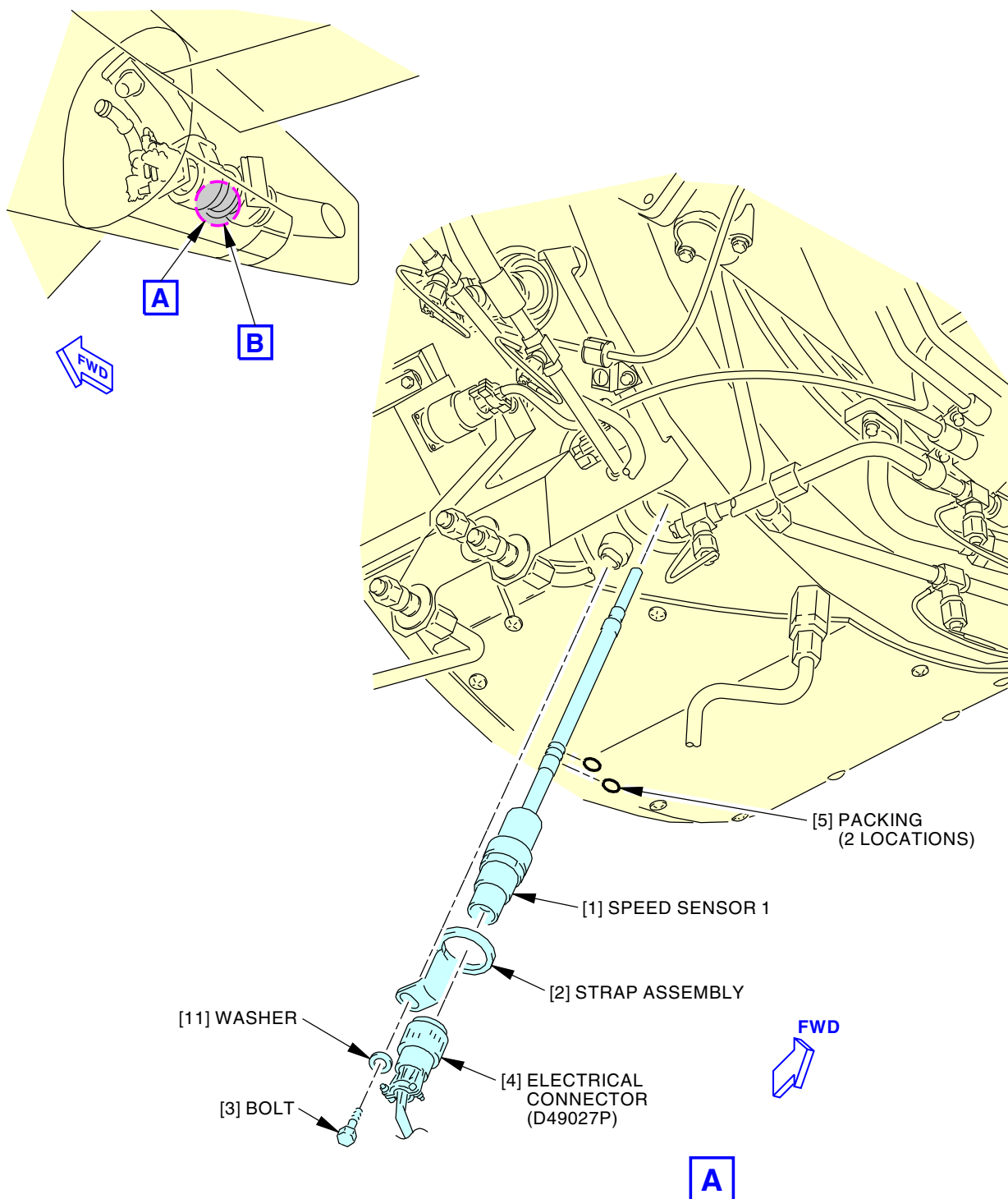
————— **END OF TASK** —————

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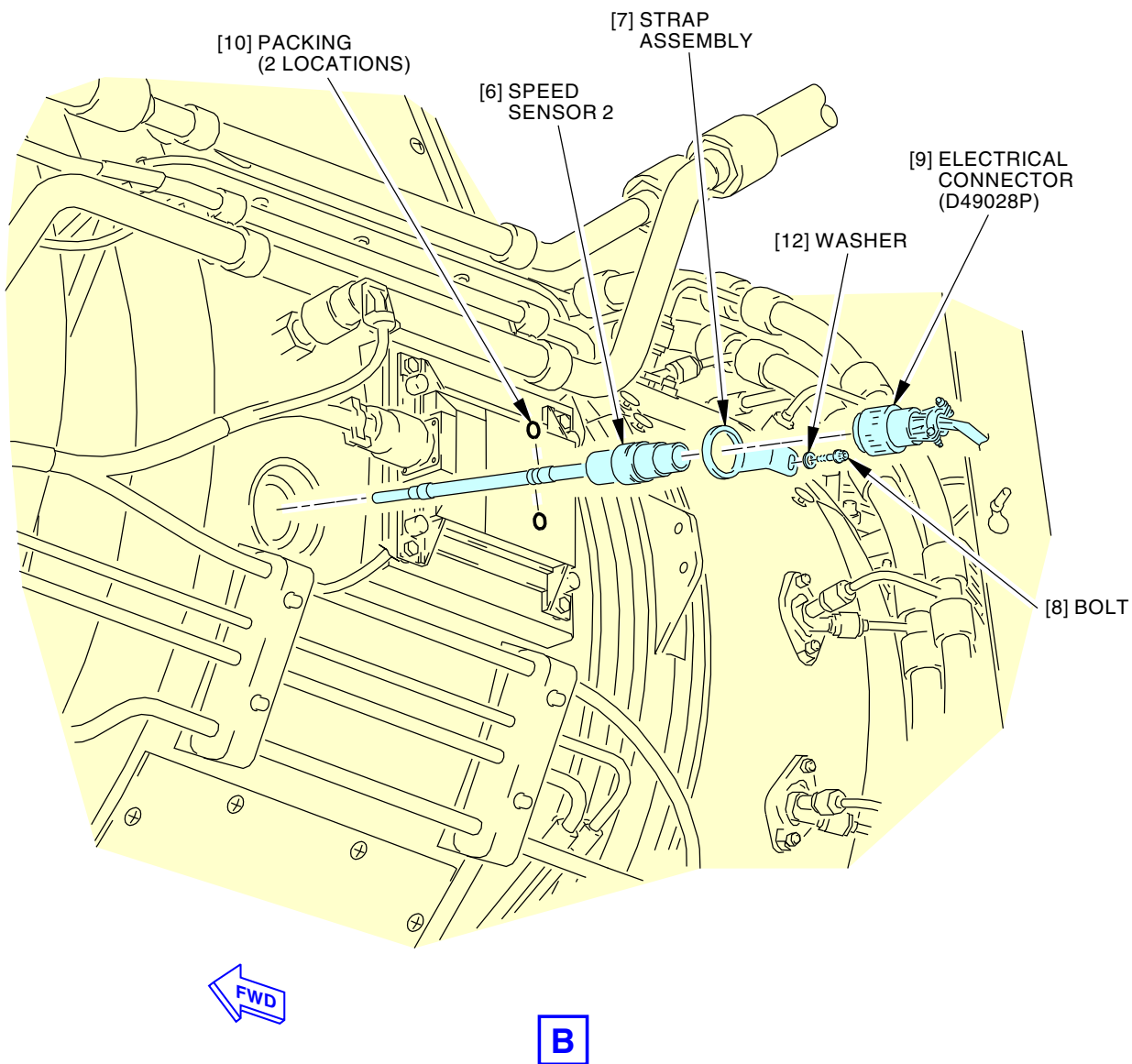
Speed Sensor Installation
Figure 401/49-61-02-990-801 (Sheet 1 of 2)

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Speed Sensor Installation
Figure 401/49-61-02-990-801 (Sheet 2 of 2)

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TASK 49-61-02-400-801

3. Speed Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (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-4828	Monopole Wrench - used to R/I APU speed sensor and oil heater Part #: 834770-1 Supplier: 06848

C. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Speed sensor 1	49-61-02-01-065	ARO ALL
5	Packing	49-61-02-01-070	ARO ALL
6	Speed sensor 2	49-61-02-01-065	ARO ALL
10	Packing	49-61-02-01-070	ARO ALL

E. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

F. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. Procedure

**CAUTION**

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-61-02-420-001

- (1) Do these steps to install the speed sensor 1 [1]:
 - (a) Lubricate the two new packings [5] with a light coat of Mobil Jet Oil II, D00520.
 - (b) Install the two packings [5] on the speed sensor 1 [1].

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- (c) Install the speed sensor 1 [1] in the inlet plenum and hand-tighten.

NOTE: You can use the monopole wrench, SPL-4828 as an alternative tool to install the speed sensor 1 [1].

- (d) Install the strap assembly [2] on the speed sensor 1 [1].
(e) Install the washer [11] and bolt [3] to the strap assembly [2].
(f) Remove the cap from the electrical connector (D49027P) [4].
(g) Connect the electrical connector (D49027P) [4] to the speed sensor 1 [1].

SUBTASK 49-61-02-420-002

- (2) Do these steps to install the speed sensor 2 [6]:

- (a) Lubricate the two new packings [10] with a light coat of Mobil Jet Oil II, D00520.
(b) Install the two packings [10] on the speed sensor 2 [6].
(c) Install the speed sensor 2 [6] in the inlet plenum and hand-tighten.

NOTE: You can use the monopole wrench, SPL-4828 as an alternative tool to install the speed sensor 2 [6].

- (d) Install the strap assembly [7] on the speed sensor 2 [6].
(e) Install the washer [12] and bolt [8] to the strap assembly [7].
(f) Remove the cap from the electrical connector (D49028P) [9].
(g) Connect the electrical connector (D49028P) [9] to the speed sensor 2 [6].

H. Speed Sensor Installation Test

SUBTASK 49-61-02-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-61-02-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-61-02-740-001

- (3) Do the installation test for the speed sensor:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
(b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
(c) If a maintenance message shows for the speed sensor(s), refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
(d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-02-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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INLET TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the inlet temperature sensor
 - (2) An installation of the inlet temperature sensor.

TASK 49-61-03-000-801

2. Inlet Temperature Sensor Removal

(Figure 401)

A. **References**

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Access Panels**

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. **Prepare for the Removal**

SUBTASK 49-61-03-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-61-03-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-61-03-010-001

- (3) Open the APU access doors. To open the APU access doors, do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

Open these APU access doors:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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E. Inlet Temperature Sensor Removal

SUBTASK 49-61-03-020-001

- (1) Do these steps to remove the inlet temperature sensor [1]:
 - (a) Disconnect the electrical connector [3] from the inlet temperature sensor [1].
 - (b) Remove the lockwire from the inlet temperature sensor [1].
 - (c) Remove the inlet temperature sensor [1].
 - (d) Remove the gasket [2] from the inlet temperature sensor [1].
 - 1) Discard the gasket [2].
 - (e) Make sure you install all necessary protection covers.

———— **END OF TASK** ————

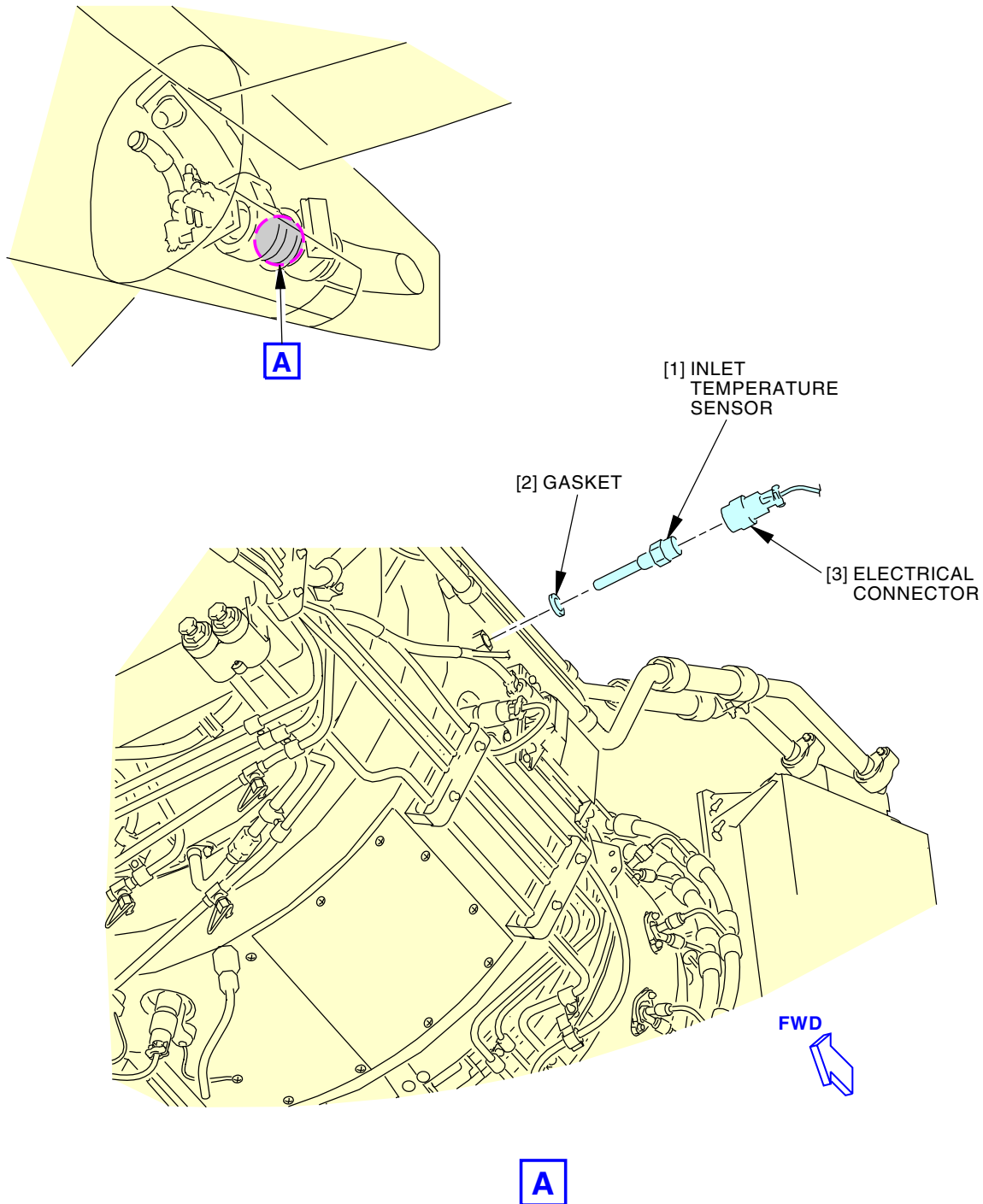
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Inlet Temperature Sensor Installation
Figure 401/49-61-03-990-801

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TASK 49-61-03-400-801

3. Inlet Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet temperature sensor	49-61-03-01-050	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure

SUBTASK 49-61-03-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Do these steps to install the inlet temperature sensor [1]:
 - (a) Install the new gasket [2] on the inlet temperature sensor [1].
 - (b) Install the inlet temperature sensor [1].
 - (c) Install the MS20995C20 lockwire, G50225 on the inlet temperature sensor [1].
 - (d) Connect the electrical connector [3] to the inlet temperature sensor [1].

G. Inlet Temperature Sensor Installation Test

SUBTASK 49-61-03-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-61-03-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-61-03-740-001

- (3) Do the installation test for the inlet temperature sensor:
- (a) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (b) If a maintenance message shows for the inlet temperature sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-03-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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APU CONTROLLER (APUC) - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) A removal of the APU controller (APUC)
- (2) An installation of the APU controller (APUC)
- (3) A test of the APU controller (APUC)
- (4) A replacement of the data memory module and the APU controller (APUC).

B. For this procedure, the APU controller is referred to as the APUC.

TASK 49-61-05-000-801

2. APU Controller (APUC) Removal

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The APU controller (APUC) and the data memory module have the data for the APU. When an APUC is replaced, the new APUC will load the APU data from data memory module.



DO NOT REMOVE THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME. IF YOU REMOVE BOTH THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME, YOU WILL LOSE THE DATA FOR THE APU.

- (2) If you must remove the data memory module and the APUC at the same time, do the Data Memory Module and APU Controller Replacement Task.

B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
25-21-07-000-801	Lowered Ceiling Panel Removal (P/B 401)

C. Location Zones

Zone	Area
264	Area Above Passenger Compartment Ceiling, Right - Section 47

D. Prepare for the Removal

SUBTASK 49-61-05-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-61-05-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1

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(Continued)

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	8	C24652	APU CRK CTRL

E. APU Controller (APUC) Removal

SUBTASK 49-61-05-020-001

- (1) Do the steps that follow to remove the APUC [2]:
- (a) Remove the lower Ceiling panels [1] to get access to the APUC [2]. To remove the lower ceiling panels, do this task: Lowered Ceiling Panel Removal, TASK 25-21-07-000-801.



CAUTION

DO NOT TOUCH THE CONNECTOR PINS ON THE APU CONTROLLER. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE APU CONTROLLER.

- (b) Remove the APUC [2]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

————— **END OF TASK** —————

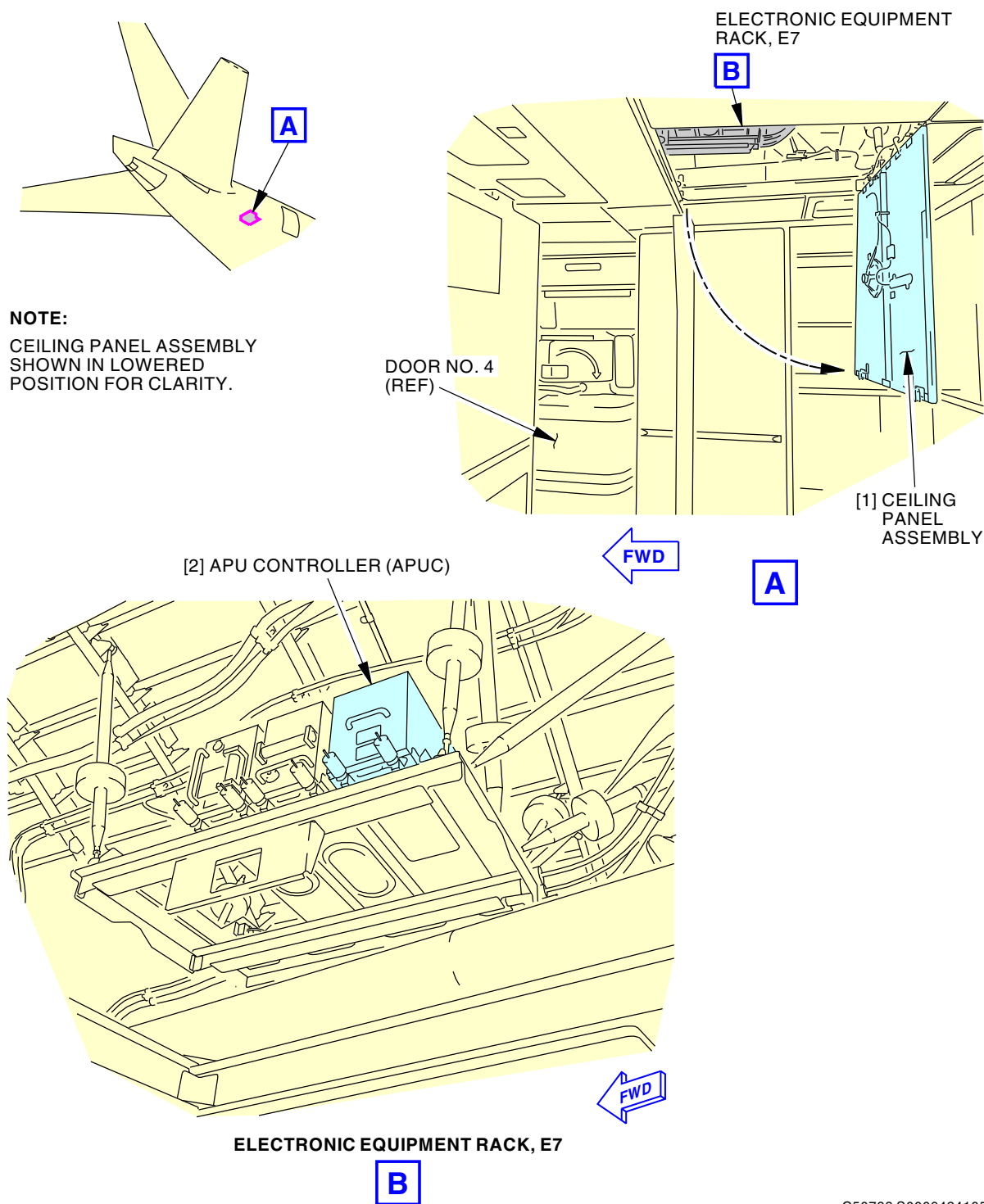
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APU Controller Installation
Figure 201/49-61-05-990-801

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TASK 49-61-05-400-801

3. APU Controller (APUC) Installation

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
25-21-07-400-801	Lowered Ceiling Panel Installation (P/B 401)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	APUC	49-61-05-01-005	ARO ALL

C. Location Zones

Zone	Area
264	Area Above Passenger Compartment Ceiling, Right - Section 47

D. APU Controller (APUC) Installation

SUBTASK 49-61-05-420-001

(1) Do the steps that follow to install the APUC:

- Install the APUC [2]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.
- Install the lowered ceiling panel [1]. To install it, do this task: Lowered Ceiling Panel Installation, TASK 25-21-07-400-801.
- Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

- Move the APU maintenance switch on the APU/EEC maintenance panel, P61, to the TEST position and wait 15 seconds.

NOTE: The APUC will load the APU data from the data memory module in 15 seconds.

- Move the APU maintenance switch on the APU/EEC maintenance panel, P61, to the NORM position.

SUBTASK 49-61-05-700-001

(2) Do this task: APU Controller (APUC) Installation Test, TASK 49-61-05-700-801.

————— **END OF TASK** —————

TASK 49-61-05-700-801

4. APU Controller (APUC) Installation Test

A. General

- A maintenance access terminal is necessary for this procedure.

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B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. APU Software Configuration Check

SUBTASK 49-61-05-860-003

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-61-05-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-61-05-860-006

- (3) Set the BATTERY switch on the P5 overhead panel to the ON position.

SUBTASK 49-61-05-860-005

- (4) Move the APU MAINT switch on the P61 overhead panel to the TEST position.

SUBTASK 49-61-05-860-007

- (5) Set the BATTERY switch on the P5 overhead panel to the OFF position.

E. APU Controller (APUC) Installation Test

SUBTASK 49-61-05-740-001

- (1) Do the steps that follow to do the installation test for the APUC:
- Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - Use the APU air to operate the left and right air conditioning packs. To supply APU air, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.
 - Use the APU generator to operate the left and the right transfer bus. To supply electrical power, do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 49-61-05-740-002

- (2) Do the steps that follow to do the APU Bite Test:
- Do this task: APU Bite Test, TASK 49-11-00-740-801.

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- (b) If a maintenance message shows for the APU controller, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— **END OF TASK** —————

TASK 49-61-05-960-801

5. Data Memory Module and APU Controller Replacement

A. References

Reference	Title
49-72-00-000-801	Data Memory Module Removal (P/B 401)
49-72-00-400-801	Data Memory Module Installation (P/B 401)

B. Location Zones

Zone	Area
264	Area Above Passenger Compartment Ceiling, Right - Section 47
315	APU Compartment, Left
316	APU Compartment, Right

C. Data Memory Module and APU Controller Replacement

SUBTASK 49-61-05-960-001

- (1) Do the steps that follow to replace the data memory module and the APU controller:
- (a) Do this task: APU Controller (APUC) Removal, TASK 49-61-05-000-801.
 - (b) Do this task: APU Controller (APUC) Installation, TASK 49-61-05-400-801.
 - (c) Do this task: APU Controller (APUC) Installation Test, TASK 49-61-05-700-801.



YOU MUST DO THE APU CONTROLLER INSTALLATION TEST BEFORE YOU REMOVE THE DATA MEMORY MODULE. IF YOU DO NOT DO THE INSTALLATION TEST FOR THE APU CONTROLLER BEFORE YOU REMOVE THE DATA MEMORY MODULE, YOU WILL LOSE THE DATA FOR THE APU.

- (d) Do this task: Data Memory Module Removal, TASK 49-72-00-000-801.
- (e) Do this task: Data Memory Module Installation, TASK 49-72-00-400-801.

————— **END OF TASK** —————

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INDICATING - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure describes the information on the APU maintenance page and the APU related information on the Status page. The APU maintenance page and the status page are shown on EICAS.

TASK 49-70-00-800-801

2. EICAS Status Page (APU Information)

(Figure 201)

A. Procedure

SUBTASK 49-70-00-910-001

- (1) To select the EICAS status page, press the STAT key on the EICAS display select panel (DSP).

SUBTASK 49-70-00-860-001

 WARNING	MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE APU INLET DOOR BEFORE YOU MOVE THE APU SELECTOR ON THE P5 PANEL TO ON. THE APU INLET DOOR WILL MOVE AUTOMATICALLY TO THE OPEN POSITION AND ACTIVATE THE APU FUEL SYSTEM.

- (2) If the APU is not operating, move the APU maintenance switch on the P61 overhead panel to the TEST position or move the APU selector on the P5 panel to ON.

NOTE: The APU controller must be powered to show the APU displays on the EICAS status page.

SUBTASK 49-70-00-800-001

- (3) The EICAS status page shows these real time APU indications:
 - (a) EGT (Exhaust Gas Temperature)
 - 1) With the APU running, the EGT display shows the temperature at the EGT thermocouples corrected to standard Sea Level condition (°C)
 - 2) With the APU not running, the EGT display shows the temperature at the EGT thermocouples in degrees Celsius.
 - 3) There are 2 EGT rakes on the APU. The EGT display shows the higher temperature of the 2 EGT rakes.
 - (b) RPM
 - 1) The RPM display shows a percentage of the APU designed operating speed (100% = 39044 RPM).
 - 2) There are 2 speed sensors on the APU. The RPM display shows the higher of the 2 speed sensor inputs.
 - (c) OIL PRESS
 - 1) The OIL PRESS display shows the APU oil pressure in Psig at the lube cluster.
 - (d) OIL TEMP
 - 1) The OIL TEMP display shows the APU oil temperature in degrees Celsius at the lube cluster.
 - (e) OIL QTY

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- 1) The OIL QTY display shows the APU oil quantity in quarts or liters (Full = 7.5 quarts or 7.1 liters)).

————— **END OF TASK** —————

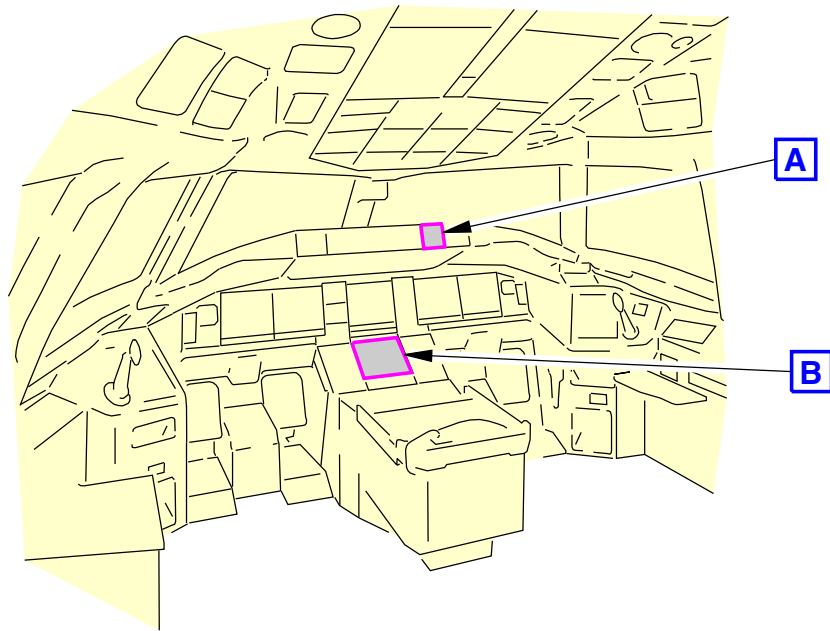
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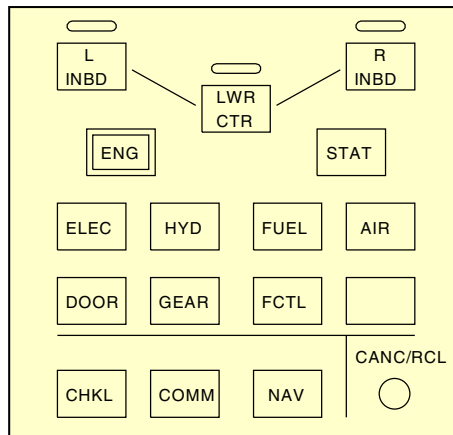
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FLIGHT COMPARTMENT



DISPLAY SELECT PANEL

A

E55757 S0006424113_V2

APU Indications
Figure 201/49-70-00-990-801 (Sheet 1 of 3)

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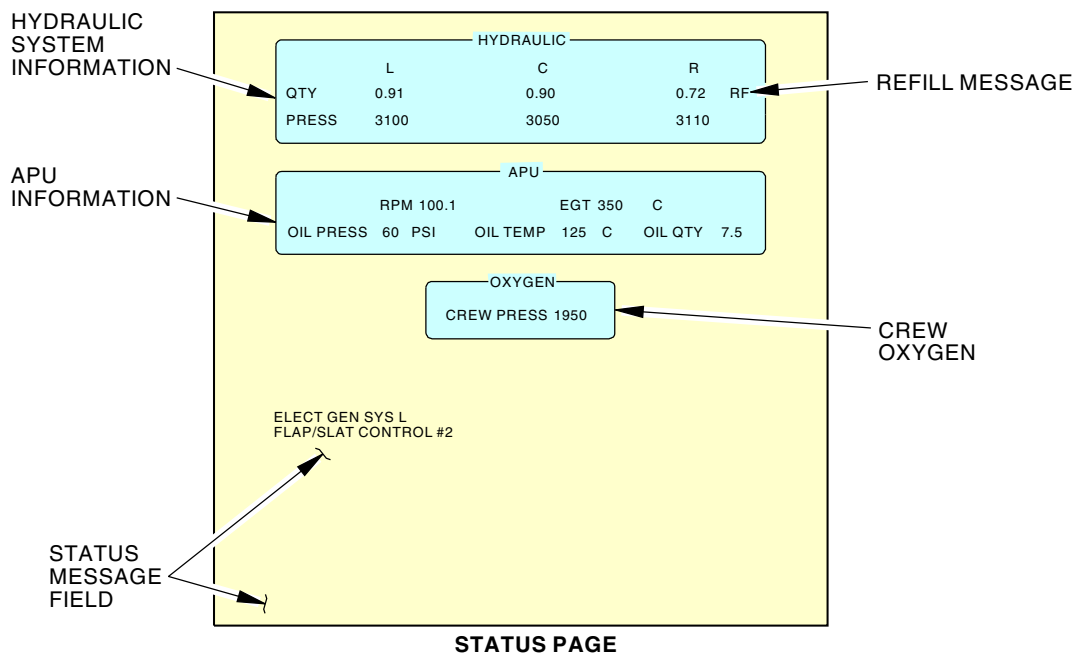
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B

APU				
SHOW PG MENU				
PNEU MODE	DUCTPRESS	BLD CORRECTED FLOW	240	
APUC MODE	ONSPEED	BLD CORRECTED FLOW SET	240	
SPEED SENSOR 1	100.6	APU BAT DC-V	12.0	
SPEED SENSOR 2	100.8	APU BAT DC-A	DIS 120	
EGT CORRECTED	388	APU GEN AC-V	0	
EGT THERMOCOUPLE 1	387	APU GEN FREQ	0	
EGT THERMOCOUPLE 2	388	APU GEN LOAD	0.00	
OIL PRESS	50	APU FUEL FEED		
OIL TEMP	130			
OIL QTY	3.50 LO			
INLET STATIC PRESS	14.5			
LOAD COMP TOTAL PRESS	30.3	S/O VLV	OPEN	CLOSED
LOAD COMP DIFF PRESS	15.3	DC PUMP	--	PRESS
COMP INLET TEMP	105	AC PUMP	OFF	--
OIL SUMP TEMP	49	STATUS CODE		
SURGE CONTROL VLV POS	63.7			
IGV ACTUATOR POS	60.0			
FMU FUEL TEMP	80			
FUEL CLUSTER POS	109.6	APU OPER HOURS	250517	
APU DOOR COMMAND	OPEN	APU STARTS	29891	
APU DOOR POSITION	OPEN			
DATE 23 JUN 90 UTC 18:54:04				

APU MAINTENANCE PAGE

B

C

E55804 S0006424114_V2

APU Indications
Figure 201/49-70-00-990-801 (Sheet 2 of 3)

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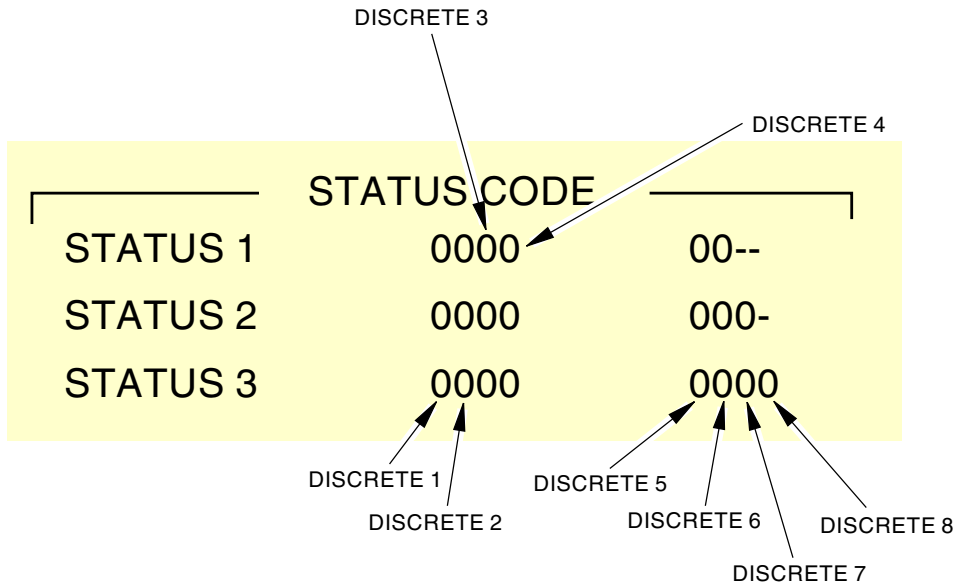
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STATUS CODE DISCRETES

C

E57200 S0006424115_V3

APU Indications
Figure 201/49-70-00-990-801 (Sheet 3 of 3)

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TASK 49-70-00-800-802

3. APU Maintenance Page

(Figure 201)

A. References

Reference	Title
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

B. Procedure

SUBTASK 49-70-00-860-002



WARNING

MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE APU INLET DOOR BEFORE YOU MOVE THE APU SELECTOR ON THE P5 PANEL TO ON. THE APU INLET DOOR WILL MOVE AUTOMATICALLY TO THE OPEN POSITION AND ACTIVATE THE APU FUEL SYSTEM.

- (1) If the APU is not operating, move the APU maintenance switch on the P61 overhead panel to the TEST position or move the APU selector on the P5 panel to ON.

NOTE: The APU controller must be powered to show most of the displays on the APU maintenance page.

SUBTASK 49-70-00-860-003

- (2) Show the APU maintenance page. To show it, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

C. APU Maintenance Page Displays

SUBTASK 49-70-00-860-004

- (1) PNEU MODE (ECS, MES, ADP, ADP-ECS, DUCT PRESS, IDLE, APU OFF)
 - (a) The PNEU MODE display shows the pneumatic demand on the APU. There are 7 different pneumatic demands for the APU.
 - 1) ECS - This shows that the APU is commanded to provide air for at least 1 air conditioning pack.
 - 2) MES - This shows that the APU is commanded to provide air for a main engine start.
 - 3) ADP - This shows that the APU is commanded to provide air to operate at least 1 air driven pump.
 - 4) ADP-ECS - This shows that the APU is commanded to provide air for both the air driven pumps and the air conditioning packs.
 - 5) DUCTPRESS - This shows that the APU isolation valve is open and the APU operating with no ADP, MES, or ECS demand.
 - 6) IDLE - This shows that the APU isolation valve is closed.
 - 7) APU OFF - This shows that the APU is not running.

SUBTASK 49-70-00-860-005

- (2) APUC MODE (TEST, START-AIR, ONSPEED, COOLDOWN, SHUTDOWN, AUTO S/D, APUC IDLE, START-ELEC)
 - (a) The APUC MODE display shows operating mode of the APU. There are 8 different operating modes for the APU.
 - 1) TEST - This shows when the APU controller is doing its power up/power down tests.
 - 2) START-AIR - This shows when the APU is doing an air turbine start.

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- 3) START-ELEC - This shows when the APU is doing a start with the electric starter motor.
- 4) ONSPEED - This shows when the APU speed is >95% and the APU selector is ON.
- 5) COOLDOWN - This shows when the APU is in the cooldown mode (105 seconds after APU selector goes off).
- 6) SHUTDOWN - This shows when the APU shutdown has been commanded. This shows from the end of cooldown to approximately 12% RPM.
- 7) AUTO S/D - This shows when the APU controller commands a protective shutdown of the APU.
- 8) APUC IDLE - This shows when the APU controller is powered and the APU is not operating or starting.

SUBTASK 49-70-00-860-006

(3) SPEED SENSOR 1

- (a) This display shows the speed of the APU in percent RPM. The SPEED SENSOR 1 data is from speed sensor 1 (39044 RPM = 100%).

SUBTASK 49-70-00-860-007

(4) SPEED SENSOR 2

- (a) This display shows the speed of the APU in percent RPM.
- (b) The SPEED SENSOR 2 data is from speed sensor 2 (39044 RPM = 100%).

SUBTASK 49-70-00-860-008

(5) EGT CORRECTED

- (a) With the APU running, the EGT display shows the temperature at the EGT thermocouples corrected to standard sea level conditions (°C).
- (b) With the APU not running, the EGT display shows the temperature at the EGT thermocouples in °C.
- (c) There are 2 EGT rakes on the APU. This display shows the higher temperature of the 2 rakes.

SUBTASK 49-70-00-860-009

(6) EGT THERMOCOUPLE 1

- (a) This display shows the exhaust gas temperature (uncorrected) data for the EGT 1 rake. This display is in degrees Celsius.

SUBTASK 49-70-00-860-010

(7) EGT THERMOCOUPLE 2

- (a) This display shows the exhaust gas temperature (uncorrected) data for the EGT 2 rake. This display is in degrees Celsius.

SUBTASK 49-70-00-860-011

(8) OIL PRESS

- (a) This display shows the APU oil pressure in Psig at the lube cluster. The APU oil pressure is read from the oil pressure sensor.

SUBTASK 49-70-00-860-012

(9) OIL TEMP

- (a) This display shows the APU oil temperature in degrees Celsius at the lube cluster. The APU oil temperature is read from the oil temperature sensor.

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SUBTASK 49-70-00-860-013

(10) OIL QTY

- (a) This display shows the APU oil quantity (quarts or liters) in the APU gearbox. The APU oil quantity is read from the oil quantity/temperature sensor (Full = 7.5 quarts or 7.1 liters). If oil quantity is less than 3.8 quarts (3.6 liters), LO will be displayed next to oil quantity.

SUBTASK 49-70-00-860-014

(11) INLET STATIC PRESS

- (a) This display shows the static pressure at the APU inlet plenum. The units for the INLET STATIC PRESS display are psia.

SUBTASK 49-70-00-860-015

(12) LOAD COMP TOTAL PRESS

- (a) This display shows the total pressure of the bleed air at the exit of the load compressor. The total pressure is read from the total pressure sensor. The units for the LOAD COMP TOTAL PRESS display are psia.

SUBTASK 49-70-00-860-016

(13) LOAD COMP DIFF PRESS

- (a) This display shows the differential pressure of the bleed at the exit of the load compressor. The APU controller uses differential pressure to calculate air flow. The differential pressure is read from the differential pressure sensor. The units for the LOAD COMP DIFF PRESS are psia.

SUBTASK 49-70-00-860-017

(14) COMP INLET TEMP

- (a) This display shows the temperature in the inlet plenum in degrees Celsius. The temperature in the inlet plenum is read from the inlet temperature sensor.

SUBTASK 49-70-00-860-018

(15) OIL SUMP TEMP

- (a) This display shows the temperature of the oil in the APU gearbox in degrees Celsius. The temperature in the APU gearbox is read from the oil quantity/temperature sensor.

SUBTASK 49-70-00-860-019

(16) SURGE CONTROL VLV POSN

- (a) This display shows the position of the surge control valve. The units for this display is degrees. The surge control valve is fully closed when the display shows 90 and is fully open when the display shows 10.

SUBTASK 49-70-00-860-020

(17) IGV ACTUATOR POSN

- (a) This display shows the position of the inlet guide vane actuator. The units for this display is degrees. The IGV actuator is fully closed when the display shows 76 and is fully open when the display shows -10.

SUBTASK 49-70-00-860-021

(18) FMU FUEL TEMP

- (a) This display shows the fuel temperature in degrees Celsius at the fuel metering unit. The Fuel metering unit is part of the fuel cluster. This temperature is read from the fuel temperature sensor.

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SUBTASK 49-70-00-860-022

(19) FUEL CLUSTER FMV POS

- (a) This display shows the position of the fuel metering valve (FMV). The units for this display is percent. The FMV is fully closed when the display shows 0 and is fully open when the display shows 100.

SUBTASK 49-70-00-860-023

(20) APU DOOR COMMAND (OPEN or CLOSED)

- (a) This display shows the commanded position of the APU air inlet door. The APU inlet door is commanded by ELMS.

SUBTASK 49-70-00-860-024

(21) APU DOOR POSITION

- (a) This display shows the actual position of the APU air inlet door. The APU air inlet door position is read by the APUC from the inlet door position switch.

SUBTASK 49-70-00-860-025

(22) BLD CORRECTED FLOW

- (a) This display shows the corrected mass flow of the APU bleed air output of the load compressor. The units for this display are pounds per minute. The mass flow of the APU bleed air is calculated by the APU controller.

SUBTASK 49-70-00-860-026

(23) BLD CORRECTED FLOW SET

- (a) This display shows the corrected mass flow of the APU bleed air output of the load compressor, commanded by the APU controller. The APU Surge Valve will be opened whenever Bleed Corrected Flow is less than or equal to Bleed Corrected Flow Setpoint. The units for this display is pounds per minute.

SUBTASK 49-70-00-860-027

(24) APU BAT DC-V

- (a) This display shows the voltage of the APU battery reported by ELMS.

SUBTASK 49-70-00-860-028

(25) APU BAT DC-A

- (a) This display shows the amperage of the APU battery reported by ELMS. If the APU battery is discharging, "DIS" will show before the number. If the APU battery is charging, "CHG" will show before the number.

SUBTASK 49-70-00-860-029

(26) APU GEN AC-V

- (a) This display shows the voltage output of the APU generator reported by the APU GCU.

SUBTASK 49-70-00-860-030

(27) APU GEN FREQ

- (a) This display shows the frequency of the APU generator reported by the APU GCU. The units for this display is Hz.

SUBTASK 49-70-00-860-031

(28) APU GEN LOAD

- (a) This display shows the APU generator load in percent of the maximum load reported by the APU GCU. The maximum APU generator load is 120 KVA.

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SUBTASK 49-70-00-860-032

(29) APU OPER HOURS

- (a) This display shows the total number of hours the installed APU has operated. These hours includes hours the installed APU has had on other airplanes.

SUBTASK 49-70-00-860-033

(30) APU STARTS

- (a) This display shows the total number of starts for the APU installed. These starts includes starts the installed APU has had on other airplanes.

D. APU FUEL FEED

SUBTASK 49-70-00-860-034

(1) S/O VLV COMMAND (OPEN or CLOSED)

- (a) This display shows the commanded position of the APU fuel shutoff valve reported by ELMS.

SUBTASK 49-70-00-860-035

(2) S/O VLV STATUS (OPEN or CLOSED)

- (a) This display shows the actual position of the APU fuel shutoff valve reported by ELMS.

SUBTASK 49-70-00-860-036

(3) DC PUMP COMMAND (ON or OFF)

- (a) This display shows the commanded status of the DC fuel pump reported by ELMS.

SUBTASK 49-70-00-860-037

(4) DC PUMP STATUS (PRESS or NO PRESS)

- (a) This display shows the actual status of the DC fuel pump reported by ELMS. If this display shows PRESS, then the DC boost pump is supplying fuel pressure to the APU. If this display shows NO PRESS, then the DC boost pump is not supplying fuel pressure the APU.

SUBTASK 49-70-00-860-038

(5) AC PUMP COMMAND (ON or OFF)

- (a) This display shows the commanded status of the AC fuel pump reported by ELMS.

SUBTASK 49-70-00-860-039

(6) AC PUMP STATUS (PRESS or NO PRESS)

- (a) This display shows the actual status of the AC fuel pump reported by ELMS. If this display shows PRESS, then the AC boost pump is supplying fuel pressure to the APU. If this display shows NO PRESS, then the AC boost pump is not supplying fuel pressure the APU.

E. STATUS CODE (View C)

(Figure 201)

SUBTASK 49-70-00-860-040

- (1) The purpose of the STATUS CODEs is to display information about the APU system in a compact form. There are 3 status fields and 8 discretes for each field. If a discrete shows "1", then a discrete from the APU controller is set. If a discrete shows "0", then the discrete has not been set. The discretes are independent of each other. If a discrete is not used, that field will show a dash "-".

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SUBTASK 49-70-00-860-041

(2) STATUS 1

- (a) If Discrete 1 shows "1", then ELMS is transmitting the aircraft ready signal. The aircraft ready signal means that the APU selector on the P5 overhead panel has been selected to the start position within the last 15 seconds.

NOTE: 0 = Normal for IDLE, TEST, ONSPEED, COOLDOWN, SHUTDOWN, AUTO S/D.
1 = Normal for START-AIR, START-ELEC.

- (b) If Discrete 2 shows "1", then the APU controller has set a partial failure bit. A partial failure means that there was a failure of an LRU on the APU or a partial failure of the APU controller.

NOTE: 0 = Normal for all modes.

- (c) If Discrete 3 shows "1", then the APU controller has set an incomplete data bit. An incomplete data flag means that not all of the parameters are available to the APU controller. Incomplete data does not mean that there is a failure in the APU system. For example, if the APU controller has power and the APU is not operating, this discrete will show due to inability to calculate Bleed Corrected Flow.

NOTE: 0 = Normal for ONSPEED, COOLDOWN, SHUTDOWN, AUTO S/D.
1 = Normal for IDLE, TEST, START-AIR, START-ELEC.

- (d) Discrete 4 is not used.

- (e) If discrete 5 shows "1", then the APU controller has set a shock mode bit. The shock mode flag means that the APU is operating at the maximum fuel schedule and will decrease bleed output in order to continue providing required electrical load.

NOTE: 0 = Normal for all modes.

- (f) If discrete 6 shows "1", then the APU controller has requested the airplane to open the APU bleed valve. The APU controller will make this request in order to do an air turbine start attempt.

NOTE: 0 = Normal for all modes except START-AIR.
1 = Normal for START-AIR.

- (g) Discrete 7 is not used.

- (h) If discrete 8 shows "1", then an alternate value from the aircraft air data is being used for APU Inlet Static Pressure.

NOTE: 0 or 1 = Normal for all modes.

SUBTASK 49-70-00-860-042

(3) Status 2

- (a) If discrete 1 shows "1", then the APU controller is in the attended mode. The APU is in the attended mode when the airplane is in the air or the airplane is on the ground with a main engine operating or starting.

NOTE: 0 or 1 = Normal for all modes.

- (b) If discrete 2 shows "1", then the APU Controller is receiving the Aircraft Ready Signal.

NOTE: 0 = Normal for IDLE, TEST, COOLDOWN, SHUTDOWN, AUTO S/D.
1 = Normal for START-AIR, START-ELEC, ONSPEED.

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- (c) If discrete 3 shows "1", then the APU selector on the P5 overhead panel is in the START position.

NOTE: 0 = Normal for all modes.

- (d) If discrete 4 shows "1", then the APU fire detection system has detected a fire.

NOTE: 0 or 1 = Normal for all modes.

- (e) If discrete 5 shows "1", then the APU Maintenance Switch on the P61 panel is in the TEST position.

NOTE: 0 or 1 = Normal for all modes.

- (f) If discrete 6 shows "1", then the inlet guide vanes are being closed by the APU controller to try to reduce the turbine inlet temperature.

NOTE: 0 = Normal for all modes.

- (g) If discrete 7 shows "1", then the APU controller sees the APU bleed valve is commanded open by the airplane (ASCPC).

NOTE: 0 or 1 = Normal for all modes.

- (h) Discrete 8 is not used.

SUBTASK 49-70-00-860-043

(4) STATUS 3

- (a) If discrete 1 shows "1", then the APU controller has set the EICAS Advisory message, APU SHUTDOWN.

NOTE: 0 = Normal for all modes.

- (b) If discrete 2 shows "1", then the APU controller has set the EICAS Caution message, APU LIMIT.

NOTE: 0 = Normal for all modes.

- (c) If discrete 3 shows "1", then the APU controller has set the EICAS Status message, APU.

NOTE: 0 = Normal for all modes.

- (d) If discrete 4 shows "1", then the APU controller has set the EICAS Status message, APU OIL QTY.

NOTE: 0 = Normal for all modes.

- (e) If discrete 5 shows "1", then the APU controller has set the EICAS Status message, APU CONTROL.

NOTE: 0 = Normal for all modes.

- (f) If discrete 6 shows "1", then the APU controller has set the EICAS Status message, APU AIR STARTER.

NOTE: 0 = Normal for all modes.

- (g) If discrete 7 shows "1", then the APU controller has set the EICAS Status message, APU BLEED AIR.

NOTE: 0 = Normal for all modes.

- (h) If discrete 8 shows "1", then the APU controller has set the EICAS Status message, APU START SYSTEM.

NOTE: 0 = Normal for all modes.

———— **END OF TASK** ————

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EXHAUST GAS TEMPERATURE (EGT) THERMOCOUPLES - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the exhaust gas temperature (EGT) thermocouples.
 - (2) An installation of the exhaust gas temperature (EGT) thermocouples.
- B. There are 2 exhaust gas temperature (EGT) rakes with 2 EGT probes on each rake. The EGT probes are located on the aft end of the APU next to the fuel manifolds. For this procedure, the exhaust gas temperature thermocouple probes are referred to as the EGT thermocouples.

TASK 49-71-01-000-801

2. Exhaust Gas Temperature (EGT) Thermocouple Removal

(Figure 401)

A. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

D. Prepare for the Removal

SUBTASK 49-71-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-71-01-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-71-01-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)
Open the access doors that follow:

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left

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(Continued)

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

316AR	Auxiliary Power Unit (APU) Access Door, Right

E. EGT Thermocouple Removal

SUBTASK 49-71-01-020-001

- (1) Do the steps that follow to remove the EGT thermocouples [1]:
 - (a) Remove the nut [4], nut [5] that attach the EGT leads [3] to the EGT thermocouples [1].
 - (b) Remove the EGT leads [3].
 - (c) Loosen the bolts [2].
 - (d) Turn the EGT thermocouples [1] counterclockwise until the flanges disengage the studs.
 - (e) Remove the EGT thermocouples [1].
 - (f) Make sure you install all necessary protection covers.

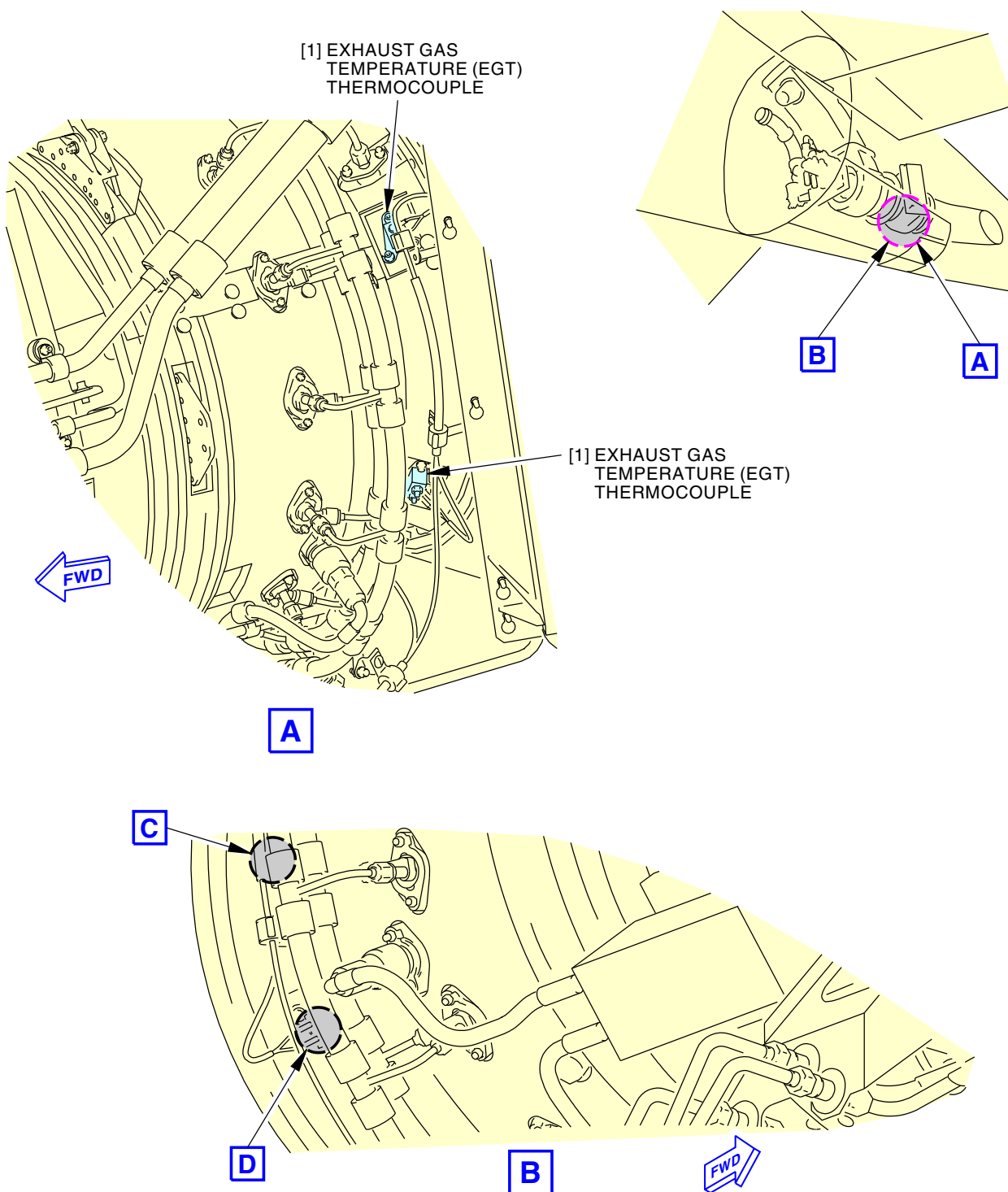
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**APU EGT Thermocouple Probes Installation
Figure 401/49-71-01-990-801 (Sheet 1 of 2)**

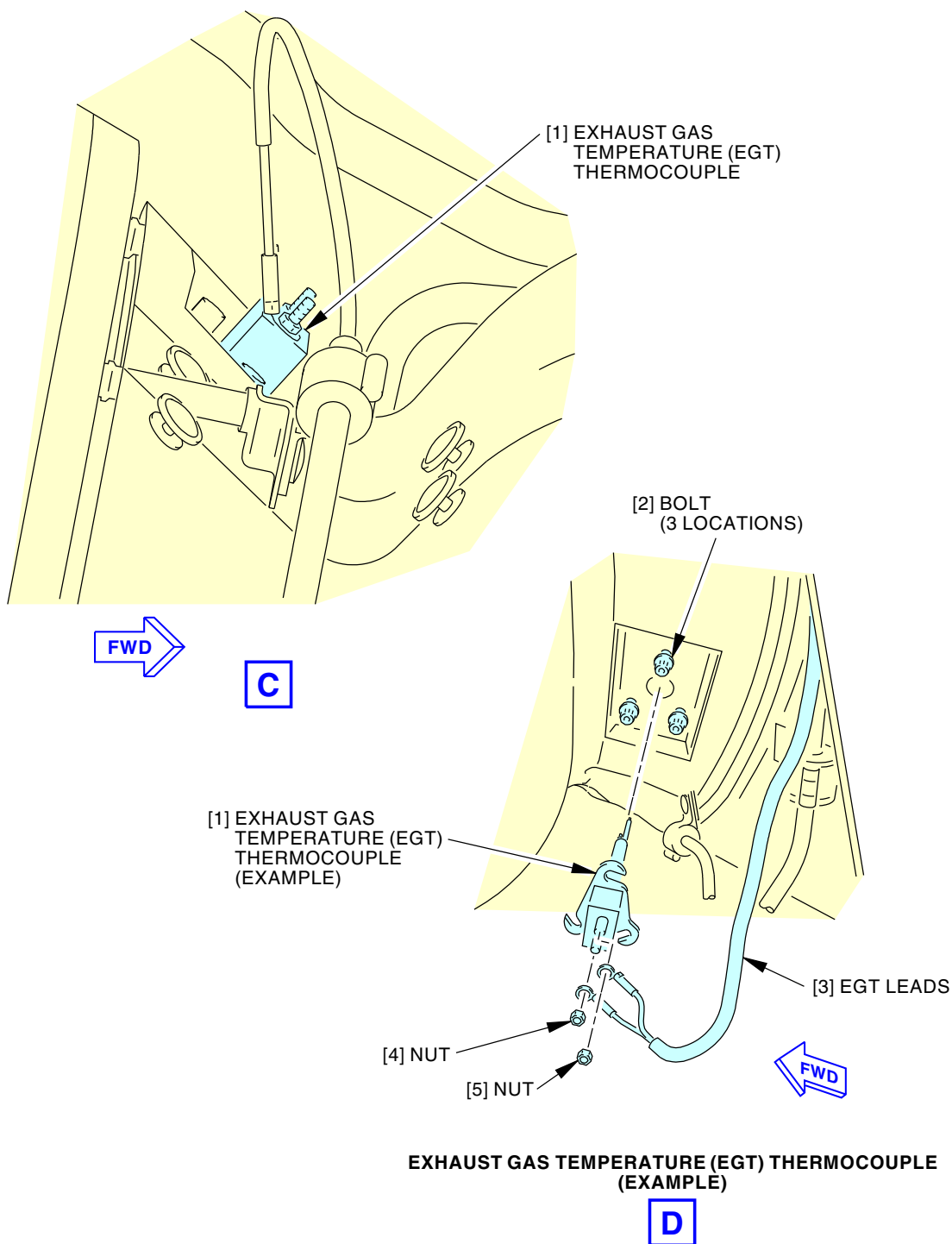
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APU EGT Thermocouple Probes Installation
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TASK 49-71-01-400-801

3. Exhaust Gas Temperature (EGT) Thermocouple Installation

(Figure 401)

A. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	BAC5008

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	EGT thermocouple	49-71-01-01-050	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-71-01-420-001

- (1) Do these steps to install the two EGT thermocouples [1]:
 - (a) Apply a thin layer of Never-Seez NSBT compound, D00006 on the threads of the three bolts [2].
 - (b) Install the three bolts [2] in the APU.
 - (c) Install the EGT thermocouple [1] in the APU.
 - (d) Turn the EGT thermocouple [1] clockwise until the flanges fully engage the three bolts [2].
 - (e) Tighten the three bolts [2].
 - (f) Connect the EGT lead [3] to the EGT thermocouple [1].
 - (g) Install the two nuts [4], [5] on the EGT thermocouple [1].
 - 1) Tighten the two nuts [4], [5] to 35 in-lb (4.0 N·m)-40 in-lb (4.5 N·m).

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G. EGT Thermocouple Installation Test

SUBTASK 49-71-01-860-003

- (1) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-71-01-860-004

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-71-01-740-001

- (3) Do the installation test for the EGT thermocouples:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the EGT thermocouples, then refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-71-01-410-001

- (1) Close the APU access doors. To close the APU access doors, do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

Close these APU access doors:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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DATA MEMORY MODULE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the data memory module
- (2) An installation of the data memory module.

TASK 49-72-00-000-801

2. Data Memory Module Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The data memory module contains the APU data.

NOTE: Reference Honeywell SB 331-49-8081 (Replacement of Discrepant Data Memory Module (DMM) PN 3876287-1) for detailed information (if applicable).



DO NOT REMOVE THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME. IF YOU REMOVE BOTH THE DATA MEMORY MODULE AND THE APU CONTROLLER AT THE SAME TIME, YOU WILL LOSE THE DATA FOR THE APU.

- (2) If you must remove the data memory module and the APU controller at the same time, do this task. Data Memory Module and APU Controller Replacement, TASK 49-72-00-960-801

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

D. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

E. Prepare for the Removal

SUBTASK 49-72-00-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-72-00-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-72-00-010-001

- (3) Open the APU access doors. (APU Access Doors (Open), TASK 49-11-02-010-801)

Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Data Memory Module Removal

SUBTASK 49-72-00-020-001

- (1) Do the steps that follow to remove the data memory module [1]:
- (a) Disconnect the electrical connector [3].
 - (b) Remove the bolts [2], bolt [5], and washers [4].
 - (c) Remove the data memory module [1].



CAUTION

IF YOU WILL SUBSEQUENTLY USE THE REMOVED DATA MEMORY MODULE ON A DIFFERENT APU, SEND IT TO THE APU MANUFACTURER TO BE CORRECTLY PREPARED.

- (d) Make sure you install all necessary protection covers.

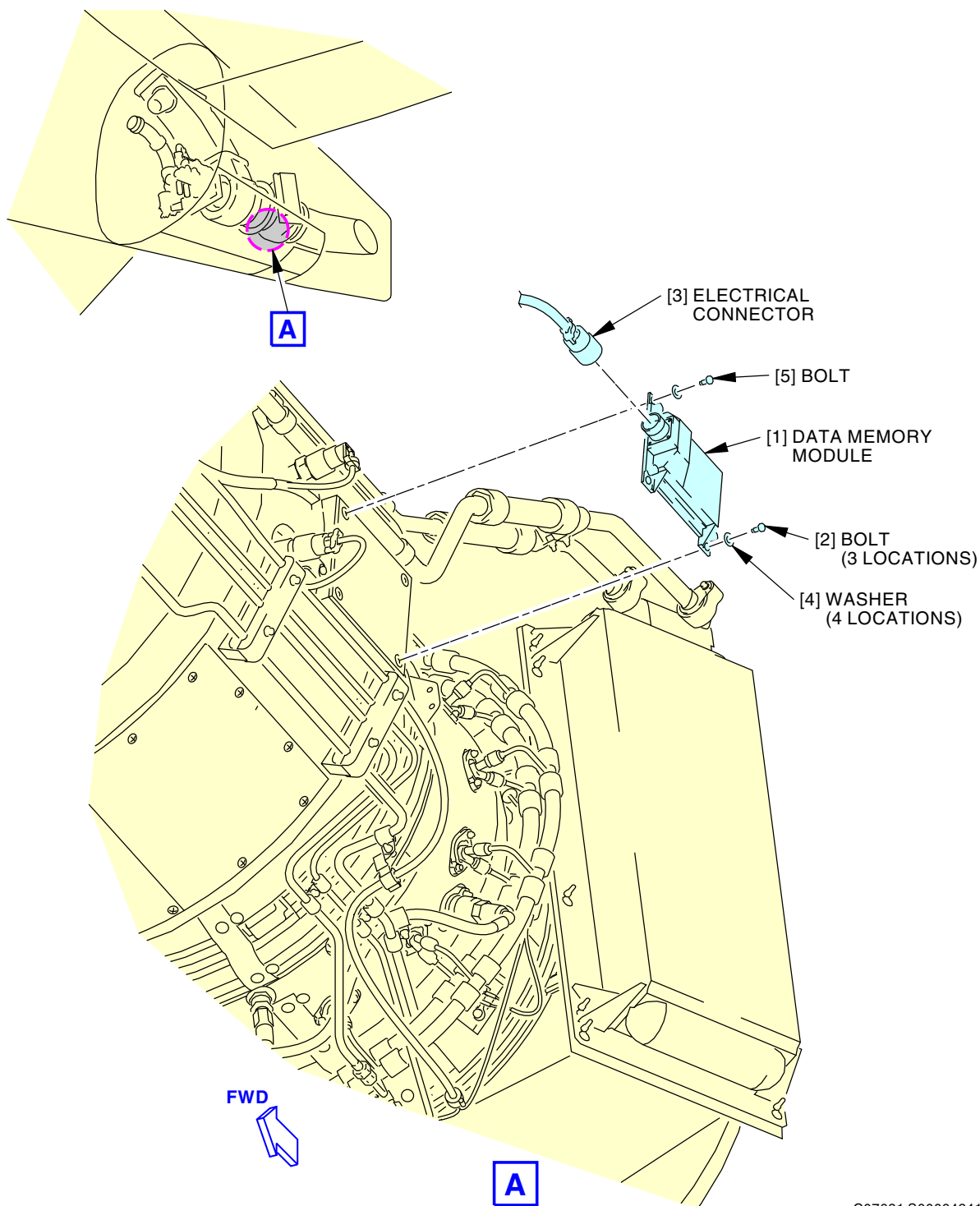
———— **END OF TASK** ————

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Data Memory Module Installation
Figure 401/49-72-00-990-801

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TASK 49-72-00-400-801

3. Data Memory Module Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The data memory module contains the APU data.

NOTE: Reference Honeywell SB 331-49-8081 (Replacement of Discrepant Data Memory Module (DMM) PN 3876287-1) for detailed information (if applicable).

B. References

Reference	Title
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Data memory module	49-72-01-01-060	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Data Memory Module Installation

SUBTASK 49-72-00-420-001



YOU MUST USE A NEW DATA MEMORY MODULE AND NOT A DATA MEMORY MODULE FROM A DIFFERENT APU. IF YOU DO NOT USE A NEW DATA MEMORY MODULE, LOSS OF DATA OR INCORRECT DATA CAN OCCUR. A REPLACED DATA MEMORY MODULE REMOVED FROM AN APU MUST BE SENT TO THE APU MANUFACTURER TO BE CORRECTLY PREPARED FOR INSTALLATION ON A DIFFERENT APU.

- (1) Do the steps that follow to install the data memory module [1]:
- (a) Install the data memory module [1].
 - (b) Install the bolts [2], bolt [5], and washers [4].
 - 1) Tighten the bolts [2], bolt [5].
 - (c) Remove the cap from the electrical connector [3].
 - (d) Connect the electrical connector [3].

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G. Data Memory Module Installation Test

SUBTASK 49-72-00-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-72-00-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-72-00-740-001

- (3) Do the steps that follow to do the installation test for the data memory module (DMM).
- (a) Move the APU maintenance switch on the APU/EEC maintenance panel, P61, to the TEST position.
 - (b) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (c) If a maintenance message shows for the data memory module, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (d) Move the APU maintenance switch to the NORM position.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-72-00-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

TASK 49-72-00-960-801

4. Data Memory Module and APU Controller Replacement

A. References

<u>Reference</u>	<u>Title</u>
49-61-05-000-801	APU Controller (APUC) Removal (P/B 201)
49-61-05-400-801	APU Controller (APUC) Installation (P/B 201)
49-61-05-960-801	Data Memory Module and APU Controller Replacement (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
264	Area Above Passenger Compartment Ceiling, Right - Section 47
315	APU Compartment, Left

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Zone	Area

316	APU Compartment, Right

C. Procedure

SUBTASK 49-72-00-960-001

- (1) Do the steps that follow to replace the data memory module and the APU controller:
 - (a) Do this task: APU Controller (APUC) Removal, TASK 49-61-05-000-801.
 - (b) Do this task: APU Controller (APUC) Installation, TASK 49-61-05-400-801.
 - (c) Do this task: Data Memory Module and APU Controller Replacement, TASK 49-61-05-960-801.



YOU MUST DO THE APU CONTROLLER INSTALLATION TEST BEFORE YOU REMOVE THE DATA MEMORY MODULE. IF YOU DO NOT DO THE INSTALLATION TEST FOR THE APU CONTROLLER BEFORE YOU REMOVE THE DATA MEMORY MODULE, YOU WILL LOSE THE DATA FOR THE APU.

- (d) Do this task: Data Memory Module Removal, TASK 49-72-00-000-801.
- (e) Do this task: Data Memory Module Installation, TASK 49-72-00-400-801.

————— **END OF TASK** —————

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APU EXHAUST DUCT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU exhaust duct
- (2) An installation of the APU exhaust duct.

TASK 49-81-01-000-801

2. APU Exhaust Duct Removal

(Figure 401)

A. General

- (1) The exhaust duct with the muffler weighs approximately 63 pounds. The exhaust duct with the muffler attached to the exhaust duct panel weighs approximately 93 pounds.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-81-02-000-801	APU Exhaust Duct Insulation Blanket Removal (P/B 401)
49-81-02-400-801	APU Exhaust Duct Insulation Blanket Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: \$0855 Part #: 234350 Supplier: \$0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: \$0856 Part #: DFD5019 Supplier: \$0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: \$0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

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F. Prepare for the Removal

SUBTASK 49-81-01-860-001

- (1) Make sure the APU selector on the P5 overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-81-01-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-81-01-010-001

- (3) Open the APU access doors. APU Access Doors (Open), TASK 49-11-02-010-801
Open the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. APU Exhaust Duct Removal

SUBTASK 49-81-01-020-001



BE CAREFUL WHEN YOU MOVE THE EXHAUST DUCT AND THE EXHAUST DUCT PANEL. TOGETHER, THE EXHAUST DUCT, THE EXHAUST DUCT PANEL AND THE MUFFLER WEIGH MORE THAN 93 POUNDS (43 KG). INJURIES TO PERSONS CAN OCCUR.



BE CAREFUL WHEN YOU MOVE THE EXHAUST DUCT. THE EXHAUST DUCT BLANKET CAN BE EASILY DAMAGED.

- (1) Do the steps that follow to remove the exhaust duct [3]:
 - (a) If the APU is installed, do the steps that follow:
 - 1) Remove the exhaust duct clamp [2] that attaches the exhaust duct [3] to the APU [1].
 - 2) Remove the bolts [4] that attach the exhaust duct panel [5] to the tail cone, View B (Figure 401).
 - 3) Remove the exhaust duct panel [5] and the exhaust duct [3] as an assembly.
 - 4) Set the exhaust duct panel and the exhaust duct on a flat smooth surface.

NOTE: You can easily scratch the exhaust duct panel while you disconnect the exhaust duct.
 - 5) Pull on the exhaust duct [3] to disconnect it from the exhaust duct panel [5].

NOTE: The exhaust duct [3] is attached to the exhaust duct panel [5] with leaf springs.

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- (b) If the APU [1] is removed, pull on the forward end of the exhaust duct [3] to release it from the exhaust duct panel [5].

NOTE: The exhaust duct [3] is attached to the exhaust duct panel [5] with leaf springs.

SUBTASK 49-81-01-150-001

- (2) If you removed the exhaust duct panel; use the sealant removal tool, COM-2481 to remove the sealant from the exhaust duct panel and the airplane structure.

SUBTASK 49-81-01-210-001

- (3) Do the steps that follow to examine the exhaust duct:
- (a) Examine the insulation blanket for holes or burns.
- 1) If the insulation blanket has burns or holes, do this task: APU Exhaust Duct Insulation Blanket Removal, TASK 49-81-02-000-801.
 - 2) Examine the exhaust duct for cracks, holes, burns and broken welds.
 - 3) If the exhaust duct has damage, replace it.
 - 4) Do this task: APU Exhaust Duct Insulation Blanket Installation, TASK 49-81-02-400-801.
- (b) Make sure the lacings for the insulation blanket are not broken.

———— **END OF TASK** ————

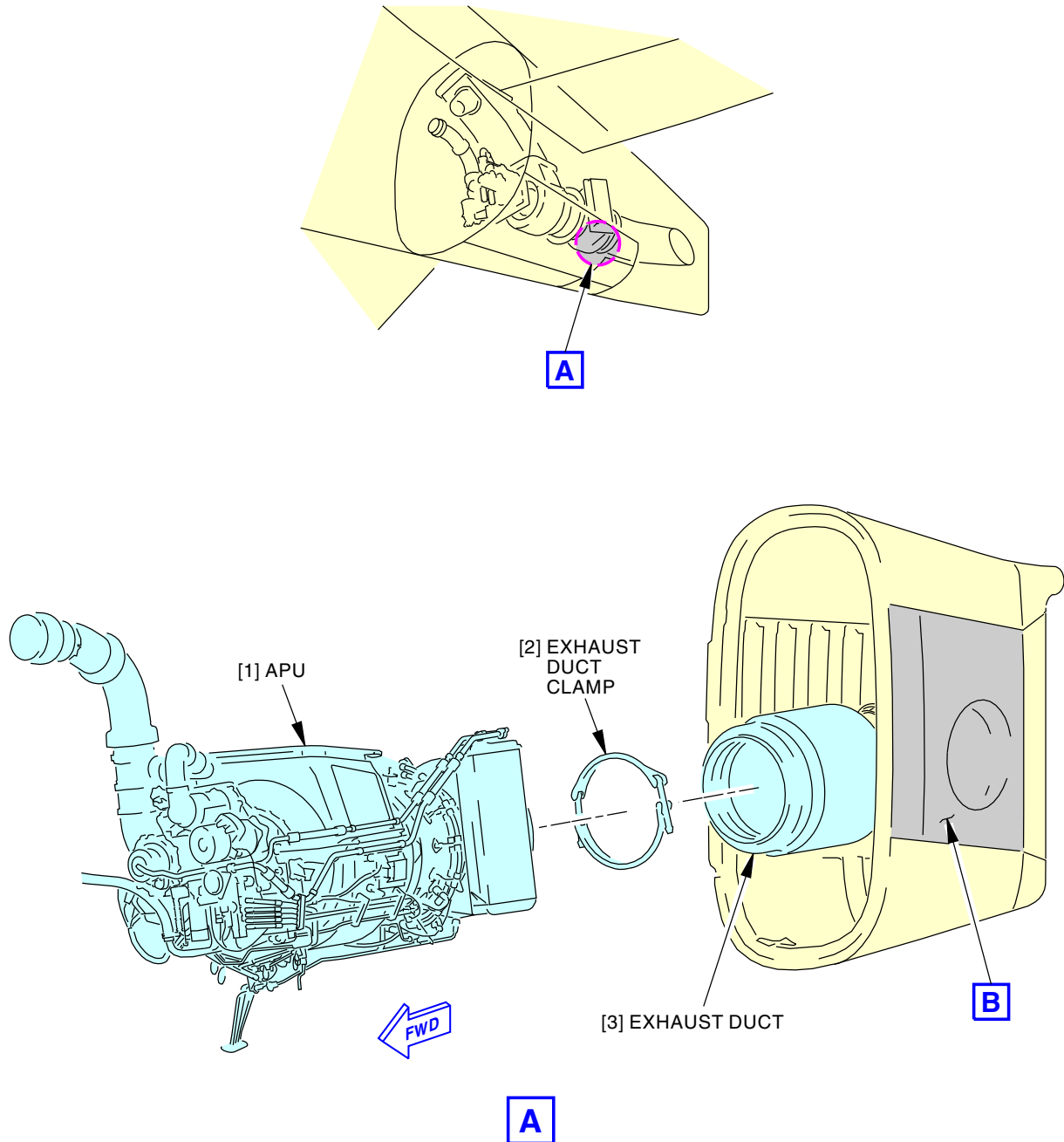
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APU Exhaust Duct Installation
Figure 401/49-81-01-990-802 (Sheet 1 of 2)

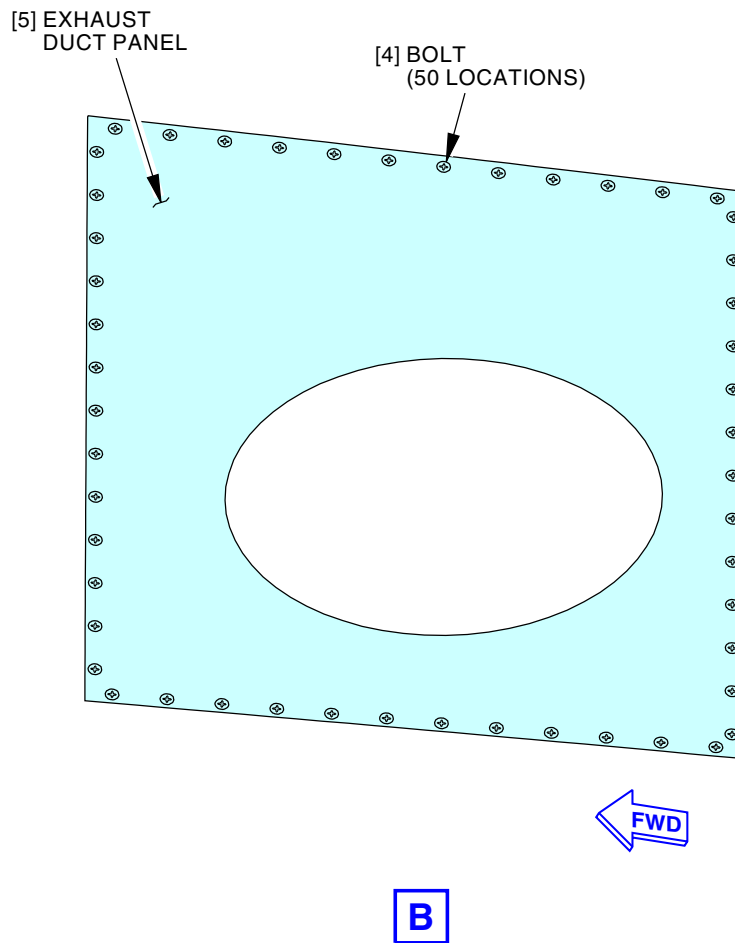
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APU Exhaust Duct Installation
Figure 401/49-81-01-990-802 (Sheet 2 of 2)

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TASK 49-81-01-400-801

3. APU Exhaust Duct Installation

(Figure 401)

A. General

- (1) The exhaust duct with the muffler weighs approximately 63 pounds (28.58 kg). The exhaust duct with the muffler attached to the exhaust duct panel weighs approximately 93 pounds (42.20 kg).

B. References

Reference	Title
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Exhaust duct	49-81-01-02-005	ARO ALL
5	Exhaust duct panel	53-83-51-55-005	ARO ALL
		53-83-51-55-035	ARO 001-003

E. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

F. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

G. APU Exhaust Duct Installation

SUBTASK 49-81-01-390-001

- (1) If the exhaust duct panel is removed, do the steps that follow:
 - (a) Apply a parting agent on the mating surface of the exhaust duct panel [5].
 - (b) After the parting agent is dry, apply the sealant, A00160 on the airplane mating surface.

SUBTASK 49-81-01-420-001



BE CAREFUL WHEN YOU MOVE THE EXHAUST DUCT AND THE EXHAUST DUCT PANEL. TOGETHER, THE EXHAUST DUCT, THE EXHAUST DUCT PANEL AND THE MUFFLER WEIGH MORE THAN 93 POUNDS (43 KG). INJURIES TO PERSONS CAN OCCUR.



BE CAREFUL WHEN YOU MOVE THE EXHAUST DUCT. THE EXHAUST DUCT BLANKET CAN BE EASILY DAMAGED.

- (2) Do the steps that follow to install the exhaust duct [3]:
 - (a) If the APU [1] is installed, do the steps that follow:

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- 1) Connect the exhaust duct [3] to the exhaust duct panel [5].

NOTE: The exhaust duct [3] attaches to the exhaust duct panel [5] with leaf springs.

- 2) Install the exhaust duct [3] and the exhaust duct panel [5] in the tail cone.
- 3) Install the bolts [4] that attach the exhaust duct panel [5] to the tail cone, View B (Figure 401).
- 4) Make sure the sealant is aligned with the airplane skin and the exhaust duct panel.
- 5) Align the exhaust duct [3] with the aft end of the APU [1] and install the exhaust duct clamp [2].

a) Tighten the clamp to 70-90 pound-inches (7.9-10.2 newton-meters)

- (b) If the APU [1] is removed, do the steps that follow:

- 1) Put the aft end of the exhaust duct [3] into its position on the exhaust duct panel [5].
- 2) Push the exhaust duct [3] aft until it clicks into position.

NOTE: The exhaust duct [3] attaches to the exhaust duct panel [5] with leaf springs.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-01-860-003

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-81-01-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-81-01-410-001

- (3) Do this task:

APU Access Doors (Close), TASK 49-11-02-410-801

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— **END OF TASK** —————

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APU EXHAUST DUCT INSULATION BLANKET - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the APU exhaust duct insulation blanket
 - (2) An installation of the APU exhaust duct insulation blanket.
- B. The APU exhaust duct must be removed to get access to the insulation blanket.

TASK 49-81-02-000-801

2. APU Exhaust Duct Insulation Blanket Removal

NOTE: Figure 401.

A. **References**

Reference	Title
49-81-01-000-801	APU Exhaust Duct Removal (P/B 401)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-81-02-010-001

- (1) Remove the APU exhaust duct [1]. To remove it, do this task: APU Exhaust Duct Removal, TASK 49-81-01-000-801.

D. **APU Exhaust Duct Insulation Blanket Removal**

SUBTASK 49-81-02-020-001

 CAUTION	BE CAREFUL WITH THE INSULATION BLANKET. THE BLANKET CAN BE EASILY DAMAGED. DO NOT LET THE BLANKET TOUCH SHARP EDGES. DAMAGE TO THE BLANKET CAN OCCUR.

- (1) Remove the insulation blanket:
 - (a) Remove the lacing [3] (lockwire) from the upper insulation blanket [2], lower insulation blanket [5], and rear insulation blanket [6].
 - (b) Remove the upper insulation blanket [2], lower insulation blanket [5], and rear insulation blanket [6] from the APU exhaust duct [1].

———— **END OF TASK** ————

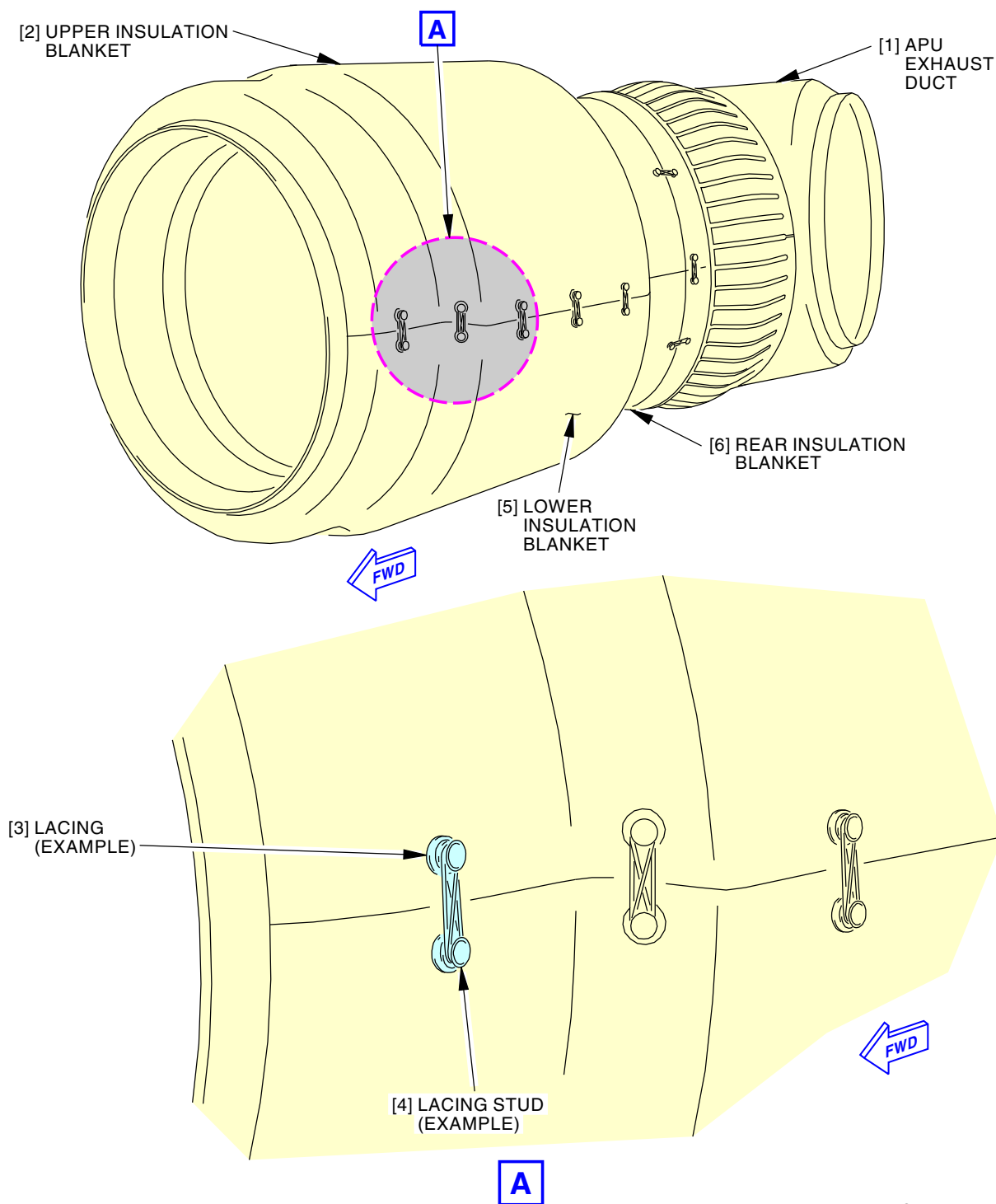
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**APU Exhaust Insulation Blanket Installation
Figure 401/49-81-02-990-802**

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TASK 49-81-02-400-801

3. APU Exhaust Duct Insulation Blanket Installation

NOTE: Figure 401.

A. References

Reference	Title
49-81-01-400-801	APU Exhaust Duct Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	APU exhaust duct	49-81-01-02-005	ARO ALL
2	Upper insulation blanket	49-81-02-01-005	ARO ALL
5	Lower insulation blanket	49-81-02-01-015	ARO ALL
6	Rear insulation blanket	49-81-02-01-010	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. APU Exhaust Duct Insulation Blanket Installation

SUBTASK 49-81-02-420-001



BE CAREFUL WITH THE INSULATION BLANKET. THE BLANKET CAN BE EASILY DAMAGED. DO NOT LET THE BLANKET TOUCH SHARP EDGES. DAMAGE TO THE BLANKET CAN OCCUR.

(1) Install the insulation blanket:

- (a) Put the upper insulation blanket [2], lower insulation blanket [5], and rear insulation blanket [6] in its position on the APU exhaust duct [1].
 - 1) Make sure you align the lacing studs [4] along the duct.



DO NOT USE THE LACINGS TO MOVE THE ENDS OF THE INSULATION BLANKET TOGETHER. DO NOT TIGHTEN THE LACINGS TOO MUCH. DAMAGE TO THE INSULATION BLANKET AND THE LACING STUDS CAN OCCUR.

- (b) While one person holds the upper insulation blanket [2], lower insulation blanket [5], and rear insulation blanket [6] together, install the lacings [3] (lockwire).

NOTE: You can use these types of lockwire:

0.041 inch diameter corrosion resistant steel lockwire, G01505 or,
0.032 inch inconel lockwire, G01505 or,
0.040 inch inconel lockwire, G01505.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-02-410-001

- (1) Install the APU exhaust duct [1]. To install it, do this task: APU Exhaust Duct Installation, TASK 49-81-01-400-801.

————— **END OF TASK** —————

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OIL QUANTITY/SUMP TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the oil quantity/sump temperature sensor
- (2) An installation of the oil quantity/sump temperature sensor.

B. For this procedure, the oil quantity/sump temperature sensor is referred to as the oil quantity sensor.

TASK 49-94-01-000-801

2. Oil Quantity/Sump Temperature Sensor Removal

(Figure 401)

A. **References**

Reference	Title
12-22-05-610-801	Drain the APU Oil (P/B 301)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-94-01-630-001

- (1) Drain the oil from the APU. To drain the oil, do this task: Drain the APU Oil, TASK 12-22-05-610-801.

D. **Oil Quantity/Sump Temperature Sensor Removal**

SUBTASK 49-94-01-020-001

- (1) Do the steps that follow to remove the oil quantity sensor [1]:
 - (a) Disconnect the electrical connector [3] from the oil quantity sensor [1].
 - (b) Loosen the nuts [2].
 - (c) Turn the oil quantity sensor counterclockwise to disengage the studs.



CAUTION

BE CAREFUL WHEN YOU REMOVE THE OIL QUANTITY/SUMP SENSOR FROM THE GEARBOX. THE END OF OIL QUANTITY/SUMP TEMPERATURE SENSOR CAN CATCH ON THE BOSS AND BECOME DAMAGED.

- (d) Remove the oil quantity sensor [1].
- (e) Remove the packing [4] from the oil quantity sensor [1].
- (f) Make sure you install all necessary protection covers.

———— **END OF TASK** ————

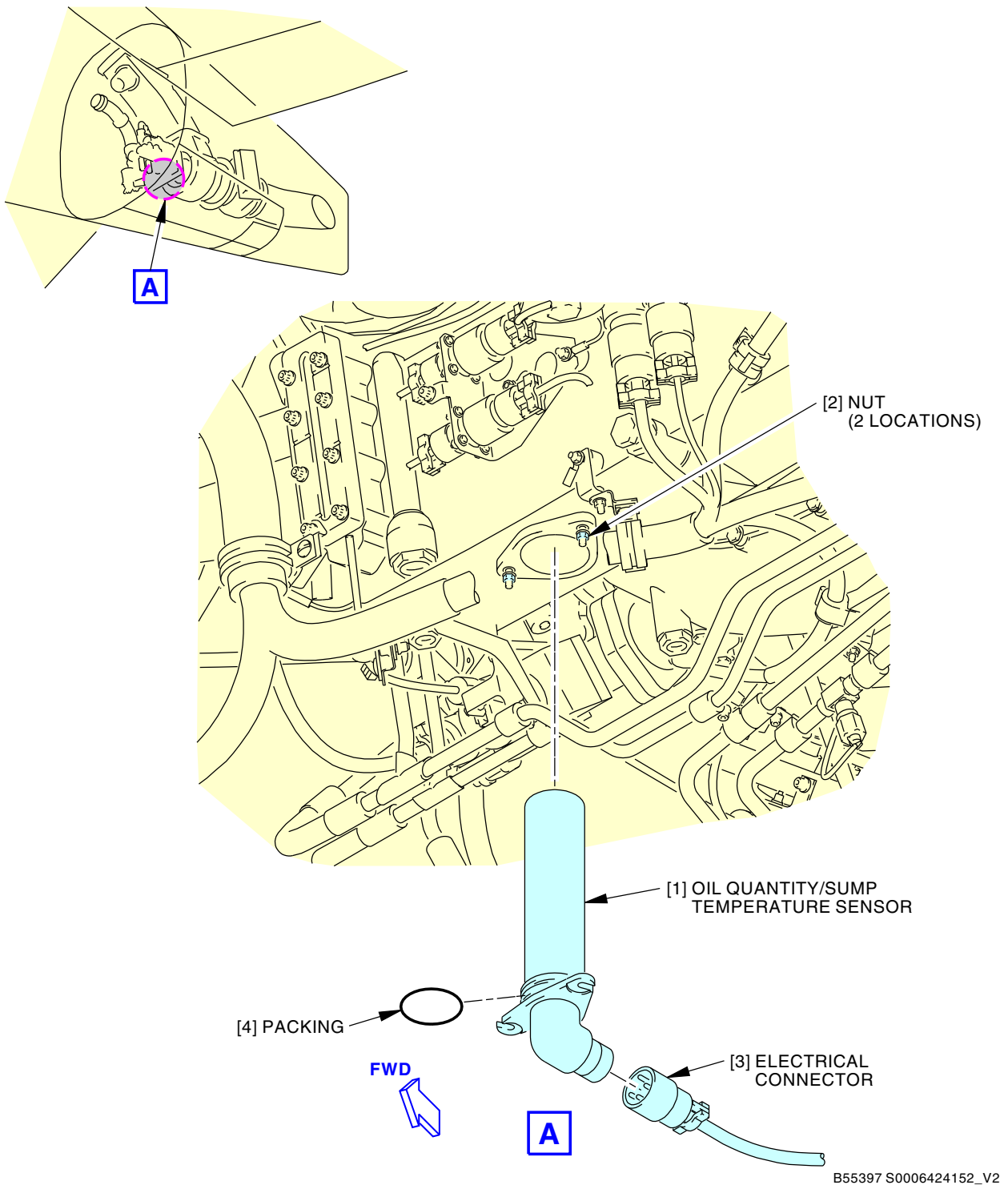
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Oil Quantity/Sump Temperature Sensor Installation
Figure 401/49-94-01-990-801

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TASK 49-94-01-400-801

3. Oil Quantity/Sump Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
12-22-05-600-801	Fill the APU with Oil (P/B 301)
49-11-00-740-801	APU Bite Test (P/B 501)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil quantity sensor	49-94-01-01-050	ARO ALL
4	Packing	49-94-01-01-065	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Oil Quantity/Sump Temperature Sensor Installation



CAUTION REMOVE THE PROTECTION COVERS FROM THE OPENINGS AS NECESSARY. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

SUBTASK 49-94-01-420-001

- (1) Do the steps that follow to install the oil quantity sensor [1]:
 - (a) Lubricate the new packing [4] with Mobil Jet Oil II, D00520.
 - (b) Install the packing [4] on the oil quantity sensor [1].
 - (c) Install the oil quantity sensor [1] in the gearbox.
 - (d) Turn the oil quantity sensor [1] clockwise until the flange fully engages the studs on the gearbox.
 - (e) Tighten the nuts [2].
 - (f) Connect the electrical connector [3] to the oil quantity sensor [1].

SUBTASK 49-94-01-610-001

- (2) Fill the APU with oil. To fill it, do this task: Fill the APU with Oil, TASK 12-22-05-600-801.

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G. Oil Quantity/Sump Temperature Sensor Installation Test

SUBTASK 49-94-01-860-001

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C49602	APUC 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

SUBTASK 49-94-01-860-002

- (2) Remove the DO-NOT-OPERATE tag from the APU selector on the P5 overhead panel.

SUBTASK 49-94-01-790-001

- (3) Do the steps that follow to do the installation test for the oil quantity/sump temperature sensor:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Make sure there is no leakage around the oil quantity/sump temperature sensor.
 - (c) Do this task: APU Bite Test, TASK 49-11-00-740-801.
 - (d) If a maintenance message shows for the oil quantity/sump temperature sensor, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-01-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

————— END OF TASK —————

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OIL LEVEL SIGHT GAGE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the oil level sight gage
 - (2) An installation of the oil level sight gage.
- B. For this procedure, the oil level sight gage is referred to as the sight gage.
- C. To remove the sight gage you must drain the APU oil.

TASK 49-94-05-000-801

2. Oil Level Sight Gage Removal

(Figure 401)

A. **References**

Reference	Title
12-22-05-610-801	Drain the APU Oil (P/B 301)

B. **Location Zones**

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

C. **Prepare for the Removal**

SUBTASK 49-94-05-610-001

- (1) Drain the APU oil. To drain it, do this task: Drain the APU Oil, TASK 12-22-05-610-801.

D. **Oil Level Sight Gage Removal**

SUBTASK 49-94-05-020-001

- (1) Do the steps that follow to remove the sight gage:
- (a) Remove the bolt [9] that holds the clamp [8] to the sight gage.
 - (b) Remove the 7 bolts [6] and the 7 washers [5] that hold the sight gage to the oil fill housing [7].
 - (c) Remove the sight gage cover [4].
 - (d) Remove the bumper [3].
 - (e) Remove the sight glass [2].
 - (f) Remove the packing [1].
 - 1) Discard the packing [1].

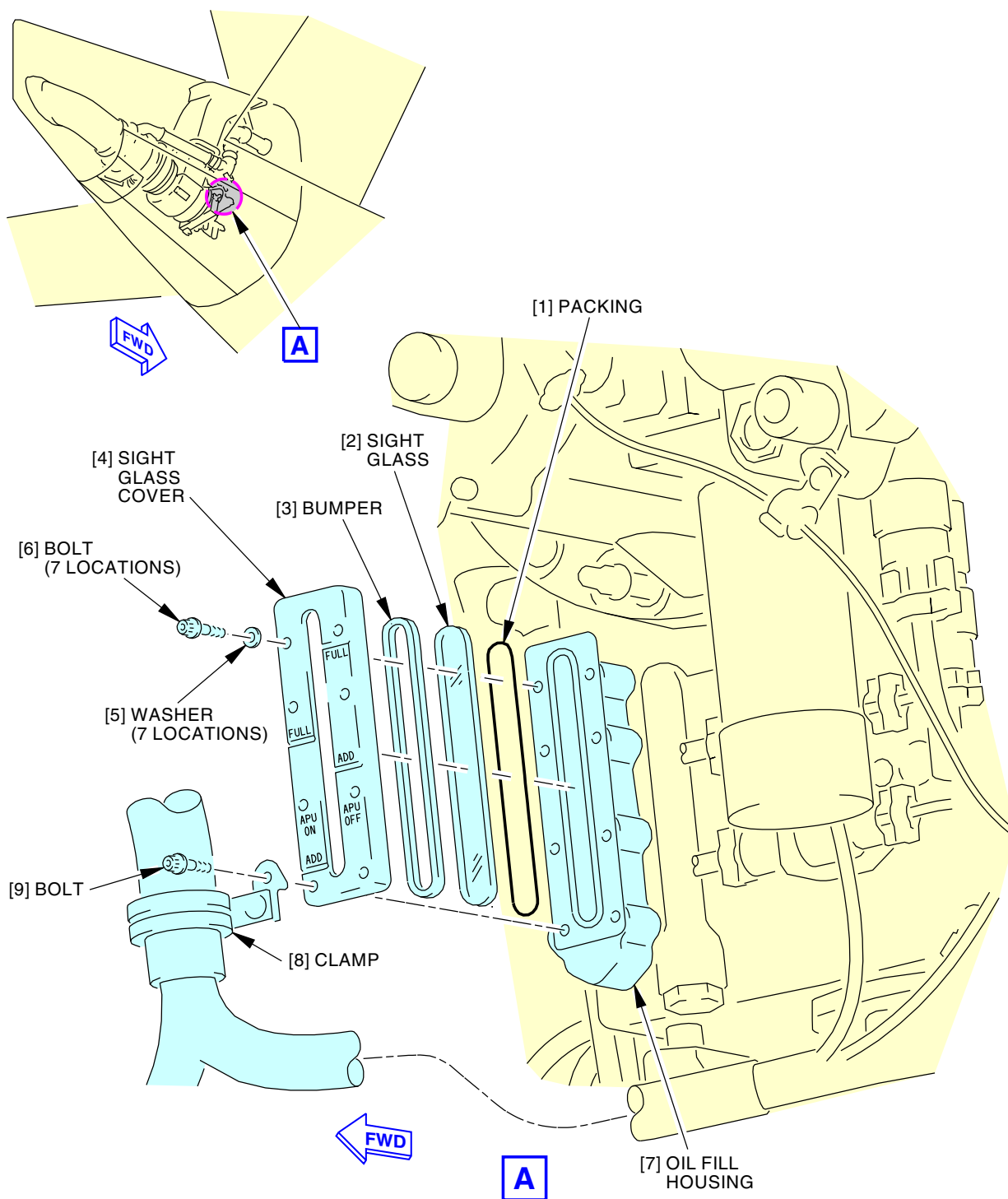
————— **END OF TASK** —————

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**Oil Level Sight Gage Installation
Figure 401/49-94-05-990-801**

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TASK 49-94-05-400-801

3. Oil Level Sight Gage Installation

(Figure 401)

A. References

Reference	Title
12-22-05-600-801	Fill the APU with Oil (P/B 301)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-94-01-01-115	ARO ALL
2	Sight glass	49-94-01-01-105	ARO ALL
3	Bumper	49-94-01-01-095	ARO ALL
4	Sight gage cover	49-94-01-01-090	ARO ALL

D. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right

E. Access Panels

Number	Name/Location
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

F. Procedure

SUBTASK 49-94-05-420-001

(1) Do the steps that follow to install the sight gage:

- (a) Lubricate the new packing [1] with Mobil Jet Oil II, D00520.
- (b) Put the packing [1], the sight glass [2], the bumper [3] and the sight gage cover [4] on the oil fill housing [7].
- (c) Install the 7 washers [5], and the 7 bolts [6] that hold the sight gage to the oil fill housing [7].
 - 1) Tighten the bolts [6].
- (d) Install the bolt [9] that holds the clamp [8] to the sight gage.

SUBTASK 49-94-05-610-002

(2) Fill the APU with oil. To fill it, do this task: Fill the APU with Oil, TASK 12-22-05-600-801.

G. Oil Level Sight Gage Installation Test

SUBTASK 49-94-05-790-001

(1) Do the steps that follow to do the installation test for the oil level sight gage:

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- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- (b) Make sure there is no oil leakage around the sight gage.
- (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-05-410-001

- (1) Close the APU access doors. (APU Access Doors (Close), TASK 49-11-02-410-801)

Close the access doors that follow:

<u>Number</u>	<u>Name/Location</u>
315AL	Auxiliary Power Unit (APU) Access Door, Left
316AR	Auxiliary Power Unit (APU) Access Door, Right

———— **END OF TASK** ————

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